

2021-2022

# InsideSargent

Boston University College of Health & Rehabilitation Sciences: Sargent College

## UNLOCKING THE CLUES TO DYSLEXIA

JENNIFER ZUK USES NEUROBIOLOGICAL  
AND ENVIRONMENTAL DATA TO IDENTIFY  
DYSLEXIA EARLIER AND HELP KIDS SOONER



Can big data help  
fight COVID in  
Africa? P 18

Brain imaging  
illuminates how  
infants learn to  
move, P 22

Wearable sensors  
could change how  
knee osteoarthritis  
is treated, P 24



# Contents

2021-2022

Boston University College of Health & Rehabilitation Sciences: Sargent College



## 10 UNLOCKING THE CLUES TO DYSLEXIA

For speech-language pathologist Jennifer Zuk, the goal of earlier identification of learning disabilities is personal



**8 The State of OT**  
Wendy Coster and Tatiana Pontes on the evolution of the occupational therapy field—and how Sargent is guiding it into the future



**14 Back to Health**  
The pandemic fueled a back pain epidemic. Physical therapists Diane Dalton and James Camarinos offer advice on how to ease recovery.



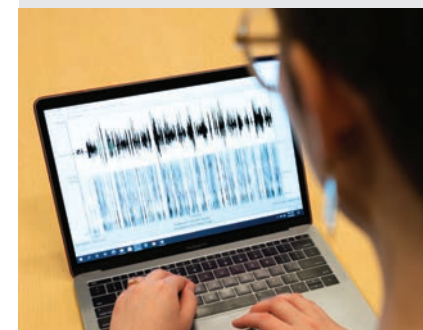
**16 When Research Meets Advocacy**  
Jennifer Kaldenberg works to improve the lives of adults with low vision—and she's doing it with iPad apps



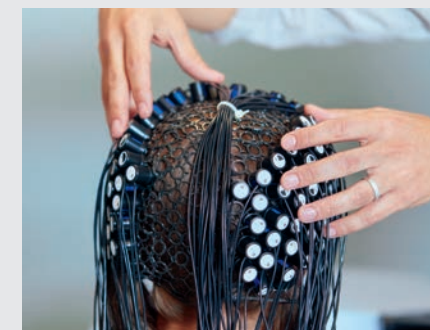
**18 Combating Disease with Big Data**  
Can information sharing overcome health system inequities across Africa in the battle against COVID-19?

KELLY DAVIDSON (10); MICHAEL D. SPENCER (1) AND GOTHAM STUDIOS (R) (8); ISTOCK (14); CHRIS MCINTOSH (16); ISTOCK (18)

MICHAEL D. SPENCER (21); CIARA CROCKER (22); ISTOCK (24); JIMMEL GREENE (26); PATRICK STRATTNER (28)



**21 Trans Men Find Their Voice**  
Noninvasive techniques borrowed from voice therapy may help lower pitch without the need for testosterone treatment



**22 Fine-Tuning Movement**  
Claudio Ferre studies brain activity to illuminate how infants, particularly those with cerebral palsy, learn to control their arms and hands



**24 Measuring Mobility Improvement**  
Deepak Kumar believes wearable sensors could change the future of physical therapy treatments for knee osteoarthritis



**26 A Career of Caring**  
Physical therapist Senora Simpson continues to draw on lessons learned at Sargent—and from racism faced elsewhere



**28 Practical Applications**  
Lynn Safenowitz has found creative occupational therapy solutions to common problems, from bullying to stress

### ALSO IN THIS ISSUE

- 2 Dean's Message
- 3 Snapshots
- 25 My Favorite Sargent Memory
- 30 Faculty in Print
- 32 Why I Give
- 33 Sargent at a Glance

## InsideSARGENT

2021-2022



Follow BU Sargent College on:  
[facebook.com/busargent](https://facebook.com/busargent)  
[instagram.com/busargent](https://instagram.com/busargent)  
[linkedin.com/school/busargent](https://linkedin.com/school/busargent)  
[twitter.com/busargent](https://twitter.com/busargent)  
[youtube.com/busargent](https://youtube.com/busargent)

**Dean**  
Christopher A. Moore, PhD

**Assistant Dean for Development & Alumni Relations**  
Kristina Lentz Capano

**Associate Director of Communications**  
Stephanie Rotondo (COM'18)

**Editor**  
Marc Chaloufour

**Contributors**  
Michael S. Goldberg, Art Jahnke, Louise Kennedy Corrigan, Taylor Mendoza (CAS'18), Stephanie Rotondo (COM'18), Mara Sassoon, Thea Singer, Andrew Thurston, Ting Yu

**Designer**  
Bruno Perosino

Produced by Boston University Marketing & Communications

**About**  
*InsideSARGENT* is a publication of Boston University College of Health & Rehabilitation Sciences: Sargent College. For additional copies or more information about BU Sargent College, contact Kristina Lentz Capano at [klcapano@bu.edu](mailto:klcapano@bu.edu) or 617-358-8141. Visit us at [bu.edu/sargent](https://bu.edu/sargent).

Boston University is an equal opportunity, affirmative action institution.

Printed on FSC-certified paper.  
Please recycle this publication.



## Dean's Message



**“A pioneer in the study of physical training and exercise, our founder was a century ahead of his time in his advocacy for everyone’s right to participate fully in their own lives, regardless of ability, gender, or race.”**

**Dear Friends,**

As we settle into another fall semester, we have even more than usual to be grateful for. After a year full of challenges, Sargent has returned to almost normal operations while continuing to take all prudent precautions to safeguard everyone’s health and safety. Students are back learning in the classrooms, conducting research in the labs, and studying state-of-the-science practices in our clinics. Boston University’s vibrant residential community is thriving.

This year, we commemorate the 140th anniversary of the founding of Sargent College. It’s a particularly fitting moment in history to celebrate Dudley Allen Sargent’s legacy of inclusion and participation for all. A pioneer in the study of physical training and exercise, our founder was a century ahead of his time in his advocacy for everyone’s right to participate fully in their own lives, regardless of ability, gender, or race—and we continue to foster this spirit today.

One way we’ve done this is through our focus on sustained health, maximizing every person’s participation in life by supporting their healthcare objectives. I’m particularly proud of the way this issue of *Inside Sargent* highlights how our award-winning faculty further this commitment. Speech-language pathologist Jennifer Zuk is researching early screening methods for children at risk for dyslexia (page 10), while neuroscientist Claudio Ferre explores how cutting-edge fNIRS technology can help children with cerebral palsy develop and improve their motor skills (page 22). Focused on a different phase of the life span, Jennifer Kaldenberg, an occupational therapist, uses iPads to help adults with low vision complete activities of daily living (page 16). And Deepak Kumar is using wearable sensors to develop improved physical therapy treatments for people with knee osteoarthritis (page 24). You’ll also read about treating low back pain (page 14), helping transgender men adjust their vocal pitch (page 21), and using nutrition as medicine (page 3)—all areas where our faculty’s research and clinical expertise improves quality of life.

Sustaining and maximizing health throughout the life span is certainly a complex challenge. There is a lack of adequate research-based evidence in many areas, which can lead to the persistence of unproven or outdated treatments. Our clinical scientists are seeking new answers to these challenges by mining the enormous reservoir of evidence being amassed in the electronic medical records of patients across the nation. And most disturbing, there is the inequitable distribution of healthcare resources—disparities on which the pandemic shined a painful spotlight. As we continue our efforts to counter the pernicious effects of the pandemic, we must remember that the public health crisis continues in many places where access to vaccines and testing is limited or rejected. Lawrence Were, an assistant professor of health sciences, is working on this problem with colleagues in Africa by creating and implementing data-driven solutions to address inequities in access to vaccinations and treatment (page 18).

Tackling these challenges requires clinicians to work even more closely and effectively across disciplines with updated health policies and systems to support their patients’ ambitions. We’ll continue to lead our disciplines toward achieving these goals and creating a more equitable healthcare system.

Finally, after 18 months of Zoom and online connections, I can’t wait to resume our in-person events, lectures, and meetings at Sargent and across the country, and look forward to seeing you then!

Warmly,

Christopher A. Moore  
Dean and Professor

DAN AGUIRRE

## FOOD AS MEDICINE

IN A TIME OF PANDEMIC AND RISING HEALTHCARE COSTS, AN OLD IDEA IS AS RELEVANT AS EVER

**THE USE OF FOOD AS MEDICINE ISN’T NEW. GENERAL NUTRITION AND SPECIFIC foods** have been used to manage health for centuries. Diet can prevent, or help to manage, chronic conditions. So why aren’t doctors prescribing vegetables? Stacey Zawacki, a clinical assistant professor of nutrition and director of the BU Sargent Choice Nutrition Center, spoke with *Inside Sargent* about the necessity of applying this old concept to modern society—and the barriers preventing us from doing so.

**The idea of food as medicine dates back centuries—what makes it relevant in 2021?**

Healthcare costs continue to rise and a lot of very expensive conditions like heart disease, type 2 diabetes, some cancers, and stroke have a nutrition relationship. We also have a strong culture of personal responsibility in the United States. People are expected to know what’s best for themselves and their families. But when they go into a store, the foods that are most affordable, designed to be very palatable, and highly marketed are the opposite of what is recommended, which are fruits and vegetables, whole grains, nuts and seeds, heart healthy oils, and omega-3 rich seafood. It’s really hard for people to overcome those forces.

**How do you address this issue at Sargent?**

In my class, Nutrition and Chronic Disease, we look at where policies, institutions, and industry either support or undermine health, and at programs and their role in supporting health and preventing chronic disease. And we have the Sargent Choice



Healthy Food and Education Program, a collaboration between the Sargent Choice Nutrition Center and BU Dining Services that’s designed to make healthy eating easier.

**What has the COVID pandemic revealed about nutrition issues?**

We see people with conditions that have a nutrition driver, like heart disease, type 2 diabetes, and obesity at higher risk for severe COVID. We also see disparities in income, education, housing, job training, healthcare, and safe neighborhoods making that diet-disease relationship more severe.

**How does food as medicine fit into the US medical model of healthcare?**

The approach with medicine is to treat a health condition while the public health approach says, “Let’s keep people from getting sick in the first place.” But we’re investing so much money to handle the medical costs that there isn’t much left over to prevent them. And most medical practitioners don’t have training and preparation in food and nutrition

interventions. We have to prepare them better to collaborate with nutrition professionals and utilize nutrition as medicine.

**What is the solution?**

We’ve been focusing on educating and motivating individuals to eat the foods that are recommended—that isn’t enough in today’s food environment. There are proposals like taxing foods that most of us should eat less of or subsidizing the foods that most of us should eat more of. But there’s not widespread adoption of these—and there’s lots of pushback and lobbying to prevent that from happening. We can’t afford to keep going at the rate that we’re going—and we’re starting to see that it is cheaper to give people the foods they need to manage their health conditions than it is to treat them in a hospital. —*Marc Chalufour*

**WebExtra**

Read an expanded version of this interview at [bu.edu/sargent/inside-sargent](https://bu.edu/sargent/inside-sargent).

CYDNEY SCOTT



## NEW COURSE EXAMINES RACIAL DISCRIMINATION IN HEALTHCARE

FOR HEALTHCARE PROFESSIONALS, THE VOW OF “DO NO HARM” IS A GUIDING

principle. But research and medical treatment for communities of color has sometimes been anything but harmless, afflicted with issues of informed consent, bias, and unethical practices. In the 1930s and ’40s, the Tuskegee Syphilis Project included nearly 400 Black men with the disease who were never treated, so researchers could study the course of the disease. The “immortal” cancer cells of Henrietta Lacks, taken without her consent, have been studied for decades. And racial inequalities in healthcare access and outcomes, including infant and maternal health, continue today.

Disparities such as these will be covered in a new undergraduate course in spring 2022: Analyzing Bias and Discrimination in Medicine, Health, and Science. A collaboration between Sargent and BU College of Arts & Sciences, it will help students recognize discrimination, understand systemic patterns of oppression, and reflect on implicit biases so they can advocate for social change.

“There is an immense amount of systemic racism embedded in the health sciences,” says Shannon Peters, a health sciences lecturer at Sargent who codeveloped the course. Data from the Kaiser Family Foundation show health inequities among communities of color during the COVID-19 pandemic, with increased risks of hospitalization and death, and more barriers to testing. These disparities are not new. Life expectancy among Black people and Native Americans is four years less than that of white people; disparities in teen birth rates, infant mortality, and HIV/AIDS death rates are particularly significant for Black, Latinx, and Native American people.

Cotaught by professors in health science, human physiology, and biology,



A new course on bias in healthcare aims to address some of the issues that led to a national racial reckoning in 2020.

the new course will cover biases in medicine, healthcare, and research. Faculty will also encourage students to examine their own beliefs and behaviors. “When we talk about racism, we tend to intellectualize and that distances us from the actual content,” says Peters, one of three course instructors. “We want to break that cycle.” That means many assignments will focus on individual storytelling, with students asked to share video diaries reflecting on and analyzing topics such as their awareness of social identities or media coverage of events affecting communities of color.

The course is part of both Sargent’s and the University’s focus on fostering

an inclusive culture through hiring and recruitment efforts, dedicated resources, and events hosted in partnership with student groups such as Diverse-OT and the Howard Thurman Center for Common Ground. And it begins at a pivotal time, as the nation grapples with a confluence of race reckonings and BU students call for more antiracist programming.

“I have a lot of hope,” says Peters, who believes the class will provide students with steps to combat racism and oppression. “They are really excited about entering the health professions and want to be making these changes and developing these antiracist skills.”

—Stephanie Rotondo

## NEW FACULTY & PROMOTIONS

From top: Pedro Almeida, Sarah Villard, Hagere Yilma



### NEW FACULTY

**Pedro Almeida**, clinical assistant professor, occupational therapy

**Sarah Villard**, research assistant professor, speech, language, and hearing sciences

**Hagere Yilma**, clinical assistant professor, health sciences

### PROMOTIONS

**Elizabeth Hoover**, clinical professor, speech, language, and hearing sciences

**Tatiana Pontes**, director, entry level program, doctor of occupational therapy

**Cara Stepp**, professor, speech, language, and hearing sciences

**Basilis Zikopoulos**, associate professor, human physiology

CYDNEY SCOTT (TOP); FACULTY PORTRAITS COURTESY OF THE SUBJECTS

FRITZ LIEDTKE

## IS TELEHEALTH EFFECTIVE FOR VOICE DISORDERS?

STUDY SHOWS SPEECH-LANGUAGE PATHOLOGISTS’ EVALUATIONS ARE AS ACCURATE VIRTUALLY AS THEY ARE IN PERSON

SO MUCH FOR FLIPPING THROUGH OLD COPIES OF NATIONAL GEOGRAPHIC AND

*People*. For the past 18 months, many of us have counted off the minutes before our healthcare appointments in virtual waiting rooms. According to a February 2021 study in *Health Affairs*, more than 30 percent of COVID-era outpatient visits have been conducted remotely.

The pandemic may have turned telehealth into an essential connection between doctors and patients, but many, including speech-language pathologist Kimberly Dahl, have worried it’s an inferior replacement for in-person visits.

When COVID lockdowns began, Dahl (’24) was a clinical fellow at Oregon Health & Science University’s voice and swallowing clinic—and was accustomed to sitting in the same room as her patients, watching and listening carefully to monitor voice conditions. Suddenly, she was analyzing them through a video conferencing program.

“It raised the question of how reliably and how well we were hearing someone’s voice through these platforms,” says Dahl.

There were plenty of glitches during the switch to virtual sessions, too, including some specific to diagnosing voice disorders. Not all the tasks on the auditory-perceptual voice evaluation—a standard test to help measure the characteristics of a patient’s voice—worked well on web conferencing platforms. When

patients were asked to hold a vowel or tone, the programs’ background noise suppression software would mistakenly kick in—there are ways to shut it down in advance—and the call would go silent.

“It’s fairly universal among voice clinicians to wonder about the nature of the voice through these electronic means, how that affects our practice,” says Dahl.

It turns out those worries are largely unfounded. Now a doctoral student in Professor Cara Stepp’s Sensorimotor Rehabilitation Engineering Lab, Dahl recently helped wrap up a study on the reliability and effectiveness of remote voice evaluations. She and her fellow BU researchers—including Lauren F. Tracy, a BU School of Medicine assistant professor of otolaryngology, and Daniel Buckley, a Boston Medical Center speech-language pathologist—found clinicians were as accurate online as they were in person.

For the study, Dahl had 10 speech-language pathologists and 10 laryngologists review prerecorded voice samples from 20 patients. The patients had a range of common and rare issues, including those related to tension in the larynx and neurological conditions, such as Parkinson’s disease. Dahl compared assessments of the original, high-quality samples to the clinicians’ evaluations of the same voices when broadcast via two popular web conferencing platforms.

“There was no statistically supported difference across the platforms in



Kimberly Dahl wondered if speech-language pathologists could use telehealth effectively—and found that they can.

comparison to in person,” says Dahl. “It gives clinicians some confidence that this tool that we rely on so much, our ear, is something that we can use reliably in telepractice.”

That’s significant not just for the duration of the pandemic, she says, but for expanding care beyond it. If telehealth is as effective as in-person care for certain tests or appointments, it can allow clinicians to help patients they might typically not see, such as those with mobility issues or who live in rural areas.

“To think that we can continue to reach those patients who might otherwise not get voice care, that’s important.”—Andrew Thurston



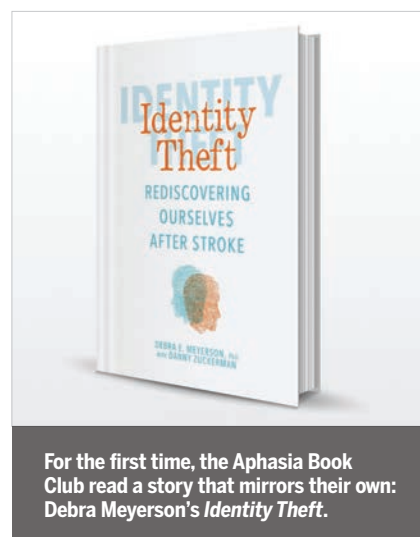
## APHASIA BOOK CLUB APPLIES BIBLIOTHERAPY TO TREATMENT

FOR THE PAST 12 YEARS, A COHORT OF STROKE SURVIVORS HAS BEEN brought together by Sargent’s Aphasia Resource Center to discuss books. As they talk about *Where the Crawdads Sing*, *Where’d You Go, Bernadette?*, or another *New York Times* bestseller, Aphasia Book Club members also connect over their shared experience of living with aphasia, a language disorder often caused by brain injury or stroke. The group isn’t just about support and socialization. It’s therapeutic too: center staff use meetings as an opportunity to study how bibliotherapy—the use of reading materials as treatment for medical and psychological disorders—can help people with aphasia.

“There’s a lot of evidence out there about the power of group treatment for recovery in aphasia,” says Liz Hoover (MED’13), clinical director of the Aphasia Resource Center. And for the first time, in spring 2021, amidst the coronavirus

pandemic, she and her team looked at how the group benefited from reading a story that mirrors their own: *Identity Theft: Rediscovering Ourselves After Stroke*, by stroke survivor and Sargent Clinical Advisory Board member Debra Meyerson, with Danny Zuckerman. “Aphasia results in social isolation because it disrupts the ability to communicate,” Hoover says. “During a pandemic, the risk of social isolation is exponentially greater. Our results showed that reading this text at this time was beneficial not just to their language, but also their general sense of well-being.”

The Aphasia Resource Center, along with a similar program at California State University, East Bay, partnered with Meyerson’s organization, Stroke Onward, to study how reading the book can influence recovery and identity after a stroke. The two centers developed supportive materials, including chapter summaries, worksheets, character guides, and story timelines, to help members who may struggle with the ability to understand written or spoken language. It’s an idea that is catching on: Stroke



For the first time, the Aphasia Book Club read a story that mirrors their own: Debra Meyerson’s *Identity Theft*.

Onward is now using the materials in six other aphasia centers.

“I think when group treatment surrounds meaningful themes and has clear communication goals in mind, the opportunities for growth, both from a psychosocial perspective and a communication skills perspective, are tremendous,” says Hoover. —Taylor Mendoza

## AWARDS AND HONORS HEALTH SCIENCES

**Kris Mogensen**, nutrition instructor, was named secretary-treasurer for the American Society for Parenteral and Enteral Nutrition.

### OCCUPATIONAL THERAPY

**Simone Gill**, associate professor of occupational therapy, was named to the American Occupational Therapy Association Roster of Fellows.

### PHYSICAL THERAPY

**Deepak Kumar**, assistant professor of physical therapy, received the “Top Performing Reviewer Award” from *Arthritis Care & Research*, the official journal of the American College of Rheumatology & the Association of Rheumatology Professionals.

**LaDora Thompson**, Travis M. Roy Professor, was elected to the Board of Directors for the Gerontological Society of America.

**Cara Lewis**, associate professor of physical therapy, was elected secretary for the Academy of Physical Therapy Research.

**Anna Roto** (’22) and Neuromotor Recovery Lab research engineer **Dheepak Arumukhom Revi** (ENG’25,’25) received the Marilyn Gossman Seminar Graduate Student Speaker Award at the American Physical Therapy Association Combined Sections Meeting.

**Julie Starr**, clinical associate professor of physical therapy, was elected a chief delegate for the Academy of Cardiovascular and Pulmonary Physical Therapy.

## SPEECH, LANGUAGE, AND HEARING SCIENCES

**Jayden Lee** (’21) was awarded a student participation grant for her presentation at the Acoustical Society of America’s “Acoustics Virtually Everywhere” conference.

**Chris Moore**, dean and professor, will receive the Honors of the Association Award from the American Speech-Language-Hearing Association (ASHA).

**Cara Stepp**, professor of speech, language, and hearing sciences, was named editor-in-chief of the speech section of the *Journal of Speech, Language, and Hearing Research*.

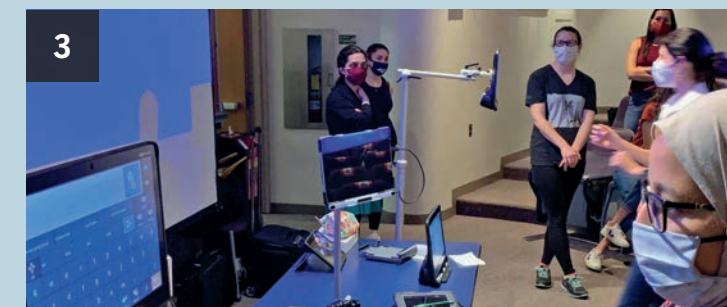
**Jennifer Zuk**, assistant professor of speech, language, and hearing sciences, will receive the Early Career Contributions in Research Award from ASHA.

ANDREWS MCMIEL PUBLISHING

# Adapting to the Pandemic

STUDENTS AND FACULTY, ACCUSTOMED TO IN-PERSON classes and hands-on training, had to adapt to the realities of the coronavirus pandemic. Social distancing and personal protective equipment (PPE) became the norm as classes carried on.

1. Physical therapy students in full PPE made up for lost in-person class time by learning and practicing skills at an intensive September boot camp.
2. The Center for Stuttering Therapy resumed in-person sessions to help people with the speech disorder.
3. Speech-language pathology students in their augmentative communication class.
4. Speech-language pathology master’s students designed and delivered remote pediatric evaluations during their clinical placement at Sargent’s Academic Speech, Language & Hearing Center.
5. First-year occupational therapy students in full PPE worked with assistive devices in their functional movement course.
6. Students in Elizabeth Co’s human physiology class sat socially distanced after displaying badges on their phones attesting that they had recently tested negative for COVID.





# The State of OT

Wendy Coster and Tatiana Pontes on the evolution of occupational therapy in the US and internationally—and how Sargent is helping guide it

Edited by Marc Chalufour

**W**hen Wendy Coster joined Sargent's faculty in 1986, she began working with a team to develop a way to measure the functional ability of children with disabilities, from which eating skills they had mastered to how much help they needed to get dressed. The result, the Pediatric Evaluation of Disability Inventory (PEDI), revolutionized how occupational therapists and other rehabilitation providers measured the effectiveness of their interventions by focusing on outcomes that were meaningful to children and their families. Developing additional measures became a focus of Coster's career, while, at the same time, she was guiding the college's OT department to the top of its field—the Doctor of Occupational Therapy (OTD) program has been ranked first among peers by *U.S. News & World Report* in three of the four rankings since 2008. Coster (75) retired in August after 35 years at the college.

Tatiana Pontes, who joined the Sargent faculty in September 2020, assumed the role of director of the OTD program in

September 2021. Pontes, a clinical associate professor, brings an international perspective to Sargent, having grown up and studied in Brazil and, most recently, working as a research associate at the University of Western Ontario in Canada. Like Coster, she has focused on developing ways to better understand and measure the everyday activities and development of children.

In April, the two colleagues spoke via Zoom about the evolution of occupational therapy, Sargent's influential role in the field, and where they see their profession heading.

**Tatiana Pontes:** As someone who just arrived at Sargent, I would love to hear your perspective on how the occupational therapy department has changed over the years.

**Wendy Coster:** The level of education of our students has changed: We no longer have an undergraduate program—our entry level is a clinical doctorate, which reflects how important the knowledge is that we have, how much education is required to develop those skills, and the maturity and professionalism that goes with that. The other way things have changed is the sense of the profession as a vital part of the healthcare system—as playing a major role in health and well-being, particularly for people with disabilities, and seeing ourselves as more autonomous, not just helpers to the medical world.

How has occupational therapy changed in Brazil since you were a student?

**TP:** Occupational therapy in Brazil began with a focus on supporting occupational performance, with the goal of enabling participation in daily life. However, with the growth of the medical model, which focuses on fixing bodily injuries and curing illnesses, many occupational therapists shifted their focus to remediating underlying medical issues. Over the past two decades, we have made a concerted effort to return to our original path—as well as expanding beyond health to promoting social justice. However, the profession in Brazil has still not fully embraced occupation as the core concern of the profession.

**WC:** I think that's gone on all around the world, with occupational therapy trying to reconnect with its original orientation and its original philosophical base, after becoming enamored of the medical world and thinking that we have to think like that. But medicine is also coming closer to viewing what we do as part of what is needed for health. They're realizing that, beyond treating the body, they must think about the person and what's

meaningful and important in their life and in their daily activity. It's nice to have been in the profession long enough to see that.

Your orientation from Brazil fits really well with our emphasis on community-based practice, particularly with our students focused on what they can contribute to issues of social justice.

**TP:** I think that's why I feel so at home at BU. Many programs tend to be more disease-centered instead of occupation-centered—that's not what happens here.

**WC:** I see a lot of emphasis on basic science and very traditional research approaches that are disease- or condition-focused—but in our OT program, we don't have a course on clinical conditions because we don't want students to be thinking about the people they see as a diagnosis. We want them to think first about them as a whole being.

Another thing that comes with being in a research-intensive university like BU is an obligation to contribute to the mission of generating knowledge. I'm very proud of the fact that our faculty have always been known for their scholarship.

**TP:** Your development of the PEDI was a major turning point, because we started looking at what had changed in a child's life that impacted what they could do. Now, I'm interested in understanding why children develop the array of activities or occupations in which they engage. My research is focused on the creation of a new measure that focuses on understanding the development of children's daily activities.

The way that occupational therapy has changed—we can tell that history by talking about the measures that have been created and used at BU.

**WC:** That's true. I certainly never knew when I started out working on measures that it was going to be my whole career. I thought I was going to take care of one problem and then go on and do other things.

I was working with children with emotional and behavioral disorders. And I was testing them the way I was taught to test them, using developmental tests, which told me they were delayed—which I already knew. Nothing in the assessment that I did helped me suggest a strategy to help that child function better. There was a total disconnect.

One of the interesting things that we found in an early study with the PEDI was that even if the child's impairments didn't change very much, they could still change functionally after some of these interventions. That really contradicted a lot of the theories of that time and reshaped people's thinking about good outcomes.

**TP:** The work you have done has impacted our profession globally—the PEDI has been translated and adapted in 18 countries. Something that drew me to BU is how the program embraces a global perspective of occupational therapy, not just an American perspective. You and the program recognize what is happening worldwide.

**WC:** There's so much good work going on in other countries. I'm eager for our students to get exposed to that.

**TP:** I think Sargent OT's community-based practice will get stronger and I think we will be incorporating more of the concepts of occupational justice and trying to understand occupational disruption—and how systems can impact people's lives.

**WC:** You and I have actually revised a summer course that touches on these issues of social economic and political factors that influence people's daily lives. We look at the system and policy level, so students can see how the intersection of these factors constrain what people can do and limit them from being able to use their capacities. The events of the last year have really pushed that and it's where I see very exciting work going on.

That's the real shift—from health as a physical or disorder-related condition to health as a sense of well-being, which is the World Health Organization definition. You're going to be able to lead that effort, and that helps me leave comfortably, knowing that the people continuing this work have that same kind of vision and excitement about the possibilities. ■



WebExtra

Read an expanded version of this conversation at [bu.edu/sargent/inside-sargent](https://bu.edu/sargent/inside-sargent).

Wendy Coster, former OT department chair and OTD program director, recently retired after 35 years at Sargent.

Tatiana Pontes steps in as the director of the top-ranked Doctor of Occupational Therapy program.



# UNLOCKING THE CLUES TO DYSLEXIA

**For speech-language pathologist Jennifer Zuk, the goal of earlier identification of learning disabilities is personal**

By Ting Yu

**F**or most kids, discovering the delightful oddness of a Shel Silverstein poem or chasing the thrills of Harry Potter can unlock new worlds and spark imaginations. But what if simply decoding the word m-a-g-i-c is an exhausting struggle?

Researchers estimate that between 3 and 12 percent of Americans have dyslexia, a learning disorder that makes it hard to decipher the relationship between sounds, letters, and words. Reading fluently plays a critical role as the gateway to most school learning, and children with dyslexia often feel frustrated and embarrassed by their failure to master what seems to come naturally to their peers. Interventions to treat dyslexia are effective, but unfortunately, most kids don't get diagnosed until late in elementary school. By then, they've internalized years of discouragement and stigma that can have negative impacts on their self-esteem and education. Studies have linked dyslexia with higher rates of anxiety, depression, and behavioral disorders in school-age children.

But what if there was a way to tell sooner which kids were at risk of developing dyslexia? Could we prevent that downward spiral before a child even enters kindergarten?

Speech-language pathologist Jennifer Zuk is certain that we can. Zuk, who joined Sargent's faculty in 2020 and is launching the new Communication and Neurodevelopment Lab, will focus primarily on determining which factors in early childhood—neurobiological and environmental—shape the acquisition of reading, speech, and language. “There’s increasing evidence that brain development within the first two years of life sets a foundation for one’s long-term outcomes,” Zuk says. “We know that there’s an effective window for early intervention, and yet schools tend to wait until children show repeated, significant difficulty with learning to read before identifying an issue and providing an intervention plan. It’s heartbreaking. How can we optimize the sensitivity and specificity of early screening so that schools can allocate limited resources in the best way possible?”

## A PERSONAL PROJECT

Zuk's passion for her work is deeply personal. Growing up, she watched her younger sister struggle through school. “She would spend hours upon hours on her homework,” Zuk recalls. “Teachers misperceived her as ‘lazy’ and ‘unmotivated’—descriptions that didn’t match up with the bright, engaged child her family knew at home. It wasn’t until her sister’s junior year in high school that she was finally identified as having attention deficit/hyperactivity disorder (ADHD).

“I witnessed her struggle for years and be inadequately served by mainstream systems,” Zuk says. “When children’s necessary level of support is not properly identified, they can spend years in an academic environment with no clear means for them to succeed.”

Her sister’s late diagnosis led to years of unnecessary struggle and strained her self-confidence in school. It wasn’t until she was seen by a neuropsychologist and received an appropriate identification and treatment plan that she was able to turn things around. After much hard work, she went on to graduate from college and recently earned her master’s degree from Northeastern University. She now works as an academic advisor for undergraduate students.

“It has been remarkable to see how the right path can make all the difference,” Zuk says. “That’s definitely been my driving force.”

Given the complexity of human brains, Zuk says she takes a multidimensional view of developmental disorders. She believes a confluence of cognitive-linguistic, environmental, and neural factors interact to either increase a person’s risk of developing a disability or combine to offer some protective benefit. If we can gain a sharper understanding of how these factors work together—and identify kids who are at risk earlier—Zuk is hopeful that we can shift away from a reactive stance of treating deficits and move toward the development of proactive strategies that can build children’s skills and capacity to succeed.

In 2020, Zuk, then at Boston Children’s Hospital, with colleagues from Harvard and Massachusetts Institute of Technology, published the findings of a three-year study that explored whether certain factors could be used to predict which students would go on to develop dyslexia *before* they began formal reading instruction. The study included a subset of 74 kindergarteners from 20 schools across New England who were followed through the second grade. Participants were screened on a variety of preliteracy measures, such as phonological awareness and letter identification, to determine their risk status. Researchers also conducted magnetic resonance imaging (MRI) of their brains to look for structural differences that could be potential biomarkers for dyslexia.

The findings confirmed their belief that a multidimensional approach could help identify students who may develop dyslexia from a very young age—well before they get



KELLY DAVIDSON (RIGHT); SELVANEGRA/ISTOCK (LEFT)



In her new Communication and Neurodevelopment Lab, Zuk will study the early childhood factors that shape the acquisition of reading, speech, and language.



“As we think about individualized instruction and treatment plans, there’s a wonderful opportunity to not only target areas of weakness but also foster, promote, and build up areas of strength that could help children succeed over time.”

—JENNIFER ZUK

disillusioned and begin to fall behind. Among kids who were identified as being at-risk for dyslexia, those who had more clearly articulated speech at the start of kindergarten turned out to have stronger reading outcomes at the end of second grade. Students from households with higher socioeconomic status also fared significantly better, suggesting a child’s home environment and access to resources confer meaningful learning advantages. Finally, through close examination of the neuroimaging, Zuk and her colleagues discovered a specialized network within the brain—“an alternate neural pathway”—that was identifiable in the brain scans of at-risk kindergartners who later became skilled readers.

What’s exciting is that all of these factors are clearly discernible before most kids start learning to read, Zuk says. “As we think about individualized instruction and treatment plans, there’s a wonderful opportunity to not only target areas of weakness but also foster, promote, and build up areas of strength that could help children succeed over time.”

#### LITERACY AT HOME

Zuk, who holds a master’s in education and a doctorate in speech pathology, says designing studies that can make a difference for kids means keeping a pulse on what’s happening in classrooms.

During her time at Harvard, she formed a partnership with the Southport School in Connecticut, which primarily serves students with dyslexia and ADHD. “They’ve helped me stay grounded with what’s really going on with the kids,” she says.

As her lab prepares to launch its first studies in the next few months, Zuk is focused on how students with dyslexia are faring in light of the pandemic and the past year’s radical schooling changes. “COVID has put a dramatic set of restrictions on what a young child can be exposed to, so the home literacy environment is more important than ever,” she says. With classrooms and libraries closed, something as simple as a parent reading to their child may be the primary way that child gets introduced to new concepts and words.

For children with dyslexia, such experiences may carry even more weight. However, because dyslexia is heritable, a child who has the disorder is more likely to have a parent who has it, too. Previous research has documented the reluctance of parents with dyslexia to read with their children—an understandable disinclination that can perpetuate the cycle of struggle.

In May, in collaboration with the Southport School, Zuk and Kelsey Davison (’25) launched an online parent survey to assess how their personal experiences with reading shape home literacy environments and parent-child reading prac-

tices in early childhood. Do adults who struggled to read become parents who feel less confident supporting their child’s literacy development at home? “It really gets at the dilemma of how difficult it can be to disentangle genetic susceptibility from environmental contributions,” Zuk says.

Zuk’s peers are already taking note of her work: she is the 2021 recipient of the Early Career Contributions in Research Award from the American Speech-Language-Hearing Association.

Ultimately, Zuk hopes to contribute to a body of scientific research that celebrates individual differences in the experiences of people like her sister rather than stigmatizing them. As researchers further specify early risk factors and markers of dyslexia—making early diagnosis more common—Zuk believes it will open up new avenues for early childhood interventions and instructional approaches that could proactively set kids up for success so that they never fall behind. “There’s one view that disability is a problem to be fixed,” she says. “But there’s another perspective that sees a person with diverse attributes and strengths that shape who they are and what they can do and works to empower them.” ■

KELLY DAVIDSON

## TEAMING UP

Three Sargent researchers hope interdisciplinary collaboration will elevate their work

When Jennifer Zuk came to Sargent in July 2020, she was drawn by the promise of working with scientists in other academic fields who shared similar research interests. Zuk and Tyler Perrachione, director of Sargent’s Communication Neuroscience Research Laboratory, had been following each other’s work for years. Both scientists, in their own research, had formed a hypothesis that dyslexia might arise from differences in the brain that could be identified even before children begin to learn to read.

The potential for synergy between their labs seemed obvious. The two researchers are planning to launch a joint study that will employ a novel MRI technique developed by Perrachione’s lab to determine whether differences exist in the microstructural properties of the cerebral cortex between children with and without dyslexia—and how early they can be identified.

They are also exploring a collaboration with Basilis Zikopoulos, director of the Human Systems Neuroscience Laboratory, who specializes in studying neural networks through the use of high-resolution imaging and microscopy. Perrachione sees great potential in merging the research he’s doing on living human brains with the cellular-level data gleaned from Basilis’ studies of postmortem human brain tissue. “By working in parallel, we get a more complete picture of how variations in brain structure relate to important questions in cognition and development,” says Perrachione.

Though Zikopoulos’ work focuses more on communication disorders, such as autism, the parallels in their research—and the benefits of joining forces—are undeniable.

“We started comparing the very high-resolution data we have with MRI scans similar to the ones Tyler is using,” Zikopoulos says. “The major advantages of MRI are that you can use living subjects and look at the function of circuits during different tasks. When we combine the two methods, it can inform both of our studies to provide us with even more accurate information and detail about the living human brain.”

Down the road, the scientists hope that a better understanding of these neurobiological markers of different disorders can spark research into more targeted early treatment and interventions.

“It’s astounding to find an academic community that actually engages in interdisciplinary research as the starting point,” Zuk says. “Having colleagues where there’s such a natural fit has been a remarkable gift.”

And one that Perrachione believes will lead to exponential progress. “The way the scientific enterprise is set up is very insular,” he says. “But the real innovation comes at the fringes, where two labs bump into each other and say, ‘Wait a second, we’re thinking about similar things. Wouldn’t it be cool if we came together to ask another question?’ It’s these collaborations that really push us, and I think we’re ready to take a big step forward on these questions.”



# Back to Health

THE PANDEMIC FUELED A LOW BACK PAIN EPIDEMIC. WHAT NOW?  
BY MARC CHALUFOUR

**M**aybe it started as a twinge or a dull ache. Days, then weeks, spent hunched over a laptop at the dining room table made it worse. Transitioning to the couch for evening Netflix binges didn't help. That occasional twinge evolved into persistent low back pain.

Our bodies, and our backs in particular, need to move. A lot can go wrong when they don't. But since the coronavirus pandemic upended society in March 2020, physical activity has plummeted, time spent sitting has skyrocketed, and isolating at home to avoid the virus has fueled a different kind of epidemic: low back pain.

Even before COVID-19, more than 8 in 10 American adults were expected to have a significant episode of low back pain in their lifetimes, says Diane Dalton, a clinical associate professor and physical therapist at the BU Physical Therapy Center in the Ryan Center. The pandemic created a perfect recipe for the acceleration of those episodes. "Chronic back pain was at epidemic levels as it was," Dalton says. "Now it's going to be worse."

## PERFECT STORM

"The way we use our bodies has changed over time," says James Camarinos, clinic director of the BU Physical Therapy Center. "In the last 12 months, probably more so than ever."

Pandemic-related lockdowns and quarantines forced abrupt changes to daily routines. For anyone who started working from home, commutes were eliminated, walks between meetings or to the office coffee machine wiped out, and gyms closed. A study in the *Annals of Internal Medicine*, using data from digital activity trackers, showed step counts decreased by 27.3 percent worldwide in the first month of the pandemic. *The British Journal of Sports Medicine* reported that sitting time rose 30 percent.

If you spend the day stationary, even a perfectly ergonomic workspace won't prevent back pain. Regular movement keeps the back engaged and healthy. "It's

ISTOCK PHOTO

---

**OUR BODIES, AND OUR BACKS IN PARTICULAR, NEED TO MOVE. A LOT CAN GO WRONG WHEN THEY DON'T. BUT SINCE THE CORONAVIRUS PANDEMIC UPENDED SOCIETY IN MARCH 2020, PHYSICAL ACTIVITY HAS PLUMMETED.**

---

activating the muscles that support the back, moving the joints, getting your heart rate up so there's more blood flow into all of the body's tissues," Dalton says.

The pandemic also fueled a rise in several other risk factors for back pain, according to the American Psychological Association's "Stress in America" poll. That report, published one year into the pandemic, revealed that 42 percent of Americans gained more weight than intended (an average of 29 pounds); 67 percent reported changes in sleep patterns; and 23 percent drank more alcohol to cope with stress.

And for people already living with back pain, the pandemic disrupted the routines they used to manage their discomfort, like periodic physical therapy treatment and regular exercise. "I think people just lost their strategies," Camarinos says. "People's sense of normalcy was upended and the things that helped them stay physically healthy suddenly, *poof*—gone."

## A COMPLICATED MATTER

The pandemic may explain why back pain is on the rise, but pinpointing the exact cause of the pain—that's complicated.

Your back is an intricate structure. Five vertebrae (L1-L5) make up the lower, or lumbar, region. Discs pad those vertebrae, ligaments hold them in place, and tendons bind them to surrounding muscles. Thirty-one sets of nerves control motion and carry messages to and from the brain.

"There's a lot we don't understand about back pain—85 percent of the time, we can't put our finger on the cause," Dalton says.

Instead of diagnosing the precise problem, she says, a physical therapist will often look for common symptoms that are known to respond to specific interventions. She compares it to an ankle sprain where the damage could be to ligaments, muscles, or both—and the combination might be irrelevant to a successful treatment.

Dalton cautions against putting too much faith in diagnostic images, like MRIs and X-rays, which can provide misleading information. A scan might reveal degeneration of the spine, which can be a normal product of aging and may not be the source of the pain. That can lead to a vicious cycle of managing discomfort by avoiding activity, thus weakening the back further.

## EARLY INTERVENTION

One of the best predictors of future back pain, Dalton says, is previous back pain. And early intervention is critical. If ignored, periodic pain can become chronic. That, in turn, could lead to invasive surgeries and medications, including opioids.

While the pandemic brought in-person physical therapy appointments to an abrupt halt, the healthcare industry adapted quickly by embracing telehealth—technology that can allow patients to get help more quickly.

"Telehealth was sort of at a tipping point at the beginning of 2020. People were coming around to the idea, but to the general healthcare market as a whole, telehealth was still a niche offering," says Bob Knox (CGS'08, Sargent'10, SPH'12), who was a product manager at AmWell, a telemedicine company, until January 2021. "That flipped overnight."

The BU Physical Therapy Center has gradually returned to in-person treatments—by spring 2021, about 85 percent of patients had returned to the Ryan Center—but that doesn't mean telehealth will be phased out. Virtual visits are often quicker to get, which eliminates one barrier to progress. They also help physical therapists understand—and potentially adjust—their patients' daily environments, like how they sit at the computer. And they could help people avoid problems before they begin by enabling them to check in with physical therapists for periodic injury screenings, rather than wait until they've aggravated an injury.

For now, Dalton has simple advice for people emerging from the pandemic with new or more severe back pain: get moving again and rebuild your capacity.

"It boils down to a gradual increase in activity—and maintaining that over time," says Dalton. "As healthcare providers, we need to figure out how to support people with behavior change." ■

## WebExtra

Read more about the BU Physical Therapy Center's pivot to telehealth early in the pandemic at [go.bu.edu/sargent/patients-zoom](https://go.bu.edu/sargent/patients-zoom).





By teaching people with visual impairments how to use iPads, Jennifer Kaldenberg has helped them eliminate a range of assistive devices.

# When Research Meets Advocacy

**JENNIFER KALDENBERG WORKS TO IMPROVE THE LIVES OF ADULTS WITH LOW VISION**

BY MARA SASSOON

**P**eople with visual impairments rely on countless assistive devices—from magnifiers to audiobook players to electronic notetakers—to get through the day. These gadgets help them perform tasks like cooking, texting, and completing work assignments.

But having so many devices can be problematic, says Jennifer Kaldenberg, a clinical associate professor of occupational therapy. Some people get overwhelmed by the sheer number of tools—and how to use them. Even devices that could make a big difference to someone’s well-being often end up collecting dust.

Since 2015, Kaldenberg has been studying whether a single Apple iPad can successfully replace a drawerful of devices. She trained a group of four older women with various degrees of visual impairment—caused by eye conditions such as macular degeneration, optic neuritis, and corneal transplantation—to use the tablets for everything from connecting with family to reading books to managing medications, then monitored how that influenced their lives.

“Once they had the basics down, we wanted to help the women with their specific goals or interests,” says Kaldenberg. “One of the women, for instance, stated that she hadn’t worn makeup in five years and she just really wanted to do that independently and feel good.”

They introduced her to Camera Zoom. The app, which allows users to zoom in while looking at themselves, proved more helpful than the regular magnification devices the participant had been using. “She was able to zoom in on her eyes and put on her mascara,” says Kaldenberg. “Seemingly simple things like this were very meaningful.”

The study, conducted with Stacy Smallfield, an associate professor of occupational therapy and medicine at Washington University in St. Louis, Mo., found the iPad successfully replaced many of the devices these women commonly used for their day-to-day tasks. And the iPads didn’t suffer the same fate as many other short-lived or discarded assistive devices. Five years after joining the study, the women were still using them every day.

## EMPOWERING PEOPLE WITH LOW VISION

Kaldenberg specializes in working with people with visual impairments and has devoted her teaching—training occupational therapy and optometry students on successful therapy interventions—and research to improving their lives. Advocating for the elderly is another important component to her research, and the iPad study is just one example of that.

She’s previously examined other occupational therapy interventions that can be used to improve the leisure and social participation of older adults with low vision, who are at a higher risk for social isolation. She and her coresearchers looked at 13 studies that tested various interventions and determined the best type was a problem-solving approach, in which practitioners help their clients define barriers to participating in social and leisure activities, work with them to set realistic goals, and then come up with solutions to those barriers. For instance, practitioners can consult with their patients to find ways to make activities like going out to dinner or seeing a movie with friends more feasible and enjoyable. Kaldenberg has also studied ways to incorporate vision intervention into daily practices at nursing homes to

limit fall risk, and how occupational therapists can assist in productive aging for people with low vision.

She even considers further implications for her research on the iPad: “There are a lot of studies nowadays looking at social isolation and loneliness in older adults,” says Kaldenberg. “Beyond this study, the iPad could be looked at as a tool to address that.”

## GROUP TRAINING AS INTERVENTION

Kaldenberg says the findings of the iPad study challenge the stereotype that older adults can’t learn new technology. She also hopes it highlights the benefits of group training, which is often overlooked.

“A lot of times, intervention is done one-on-one, but we found that this group structure was really helpful,” she says. In particular, the women wound up learning from each other. “They were finding different strategies that might be helpful. Somebody would say, ‘Oh, I tried it this way, and this way works better.’ Having those multiple perspectives was really helpful.”

Kaldenberg plans to expand her research to include participants with a greater diversity of backgrounds and a wider breadth of diagnoses. Among the issues she hopes to explore are barriers such as Wi-Fi cost and access, and whether lower-cost tablets can be as effective as an iPad.

“We started this study to see if we could have a meaningful impact on older adults,” says Kaldenberg. “And I think we saw how one device—instead of having a drawer full of devices—can help them perform tasks more efficiently and effectively in their everyday lives.” ■

CHRIS MCINTOSH (XZ)





# Combating Disease with Big Data

LAWRENCE WERE HOPES THAT INFORMATION SHARING WILL HELP AFRICAN COUNTRIES OVERCOME HEALTH SYSTEM INEQUITIES IN THE BATTLE AGAINST COVID-19

BY ART JAHNKE

ISTOCK PHOTO

**I**n March 2021, the opposition candidate running for the presidency of the Republic of Congo never learned how many people voted for him. On the day of the election, 61-year-old Guy-Brice Parfait Kolélas died aboard a medical transport to France. He had been diagnosed with coronavirus.

Kolélas is one of at least three high-profile African politicians who have died of coronavirus, which also claimed the lives of Abba Kyari, chief of staff to the president of Nigeria, and Jackson Mphikwa Mthembu, a cabinet minister in South Africa. It is widely believed that several other politicians were victims of COVID, although their deaths have been attributed to other causes. State tallies of coronavirus deaths and case numbers in African states are famous for their uncertainty, and, in some cases, for their deliberate obfuscation.

“We have countries in Africa that, as early as May 2020, decided they would no longer report COVID numbers,” says Lawrence Were, an assistant professor of health sciences at Sargent and of global health at the School of Public Health. “The leadership of some countries felt that it was not in their best interests to acknowledge that there were cases of COVID, so you know, if you don’t measure it, it doesn’t exist.”

This, Were says, highlights the need of healthcare systems in Africa that have the capacity and means to collect and analyze granular data to respond to pandemics. He and a group of pan-African researchers are trying to make that data accessible to all in hopes of slowing the virus’ deadly spread.

## DATA-DRIVEN SOLUTIONS

Were is a lead researcher on the COVID-19 in Africa Data Science Initiative, a team that includes Tom Achoki of the Africa Institute for Health Policy. The group is aggregating as much information as possible about the spread of COVID in Africa and modeling its trajectory, hoping to better understand the economic impact and the capacity of country-level healthcare systems to respond to the pandemic over time. With help from Data Clinic, the pro bono data and tech arm of the financial sciences company Two Sigma, the initiative has developed a dashboard that tracks COVID’s toll on a continent that is poorly prepared to deal with it. The team hopes that the dashboard, which is available in English, Swahili, Arabic, French, and Portuguese, will advance the work of other researchers, and will help local health officials and relief agencies implement necessary protocols, including mask mandates and lockdowns, and eventually, clinical solutions such as vaccines and therapeutics rollouts.

According to Achoki, the dashboard has already been used by the authors of at least 14 key research papers. “Researchers like those can help us develop our models,” he says. And, Were adds, “As we further develop the dashboard, we are hoping to have African governments use the dashboard to create data-driven scenarios that will show how long it is going to take for increased vaccinations to lead to herd immunity.”

## HISTORY REPEATS

Were’s research is driven by more than academic interests. “For me, this comes from a health systems point of view, it comes

DAVE GREEN

**WERE POINTS OUT THAT WHEN CHINA, EUROPE, AND THE US WENT INTO LOCKDOWN MODE, AFRICAN COUNTRIES FOLLOWED SUIT. WHILE THAT DID HELP TO CONTAIN THE VIRUS, AFRICAN COUNTRIES COULDN’T MATCH THOSE MORE DEVELOPED COUNTRIES’ MOVES TO FUND RECOVERY EFFORTS.**

Lawrence Were uses big data to understand how health systems in Africa can address the spread of infectious diseases, from HIV to COVID.





**“WE KNOW WHAT PUBLIC HEALTH TOOLS CAN BE USED TO DAMPEN THE SPREAD, BUT REALLY THE ONLY WAY THAT WE WILL GET TO THE OTHER SIDE, WHERE WE CAN MANAGE WITH COVID IN OUR EVERYDAY LIVES, IS GOING TO INVOLVE VACCINES.”**

—LAWRENCE WERE

from a historical point of view, and it also comes from a personal point of view,” he says. “I grew up in Kenya and I saw firsthand the destruction caused by HIV. I saw my schoolteachers get sick and die, and my relatives get sick and die. I don’t want to see that history repeat itself.”

More recently, Were was the lead researcher on a study of health insurance enrollment among HIV positive women in Kenya. When COVID-19 arrived in Africa, he feared that it, like HIV, would overwhelm the continent’s relatively fragile health systems. Now, he says, those fears have played out in several ways, starting with a lack of available testing. What testing was available revealed the disturbing fact that 70 percent of people who tested positive were asymptomatic. “Those people were out there interacting with others,” says Were, “and they had no idea that they were carrying the virus.”

Worse, many of those who did know they carried the virus had little choice but to be out there. Were points out that when China, Europe, and the US went into lockdown mode, African countries followed suit. While that did help to contain the virus, African countries couldn’t match those more developed countries’ moves to fund recovery efforts. “They didn’t have resources to provide unemployment,” says Were. “People had to go back to work. When that happened, we began to see the numbers in Africa going up.”

The problems were compounded by a widespread lack of medical care. “Only the super rich in society get into the few ICU beds that are available,” he says. “And now we are seeing the same thing with vaccines.”

#### OVERCOMING VACCINE INEQUITY

In the United States and Europe, the surprisingly rapid development and rollout of COVID-19 vaccines was made possible by

many billions of dollars of public funding, along with strategic partnering of governments and pharmaceutical companies. By late March, according to the *New York Times*, wealthy and middle-income countries had received about 90 percent of the nearly 400 million vaccines delivered so far, and roughly three-quarters of vaccines had gone to only 10 countries. Africa, with 17 percent of the world’s population, had administered roughly 2 percent of the vaccine doses given globally.

“When we look at what’s going on with vaccinations outside the US and Europe, we see that a lot of the world is depending on those countries to sell them vaccines or donate vaccines,” says Were. “If you don’t have the money to buy vaccines from pharmaceutical companies, and if no one is donating vaccines, you are in kind of a waiting game.”

“It’s a health systems issue,” says Were. “It’s a supply issue on one hand, but also the countries that have been able to get vaccines have not been able to distribute them. Part of that is adverse events from vaccines and the misinformation that stems from that.” Achoki adds that “this has made the vaccine rollout in Africa challenging, hindering efforts to fast-track the process with an eye on herd immunity.”

*Axios*, for example, reported that one month after the first shipment of vaccines arrived in the Democratic Republic of Congo, they were still sitting in a warehouse in Kinshasa. And in much of Africa, vaccine distribution is complicated by the need to keep vaccines at super low temperatures until shortly before they are administered. All of which adds up to low expectations for Africa’s vaccine rollout.

“The Africa CDC hopes to get 60 percent of the continent vaccinated by the end of next year,” says Were. “Some countries expect that at best they will have vaccinated one-third of the population by mid-2023.”

Even those modest expectations may have to be adjusted downward. More transmissible and more deadly variants of the virus are already blamed for recent increases in the numbers of cases and deaths. In August, the Africa CDC warned that of the 55 countries they monitor, 23 were reporting fatality rates above the current global average of 2.1 percent.

Were expects, and hopes, that the vaccine rollout information presented on the dashboard will help health officials. Specifically, the dashboard is being designed to identify gaps in vaccine rollout and various health systems levers—including financing, delivery systems, and the healthcare workforce—that can be engaged to optimize and fast-track vaccinations.

“We now have a good understanding of how COVID is spread,” says Were. “We know what public health tools can be used to dampen the spread, but really the only way that we will get to the other side, where we can manage with COVID in our everyday lives, is going to involve vaccines. And I think the greatest contribution of this work is going to be around vaccines.”

Until vaccines become available, he says, the most compelling reason for hope is the African people themselves.

“Africans are very resilient,” he says. “It’s encouraging to see people trying to make things work despite the limitations. It’s good to see people trying to innovate and to carry on with life as close to normal as possible.” ■

# Helping Trans Men Find Their Voice

TECHNIQUES BORROWED FROM SPEECH-LANGUAGE THERAPY MAY HELP IN LOWERING PITCH

BY ANDREW THURSTON

**W**hen actor Elliot Page gave his first interview after announcing he was transgender, he talked about the massive impact of gender-affirming surgery. It was “not only life-changing,” he told *Time* in February 2021, “but lifesaving.” Other trans men—who can be at a higher risk of suicide or hate-based violence because of their identity or appearance—have shared similar stories about a short haircut or their first beard. But, according to a 2021 BU-led study, the most sought-after physical change among trans men is a deeper voice.

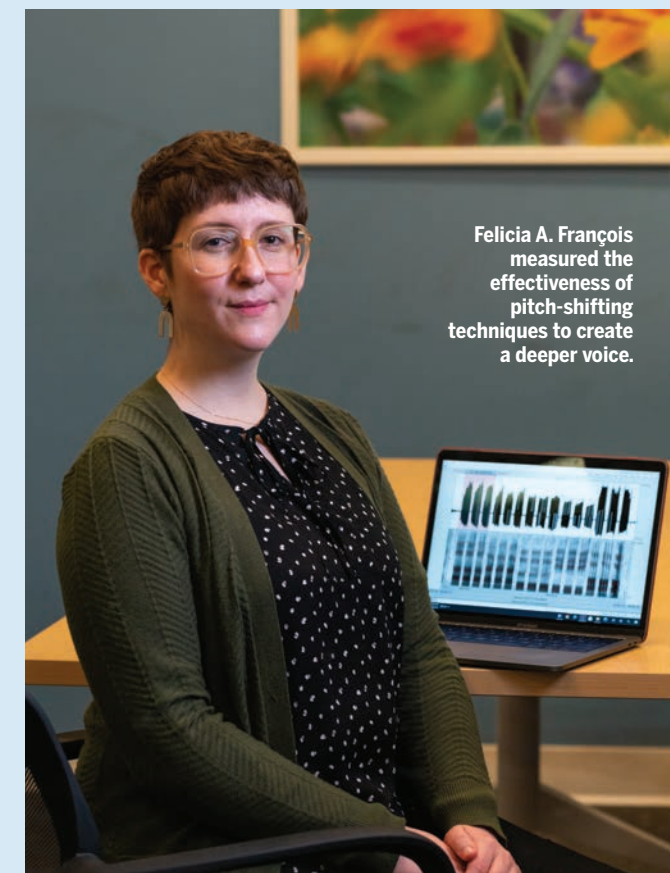
Despite its importance—and its lifesaving potential—there’s been little research on helping trans men find their voice. For many, the typical route to a deeper sound has been testosterone therapy, but it’s not always effective.

“There is an unfounded prevailing view that taking exogenous testosterone will ‘fix’ the voice, but we still don’t know the mechanism of action of testosterone in this population—and we know for certain that it simply isn’t sufficient in a large segment of speakers,” says Cara Stepp, a coauthor on the study and professor of speech, language, and hearing sciences.

Her lab is looking to address that knowledge gap, exploring the factors that make someone sound masculine and alternatives to testosterone for shaping voice.

One recent project, led by master’s student Felicia A. François, investigated the effectiveness of pitch-shifting techniques borrowed from the treatment of disorders such as puberphonia—when a male voice doesn’t change after puberty.

François (’21) recruited 15 people who identify as transmasculine, recording them speaking before and after a therapist massaged the muscles around their larynx and performed laryngeal reposturing, a noninvasive method of moving the voice box



Felicia A. François measured the effectiveness of pitch-shifting techniques to create a deeper voice.

to a lower position. She then evaluated changes to their voice’s pitch, how high or low it sounds, using acoustic analysis software.

“It was really effective for folks who didn’t already have a super low pitch and were on the cusp of the feminine and masculine zone,” says François. She also calculated vocal tract length—the distance between the lips and vocal cords—which can have an impact on resonance, or the fullness of someone’s voice.

The therapeutic techniques didn’t work as well for those with a long history of taking testosterone or with an already low pitch. One limitation of her study, says François, was that the massage was given once and for just 15 minutes. She thinks that might not be enough for people with a lot of tension and tightness around the larynx. “If we tried out these techniques every week, maybe we would have better results for some of the folks who didn’t have a quick response.”

The immediate next move, says Stepp, is to combine François’ findings with those of a new perceptual study: independent listeners rating how masculine or feminine a participant’s voice sounds to the human ear before and after intervention.

Although François recently wrapped up her master’s program, helping gender diverse people find their true voice is something she’s continuing as a clinical fellow at the University of Wisconsin–Madison. For her, the work is personal. As a singing and voice coach, she’s guided many people who are transgender through their journey. And her husband is trans too.

“It’s all part of crafting who they are,” she says, “who they want to be, and how they can show themselves authentically in the world, feel affirmed, and feel good about themselves.” ■



# FINE-TUNING MOVEMENT

IMAGING BRAIN ACTIVITY COULD HELP ILLUMINATE HOW INFANTS, PARTICULARLY THOSE WITH CEREBRAL PALSY, LEARN TO CONTROL THEIR ARMS AND HANDS

BY ANDREW THURSTON

**A**ny parent who's tried to coax a squirming, screaming baby into a diaper—or watched their beloved child fidget free from a supposedly secure swaddle—would swear that every move was designed to frustrate them. A battle of wills the baby wins again and again.

But those wriggly infants are just as innocent as they look. It takes babies months to figure out how to control their bodies: most early movements are involuntary or reflexive. And even the ones they mean to make are jerky—often as bewildering to the infant as their parents.

In Sargent's Development, Experience, and Motor Recovery Lab, neuroscientist Claudio L. Ferre studies how babies—especially those with, or at risk of, cerebral palsy—learn to fine-tune their motor skills.

He recently started a National Institute of Neurological Disorders and Stroke-funded project that uses a portable

optical imaging technology to watch what happens in the infant brain as it begins to exert greater control over motion. With functional near-infrared spectroscopy (fNIRS), which beams noninvasive light into the head, Ferre is monitoring which brain areas are working hardest—or not working as expected—as babies try to turn reflexive jiggles into determined grasps.

“The idea is to prospectively track infants at high risk for developing cerebral palsy and see what's different about their movements, their ability to experience sensation of movement,” says Ferre, an assistant professor of occupational therapy. “One of the unique things about this project is that we want to understand that in terms of brain development.”

Ferre's goal is to better understand how we learn to govern our bodies—the development of the circuits that connect brain and limbs—and use that information to help improve therapies and outcomes for children with motor disorders.

## MAPPING BRAIN ACTIVITY

Around one in 345 children in the United States has cerebral palsy, according to the Centers for Disease Control and Prevention. A group of motor disorders often caused by a brain injury before, during, or soon after birth—and more common in preterm babies—cerebral palsy can leave people with stiff muscles, poor coordination, or uncontrollable spasms. There's no cure, but early interventions have been shown to help.

“Cerebral palsy brain injury happens very early on in development, which means the brain has a lot of time to reorganize,” says Ferre, who recently published a paper in *Neurorehabilitation & Neural Repair* on how different types of newborn brain injury impact hand function. Cerebral palsy can be congenital or caused by injury, infection, or decreased blood or oxygen flow. “It's very different from an adult stroke, for example, where usually a very singular focal area is affected. The changes we see in the brain in children with cerebral palsy tend to be more widespread, which also means there's a lot of variability.”

For the latest project, Ferre is using an fNIRS machine to examine brain activity as infants move their hands and arms. The infants in the study wear a small cap covered in optodes—optical sensors—that transmit and receive infrared light, which travels about 5 to 10 millimeters underneath the cranium. By tracking how much of the light gets absorbed and how much bounces back, he can see which parts of the brain are drawing the most oxygen to power activity and which aren't.

“The light penetrates, just diffuses through the scalp and skull into the brain and is absorbed by hemoglobin,” says David Boas, a BU professor of biomedical engineering and fNIRS pioneer who's working with Ferre. “When there's brain activity, it modulates hemoglobin concentration and we can get maps of brain activity.”

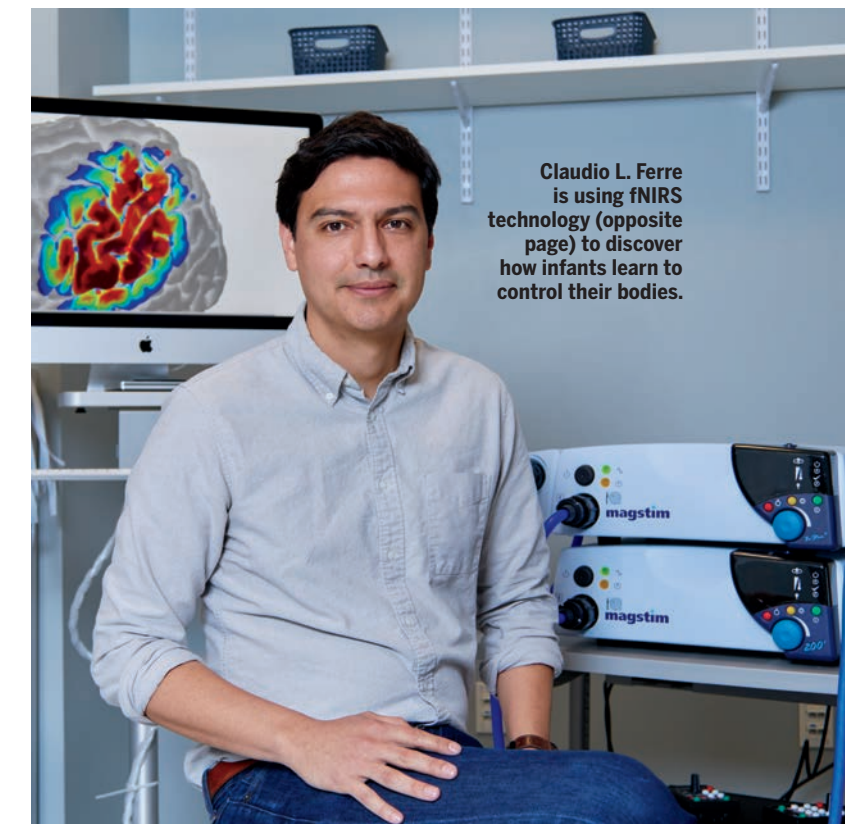
Because fNIRS doesn't require subjects to lie motionless, they can be monitored while performing routine activities; the babies in Ferre's project lie on a play mat or sit in their caregiver's lap.

It's a technology Boas is using with other Sargent researchers, too, charting the brain during stroke recovery and Parkinson's treatment. He's also collaborating with Swathi Kiran, associate dean for research, and Terry Ellis, chair of physical therapy and athletic training, to develop new, even more portable fNIRS tech. Existing versions still require subjects to be tethered to a machine—albeit using very long cables—but they're working on an all-in-one wearable system that Boas says will “enable neuroimaging in the everyday world.”

## MATCHING MOVEMENT TO THOUGHT

Ferre begins a typical fNIRS session measuring five minutes of spontaneous movements in the infants, some considered at risk for cerebral palsy, some not, and all aged between two and six months.

“They're not reaching for objects yet, they're not doing a whole lot with their limbs—it's not what we would consider skilled motor behavior,” he says. “What they're doing is kind of



Claudio L. Ferre is using fNIRS technology (opposite page) to discover how infants learn to control their bodies.

fidgeting around and so we're going to be using some wearable sensors on the wrists and just below the shoulder that essentially track those movements and observing that in relation to brain activity using fNIRS.”

He's also developed novel devices—including one built in collaboration with a BU College of Engineering student, Manuel Sobol (ENG'22)—to stimulate the infants' hands and control their twitches and sensations. He says matching actions to brain activity is particularly helpful in infants with a brain injury.

“Usually when there is a neural injury, parts of the brain that would have controlled movement are no longer active or they become less active,” says Ferre, who also has a background in psychology and kinesiology and teaches a class on functional movement. Watching as unaffected brain areas start taking over will help him see how the brain reorganizes after an injury.

After a year, Ferre will reconnect with the at-risk children to confirm any cerebral palsy diagnoses and review their activity again. He hopes the study will not only uncover the relationship between motor and sensory development in children with a disorder, but in the general population too.

“There's actually a lot we don't know about the integration of motor and sensory development in typically developing infants,” says Ferre. The current theory is that early uncontrolled squirming and reflexive waving teaches the brain how movement works, providing the foundation for more deliberate and precise limb control. “Early in development, spontaneous movements are generated by subcortical and spinal pathways. But every time these movements occur, they provide an opportunity for the infant to learn about how their limbs move through space.”

Despite the study's potential, there's one thing Ferre and Boas won't be able to help the families in their research with: just how you get a waving, kicking infant into that diaper. ■



# MEASURING MOBILITY IMPROVEMENT

HOW WEARABLE SENSORS COULD CHANGE THE FUTURE OF PHYSICAL THERAPY TREATMENTS FOR KNEE OSTEOARTHRITIS

BY MARA SASSOON

**T**here isn't a cure for knee osteoarthritis, the debilitating condition where the joint's cushioning cartilage wears down. The treatment that has proven most effective for the disease, which causes painful friction between the bones and afflicts almost 14 million people in the United States, is exercise-based physical therapy. But, the problem is, it's difficult to accurately measure a patient's improvement outside of a clinical or laboratory setting. Deepak Kumar wants to change that.

An assistant professor of physical therapy, he's started a new clinical trial to develop wearable sensor technology that can measure patients' improvement remotely.

"There are devices like the FitBit that measure how many steps a patient is walking every day, but they don't give us the information we need about the quality of their walking—has their walking pattern changed, are they more symmetric, how much time are they spending on their painful knee versus their nonpainful knee," says Kumar, who is also the director of Sargent's Movement & Applied Imaging Lab. "There just isn't a good way to get that information while the patients are out and about in their everyday life."

Kumar and his coresearcher Tuhina Neogi, a professor of medicine and chief of rheumatology at Boston Medical Center (BMC), are collaborating with the BU Physical Therapy Center, BMC, Pfizer, and Eli Lilly on the clinical trial.

For the study, participants wear a tiny sensor on their lower back. They're expected to wear the sensors all day, every day, for five weeklong periods before, during, and after physical therapy treatment, even during activities like sleeping and showering. The sensor has an accelerometer and a gyroscope to capture metrics like the angular velocity of the body. The participants, all age 50 and older and diagnosed with knee osteoarthritis, take part in 18 physical therapy sessions over 12 weeks, with a combination of in-person visits at the BU Physical Therapy Center and virtual sessions.

Kumar says there are many benefits to having a device that measures patients' improvement outside of a lab setting. "In the lab, we have our patients do certain activities—walking, getting up from a chair—and that might not reflect how they do those activities in their daily life because it's an artificial environment."

Kumar, who expects to conclude the study by early 2022, will compare the sensor data to information recorded by 3D optical motion capture—a sophisticated, lab-based system of cameras and sensors used to track movement in detail—to check its accuracy.

"The main goal of this study is to validate the small single sensor against this 3D motion capture, and then use the validated metrics to see if we can detect improvement after physical therapy," Kumar says. He hopes that these smaller sensors can then be used in future large-scale studies to measure outcomes of physical therapy on osteoarthritis, with the goal of refining treatment. ■

Deepak Kumar hopes that wearable sensors can measure knee osteoarthritis patients' improvements remotely.



ISTOCK PHOTO: CONOR DOHERTY (INSET)

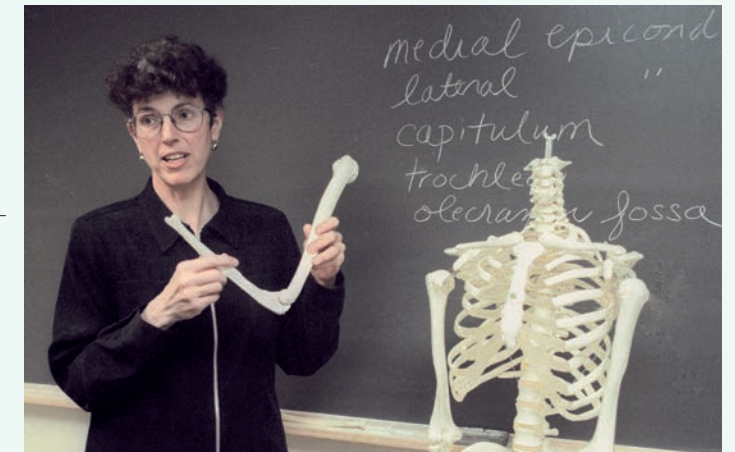
BU PHOTO (TOP, BOTTOM); KALMAN ZABARSKY & VERNON DOUCETTE (MIDDLE)

## My Favorite Sargent Memory

**"Experiencing the care, support, and encouragement each day shared by the dean, faculty, and my classmates. At Sargent—then and now—there is continually an atmosphere of excitement, encouragement, cooperation, and learning. This feeling is commonly referred to as Sargent Spirit—which, by the way, is still very much a part of my personal well-being."**  
—Lorraine Marut Cocolis ('63)



**"The biggest honor of my life, as an alum, was to be given the Twinness award. I never could have dreamed that I would have been chosen for this prestigious honor. Sargent Spirit of Sargent School has been my guiding star throughout my adult life!"** —Bonnie Brooks ('63)



**"All the 'Move Up Days,' were wonderful. That is when each class sang their own songs as we approached the next year and one song was chosen as the most creative. The whole college experience was great because we were a small school and got to know everyone. I met many lifelong friends."** —Inez McLaughlin ('57)



**"Skit night. It was a night to let go of the stress of studying and come together as a class, while having a lot of laughs—mainly at the expense of the professors, but in good fun and spirit."** —Christie Scala Amorosino ('93,'94)

**"I had the opportunity to learn from and interact more closely with a brilliant group of faculty and challenge and be challenged by a group of classmates who were similarly passionate about the rehabilitative sciences. To say we bonded as a class is an understatement—we built a community of diverse yet like-minded, soon-to-be professionals."** —Michael Silverman ('91)

Read extended versions of these memories, and dozens more, at [BU.EDU/SARGENT/INSIDE-SARGENT](http://BU.EDU/SARGENT/INSIDE-SARGENT).

**WE NEED YOUR MEMORIES!** Throughout the year, across Sargent's publications, social media, and website, we will share more of your memories. To submit yours, visit [go.bu.edu/sargent/favorite-memory](http://go.bu.edu/sargent/favorite-memory) or look for an upcoming email with a link.



# A CAREER OF CARING

**SIX DECADES AFTER GRADUATING, PHYSICAL THERAPIST SENORA SIMPSON STILL DRAWS ON LESSONS LEARNED AT SARGENT—AND FROM RACISM FACED ELSEWHERE**

BY MICHAEL S. GOLDBERG

Following a decorated career in physical therapy and public health policy, Senora Simpson has devoted herself to gardening—in particular growing and showing azaleas and rhododendrons.

**T**he lessons Senora Simpson absorbed from her Sargent College professors are as clear today as they were more than six decades ago. Respect every person you work with. Demonstrate empathy for colleagues and patients alike. And expect the best work from yourself and those around you.

Simpson, who graduated in 1957 with a physical therapy degree, felt both individual attention and high expectations from the moment she arrived on the Sargent campus, then in Cambridge, in the fall of 1953.

“They were people who cared about the students as individuals,” says Simpson. For a Black student in 1953—one year before the US Supreme Court declared segregation unconstitutional—that sort of reception wasn’t a given.

## EARLY CAREER ADVERSITY

Simpson was one of only four Black physical therapy students in her class. But, she says, they were treated the same as their classmates. And when the time came for Simpson to gain clinical experience and job referrals, her college mentors both helped her and stood up for her.

In Simpson’s senior year, she expressed interest in an internship at a Washington, D.C., hospital. One of her professors, Adelaide McGarrett (Sargent’33, Wheelock’47), told her it was not a suitable placement for a Black student and rejected

the idea over Simpson’s protests. “She finally said very openly, ‘They will fail you. And you are a good student,’” says Simpson, who first decided to study physical therapy after her close friends’ baby was diagnosed with cerebral palsy and she saw the impact the profession could have.

She received a different kind of confidence vote when, after graduation, another professor, Helen Hickey, recommended her for a position at a hospital in Brownsville, Texas, that was experiencing a polio outbreak.

Simpson was an ideal candidate because she had become proficient in a technique called manual muscle testing. “Polio patients had these sort of scattered deficits, where they would have one muscle here that was good, and another one that wasn’t. And you had to be really good at determining which muscles were the strongest,” she says.

Just before traveling to Brownsville, Simpson called to confirm she could stay in a nurse’s dorm. When she mentioned that she was Negro—the term used at the time—the person on the line said they’d have to call her back. They never did. The Texas facility had sought Sargent’s best physical therapist for the job—so Hickey refused to send anyone else. “Her stance was... You asked me to get you the best, I’m providing it to you, and you rejected it,” Simpson says.

After graduation, Simpson instead joined the rehabilitation staff at Rusk Institute of Rehabilitation Medicine in New York. There, she learned how to navigate conversations with

medical residents who came to Rusk from around the world and who, in the 1950s and 1960s, were new to physical therapy techniques and yet needed to remain in charge of a patient’s care. “We were teaching them all the time, how to order PT treatments, what PT was,” she says.

## THE POWER OF POLICY

Simpson eventually returned to Washington. After working as a physical therapist at District of Columbia General Hospital for five years, she shifted into program administration, managing a federal pilot project to deliver physical and occupational therapy services to geriatric and chronically ill patients in their homes. That program became a model for Home Health Agencies as we know them today.

The experience led to Simpson working for federal agencies for 38 years. In one of her roles, she wrote and helped implement the Early and Periodic Screening, Diagnostic, and Treatment program, which ensures that children receive free and timely assessments of medical conditions that interfere with their quality of life. She also continued her education, earning public health degrees from Johns Hopkins University and the University of Southern California. In 2008, she received the Lucy Blair Service Award, the American Physical Therapy Association’s honor for exceptional contributions to the field. And she has taught at several DC-area universities and remains a guest lecturer at the University of the District of Columbia.

Asked to reflect on her career, Simpson refers to her college days: “What you find is that you can be successful if you really care about what you’re doing and who you’re working with. That is what Sargent taught. I knew they cared. And I would do anything to make them proud.” ■

JIMMEL GREENE





# PRACTICAL APPLICATIONS

**LYNN SAFENOWITZ HAS FOUND CREATIVE OCCUPATIONAL THERAPY SOLUTIONS TO COMMON PROBLEMS, FROM BULLYING TO STRESS**

BY MICHAEL S. GOLDBERG

A hydroponic garden at the Resnick Neuropsychiatric Hospital helps Lynn Safenowitz and her team work with patients to strengthen their functional skills.

**L**ynn Safenowitz’s professional experiences show how broad and varied the occupational therapy profession can be.

Consider three recent programs that Safenowitz (’84) has overseen as assistant director of rehabilitation services at Resnick Neuropsychiatric Hospital at UCLA in Los Angeles: teaching children about bullying prevention as part of their social skills development; building a sensory garden to reduce adult psychiatric patients’ anxiety; and showing adolescents how to harvest and cook their own food. Each illustrates the intrinsic rewards of occupational therapy, she says: finding imaginative and meaningful ways to help people live better lives by strengthening their functional skills.

“Being creative with the functional application of therapies—whether that means social skills training, mindfulness meditation, or nutrition and cooking education—is what makes OT both relevant and unique,” Safenowitz says.

### MEANINGFUL WORK

Safenowitz discovered OT during a health professions survey course she took as a college junior. She was looking for a way to help people, especially kids, after watching her younger brother struggle in separate classes for children with learning disabilities. She saw an opportunity to engage in hands-on, meaningful work and decided to pursue the subject with a master’s degree at Sargent.

Safenowitz says the two-year Sargent master’s program, which included internships at Mount Sinai Hospital in New York (working with patients with physical disabilities), Resnick (where she later landed her current job), and the Churchill School in New York, provided the foundation for her professional career.

After leaving BU, Safenowitz performed OT evaluations for student services in the New York Unified School District. There, she assessed children’s gross and fine motor skills, visual perceptual abilities, and their social skills and play levels, and recommended OT services. Then she relocated to California for a full-time position at Resnick, working for several years before scaling back her schedule—and eventually leaving the hospital—to raise her family. During this stage of her career, she also delivered early intervention services in “Mommy and Me” OT therapy groups at her synagogue helping preschool-aged children with their language development and motor and social skills.

### A PROACTIVE APPROACH

Since rejoining Resnick part time in 2012, Safenowitz has overseen several research-driven projects that illustrate the diverse applications of OT.

Take bullying prevention. With the rise of social media, Safenowitz says the recreational therapists in her department often encounter children and adolescents who’ve experienced—or contributed to—the problem. After some research and professional seminars, therapists conducted role-playing exercises designed to elevate the young people’s

**“BEING CREATIVE WITH THE FUNCTIONAL APPLICATION OF THERAPIES IS WHAT MAKES OT BOTH RELEVANT AND UNIQUE.”**

—LYNN SAFENOWITZ

empathy. The program’s highlight was an antibullying summit hosted at UCLA.

“[The kids] practiced role-playing of bullying and being bullied, and what to do and what not to do,” Safenowitz says. “It’s [about] creating an understanding of how people feel.”

A similar pattern of research combined with experimentation led to the sensory garden. The garden tested the idea that group participation in tending the plants could help inpatients who are experiencing depression and other conditions learn new skills and improve their moods. In a second gardening project, outpatients of all ages plant seeds, tend plants, and harvest hydroponic produce in a courtyard at one of the hospital’s buildings. They also learn to cook with some of their harvest and package produce to take home or deliver outside the hospital. Safenowitz says the relaxing environment is a perfect location for mindfulness exercises and group discussions.

The courtyard garden is also a way for younger patients to connect their hospital-based experiences to a practical application of their efforts. This was done first in cooking sessions and then in preparing produce for delivery to Students 4 Students, a group run by UCLA students for peers who lack housing.

This is the kind of experience that makes OT intrinsically rewarding, a message that Safenowitz communicates to her team of about 21 therapists, plus interns (including some from Sargent), and which informs her work on the Sargent College clinical advisory board that she joined in 2020. And it’s a theme that applies to her career, from her early-career work helping young children with their motor and social skills to the Resnick patient population.

“Providing therapy and seeing the growth and development is what is rewarding,” she says. “I remember when a toddler who didn’t speak in my early intervention program started to speak. It’s just amazing when you see the success that your patients achieve.” ■

PATRICK STRATTNER



# 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 2020-2021.

**Abbott-Gaffney, C.** and **Jacobs, K.** (2020). Telehealth in school-based practice: Perceived viability to bridge global OT practitioner shortages prior to COVID-19 global health emergency. *WORK*, 29–35. doi: 10.3233/WOR-203240.

**Abur, D.** and **Stepp, C. E.** (2020). Auditory acuity to changes in self-generated vocal pitch in Parkinson's disease. *Journal of Speech, Language, and Hearing Research*, 63(9), 3208–3214.

**Almeida, P. H. T. Q.**, Bernardo, L. D., **Pontes, T. B.**, Davis, J. A., Deodoro, T. M. S., Ferreira, R. G., Souza, K. I., and Macdermid, J. C. (2021). Short-term impact of social distancing measures during the COVID-19 pandemic on cognitive function and health perception of Brazilian older adults: A pre-post study. *Journal of Applied Gerontology*. doi: 10.1177/07334648211015458. (Epub ahead of print).

**Awad, L. N.**, Lewek, M., Kesar, T. M., Franz J., and Bowden, M. (2020). These legs were made for propulsion: Advancing the diagnosis and treatment of post-stroke propulsion deficits. *Journal of NeuroEngineering and Rehabilitation*, 17, 139. doi.org/10.1186/s12984-020-00747-6.

Johnston, T. E., Keller, S., Denzer-Weiler, C., and **Brown, L.** (2021). A clinical practice guideline for the use of ankle-foot orthoses and functional electrical stimulation post-stroke. *Journal of Neurologic Physical Therapy*, 45(2):112–196. doi: 10.1097/NPT33675603.0000000000000347.

**Colón-Semenza, C.**, **Fulford, D.**, and **Ellis, T.** (2021). Effort-based decision-making for exercise in people with Parkinson's disease. *Journal of Parkinson's Disease*, 11(2):725–735. doi: 10.3233/JPD-202353. PMID: 33459665.

**Costello, K. E.**, Eigenbrot, S., Geronimo, A., Guermazi, A., **Felson, D. T.**, Richards, J., and **Kumar, D.** (2020). Quantifying varus thrust in knee osteoarthritis using wearable inertial sensors: A proof of concept. *Clinical Biomechanics*, 80:105232. PMID: PMC7749075.

Buckley, D. P., **Dahl, K. L.**, Cler, G. J., and **Stepp, C. E.** (2020). Transmasculine voice modification: A case study. *Journal of Voice*, 34(6), 903–910.

Cler, G. J., McKenna, V. S., **Dahl, K. L.**, and **Stepp, C. E.** (2020). Longitudinal case study of transgender voice changes under testosterone hormone therapy. *Journal of Voice*, 34(5), 748–762.

**DeBiasse, M. A.**, Qamar, Z., and Burt, K. G. (2021, in press). A social media intervention for dietetics professionals to increase awareness about racial/ethnic diversity and inclusion in dietetics: Black voices centered. *Journal of Critical Dietetics*.

**Escher, A.**, Berger, S., and **Carney, A.** (2020). Communication: Assessment and intervention. In: D. Powers-Dirette and S. Gutman (eds.), *Occupational Therapy for Physical Dysfunction*, (8th ed.). Baltimore: Walters Kluwer.

Mote, J. and **Fulford, D.** (2020). Ecological momentary assessment of everyday social experiences of people with schizophrenia: A systematic review. *Schizophrenia Research*, 216, 56–68.

Mote, J. and **Fulford, D.** (2021). Now is the time to support Black Americans living with serious mental illness: A call to action. *JAMA Psychiatry*, 78, 129–130.

Timbie, C., **Garcia-Cabezas, M. A.**, **Zikopoulos, B.**, and **Barbas, H.** (2020). Organization of primate amygdalar-thalamic pathways for emotions. *PLOS Biology*, 27;18(2):e3000639. doi: 10.1371/journal.pbio.3000639. eCollection. PMID: 32106269.

**Gill, S. V.**, Abplanalp, S. J., Keegan, L., and **Fulford, D.** (2020). Effort-based decision-making and gross motor performance: Are they linked? *Brain Sciences*, 10: 1–10.

DeDe, G. and **Hoover, E. L.** (2021). Measuring treatment change at the discourse level for people with mild and severe aphasia. *Topics in Language Disorders*, 41(1), 5–26.

**Hutchinson, K. J.**, **Sloutsky, R.**, Collimore, A., Farmer, B., Harris, B., **Ellis, T. D.**, and **Awad, L. N.** (2020). A music-based digital therapeutic: Proof-of-concept automation of a progressive and individualized rhythm-based walking training program after stroke. *Neurorehabilitation and Neural Repair*, 34:11.

Conroy, C. and **Kidd, G., Jr.** (2021). Uncertainty about amplitude eliminates negative masking in a pure-tone amplitude discrimination experiment. *Journal of the Acoustical Society of America*, 1, 1–6. doi.org/10.1121/10.0003042.

Angelopoulou, G., Meier, E. L., Kasselimis, D., Pan, Y., Tsolakopoulos, D., Velonakis, G.,... and **Kiran, S.** (2020). Investigating gray and white matter structural substrates of sex differences in the narrative abilities of healthy adults. *Frontiers in Neuroscience*, 13(1424). doi: 10.3389/fnins.2019.01424, PubMed PMID: 32063823.

**Lauer, J. M.**, Ghosh, S., Ausman, L. M., Webb, P., Bashaasha, B., Agaba, E., Turyashemerwa, F. M., Tran, H. Q., Gewirtz, A. T., Erhardt, J., et al. (2020). Markers of environmental enteric dysfunction are associated with poor growth and iron status in rural Ugandan infants. *The Journal of Nutrition*, 150(8):2175–2182.

Graber, K. L., Loverro, K. L., Baldwin, M., Nelson-Wong, E., Tanor, J., and **Lewis, C. L.** (2021). Hip and trunk muscle activity and kinematics during walking with and within unilateral weight. *Journal of Applied Biomechanics*, 1–8. doi: 10.1123/jab.2020-0273.

**Locks, L. M.**, Katz, E., Simmons, E., et al. (2020). Seasonal trends and maternal characteristics as predictors of maternal undernutrition and low birthweight in Eastern Maharashtra, India. *Maternal & Child Nutrition*. 2, 17.

Brown, C., **Marinko, L.**, LaValley, M. P., and **Kumar, D.** (2021). Quadriceps strength after anterior cruciate ligament reconstruction compared with uninjured matched controls: A systematic review and meta-analysis. *Orthopaedic Journal of Sports Medicine*, 8;9(4):2325967121991534. doi: 10.1177/2325967121991534. PMID: 33889639; PMID: PMC8040575.

**McGurk, S. R.** and **Mueser, K. T.** (2021). *Cognitive Remediation for Successful Employment and Psychiatric Recovery: The Thinking Skills for Work Program*. New York: Guilford Press.

**Mogensen, K. M.** and Robinson, M. K. In: GM Doherty (ed.). *Surgical metabolism and nutrition. Current Diagnosis & Treatment Surgery*, (15th ed.). New York: McGraw Hill Lange Textbooks. 2020:121–145.

Padgett, L., Dyk, K., Kelly, N., **Newman, R.**, Hite, S., and Asher, A. (2020). Addressing cancer-related cognitive impairment in cancer survivorship.

*Oncology Issues*, 35, 52–57. doi: 10.1080/10463356.2020.1692601.

**O'Keefe, E.**, Witt, W., Hardy, K., and Yourkavitch, J. (n.d.). (2020). APHA Opposes Separation and Confinement to Detention Centers of Immigrant and Refugee Children and Families at U.S. Borders. American Public Health Association, Policy Statement 20207.

Long, K. A., Gordillo, M., and **Orsmond, G. I.** (2020). Improving the validity and generalizability of adult autism research through incorporating family and cultural context. *Autism in Adulthood*, 2(3), 177–284. doi.org/10.1089/aut.2019.0061.

**Pontes, T. B.**, Mah, K., Arnold, A. K., Polatajko, H. J., and Davis, J. A. (2020). The occupational repertoires of children with mobility difficulties: The child's perspective. *British Journal of Occupational Therapy*, 83(4), 228–236. doi.org/10.1177/0308022619897877.

Freedman, J., Hage, S., and **Quatromoni, P. A.** (2021). Eating disorders in male athletes: Factors associated with onset and maintenance. *Journal of Clinical Sport Psychology*. doi: 10.1123/jcsp.2020-0039.

**Sloutsky, R.**, Yücel, M. A., Collimore, A. N., Ottman, E., **Ellis, T. D.**, **Walsh, C. J.**, Boas, D. A., and **Awad, L. N.** (2021). Targeting post-stroke walking automaticity with a propulsion-augmenting soft robotic exosuit: toward a biomechanical and neurophysiological approach to assistance prescription. *10th International IEEE/EMBS Conference on Neural Engineering (NER)*, 862–865. doi: 10.1109/NER49283.2021.9441244. (Best Paper Award).

Lindsay, S. F., Woodhams, E. J., White, K. O., Drainoni, M., Johnson, N. L., and **Yinusa-Nyahkoon, L. S.** (2020). Understanding barriers to contraception screening and referral in female adolescents and young adults with cancer. *Journal of Adolescent and Young Adult Oncology*.

Liu X., Bautista J., Liu E., and **Zikopoulos B.** (2020). Imbalance of laminar-specific excitatory and inhibitory circuits of the orbitofrontal cortex in autism. *Molecular Autism*, 11(1):83. doi: 10.1186/s13229-020-00390-x. PMID: 33081829.

**Zuk, J.**, Yu, X., Sanfilippo, J., Figuccio, M., Dunstan, J., Carruthers, C., Turesky, T., Grant, E., and Gaab, N. (2021). White matter in infancy is prospectively associated with language outcomes in kindergarten. *Developmental Cognitive Neuroscience*, 50, 100973.





# Why I Give

## Fernando Limbo III (CGS'10, Sargent'16)

Fernando Limbo III can't say enough about Sargent Spirit. It drew him to the college when, as a freshman at the College of General Studies, he attended Sargent Camp, in Hancock, N.H. And it sustained him through the challenges of his undergraduate career. Today, it drives his generosity to Sargent College, both in his volunteer activities and financial contributions.

"Sargent is known for its strong sense of community—the incredible support it provides for students and alumni and for its focus on the whole person," Limbo says. "If it weren't for my professors and advisors, I wouldn't have made it through. So how can I not do my best to help out in whatever way I can?"

A member of the Sargent College Alumni Association (SCAA) Nominating Committee, which makes board recommendations to the SCAA, he recently stepped up his commitment, helping to launch a professional development workshop series with other alumni and Debbie Claar, assistant director of academic services.

"As an undergrad, I really appreciated the networking events where Sargent brought alumni to campus to share their experiences," says Limbo, who now works as an executive recruiter in the tech industry after a stint recruiting

in the healthcare field. "I wanted to expand on that." The workshop topics include résumé and interview preparation, finding your passion, and other skills that will help students transition into their careers.

Philanthropy, Limbo says, is an integral part of his Catholic faith: he served as president of the BU Catholic Center as an undergrad. He gives to the Sargent College Fund because of its flexibility—distribution is up to the dean's discretion.

"The dean will know what's most needed by the students and the faculty," he says. "When I learned that the Sargent College Fund was an option, it was a no-brainer." —*Thea Singer*



## Mindy Hilson ('77,'82)

In her junior year of studying physical therapy at Sargent, Mindy Hilson contracted mono. With deep fatigue and frequent fevers, she thought she would have to drop out. But then, she says, her advisor told her, "I don't want you to leave. We'll help you get through this."

And that's what happened: faculty, friends, and classmates all pitched in.

"Everyone took notes for me, they helped me, and I made it through that semester," Hilson says. "And that was what Sargent epitomized: this group of students who all cared about each other and wanted to help people."

The experience confirmed her decision to study PT—and to do it at Sargent. She had first thought of the field after receiving PT for scoliosis. Then her brother, Bennett Blumenkopf (CAS'73, MED'76), who was studying medicine at BU at the time, recommended applying to Sargent. "He thought the people in the program were bright, nice, and compassionate," she says. "It was a small community, and it was just wonderful—easy to meet people and develop great friendships. There's a very uplifting type of person who goes into PT. For me, it was just a great fit."

Hilson went on to practice PT—and even met her husband when he came to her as a patient. "PT provided me with an amazing life," she says.

She'd love to see a new generation of students have that same rich experience. That's why Hilson has endowed a Century Challenge scholarship for Sargent undergraduates, meaning that BU will match the income from her fund for 100 years. And she hopes those students will pursue careers in PT.

"For me, PT's the best," Hilson says. "If you can't get people active and functional in their lives, then what is life?" —*Louise Kennedy*



COURTESY OF FERNANDO LIMBO III; COURTESY OF MINDY HILSON

# BU Sargent College

## Who We Are

Students	Undergraduate	Graduate
Number of full-time students	1,096	609
Faculty		
Full-time	78	
Part-time	47	

## Alumni

19,150 in 73 countries

## Clinical Sites

More than 1,700 in 50 states and 3 countries

## Areas of Study

Athletic Training  
 Behavior & Health  
 Health Science  
 Human Physiology (Pre-Med)  
 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

## 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

- 100%** ATHLETIC TRAINING
- 100%** NUTRITION
- 100%** OCCUPATIONAL THERAPY
- 100%** PHYSICAL THERAPY\*
- 100%** SPEECH-LANGUAGE PATHOLOGY

Percentage of BU Sargent College students in entry-level graduate professional programs who passed their certification exams.

\*Data averaged over the past 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 1,700 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

635 COMMONWEALTH AVENUE  
BOSTON, MA 02215

NONPROFIT  
US POSTAGE  
PAID  
BOSTON MA  
PERMIT NO. 1839

# YOU

Are dedicated to advancing BU  
Are a leader, inspiring others to make a difference  
Give in many ways to make the world a better place

# WE

Educate the leaders of tomorrow  
Push the boundaries of scholarship  
Tackle great societal challenges from health inequities to climate change

You belong in a  
**BU Leadership Society**

### LOYALTY SOCIETY



The **Loyalty Society** recognizes and honors the more than 30,000 donors who support Boston University consistently every year.

Donors are welcomed into the **1839 Society** when they give a cumulative amount of at least \$1,000 within a fiscal year.



Your generosity and commitment will help ensure BU's position as a leading global research and teaching institution, paving the way to a more equitable, just, and healthy world.

Take your place in BU's Leadership Societies today.  
Learn more at [bu.edu/givingsocieties](http://bu.edu/givingsocieties)

### Get in Touch

**Email:** [saralum@bu.edu](mailto:saralum@bu.edu)

**Phone:** 617-353-4322

#### Mail:

Boston University  
College of Health  
& Rehabilitation  
Sciences: Sargent College  
Development & Alumni  
Relations Office  
635 Commonwealth Avenue  
Boston, Massachusetts 02215

[bu.edu/sargent/alumni](http://bu.edu/sargent/alumni)



Follow **BU Sargent College** on:  
[facebook.com/busargent](https://facebook.com/busargent)  
[instagram.com/busargent](https://instagram.com/busargent)  
[linkedin.com/school/busargent](https://linkedin.com/school/busargent)  
[twitter.com/busargent](https://twitter.com/busargent)  
[youtube.com/busargent](https://youtube.com/busargent)