2012–2013

InsideSARGENT

Boston University College of Health & Rehabilitation Sciences: Sargent College

1 IN 17 AMERICANS IS ABOUT TO GET A NEW HERO

SEVERE MENTAL ILLNESS AFFECTS 6 PERCENT OF AMERICANS, BUT FEW CAN ACCESS THE BEST—OR EVEN ADEQUATE—CARE.

KIM MUESER PLANS TO CHANGE THAT.

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BOSTON UNIVERSITY

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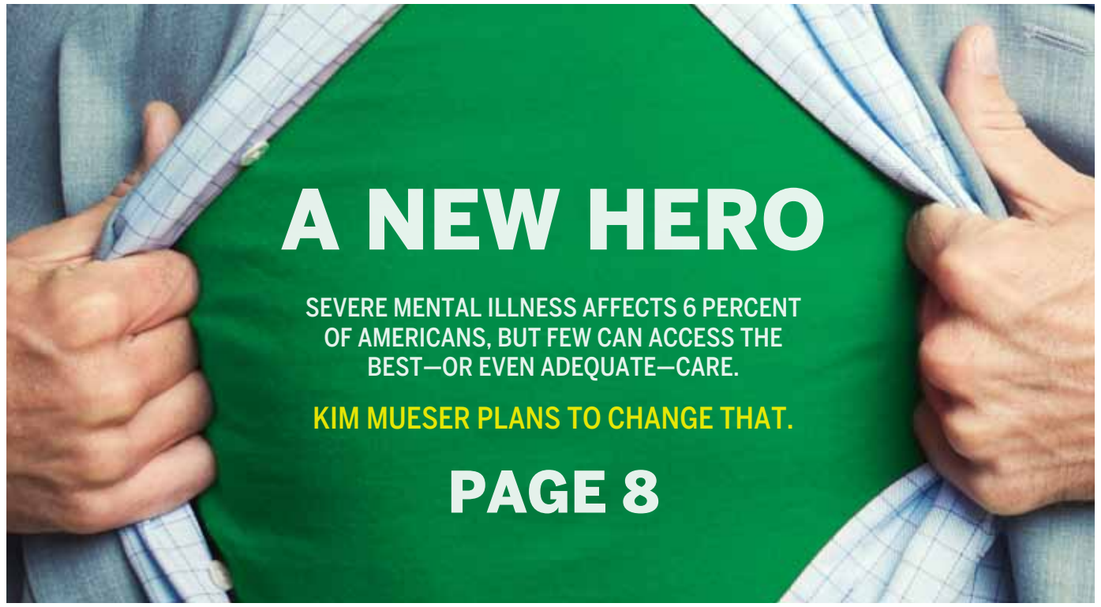

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National Parkinson's Center
Sargent is home to a first-of-its-kind national center for Parkinson's disease. Check out its latest research at **www.bu.edu/neurorehab**.

How Kids Learn Language
Sargent's Child Language Lab is changing our understanding of how toddlers talk. Delve into the research and its implications at **www.bu.edu/childlanguage**.

Arthritis Answers Podcasts
Subscribe to Sargent's Center for Enhancing Activity & Participation among Persons with Arthritis podcast series at **www.bu.edu/enact/ala_podcasts**.

InsideSARGENT
2012–2013

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About
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Dear Friends,

This is a historic time for health care, as advances in research and technology are under way that will benefit generations to come. At BU Sargent College, we're proud to foster an environment in which education, research, and clinical practice converge to encourage such advancement. Though varied in our disciplines—Sargent academics and practitioners work on projects ranging from developing resources for autistic children to mapping brain circuitry—our efforts have always been grounded in a single question: How can we help?

In this issue of *Inside Sargent*, we focus on just a few of the many individuals striving to make a difference in the lives of the people they treat, including a researcher aiming to keep health care affordable and an interdisciplinary team helping a pianist with Parkinson's disease keep on playing. The cover story features a recent addition to Sargent College, Kim Mueser, executive director of BU's Center for Psychiatric Rehabilitation and professor of occupational therapy. His research is giving new hope to the nation's severely mentally ill by removing the stigma of mental illness and helping them secure and maintain lasting employment.

Mueser's work is just one example of Sargent's impact beyond Boston. In this issue, you'll read about Clinical Associate Professor Eileen O'Keefe's efforts to improve the health of women in rural India. We also examine the innovative interventions two nutrition professors have developed to fight childhood obesity in America and the work of Child Language Laboratory Director Sudha Arunachalam to shed light on one of the great mysteries of human cognition—how we learn language. Such endeavors aren't limited to our faculty; students, too, are playing their part. Human physiology student Jamie Lim learned more than he anticipated during an outreach trip to treat malaria in Uganda—he contracted the illness himself and discovered a more personal connection to his patients as a result.

I hope you'll find these profiles as compelling as I do. All of our featured individuals strongly believe in using their knowledge and talent to help people live better, healthier lives. As I look ahead to the future of our professions, I am filled with optimism for what we can accomplish. The debate about health care will no doubt go on in Washington, D.C., but whatever the political and financial future holds, we are poised to achieve great things through education, research, clinical practice, and always asking: How can we help?

With warm regards,

Gloria Waters

Gloria Waters
Dean and Professor

"THOUGH VARIED IN OUR DISCIPLINES—SARGENT ACADEMICS AND PRACTITIONERS WORK ON PROJECTS RANGING FROM DEVELOPING RESOURCES FOR AUTISTIC CHILDREN TO MAPPING BRAIN CIRCUITRY—OUR EFFORTS HAVE ALWAYS BEEN GROUNDED IN A SINGLE QUESTION: HOW CAN WE HELP?"

MAKING HEALTH CARE ADD UP

STEERING LIFE-SAVING RESEARCH THROUGH TIGHTENING BUDGETS.

In one hand, the hospital manager holds a budget report awash with red ink; in the other, a proposal for a potentially life-saving, but expensive-sounding, screening program. If the new test is introduced, might something else have to be cut—and might the *someone* else benefiting from it have to suffer—to balance the books?

"It's a very sensitive issue," admits Kee Chan, an assistant professor and expert on health care cost effectiveness. "How do you evaluate a life?"

Chan has developed a mathematical model to help doctors, hospitals, and governments weigh the merits—and prices—of new public health programs. A former researcher at the National Institutes of Health, she also collaborates with scientists and researchers to show them how to put their advances to work in the clinic.

Bench to Bedside

Whether they've designed a new pill or disease test, many researchers still ignore a vital question: "How would you actually implement this?" Faced with those holding the purse strings, they fail to grapple with potential budget impacts, from employing new staff to the program's projected shelf life. It leaves many pioneering projects stuck on the lab bench when they could be making a difference at the bedside.

"The reality is that there's only so much money in the pot," says Chan. "If you're talking to policy makers or health facility managers, they're interested in how investing in this new technology, intervention, or screening program would save 'x' number of lives or improve 'x' number of years lived."

The Price of Life

Chan's model can be tailored to help researchers at BU and other institutions consider those cost and implementation questions. Based on a mathematical approach called the Markov Model, which is used to measure probability, it's

continued on next page →

"THE REALITY IS THAT THERE'S ONLY SO MUCH MONEY IN THE POT. IF YOU'RE TALKING TO POLICY MAKERS OR HEALTH FACILITY MANAGERS, THEY'RE INTERESTED IN HOW INVESTING IN THIS NEW TECHNOLOGY, INTERVENTION, OR SCREENING PROGRAM WOULD SAVE 'X' NUMBER OF LIVES…"
–KEE CHAN

Assistant Professor Kee Chan helps health researchers consider questions of budget versus health benefit.

Photos by Kalman Zabarsky

Health Care *continued from page 3*

a way of crunching numbers that allows her to examine a myriad of potential impacts. She can also calculate a dollar figure for every year—or improved year—added to a life. Generally, if a program costs less than $50,000 per quality-adjusted life year, or QALY, it has a good chance of making the cut. "It's not that one life is worth more than the other," says Chan, "but it's a way to evaluate the health benefits or outcome of investing in a program."

Recent projects have included assessing a change in HIV screening policy at the Department of Veterans Affairs and studying the viability of new Hepatitis C drugs. Chan, a trained geneticist, bases her theories on a practical success of her own: A Severe Combined Immunodeficiency screening test for newborns she developed in 2005 is used in ten states, including Massachusetts. She credits the inclusion of implementation questions from the outset for the screen's rapid adoption—the test she developed uses a dried blood spot already collected at birth by most hospitals.

Today, Chan is still more likely to be contacted by researchers edging towards the end of a study than those starting out—the point when they realize, "Oh, I can actually use this in the community; what should I do?"—but given the economic environment, that's changing. She's weaving cost-effectiveness questions into a project with researchers studying obesity in Chicago and will soon be traveling to China to examine the implementation of a new HIV medication program.

With a price increasingly placed on our health, Chan's work could help more life-saving programs justify their place in the budget.–*Andrew Thurston*

FACING AIDS

STUDENT-LED GROUP FINDS NOVEL WAYS TO FUND DISEASE FIGHT

BU FACE AIDS founders Jeremy Meltzer ('12, SPH'13) and Colin Mooney ('13) with Paul Farmer of Partners In Health. Photo by Angela Miglietta Comeau

Flowers + condoms = "flondoms." And money for the fight against HIV and AIDS. The unconventional bouquets were sold by the BU chapter of FACE AIDS, a student-led organization that raises funds to support Partners In Health's (PIH) programs for HIV-affected communities in Rwanda.

According to BU FACE AIDS founders Jeremy Meltzer ('12, SPH'13) and Colin Mooney ('13), since its 2011 launch the chapter has developed close ties with Boston-based PIH. The connection has allowed members to go beyond fundraising, attending expert lectures and joining volunteer efforts.

"Though we've started small, we have big plans," write Meltzer and Mooney. "Our hope is to provide opportunities through FACE AIDS or Partners In Health for Sargent undergraduates. We are also planning a workshop with Partners In Health to help students develop their community organizing and leadership skills, focusing on global health and social justice."

ARTHRITIS ADVICE ON THE MOVE

PODCAST SERIES TAKES RESEARCH BEYOND JOURNALS

Advice for living with arthritis is now available in your kitchen. And at the gym. And on the bus. BU Sargent College's Center for Enhancing Activity & Participation Among Persons with Arthritis has launched a podcast series to help patients and clinicians access its research—wherever they are. The first *Active Living with Arthritis* podcasts feature exercise tips, including guidance on building a healthy routine and suggested workouts; future episodes are planned on topics as diverse as buying the right kind of footwear to coping with office life.

To subscribe to the podcasts, visit **www.bu.edu/enact/ala_podcasts**.

Students from BU helped villagers construct two gardens in rural Panama in January 2012. Photo courtesy of Danka Charland

GREEN FINGERS

The garden plots are small, just six-by-nine feet. The seeds they hold humble: cucumber, onion, melon, string bean. But those modest plantings promise self-sufficiency to two indigenous families of the rustic Piriati Embera community in eastern Panama.

The organic gardens were built in January 2012 by student volunteers working with the health and sustainable development organization, Global Brigades. The team from BU, which included Sargent College staff and students, also educated villagers about soil contamination, natural pest repellents, and composting and recycling.

THE MODEST PLANTINGS PROMISE SELF-SUFFICIENCY TO TWO INDIGENOUS FAMILIES.

The local families have an average income of $75 per month, a starch-dependent diet, and an agricultural approach that quickly exhausts the land, so the combination of planting and education will allow them to "contribute to their income and learn how to be better keepers of the environment," says Danka Charland (MET'01, '03), the human physiology program administrator who traveled with the students on the eight-day project.

TOP HONORS

Occupational therapy's highest honor and an appointment to advise the federal government on health policy: two Sargent faculty members—**Karen Jacobs** and **Joe Perkell**—received significant accolades in 2011–2012. And they weren't alone.

The Interagency Autism Coordinating Committee named a paper by Professor **Helen Barbas** among its 10 most important mental health publications.

Research Assistant Professor **Virginia Best** won an Academy of Research in Otolaryngology young investigator award.

Center for Psychiatric Rehabilitation Director of Services **Dori Hutchinson** was named chairwoman-elect of the U.S. Psychiatric Rehabilitation Association (USPRA).

Clinical Professor **Karen Jacobs** gave the Eleanor Clarke Slagle Lecture at the American Occupational Therapy Association's 2012 annual conference.

The Federation of State Boards of Physical Therapy recognized Assistant Professor **Cara Lewis** with its Outstanding Service Award.

Senior Research Scientist **Joe Perkell** was appointed for a five-year term to the federal National Deafness and Other Communication Disorders Advisory Council.

The USPRA presented Senior Training Associate **Maria E. Restrepo-Toro** with the 2012 LeRoy Spaniol Educator Award.

WEB Extra
Keep track of all faculty achievements at **www.bu.edu/sargent/press-releases**.

OUTSTANDING SENIOR AWARDS

Every year, Sargent honors some outstanding seniors for their academic, clinical, research, or community contributions. The 2012 senior award winners were (from left to right): Jena Daniels, Amanda Matteo, Robert Ali, Julie Goldberg, Kristely Bastien, Amanda Schmitz, Michelle Kielty, Sarah Hodge, Antigone Matsakis, Priscilla Agyemang, and Jacob Koshy. Photo by Patrick Singleton

To Moop or Not To Moop

THE DISCOVERY THAT KIDS COMPREHEND VERBS LONG BEFORE THEY CAN SPEAK THEM COULD BENEFIT CHILDREN WITH AUTISM.

BY PATRICK L. KENNEDY

PHOTOS BY VERNON DOUCETTE

WEB Extra

Delve into the Child Language Lab's research and its implications at **www.bu.edu/childlanguage**.

THEY DON'T TALK MUCH, but they listen. And learn. Even the youngest toddlers are rapidly building a vocabulary, even if they aren't able to reproduce aloud all they've learned. In fact, when a child hears an unfamiliar verb, even absent a visual cue, she will usually figure out from the context of the sentence whether it's transitive or intransitive, then file it away and retrieve it when she encounters a likely definition. (She sees her brother rubbing Fido, then remembers Mommy spoke of *petting* the dog.)

That's the finding Sudha Arunachalam published in a 2012 edition of the journal *Language and Cognitive Processes.* Arunachalam is director of the BU Child Language Lab and an assistant professor of speech, language and hearing sciences.

"Learning language is really one of the great mysteries of human cognition," says Arunachalam. "Children understand more than they say."

In the past, the language scientist explains, studies of lexical acquisition focused on nouns, because, generally, the first words out of a child's mouth are indeed nouns. Parents naturally think teaching words means, "I hold up a ball and say, 'Look, here's a *ball.* Do you see the *ball?*'" Arunachalam says. "But real-world learning is much more complicated than that, and verbs in particular are more complicated, which is why we chose to look at them."

In a 2010 study, Arunachalam and colleagues established that 27-month-olds are capable of correctly identifying a verb's syntactic properties. They showed children a video of a conversation with a made-up verb cast as either transitive ("The boy wants to *moop* the ball") or intransitive ("The boy and the dog want to *moop*"). Then, the toddlers watched two scenes side by side: one depicted a boy spinning a girl in circles; the other, the boy and girl each waving one hand. Finally, the kids were asked to point to the scene that showed *mooping.* Those who'd started with the dialogue video in which *moop* was transitive picked the transitive video (the boy acting upon the girl by spinning her) and those who'd watched the intransitive dialogue picked the intransitive scene (the boy and girl together performing an action, waving, with no object).

In her latest study, Arunachalam tried the same experiment but with even younger children—most 21 months, some just 19 months—and with a technological twist: instead of asking the toddlers to indicate their choice by pointing, she used a corneal reflection monitor to track their eye movements upon hearing the question. "It's kind of extraordinary," she says. "We can measure their comprehension by almost literally looking through their eyes."

DESPITE THE CHALLENGES of working with such young subjects (the journal article notes that "nine toddlers were excluded from analysis due to fussiness"), Arunachalam and colleagues again found that most kids got the transitive-intransitive distinction. "Clearly, then, 21-month-olds have what it takes to benefit from cross-situational learning," she wrote, meaning "they can glean whatever information is available about a novel verb in one encounter, and access that information in a subsequent encounter."

That held true for the study's few 19-month-olds, Arunachalam adds. "Most 19-month-olds are barely putting words together in a sentence—and they aren't producing transitive or intransitive structures. But our study made clear that not only can they learn new verbs, they can learn them just from hearing this kind of syntactic information."

It's a remarkable advance in our understanding of how children learn words, and Arunachalam isn't finished by a long shot. She's also planning to study the effect a good nap has on word learning: "Sleep has been shown to have a large role in memory consolidation, but there's been very little work on memory for language, and *no* work on memory for word meanings in children."

Currently, Arunachalam is running the eye-tracking test again, but this time "extracting the social context from the situation to make it even harder," she says: rather than a video of a conversation, children are shown a dull video of shapes moving while they hear the novel verb spoken within a stream of unrelated sentences. It's too early to draw a conclusion, she says, but so far, "The trend is in the right direction. They do seem to be learning."

This study may have implications for the teaching of language to children suffering from autism. "Perhaps this would be helpful for them," Arunachalam says. "Maybe they would learn more easily in a context in which they didn't have to sit next to somebody or look at somebody or be explicitly taught something, but rather they could pick up information more from ambient noise." At the least, she says, this exercise could provide the children a foundation for later learning.

Assistant Professor Sudha Arunachalam has found that although nineteen-month-olds don't produce many verbs, they can learn them.

The biggest challenge for the language lab is simply getting participants. "We need 80 kids per study—80 kids whose data we can use," Arunachalam says. "Occasionally a kid will walk in the room and just want to leave. Or he'll keep holding a cup of Cheerios in front of his face, and we cannot get him to put that cup of Cheerios down." Nevertheless, she adds, "We've had tremendous success."

For *Inside Sargent* readers who are parents of toddlers, Arunachalam offers this takeaway: "Children are listening and learning, even when they are just overhearing speech that isn't directed specifically to them. So keep the household conversation going!" IS

A NEW HERO FOR 1 IN 17 AMERICANS

SEVERE MENTAL ILLNESS AFFECTS 6 PERCENT OF AMERICANS, BUT FEW CAN ACCESS THE BEST—OR EVEN ADEQUATE—CARE.

KIM MUESER PLANS TO CHANGE THAT.

BY ANDREW THURSTON

PHOTO BY CYDNEY SCOTT

THIS IS NOT WHAT SEVENTIES DISCO COOL SHOULD LOOK LIKE. A community dance. With your mom. In a New Jersey state psychiatric hospital. But for the teenage Kim Mueser, it was still pretty neat.

His mom was a clinical psychologist at the hospital and tagging along to her office afforded an insider's view of a fledgling, progressive era: deinstitutionalization.

"There was a lot of energy, a lot of optimism that these people who'd lived in the hospital for 20 years could get out and lead valuable lives," says Mueser, the newly appointed director of BU Sargent College's Center for Psychiatric Rehabilitation.

He decided early on he could play a part in that. "I've always liked to root for the underdog and to try to help people who had the greatest need, so I focused on schizophrenia."

But, while Mueser now champions the underdog cause as American editor of the *Journal of Mental Health* and frequent National Institute of Mental Health review committee member, the nation's approach to treating people with psychiatric disorders, especially severe ones, is still wedged in the past. It's not that advances haven't been made, says Mueser, but that they've remained stuck at a local level—an effective program at an individual clinic, a lone researcher trying something different with 20 test patients.

Familiar culprits can take some of the blame for the lack of universal access to the best treatments: limited funding, undertrained practitioners, enduring stigma. But the field also seems to be hampered by limited vision; great ideas largely remain just that, failing to evolve into usable, national guidelines that enable clinicians and empower patients.

This is where that changes.

AMERICA'S 'D' GRADE ON CARE

The National Alliance on Mental Illness gives America a 'D' grade on its care of people with psychiatric disorders. In its last *Grading the States* report, not one state was given an 'A,' only six mustered a 'B,' and twenty-seven were chided with a 'D' or 'F.' For people with a mental illness, those grades translate into inadequate provision of many services essential to recovery: illness self-management programs, supported housing and employment, family education programs, and wellness promotion, to name a few (the report names a total of 65).

One of the keys to improving care across the country is, according to Mueser, evidence-based practice. It sounds so fundamental, it's hard to believe it's not already commonplace. He contends that recent rehabilitation and treatment breakthroughs have had a limited impact in an environment of undertrained practitioners and high caseloads: "Much more work is needed in terms of developing models that can support the implementation of these practices in real-world treatment settings," says Mueser.

He's positioning the BU Sargent College Center for Psychiatric Rehabilitation to lead that charge. The center is an on-campus hub for mental health care research, training, and clinical programs that's funded by the National Institute on Disability and Rehabilitation Research. A pioneer in shifting the field's focus from symptom control to recovery, it's long been a globally recognized advocate of "the importance of self-determination in terms of treatment and goals." According →

→ *continued from previous page*

to Mueser, a center task now is to use "that recovery vision in implementing specific evidence-based practices."

Associate Professor of Occupational Therapy Susan McGurk, who directs cognitive remediation initiatives at the center, notes that with more than 20 research projects and clinical programs under way there, a lot of the groundwork has already been laid. "More of the wonderful services developed here will be tested in randomized-controlled trials to further increase their impact on the field," she says.

"THE SINGLE MOST POWERFUL WAY OF OVERCOMING STIGMA IS HAVING CONTACT WITH SOMEBODY WHO'S HAD A MENTAL ILLNESS. EVEN IF YOU DON'T WANT TO MAKE IT A SPECIALTY, WHEN YOU WORK WITH VERY CHALLENGING, DIFFICULT PEOPLE, IT EXPANDS YOUR SKILLS."–KIM MUESER

CONTROLLED TESTS FOR AN UNCONTROLLABLE WORLD

Close to half of people with a severe mental illness suffer from posttraumatic stress disorder (PTSD); emblematically, little work has been done to develop tailored treatments. In National Institute of Mental Health-funded research, Mueser and his team are conducting a series of randomized-controlled trials—the evidence-based approach—to evaluate a new treatment and clinician training program. It uses a cognitive-behavioral treatment that teaches clients to recognize and change inaccurate thoughts and beliefs, often related to traumatic experiences; as people with PTSD learn to challenge incorrect or unhelpful trauma-related beliefs, they gain better control over their emotions and their lives. While clients' levels of depression and PTSD symptoms are tracked during treatment, clinicians in training are given weekly feedback on their implementation of the program.

After evaluating the intervention "in a controlled study across several states with very well-trained, PhD-level clinicians," says Mueser, the researchers had "good results," but they still didn't know "whether the program would work with less academically trained, graduate-level clinicians." A second study was needed: "We're now testing the program at five different sites, including urban ones, in New Jersey. All of the clinicians providing the intervention are front line, people who are simply working with this population on a daily basis." Those aren't grant-funded positions—"all the services they provide are billable," confirms Mueser—but by expanding the reach of its study, the team has been able to probe additional questions: "Will the program work in more urban settings, with greater numbers of minority clients? Are the effects of the program long-lasting? What are the effects on other areas of functioning, such as overall functioning, quality of life, etc.?"

A WORKFORCE PROBLEM

That Mueser, who is also a professor of occupational therapy at Sargent, included a training element in the PTSD study is revealing.

"We have a workforce problem," is his blunt assessment of mental health care provision in the United States. It stretches from generalists—physicians, for instance, have been shown to provide poorer physical care to people with schizophrenia than those without—to specialists: psychology students, who should be well placed to help, don't want to; they're worried patients won't be motivated to change, according to a 2010 study.

Why is this happening? Some of it—as in the attitudes of psychology students—is stigma, says Mueser. The education system is also at fault: "You can get a PhD in clinical psychology and never meet or work with somebody with schizophrenia or bipolar disorder, which are two of the most common severe mental illnesses."

One of Mueser's aims is to take advantage of Boston University's closely intertwined health-related colleges—including Sargent and BU's schools of medicine and social work—and departments, particularly psychology, to model new curriculum and training opportunities across a broad range of disciplines. He's also hoping to establish relationships with more public mental health service providers in Boston.

"The single most powerful way of overcoming stigma is having contact with somebody who's had a mental illness," he says, referencing his teenage trips to the New Jersey state hospital. "Even if you don't want to make it a specialty, when you work with very challenging, difficult people, it expands your skills, it expands your understanding of the range of different challenges that people face." Mueser believes that working with someone with schizophrenia as they overcome symptoms such as auditory hallucinations or disordered speech, only to find barriers to work or social activities, is "good experientially and facilitates the development of clinical skills."

He's pursuing opportunities for "curriculum development and training of people in professional programs—occupational therapy, social work, psychology"—to ensure future practitioners are being taught the latest, most effective treatment methods.

Mental health advocate Gayle Berg, founder of Psychological Solutions in New York, is backing Mueser and the Center for Psychiatric Rehabilitation to break down the barriers that have "constricted and restrained" rehabilitation services for decades.

"The center continues to be a one-of-a-kind gem that enables the possibility for creative innovation and problem solving that has not only already made innumerable and significant contributions to the field," says Berg ('74), a center advisory board member, "but will allow the continuation of its extraordinary trailblazing path of changing and transforming the lives of real people living with mental illness, today and in the future."

And for the one in seventeen Americans with a severe mental illness—not to mention the one in four who suffers some form of psychiatric disorder—it should mean they finally get 'A'-grade-care. A worthy victory for all underdogs—and their longtime champion. IS

Military Mission

FOR TWO OCCUPATIONAL THERAPY STUDENTS, IMPROVING THE REHABILITATION OF SOLDIERS INJURED IN BATTLE HAS PERSONAL MEANING.

BY RACHEL JOHNSON

First the good news for America's soldiers: If they sustain a serious injury in battle, they're more likely to survive than ever before. The bad news, say two BU Sargent College occupational therapy (OT) students focused on the care of wounded warriors, is that they might not always get the help they need to transition back to civilian life—or to serving their country again.

Jeanne Brady ('07, '12), a student in Sargent's post-professional distance education doctoral program, is developing an online course to train occupational therapists to work with the wounded warrior (WW) population. "There isn't much education on treating wounded soldiers," she says. "Dealing with the whole WW population can be very foreign to OTs, but understanding military culture is key to treating these patients." Her course is designed to bridge that educational gap. "This is a big population," she says. "We need to make sure we provide OTs with the education they need in order to work with these soldiers."

Brady has been inspired by the people around her. The wife of an active-duty officer in the U.S. Marine Corps, she has seen friends return from duty with combat-sustained traumatic brain injuries. "I was just thinking, what can I do to help them transition to civilian life. It was about identifying an area of need." Her course addresses military-specific issues: how to treat combat-related injuries, typical mild traumatic brain injury symptoms to look for, and how to understand military language for more effective communication. "Now, I want to disseminate this information as far as possible," she says. "That's why I'm developing an online course."

Kristen Jackson's ('13) program is also about spreading as much information as possible about army-specific OT. The entry-level master's student has spent a year talking to army OTs—including Colonel Robinette Amaker, the army's chief occupational therapist—to create brochures to distribute at five major military bases. Her aim is to minimize the debilitating effects of OT-treatable conditions, such as traumatic brain injury, by educating army health care professionals to recognize opportunities for prompt referrals. She says that military personnel can be so focused on horrific physical injuries that cases where OT could be applied can get missed. "Soldiers are coming in with issues that an occupational therapist could treat early on, and they're being sent through a whole variety of people before they get to an OT," she says. "And then we're playing catch-up." Early intervention, she adds, can mean the difference between a soldier who is able to return to combat and someone who is out of the army forever.

"SOLDIERS ARE COMING IN WITH ISSUES THAT AN OCCUPATIONAL THERAPIST COULD TREAT EARLY ON, AND THEY'RE BEING SENT THROUGH A WHOLE VARIETY OF PEOPLE BEFORE THEY GET TO AN OT."
—KRISTEN JACKSON

Jeanne Brady, top, and Kristen Jackson, bottom. Photo of Jeanne Brady by Jane Aefsky; courtesy of Jeanne Brady. Photo of Kristen Jackson by Bethany Ann Photography; courtesy of Kristen Jackson.

Career- and life-ending injuries hit close to home for Jackson, too. "The job that my fiancé has, a bomb technician in the army, is often associated with higher incidences of traumatic brain injury," she says. "It's something that his soldiers experience on a regular basis." Helping these soldiers get on with their lives is what this education drive is all about for both Jackson and Brady. "Now soldiers are getting treated faster, are going through rehab faster," says Jackson. "People who wouldn't have survived before are surviving now; they're heroes to me, and I'm happy to be supporting them." IS

THE SCIENCE BEHIND A SIMPLE, BUT VITAL, PLEASURE

A BIOMEDICAL ENGINEER STUDIES THE SCIENCE OF SWALLOWING TO PROVIDE CLINICIANS WITH NEW TREATMENTS.

BY PATRICK L. KENNEDY

WHAT'S GOING ON ACOUSTICALLY when someone with dysarthria utters a vowel sound? Can people with swallowing disorders control their throat muscles for tasks other than swallowing? How might computers help stroke patients recover their speech production?

Ask an engineer. Cara Stepp, an assistant professor of speech, language & hearing sciences and biomedical engineering, runs the Stepp Lab for Sensorimotor Rehabilitation Engineering; she brings her engineering training to the study of normal and disordered speech and voice. The lab's long-term goal is to use its findings to help rehabilitate people who have experienced a stroke, Parkinson's disease, brain injury, or other condition that impairs speech and swallowing.

Two of its five projects use interactive computer games for assessment and rehab. "In upper limb rehab," Stepp says, "there are lots of studies showing that engaging individuals in motor rehab with a video game is really effective." The release of dopamine during game play actually encourages brain plasticity, improving one's ability to learn new muscle functions. "We're adapting that to swallowing and velopharyngeal dysfunction."

In the first project, Stepp wants to train people with dysphagia, those whose normal swallowing function has been impaired by a brain injury, to control their anterior laryngeal musculature in response to visual stimuli. A test subject wears four sensors on her neck, three to record signals, and one to send signals to a computer game in which she moves a fish up or down, eating smaller fish and avoiding a big shark. The subject sends these signals by tensing the muscles normally used for swallowing. "We're not asking anybody to do anything more, activity-wise, than they already can. So it's not strength-building; it's coordination. So far nobody can't do it." Stepp found that someone who has had a stroke, over time, was able to synch up both sides of her neck: "That was pretty promising, that the impaired side started to look more like the healthy side as she was playing the game."

The other study of this type concerns individuals with velopharyngeal dysfunction. At the back of the throat, the velum is responsible for closing off the nasal cavity when we speak. "When it's shut, we produce speech without any of the acoustic energy going through our nose," says Stepp. "When it's open, we purposefully, usually, do that to create nasal sounds—*nnn*, *mmm*, *nng*. But if you don't have control over this, then you get nasalization when you don't mean to. And that's extremely common in individuals with hearing disorders." That's because the difference isn't perceptible by sight: if you were to watch a clip of someone saying, "Mom" (nasal), with the sound muted, it would be indistinguishable from "Bob" (nonnasal). "If you don't have good auditory feedback, then you don't learn how to control this," Stepp explains.

To pinpoint the subtle acoustic differences, the lab has developed a sensor and signal processing system in which a microphone measures acoustic energy emitting from a subject's mouth and nose while an accelerometer picks up vibrations from his nose as he plays a game involving a paper airplane, moving it up and down based on his nasalization of words. "The visual feedback should motivate people to try to rehab," says Boris Virnik, a recent BU engineering undergraduate in the Class of 2012 who helped design the program. "That's really important. So we're trying to make the sensor something that's fun to use."

> **"I THINK A LOT OF ENGINEERING PROJECTS THAT GO AWRY DO SO BECAUSE THE ENGINEER HAS NO UNDERSTANDING OF THE PRAGMATICS.... I TRY NOT TO FALL INTO THAT TRAP, AND THAT'S ONE OF THE MAJOR ATTRACTIONS OF SARGENT FOR ME: I CAN GET THE IDEAS AND OPINIONS OF CLINICIANS RIGHT HERE IN THIS BUILDING."**
> –CARA STEPP

Stepp appreciates having a team of students working with her in the lab. "The BU undergrads are phenomenal," she says. "They bring hours of work, of course, but it's more than that; they take responsibility and they contribute creatively. That's a combination that is not common."

Currently, the velopharyngeal study is gathering control data from healthy adults, and the plan is to test the sensor on children with hearing disorders as well as cerebral palsy and cleft palate.

Other Stepp Lab projects include a study of the acoustic signals in the speech of people newly diagnosed with Parkinson's disease. "By the time someone is diagnosed, they may have been living with it for eight to ten years, and have lost half their brain stem," Stepp explains. "How is it that nobody notices it until then? One reason I believe is that humans are so good at compensating [while listening]. Our speech perception is specifically trained to hear intelligible speech. What I wonder is whether we can identify the perceptually subtle changes using acoustic analyses."

BU Sargent College has proved to be the perfect fit for the engineer's work in research and rehab. "I'm not a clinician, so I have to be really careful to talk with, at every opportunity, clinicians who see patients all the time," says Stepp. Fortunately, she gets to consult colleagues such as Clinical Professor Susan Langmore, "probably a top-five-in-the-country swallowing researcher. She's an amazing clinical resource."

"I think a lot of engineering projects that go awry do so because the engineer has no understanding of the pragmatics," Stepp says. "So they design something that is really elegant but has little to do with what patients actually want and need. I try not to fall into that trap, and that's one of the major attractions of Sargent for me: I can get the ideas and opinions of clinicians right here in this building." IS

< **Biomedical engineer Cara Stepp.** Photo by Kalman Zabarsky

PARKINSON'S CARE
with a Touch of Harmony

The all-around treatment approach shows Parkinson's doesn't mean the end of enjoying life—or playing piano.

BY CORINNE STEINBRENNER

Photo by Simon Watson

WHEN KAREN SAUER FIRST noticed she was having difficulty at the piano, she tried to ignore it. Then she told herself she should be practicing more. "And then, finally," she says, "it just got so bad that I realized I had to figure out what was going on."

A professional pianist and longtime member of the music faculty at Wellesley College, Massachusetts, Sauer consulted a series of specialists, eventually making her way to a neurologist. The neurologist suspected focal dystonia—a task-specific movement disorder that can affect the hands of pianists, guitarists, and other musicians—but eventually offered a more distressing diagnosis: Parkinson's disease, a progressive disorder of the central nervous system. A second neurologist confirmed the Parkinson's diagnosis and recommended not only a regimen of medications but also a visit to BU Sargent College, where physical therapists at its Center for Neurorehabilitation could help Sauer design a regular exercise routine that increases the quality of her life and could potentially slow the progress of her disease.

Sauer is among the growing number of people with Parkinson's who are including rehabilitation specialists—physical therapists, speech-language pathologists, occupational therapists, and nutritionists—early and often in their care. "Patients typically were not referred to a rehabilitation specialist unless they suffered a fall or experienced a significant change in their mobility," says Cathi Thomas (SON'87), coordinator of the American Parkinson Disease Association (ADPA) Information & Referral Center on BU's Medical Campus. "The strong message now," Thomas says, "both from the patient community and health care professionals, is that people with Parkinson's disease should be referred for these other disciplines very early on."

Doctors and patients in the Boston area are particularly likely to have received this message thanks to the efforts of the Sargent professors who've joined with Thomas to educate the local community about the benefits of rehabilitation therapy for people with Parkinson's disease.

MAKING A GOOD START

Among the many educational initiatives the BU team organizes is the Good Start Program for people newly diagnosed with Parkinson's. Good Start sessions are held each fall at Sargent. Patients and their family →

→ *continued from previous page*

members attend three evenings of educational sessions: two led by neurologists from BU's School of Medicine who talk about the diagnosis and treatments, and a third session led by a team of Sargent professors who describe the role of rehabilitation specialists in Parkinson's care.

The leader of this rehabilitation panel is physical therapist and Assistant Professor Terry Ellis (MED'05), who teaches Good Start participants what her own research has revealed about the tremendous benefits of exercise for people with Parkinson's disease. "We know that exercise is beneficial for people in general," Ellis says, "but we've been able to show in our studies that short-term participation in exercise programs leads to things like improved quality of life and better function—better walking, better fitness, better strength, better flexibility. All of these things can happen even in the presence of a degenerative disease, which is something we didn't know 20 years ago."

Ellis is then joined by Sargent colleagues with expertise in nutrition, speech-language pathology, and occupational therapy. While most people diagnosed with Parkinson's don't encounter an occupational therapist until late in the progression of their disease, says Clinical Associate Professor of Occupational Therapy Sue Berger, the Good Start Program provides her an early opportunity to get people thinking about adaptations that can keep them engaged in activities they enjoy. In many cases, she says, this simply means finding easier ways to do everyday tasks—sitting instead of standing while preparing meals or taking a shower, for example—to preserve energy for fun things like an afternoon round of golf or a night at the movies.

Clinical Assistant Professor Elizabeth Hoover, a speech-language pathologist, also appreciates the chance to educate patients early—before they have difficulty speaking or swallowing. "I hope that concept of empowerment and self-management comes through loud and clear," Hoover says, "because the earlier they start to take care of their muscles and manage their function, the longer they'll have control."

Good Start's proactive message inspires many participants to call Sargent's Center for Neurorehabilitation and schedule a diagnostic consultation. They then meet with physical therapists and speech-language pathologists, who provide a comprehensive assessment of their abilities, answer their questions, and recommend exercises that can help them stay active and improve their quality of life.

If patients later have questions about their exercise routines, they can call the helpline at APDA's National Resource Center for Rehabilitation—established at Sargent in 2010—and get answers from a licensed physical therapist. The hotline (888-606-1688) serves people living with Parkinson's nationwide and has also become a resource for health care providers looking for the most up-to-date information on how rehabilitation therapies can benefit their patients.

EDUCATING HEALTH CARE PROVIDERS

"IT TAKES A VILLAGE TO MANAGE PEOPLE WITH PARKINSON'S DISEASE. ALL HEALTH CARE PROVIDERS NEED TO KEEP THEIR EYES AND EARS OPEN FOR THINGS THAT MAY AFFECT THE PATIENT."
–MICHELE DEBIASSE

Answering questions that come across the APDA hotline is just one of the ways Sargent specialists help to educate their fellow health care providers. Another is the series of seminars BU and the APDA offer biennially for health care professionals. The two-day seminars include speakers from Sargent and BU School of Medicine, who present the latest developments in Parkinson's care to the roughly 100 therapists, nurses, and physicians who attend. "We tell them, 'Here's the latest evidence. Bring this back to your clinic to teach others,'" says Ellis. "It's a train-the-trainer model."

Much of the information presented at these seminars is about the benefits of early exercise and physical therapy, but a wide variety of Sargent faculty members have been invited to offer their expertise. Dietitian and Clinical Assistant Professor Michele DeBiasse (MED'14), for example, has spoken about the special nutritional needs of patients with Parkinson's disease.

DeBiasse's presentations always underscore the importance of a team approach to Parkinson's care. Dietitians benefit from the expertise of speech-language pathologists, she says, who can advise on the consistency of foods best suited for people who have difficulty swallowing. Occupational therapists, who often visit patients in their homes, can help dietitians better understand how their patients are actually preparing and consuming meals so they can make realistic dietary recommendations. "It takes a village to manage people with Parkinson's disease," DeBiasse says. "All health care providers need to keep their eyes and ears open for things that may affect the patient."

It's important to provide these examples of how health care providers can work together, says Ellis; while faculty members at Sargent College are accustomed to working in interdisciplinary teams, "in other environments, providers in different disciplines don't always know what the others are doing. They need to know what roles the other disciplines can play, so they can be talking to one another and referring patients to one another."

Ellis is optimistic the education she and her Boston University colleagues offer—to people with Parkinson's and to their health care providers—is helping to change the perception that neurologists are the sole providers of Parkinson's care. "This is a real paradigm shift," she says. "We're talking about intervening early and with a broader team, to really help patients reach their highest potential."

COLLABORATION IN THE CLASSROOM

When people diagnosed with Parkinson's schedule a diagnostic consultation at Sargent's Center for Neurorehabilitation, they meet with physical therapists and speech language pathologists—and students from both fields. "It's a true interdisciplinary learning experience for students here," says Assistant Professor Terry Ellis. Students can see, for example, that the "freezing" patients often experience when they walk is similar to the stutter that interrupts them as they talk. "So the students get to see how that problem affects both systems. It doesn't distinguish between whether it's going to affect the legs or speech," Ellis says. The students can then work together to come up with corresponding strategies the patient can use to cope with these very similar problems.

This team approach, says Ellis, benefits everyone involved: the patients can make just one appointment, but get the expertise of two rehabilitation disciplines; the clinicians enjoy the chance to work with respected colleagues; and the students see firsthand the tremendous benefits of collaborative care.–CS

Photo by Cydney Scott

Pianist Karen Sauer is one of those benefiting from the early intervention team approach—and defying assumptions about Parkinson's disease. Since her prompt referral, she's participated in several exercise studies at Sargent and does her best to maintain the program of walking, yoga, and cardio exercises that Tami DeAngelis ('02), a senior physical therapist, has recommended. Sauer is convinced the exercise is making a difference. It certainly helps her feel better, she says, and—five years after her initial diagnosis—her neurologist is pleased with how slowly her Parkinson's symptoms are progressing. She's even maintained enough dexterity in her hands to continue meeting and playing with her monthly piano group. IS

WEB Extra

Sargent is home to a first-of-its-kind national resource center for Parkinson's disease. Check out its latest research at **www.bu.edu/neurorehab**.

"BETTER WALKING, BETTER FITNESS, BETTER STRENGTH, BETTER FLEXIBILITY. ALL OF THESE THINGS CAN HAPPEN EVEN IN THE PRESENCE OF A DEGENERATIVE DISEASE, WHICH IS SOMETHING WE DIDN'T KNOW 20 YEARS AGO."
–TERRY ELLIS

The Ups and Downs of Global Health

JUNIOR JAMIE LIM HAS RACKED UP AIR MILES AND BATTLED MALARIA IN PREPARATION FOR A CAREER IN GLOBAL HEALTH.

BY JESSICA ULLIAN

Photo by Cydney Scott

"I'D LEARNED SO MUCH ABOUT THE BIOLOGY OF MALARIA, BUT UNTIL I SAW PEOPLE SUFFERING FROM IT, AND UNTIL I GOT IT, I DIDN'T KNOW HOW MISERABLE IT WAS. IT ADDS A HUMAN ASPECT TO MEDICINE."
–JAMIE LIM

As the son of an international banker, Jamie Lim grew up in four different countries. As a human physiology major with an interest in global health, he's occupied a multitude of worlds.

Lim ('14) spent his second year at BU Sargent College working in Professor Susan Kandarian's lab, where he assisted with her research into skeletal muscle wasting. On summer and winter breaks, he's traveled to the other side of the globe as a mentor and clinician in poverty-stricken villages with acute health care needs. And in his limited spare time, Lim volunteers with Partners In Health, the Boston-based organization that helps developing countries establish sustainable health care systems.

His interests may seem wide-ranging, but for Lim they're all linked by his goal to practice medicine internationally. And while each experience has had its high and low points—treating malaria in Uganda, he caught it himself—they've all blended to help him see the scientific, political, and personal aspects of health care, and refine his idea of what it means to be a good doctor.

"I'd learned so much about the biology of malaria, but until I saw people suffering from it, and until I got it, I didn't know how miserable it was," he says. "It adds a human aspect to medicine."

Born in Tokyo, and raised in Riyadh, New York, and Singapore, Lim knew global health was his true vocation long before he came to Sargent. "Moving around a lot gave me a really global perspective—it opened my eyes to the fact that not everyone lives the same way that I do," he says. "I saw poverty in ways that I didn't really understand before; I saw a huge disparity in health care access and quality."

At BU, he found research opportunities early: Kandarian invited him to work in her muscle biology lab after being impressed by his work in her freshman Introduction to Health Professions seminar. "I know basic science is not his passion—global health is," Kandarian says. "I think Jamie said yes to working with me because, in terms of treating infectious and other types of disease, it is very helpful to have treatments that were devised in developed countries. What I think he got a peek at by working in my lab is the kind of work that is necessary for the very beginnings of treating disease."

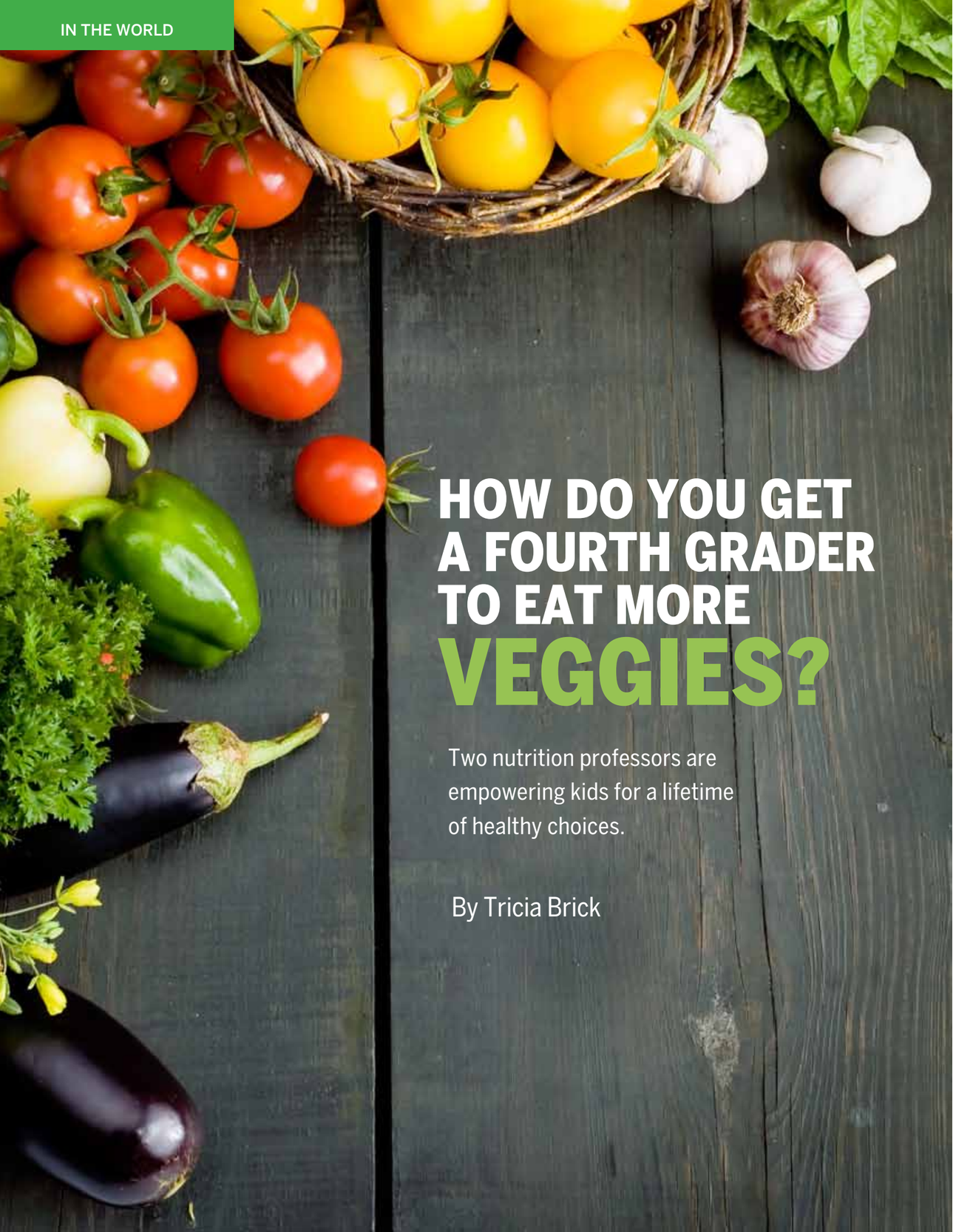
When his freshman year was finished, Lim jumped at the opportunity to take a service-learning trip to Tanzania, where he and other volunteers staffed triage clinics at a local elementary school. But after he returned, he felt uneasy about the work: "We were treating people for diseases that would inevitably ome back two weeks later," he says. "It was really frustrating."

When he traveled to Uganda six months later, he chose to work with a local, grassroots group, thinking the work might have a lasting impact. What he found was a far more intense clinical experience. Lim became the only clinician on Kimi, an island in Lake Victoria with a population of 3,500 and an HIV prevalence rate of 37 percent. He saw up to 60 patients a day, most with symptoms he was unable to treat in any meaningful way.

Discouraged, Lim returned to Boston—and found the global health experience he'd been seeking only a few blocks away. He began volunteering with the nonprofit Partners In Health (PIH), headquartered less than a mile from Sargent College, and immediately found himself working on projects intended to develop sustainable methods to resolve health care disparities, such as helping the oncology team create a patient database for cancer programs in Haiti and Rwanda, and serving as an executive assistant on a health care project based in rural Nepal.

Now, with two years at Sargent still ahead of him, Lim's further expanding his activities. His PIH stint has piqued an interest in health care politics, so he's considering a master's in public health along with an MD. He's moved on from Kandarian's lab, but inspired by the potential applications of her research, he's taking courses in global cancer disparities and outcomes. Undeterred by his bout of malaria, he also plans to travel to Southeast Asia and learn more about the regions where he might practice one day.

"I'm not in medical school yet; I'm not a doctor. There's only so much I can do," he says. "So right now I want to gain experience in whatever I can." IS



HOW DO YOU GET A FOURTH GRADER TO EAT MORE VEGGIES?

Two nutrition professors are empowering kids for a lifetime of healthy choices.

By Tricia Brick

PAULA QUATROMONI DOESN'T WANT TO TALK TO KIDS ABOUT CHILDHOOD OBESITY. A BU Sargent College associate professor of nutrition, Quatromoni (SPH'01) is well aware of the alarming statistics: More than a third of American kids and adolescents are overweight or obese, according to the Centers for Disease Control and Prevention. About 18 percent are obese, a number that has tripled in the last three decades. Low-income kids are at even higher risk: one in three low-income preschool-age kids is overweight or obese. And obesity puts children at risk for a range of health disorders, from high blood pressure to diabetes.

Sargent faculty, including Quatromoni and Clinical Professor Linda Bandini, have been involved in childhood obesity research and interventions for decades. And with the rise of ventures like First Lady Michelle Obama's Let's Move! initiative, the promotion of healthy habits to slow weight gain has enjoyed renewed attention nationwide.

But while she is active in the fight to raise a healthier generation, Quatromoni says, "We shouldn't even be saying 'childhood obesity' to fourth graders. There's so much that can be damaging, in terms of promoting chronic dieting, body image dissatisfaction, bullying, or stigma of overweight kids," she says. "I would much rather be promoting fitness and healthy eating than what the scale says. I want the messages to be positive and empowering: This is what a healthy breakfast looks like. This is what healthy snacking means."

Quatromoni has built this positive messaging into an innovative new nutrition education curriculum by joining forces with an educational online series called *KickinKitchen.TV*. A cooking show for preteens, the series combines sitcom-like plot lines and a hip-hop soundtrack with lessons on making healthy choices in and out of the kitchen.

Quatromoni, who is an advisor for the series, developed nutrition lessons coordinated with episodes of *KickinKitchen.TV*, and in fall 2011, ten of her graduate students visited fourth- and fifth-grade classrooms in Cambridge (Massachusetts) Public Schools to pilot-test the curriculum.

In three of the ten classrooms, the Sargent students taught a more traditional curriculum, though still interactive, featuring lectures, worksheets, and discussions. In the other seven classrooms, the lessons used episodes of *KickinKitchen.TV* as a jumping-off point for conversations and activities around topics like the nutritional benefits of fresh foods or the consequences of skipping breakfast.

The kids seemed to gravitate naturally to the series. "There was a significant increase in nutrition knowledge in both groups; the students learned with both the traditional lesson plans and in the digital classrooms," Quatromoni says. "But the *KickinKitchen.TV* episodes in particular just captivated the kids. They loved the characters; they loved the comedy; and they loved the cooking and the healthy eating tips."

And they wanted more: even though the program's website was still in development at the time, half of the kids checked out the site on their own at home. In the upcoming second phase of the project, Quatromoni hopes to mobilize kids' interest in social media to encourage them to use the website for finding and sharing recipes, recording food logs, and participating in physical activity challenges.

One key to the curriculum's success, Quatromoni says, is that the series meets kids where they are: online, with stories about young people who look and act like them.

"Our whole goal here is to be empowering, to motivate kids to say, 'Hey, I can go home and do this,'" she says. "And getting these nutrition messages from a fourteen-year-old cooking a vegetable frittata in her kitchen for her friends is different from me standing up there lecturing, 'You have to eat more vegetables.'" →

Photo by Vernon Doucette

"WE SHOULDN'T EVEN BE SAYING 'CHILDHOOD OBESITY' TO FOURTH GRADERS. THERE'S SO MUCH THAT CAN BE DAMAGING, IN TERMS OF PROMOTING CHRONIC DIETING, BODY IMAGE DISSATISFACTION, BULLYING, OR STIGMA OF OVERWEIGHT KIDS."
—PAULA QUATROMONI

Photo courtesy of *KickinKitchen.TV*

Associate Professor Paula Quatromoni (top) is an advisor to *KickinKitchen.TV* (above), an online series that teaches kids about healthy eating.

→ *continued from previous page*


Photo by Vernon Doucette

"WE'RE LOOKING TO SEE WHETHER KIDS WITH DEVELOPMENTAL DISABILITIES DIFFER FROM TYPICALLY DEVELOPING KIDS IN TERMS OF EATING HABITS, DIET, AND THE LEVELS OF PHYSICAL ACTIVITY THEY ENGAGE IN, BECAUSE ALL OF THESE THINGS CAN HAVE IMPLICATIONS FOR OVERALL HEALTH."
—LINDA BANDINI

HELPING TEENS WITH DISABILITIES

CLINICAL PROFESSOR LINDA BANDINI is also working to educate kids and families about nutrition and health by tailoring her messages to the needs and abilities of those she's reaching out to—in her case, young people with disabilities.

Kids and teens with developmental disabilities like autism and Down syndrome have higher rates of obesity than their typically developing peers. Yet in terms of nutrition and activity, this group has historically been understudied and is often excluded from weight loss and educational initiatives, Bandini says. Working with research teams including Sargent graduate students, she seeks to identify the risk factors particular to these groups and, in turn, to develop effective interventions to help young people with disabilities stay healthy. "The work we're doing is under the umbrella of health promotion," she says.

"We're looking to see whether kids with developmental disabilities differ from typically developing kids in terms of eating habits, diet, and the levels of physical activity they engage in, because all of these things can have implications for overall health."

Through the Children's Activity and Meal Patterns Study, Bandini has been looking at eating and physical activity in young people with autism spectrum disorders. In a recent *Journal of Pediatrics* article, she reported that kids with autism ate a less varied diet than their peers, including fewer vegetables and fruits and other foods necessary for adequate nutrition.

A second study, Teens' Recreation and Activity Choices, is seeking to shed light on what factors might influence adolescents' decision-making around physical activity. Working with three groups of young people—some with intellectual disabilities, some with autism spectrum disorders, and some typically developing kids—Bandini and her colleagues have supplemented quantitative measurements with a series of interviews, asking such questions as: What do you do in your leisure time? Do you like to play team sports? Do you like to watch TV? How do you feel when you participate in these different activities?

"We're hoping, first, to get a sense for whether the adolescents with disabilities are as active as typically developing kids," she says. "And if they're not getting enough physical activity, we hope the data may help us to understand why and, in time, to develop intervention programs."

Bandini has experience developing these types of interventions. Over the past year, she has been working with Sargent graduate students to develop a comprehensive nutrition education curriculum for adolescents with intellectual disabilities. The Sargent students developed modules and pilot tested them in Boston-area schools to ensure the lessons fit the abilities and needs of these young people.

"Reading comprehension can be a challenge for youth with intellectual disabilities, so all our lessons are hands-on, visual, with lots of interactive games," Bandini says. "They are adolescents, with adolescent likes and dislikes, so we worked hard to develop a curriculum that is specifically tailored for that age range." By customizing messages about nutrition and fitness for the populations they're reaching out to, Bandini, Quatromoni, and their colleagues are empowering kids to make smart choices for overall health rather than focusing on the numbers on a scale. IS

JOINING WITH THE CITY


Mayor Thomas Menino

In his 2012 State of the City address, Boston Mayor Thomas Menino (Hon.'01) announced a new citywide antiobesity initiative, and in collaboration with the Boston Public Health Commission, Boston University will be providing space and resources for students and faculty to establish new nutrition and exercise programs for local youth. Find out more at **www.bu.edu/today/2012/combating**.

Photo by Dan4th Nicholas

From the DL to Dublin

AN UNDERGRADUATE'S JOURNEY TO BECOMING A PHYSICAL THERAPIST BEGAN WITH A HOCKEY INJURY AND FOUND ITS DIRECTION IN IRELAND.

BY RACHEL JOHNSON


Photo by Cydney Scott

Undergraduate Matt Whitney (left) works with a patient at the Irish Wheelchair Association in Dublin, Ireland.

When Matt Whitney ('13) sees his patients, he sees himself. As a freshman, he was at another university, with different goals and a career path heading toward finance. One hockey injury, and a trip to the disabled list (DL), changed everything.

Most people don't speak fondly when describing therapy after a life-altering injury, but Whitney has a glass-half-full outlook. "I just kind of fell in love with it right there," he says, describing his yearlong rehab experience and decision to switch to BU Sargent College. "The therapists were really cool guys and they gave me an insider's point of view."

He says this insight gave him greater empathy for his patients at the Irish Wheelchair Association (IWA), where he worked while studying abroad through BU's Dublin Internship Program in the fall of 2011. The IWA is a Dublin-based organization that works to improve the physical and emotional capabilities of people with limited mobility; for Whitney, it was a chance at supervised hands-on therapy. "They kind of throw you into the fire," he says. "My boss would say, 'I booked a patient with rheumatoid arthritis for you tomorrow,' and I would have to research it and put a plan of treatment together."

An athlete himself, Whitney had pictured a professional future of rehabbing other athletes with sports-related injuries, but the Dublin program showed him how much he enjoyed getting involved in all types of therapy. "I saw a lot of people who'd had strokes," he says. "I had a cerebral palsy patient; I had a couple patients with multiple sclerosis. I had always come at therapy from the sports injury angle, and I really didn't think I had any interest in working with people with disabilities, but I loved it."

"I CAN SAY TO MY PATIENTS, 'I'VE BEEN THERE, I KNOW WHERE YOU'RE AT.'"
–MATT WHITNEY

Although he had never experienced cerebral palsy or MS himself, Whitney used the challenge of his own injury to understand his patients' situations, physically and emotionally. His therapy has been useful in the classroom, too: "A lot of the work involved the testing that I had gone through myself," he says. "I was able to say, 'Oh yeah, I remember doing that, and this is why I did it.' It helped me really understand my own therapy for the first time."

He enjoyed working with patients in Dublin so much, he plans to go on to graduate school and become a licensed physical therapist.

But Whitney knows empathizing with his patients is only half the battle. He also needs to get them to see themselves in him. Having gone through the rehab process himself, he says, he tries to be an example. "I can say to my patients, 'I've been there, I know where you're at.' And because I've been there before, they believe me." IS

WEB Extra

Watch a video of Matt Whitney's experience in Ireland at **www.bu.edu/today/2012/bu-abroad**.

Helping Women in India—
WITHOUT LEAVING BOSTON

TECHNOLOGY IS ALLOWING A PROFESSOR TO IMPROVE HEALTH CARE IN RURAL INDIA, WITHOUT STEPPING OUT OF HER BOSTON OFFICE. BY JESSICA ULLIAN

WHEN EILEEN O'KEEFE signed on to lead a women's health study in Gujarat, India, she knew she'd face a few challenges. Conducting a survey in a foreign language was one; navigating different cultural norms was another. But those were minor compared to the biggest obstacle of all: managing the study without ever setting foot on the research site 7,000 miles away.

Using Skype, email, and two intrepid research assistants, O'Keefe, a clinical associate professor and director of BU Sargent College's health science program, has been leading the India Research and Outreach Initiative for nearly two years, without ever seeing Gujarat or Charutar Arogya Mandal (CAM), the teaching hospital that's partnering with Boston University on the project. The team has already completed a 700-person study, recorded the data, and planned on-the-ground interventions in the rural villages where she hopes to have a long-term, if virtual, presence.

O'Keefe and Somashekhar Nimbalkar, the head of critical care at CAM and the study's principal investigator in Gujarat, both acknowledge some initial skepticism about such a long-distance collaboration. But at this point, Nimbalkar says, "We believe that we have exceeded our expectations, and that many such future projects can be taken up across various research fields."

"The big difference was, this really took a lot more preparation," O'Keefe says. "But now we can offer our expertise to establish good solid research in a way that our students and faculty can really contribute. And this is an interesting one to work on—a country that's changing so quickly is exciting."

The potential for collaboration with CAM was brought to O'Keefe's attention by two undergraduates in her epidemiology course, Apurv Soni and Nisha Fahey. Both aspiring doctors (who graduated from BU College of Arts & Sciences in 2011) had traveled to India in 2010 with their respective families, where Soni met Nimbalkar through a cousin who was a professor and surgeon at CAM. The students had an interest in international health, and were eager to have an impact before they completed their medical training.

When they learned that CAM's researchers were receptive to a research partnership with an American university, they began discussing what kind of health survey would be most effective. They focused on women's health, O'Keefe says, because in a community with multigenerational households, a woman's physical and mental well-being often affects a large circle of relatives and friends. Working with the CAM team's input, O'Keefe developed a 76-question survey to assess health care needs in the villages near the medical center. Researchers at CAM were eager to develop and implement new programs right away, O'Keefe says, but her experience with such studies in Hartford, Connecticut, and in Massachusetts school-based health centers has proven that interventions without strong research behind them are rarely effective in the long run.

"I really felt I couldn't have conducted an intervention without background data, trying to understand what their needs are, what decisions they make about health care," O'Keefe says.

Soni and Fahey, who both took a year after graduation to continue the research, traveled to Gujarat in fall 2011, funded by the Dudley Allen Sargent Research Fund, to begin training interviewers and start the survey. Researchers at CAM told them their initial plan, to hire locals, including men, as interviewers, wouldn't work; women wouldn't answer questions about their health with a male interviewer. Eventually, they hired a team of female social workers from the hospital. But even after addressing the gender issue, they found other challenges, such as the interviewers' reluctance to visit the poorest parts of the villages for data collection.


Photo by Cydney Scott

"WE CAN OFFER OUR EXPERTISE TO ESTABLISH GOOD SOLID RESEARCH IN A WAY THAT OUR STUDENTS AND FACULTY CAN REALLY CONTRIBUTE. AND THIS IS AN INTERESTING ONE TO WORK ON—A COUNTRY THAT'S CHANGING SO QUICKLY IS EXCITING."—EILEEN O'KEEFE

Now, with the survey completed and the data analyzed, O'Keefe and her research team can begin collaborating with CAM to develop new policies and programs to address the most critical needs. Their research revealed that 80 percent of the surveyed population had no knowledge of existing outreach programs, and that the majority of those who qualified for free health care didn't know it. They also gained insights into typical health-seeking behaviors in these rural villages: women make cost a priority when seeking care for themselves, but emphasize quality when seeking care for their children. It's all data, O'Keefe says, that provides an in-depth understanding of a population in need, which in turn allows the local medical community to be strategic in creating the most effective health care programs for the surrounding villages.

"We were aware of the direction, but not of the magnitude, of these results," says Nimbalkar.

The results may be in, but the work is far from over. Having mastered the art of long-distance project management, O'Keefe wants to move implementation forward slowly, eventually visiting the site and then putting interventions in place by the fall of 2013. "For me, this is an ongoing collaboration," she says. "We're trying to set up something that other people can build on." IS


1

1 Interviewers, such as Shailly Joshi (right), were hired by a BU team to ask women in Guajarati villages about their health care needs.

2 It was two aspiring doctors, BU students—and now alums—Apurv Soni (third from left) and Nisha Fahey (center), who first suggested that the University could play a role in improving women's health in rural India.

3 While in the country to oversee the survey on women's health, the BU researchers, including Apurv Soni (right), also educated locals about removing mosquito-laden pools of stagnant water.


2


3

Photos 1 and 3 by Nisha Fahey, photo 2 courtesy of Apurv Soni and Nisha Fahey

Grant Awards

BU SARGENT COLLEGE'S FACULTY RECEIVED **$10,561,746** IN RESEARCH FUNDING IN 2011–2012. HERE IS A LIST OF OUR PROJECTS AND THE AGENCIES AND FOUNDATIONS SUPPORTING THEM.

AGENCIES

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	AGENCY	FUNDS AWARDED 2011–2012	TOTAL AWARD
Sudha Arunachalam, assistant professor of speech, language & hearing sciences	Toddlers' Representations of Verbs: Effects of Delay and Sleep on Verb Meaning	National Institutes of Health (NIH) (Northwestern University subcontract)	$62,141	$62,141
Helen Barbas, professor of health sciences	Organization of Prefrontal Feedback Circuits	NIH/National Institute of Mental Health (NIMH)	$437,898	$2,375,077
	Prefrontal Anatomic Pathways in Executive Control	NIH/National Institute of Neurological Disorders and Stroke (NINDS)	$385,715	$2,008,051
Helen Barbas and Jamie Bunce, post-doctoral research associate	Prefrontal and Amygdalar Pathways to Memory-Related Medial Temporal Cortex	NIH/NIMH	$55,902	$159,882
Helen Barbas and Clare Timbie, MD/PhD student	Circuitry of Emotion: Integration in Orbitofrontal Cortex	NIH/NIMH	$32,428	$178,140
Jason Bohland, assistant professor of health sciences	The Online Brain Atlas Reconciliation Tool	NIH (Cold Springs Harbor subcontract)	$26,490	$76,501
Jonathan Brumberg, research assistant professor of speech, language & hearing sciences	Investigating Output Modality for a Brain-Computer Interface for Communication	NIH/National Institute on Deafness and Other Communication Disorders (NIDCD)	$163,533	$300,000
Kee Chan, assistant professor of health sciences	IPA: MultiVISN Implementation of a Program to Improve HIV Screening and Testing	Dept. of Veterans Affairs	$31,686	$31,686
Wendy Coster, professor of occupational therapy	Computer Adaptive Testing of Adaptive Behavior of Children and Youth with Autism Spectrum Disorders (ASD)	NIH/National Institute of Child Health & Human Development (NICHD)	No cost extension	$568,750
	Development of Measures of Participation and Environment for Children with Disabilities	Dept. of Education (ED)/National Institute on Disability and Rehabilitation Research (NIDRR)	No cost extension	$587,616
L. Clarke Cox, clinical associate professor of speech, language & hearing sciences	Hearing Acuity, Cognitive Aging, and Memory for Speech	NIH (Brandeis University subcontract)	$10,500	$61,572
Marianne Farkas, director of training & international services, Center for Psychiatric Rehabilitation, and E. Sally Rogers, director of research	Improved Employment Outcomes for Individuals with Psychiatric Disabilities	ED	$847,289	$4,245,042
Marianne Farkas	Bringing Recovery Supports to Scale Technical Assistance Center Strategy	Substance Abuse & Mental Health Services Administration (SAMHSA)	$151,774	$708,521
Frank Guenther, professor of speech, language & hearing sciences	Neural Modeling and Imaging of Speech	NIH/NIDCD	$245,225	$1,777,490
	Sequencing and Initiation in Speech Production	NIH/NIDCD	$347,792	$1,738,465
Frank Guenther and Emily Stephen, pre-doctoral student	Decoding Imagined Vowel Productions using Electroencephalography	NIH/NIDCD	$38,300	$101,984
Christine Helfrich, assistant professor of occupational therapy	Life Skills: Transitioning from Homelessness and Isolation to Housing Stability and Community Integration	ED/NIDRR	$199,998	$599,990
Kenneth Holt, associate professor of physical therapy	CPS Collaborative Research, Medium: Programmable Second Skin to Re-educate Injured Nervous Systems	National Science Foundation (Children's Hospital subcontract)	$52,819	$153,886
Norman Hursh, associate professor of occupational therapy	The City Connects Model of Student Support: Building a K–12 Student Support Practice and Process	Boston College subcontract	$42,685	$42,685
Dori Hutchinson, director of services, Center for Psychiatric Rehabilitation, and Margaret Ross, director, Behavioral Medicine	Boston University Suicide Prevention Program	SAMHSA	$99,230	$293,838
Susan Kandarian, professor of health sciences	The Molecular Basis of Muscle Wasting in Cancer Cachexia	NIH/National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)	$367,913	$1,841,213
	Regulation of Gene Expression in Skeletal Muscle: NF-kB Signaling in Atrophy	NIH/NIAMS	$325,405	$1,835,859
	Regulation of Gene Expression in Skeletal Muscle: NF-kB Signaling in Atrophy	NIH/NIAMS	$162,500	$325,000
Julie Keysor, associate professor of physical therapy	ENACT: Enhancing Activity and Participation for Persons with Arthritis	ED/NIDRR	$799,968	$3,999,924
Gerald Kidd, professor of speech, language & hearing sciences	Central Factors in Auditory Masking	NIH/NIDCD	$558,168	$2,788,231
	Core Center Grant—Sound Field Laboratory (Core 1)	NIH/NIDCD	$231,133	$921,876
	Spatial Hearing, Attention, and Informational Masking in Speech Identification	U. S. Air Force	$223,562	$685,945
Swathi Kiran, associate professor of speech, language & hearing sciences	Theoretically-Based Treatment for Sentence Comprehension Deficits in Aphasia	NIH/NIDCD	$581,837	$2,408,067
	Application of Multimodal Imaging Techniques to Examine Language Recovery in Post-Stroke Aphasia	NIH/NIDCD	$125,102	$252,661
Cara Lewis, assistant professor of physical therapy	Boston University Clinical and Translational Science Award Program CTSA (KL2)	NIH/National Center for Health Research Resources	$41,644	$114,932
Melanie Matthies, associate dean and associate professor of speech, language & hearing sciences	Effects of Hearing Status on Adult Speech Production	NIH/NIDCD	No cost extension	$243,210

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	AGENCY	FUNDS AWARDED 2011–2012	TOTAL AWARD
Susan McGurk, associate professor of occupational therapy	A Dismantling Study of Cognitive Remediation for Supported Employment	NIH/NIMH	$661,973	$2,771,031
	Cognitive Training & Supported Employment in Severe Mental Illness	NIH/NIDRR	$45,040	$45,040
	Cognitive Training to Improve Work Outcomes in Severe Mental Illness	NIH/NIMH	$4,286	$18,219
Kathleen Morgan, professor of health sciences	Dynamics of the Vascular Smooth Muscle Cytoskeleton	NIH/National Heart, Lung, and Blood Institute (NHLBI)	$1,749,580	$8,786,466
	Regulation of Contraction of Blood Vessels	NIH/NHLBI	No cost extension	$1,357,217
	Subcellular Organization of Signaling in Smooth Muscle	NIH/NHLBI	No cost extension	$889,955
Kim Mueser, executive director, Center for Psychiatric Rehabilitation	Enhancing Assertive Community Treatment with CBT and SST for Schizophrenia	NIH/NIMH	$27,713	$196,419
	Recovery After an Initial Schizophrenia Episode (RAISE)	NIH/NIMH	$14,936	$143,267
	Integrating Illness Management & Recovery with Assertive Community Treatment	NIH/NIMH	$19,178	$59,052
	Integrating Illness Management & Recovery with Assertive Community Treatment	NIH/NIMH	$12,545	$52,419
Gael Orsmond, associate professor of occupational therapy	Impact of Parenting Adolescents and Adults with Autism	NIH (University of Wisconsin subcontract)	$88,902	$459,551
Paula Quatromoni, associate professor of nutrition	KickinKitchen.TV—An Innovative Digital Learning Interactive Educational Program on Nutrition, Cooking, and Active Lifestyles to Prevent Childhood Obesity	Dept. of Agriculture	$32,680	$32,680
Zlatka Russinova, senior research specialist, Center for Psychiatric Rehabilitation	Advanced Research Training Program in Psychiatric Rehabilitation	ED	$149,980	$749,946
Gloria Waters, dean and professor of speech, language & hearing sciences	Assessment of Comprehension Skills in Older Struggling Readers	ED/Institute of Education Sciences	$399,515	$1,597,065
	Functional Neuroimaging Studies of Syntactic Processing	NIH/NIDCD (Massachusetts General Hospital subcontract)	$41,553	$187,010
Daniel White, research assistant professor of physical therapy	Positive Affect and Community Walking in Older Adults	NIH (Boston Medical Center subaward)	$16,200	$64,800

FOUNDATIONS

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FOUNDATION	FUNDS AWARDED 2011–2012	TOTAL AWARD
Sudha Arunachalam, assistant professor of speech, language & hearing sciences	Two-Year-Olds' Use of Linguistic Information to Acquire the Meaning of Verbs	American Philosophical Society	$4,000	$4,000
Terry Ellis, assistant professor of physical therapy	Unveiling of the Natural History of Quality of Life and Mobility Decline in Persons with Parkinson's Disease	Davis Phinney Foundation	$32,000	$96,000
	The Role of Exercise on Disability in Women with Parkinson's Disease	Center of Excellence in Women's Health	$92,000	$92,000
	A Multifactorial Exercise Program to Reduce Falls in People with Parkinson's Disease	Boston Medical Center Pepper Award	$32,400	$32,400
Mahasweta Girgenrath, assistant professor of health sciences	Modulation of Inflammation and Fibrosis in the Context of Regeneration in MDC1A	Muscular Dystrophy Association	$119,183	$357,465
	Triggering Regeneration and Tackling Degeneration: A Comprehensive Approach for Treating Muscular Dystrophy	Cure CMD	No cost extension	$100,000
	Evaluation of the Efficacy of RAP-031 Treatment of Dystrophic, Inflammatory, and Regenerative Deficiencies in Merosin-Deficient Congenital Muscular Dystrophy Animal Model (Dy)	Cure CMD	No cost extension	$50,000
Jennifer Gottlieb, research assistant professor, Center for Psychiatric Rehabilitation	Internet-Based CBT for Schizophrenia: A Pilot RCT Computer-based Program for Auditory Hallucinations	Brain & Behavior Research Foundation (formerly National Alliance for Research on Schizophrenia and Depression)	$21,891	$21,891
Jessica Kramer, assistant professor of occupational therapy	Giving Youth a Voice: A Collaborative Evaluation of the Effectiveness and Feasibility of a Novel Environmental Modification Training for Youth with Disabilities	Noonan Memorial Research Foundation	$75,000	$75,000
Jessica Maxwell, clinical assistant professor of physical therapy	Limitations in Participation Following Knee Replacement	American College of Rheumatology Research and Education Foundation (REF)	$74,884	$124,861
Paula Quatromoni, associate professor of nutrition	The Foxboro Model for Lifestyle Nutrition and Physical Fitness for Students in Grades 1–8	Aetna Foundation	$12,500	$25,000
Cara Stepp, assistant professor of speech, language & hearing sciences	Voluntary Control of Anterior Neck Musculature in Parkinsonian Dysphagia	American Laryngological Association	$10,000	$10,000
	Voluntary Control of Anterior Neck Musculature in Dysphagia	American Speech-Language-Hearing Foundation	$5,000	$5,000
Robert Wagenaar, professor of physical therapy	Continuous Monitoring of Daily Activity Levels in the Home and Community Setting: Differences between Elderly with or without a History of Falls	Leiden University Medical Center	$25,170	$50,340
Daniel White, research assistant professor of physical therapy	Factors for Change in Day-to-Day Walking in Knee OA	REF	$125,000	$375,000
	Factors Associated with Day-to-Day Walking in Older Adults with Knee OA	Foundation for Physical Therapy	$20,000	$40,000

Faculty in Print

OUR FACULTY'S RESEARCH REACHES AUDIENCES ACROSS THE GLOBE. HERE'S A SELECTION OF PUBLICATIONS AND ARTICLES WRITTEN BY BU SARGENT COLLEGE FACULTY DURING 2011–2012.

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BU Sargent College

WHO WE ARE

STUDENTS	UNDERGRADUATE	GRADUATE
Number of full-time students (as of spring 2012)	1,091	452
Average SAT	1930	n/a
Average GRE	n/a	1213
Faculty		
Full-time	70	
Part-time	64	
Alumni	**15,649** in **53** countries	
Clinical Sites	More than 1,400 in all 50 states and 4 countries	

Photo by Kalman Zabarsky

PROGRAMS OF STUDY

Applied Anatomy & Physiology
Athletic Training
Audiology
Behavior & Health
Health Science
Human Physiology (Pre-Med)
Nutrition
Occupational Therapy
Physical Therapy
Rehabilitation Sciences
Speech, Language & Hearing Sciences
Speech-Language Pathology

SPECIAL PROGRAMS

- Combined BS and MPH in Public Health
- Combined BS in Athletic Training and Doctor of Physical Therapy
- Combined BS in Health Studies and Doctor of Physical Therapy
- Combined BS in Therapeutic Studies and MS in Occupational Therapy

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 8 percent in their respective fields:

- **Occupational Therapy Program** ranked number 2 out of 156 programs
- **Physical Therapy Program** ranked number 16 out of 201 programs
- **Speech-Language Pathology Program** ranked number 21 out of 250 programs

National Certification Board Exam Passing Rates

Percentage of BU Sargent College students in entry-level graduate programs who passed the exam the first time (data averaged over the past three years):

Nutrition	100%
Occupational Therapy	96%
Physical Therapy	99%
Speech-Language Pathology	100%

ABOUT US

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

Boston University College of Health
& Rehabilitation Sciences: Sargent College

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