

2009-2010

Inside SARGENT

Boston University College of Health & Rehabilitation Sciences: Sargent College



FAMILIES & **AUTISM**

AUTISM DOESN'T JUST IMPACT
FAMILIES DURING CHILDHOOD.
FINALLY, SOMETHING IS BEING
DONE TO HELP THEM PREPARE
FOR A LIFETIME OF CARING.





Dear Friends,

It's certainly been an exciting year of change for Boston University. If you've visited the BU campus lately, I'm sure you've noticed the progress: new state-of-the-art research buildings, student residences, and other impressive facilities. As you can see from the fresh look of *Inside Sargent*, we've had many exciting changes here at BU Sargent College, too.

Inside Sargent gives you a glimpse of how we're continuing to evolve. We're constantly strengthening our undergraduate and graduate programs, and the quality of our student body and faculty. In

this issue, you'll read about some of the many exceptional clinical and educational opportunities available to our students, from trips to Guatemala to share the latest methods for treating neurological injuries to an inventive clinical practicum at an underserved high school in Chelsea, Massachusetts. Our students don't just learn from a textbook, they learn by doing.

You'll also see how Sargent students are giving back to the community through Project Health, a nonprofit organization that engages undergraduate volunteers to provide high-impact services to low-income families. The work these students are doing with Project Health is truly helping to transform our health care system.

Our Class of 2009 was one of the most impressive to come through BU Sargent College—see *Outstanding Senior Awards* on page 30 for a flavor of the accomplishments of our latest graduates, including those of Class Valedictorian Ben Schanker. A remarkable young man, Ben is currently attending Harvard Medical School, and we look forward to watching his career develop in that arena.

Our faculty are doing extraordinary things, too. Our newest faculty member, Swathi Kiran, who joined the Department of Speech, Language & Hearing Sciences in spring 2008, is researching the treatment of aphasia in bilingual patients. Kiran's work focuses on the counterintuitive finding that in relearning language following brain damage, it is often best if therapy proceeds from difficult to easy, rather than from easy to difficult. In our cover story, *Families & Autism*, you'll learn about Gael Orsmond's research on the effect autism has on the family unit and the progression of care needs from adolescence to adulthood. Karen Hutchinson, along with the Christopher and Dana Reeve Foundation NeuroRecovery Network, is studying a new treatment to enable patients with spinal cord injuries to walk again. That work is inspiring, and I encourage you to visit our website, www.bu.edu/sargent, for a photo gallery of a treatment session.

Although our College continues to grow and change, one of our most important missions will always remain: to prepare our students for their careers and other endeavors once they leave our doors. Despite the tough economy, the job market for recent college graduates in the health and rehabilitation fields continues to expand. I have no doubt that our students and alumni are bound for greatness and will make a profound impact on our country's health care system.

I hope you enjoy this issue of *Inside Sargent* and I welcome your thoughts and feedback at sargrad@bu.edu.

With warm regards,

Gloria Waters

Gloria Waters
Dean and Professor

"I HAVE NO DOUBT THAT OUR STUDENTS AND ALUMNI ARE BOUND FOR GREATNESS AND WILL MAKE A PROFOUND IMPACT ON OUR COUNTRY'S HEALTH CARE SYSTEM."

InsideSARGENT

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About
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Swathi Kiran's research is giving bilingual stroke victims new paths to recovery.

BILINGUAL BREAKTHROUGH

HELPING BILINGUAL STROKE PATIENTS TO COMMUNICATE AGAIN MEANS SKIPPING THE SIMPLE LESSONS AND STARTING WITH THE COMPLEX ONES.

By Tricia Brick

In Swathi Kiran's lab this summer, ten people learned to speak again—in two languages. In her Aphasia Research Lab, Kiran, an associate professor in the Department of Speech, Language & Hearing Sciences and a licensed speech language pathologist, is working to develop treatment programs for bilingual patients who have aphasia caused by stroke.

Aphasia is the loss of language—an impaired ability to understand or produce words or sentences. Among the approximately 20 percent of stroke victims afflicted with aphasia, some have difficulty in reading or writing, others in finding the words to identify objects or ideas, and others in putting sentences together; some will lose the ability to understand language entirely.

Though no single agreed-upon treatment program currently exists for aphasia, therapy for the disorder has traditionally paralleled the progression of normal language learning: patients are retaught language beginning with simple words and concepts and progressing through levels of increasing complexity. But Kiran has found that aphasic patients progress most efficiently when their course of treatment begins with more complex concepts.

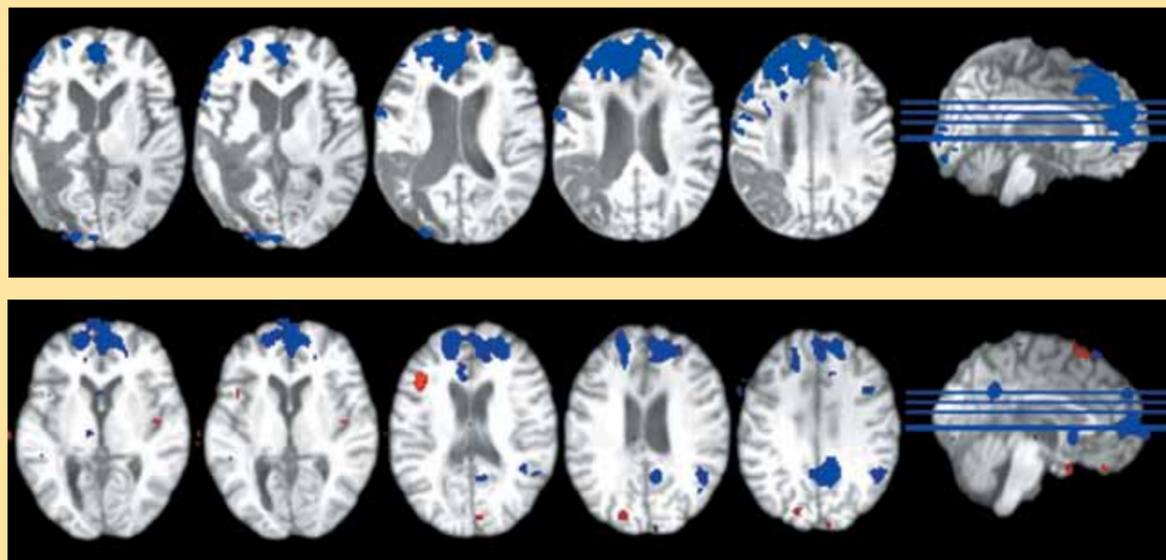
In reteaching an aphasic patient the words for various foods, for example, rather than begin with the simplest, or most typical, examples—carrot, cucumber—Kiran introduces the words for less-obvious items within the category, such as parsley and pumpkin. Patients taught in this way improve not only in identifying the foods whose names they relearn, but also in naming more-typical ones that are not taught, the carrots and cucumbers.

A FLUENT SPEAKER OF HINDI, TELUGU, TAMIL, AND ENGLISH, WITH KNOWLEDGE OF SPANISH, SWATHI KIRAN HAS LONG BEEN INTERESTED IN THE TREATMENT OF APHASIA AMONG BILINGUALS. "BECAUSE I'M MULTILINGUAL, I KNEW THE LANGUAGES WERE INTERCONNECTED. AFTER ALL, I'M DOING ALL OF THESE THINGS WITH ONE BRAIN."

Starting with more difficult tasks may seem counterintuitive, but Kiran explains that aphasic patients—who once were fluent in the language or languages they are being taught—are in a very different situation from people learning a language for the first time. "Following the stroke, these individuals have lost access to certain aspects of their brain—to certain networks of information," she says. "But it doesn't make sense to treat them like blank slates, to teach them as though they're little kids learning a new language. At a fundamental level, we're suggesting that you're not reteaching language, you're assisting in reorganization."

Kiran is now extending her research to aphasic patients who were English-Spanish bilingual before their strokes. In the United States, bilingual aphasia patients are frequently treated in English, regardless of their pre-stroke fluency, simply because the available clinicians tend to speak English. Kiran's work seeks to answer the question: Is this the best way to help these patients relearn language?

Ricardo was born into a Spanish-speaking household in Texas near the Mexican border, and grew up speaking both English and Spanish fluently. He married a woman who >



Images courtesy of Swathi Kiran.

Inside the Bilingual Brain

Take a look inside the bilingual brain as two patients with aphasia caused by a stroke complete tasks in Spanish and English. The areas highlighted in blue show brain activation in Spanish, the red in English. Both patients are stronger English than Spanish speakers; the predominance of blue suggests increased activity as they call on additional brain regions to engage in their weaker language.

> spoke no Spanish, and though he occasionally spoke Spanish with his mother and in his job as a land surveyor, English was his primary language throughout his adult life.

Then, in his mid-fifties, Ricardo suffered a massive stroke. Among the several deficits he suffered in the wake of the event was aphasia: the formerly bilingual Ricardo had lost the ability to speak in either of his languages.

Ricardo was selected by Kiran to participate in a clinical study on aphasia in post-stroke bilingual patients. She began his therapy in English, his stronger language, and over time, he slowly began to learn the words he was taught. But he did not improve in Spanish at all. “When we realized he wasn’t improving in Spanish, we switched to providing therapy in Spanish instead of English,” Kiran recalls. “And we found that as he improved in Spanish, he also improved in English—in fact, he improved more than he had during the English treatment.”

The parallel to Kiran’s previous semantic-complexity research was clear: The more difficult work, learning in the weaker language, proved to facilitate relearning in the stronger language.

Kiran is continuing her work with Spanish-English and other bilingual patients to find out whether Ricardo’s experience will be reproducible across a broader population. In addition to a systematic clinical study in which she and her colleagues provide therapy in each patient’s weaker language, she plans to use fMRI (functional Magnetic Resonance Imaging) as a tool to examine her patients as they recover to better understand which parts of the brain they are using as they

relearn language (see *Inside the Bilingual Brain*, above, for a glimpse into this work).

To extend the reach of her research, Kiran is also working with a colleague at the University of Texas at Austin to develop a computer model that simulates a bilingual person learning two languages to differing levels of proficiency. The model can then be given a simulated aphasia-causing stroke, allowing the researchers to test various therapeutic methods to see which provides the greatest improvement in both languages.

“To make a conclusive study of these theories, I’d need to study 1,500 aphasic patients,” says Kiran. “But with a model, I can do this—and, as I work with real patients, I can compare their outcomes with the model’s outcome, to see how effective a predictor the model is.”

That interplay between theory and clinical practice provides an apt parallel to Kiran’s research: She uses theoretical knowledge of how language is organized in the brain to create more effective strategies for providing therapy to her aphasic patients. Her clinical research, in turn, has the potential to offer new insight into neuroplasticity—the brain’s process of restructuring itself in learning or in response to injury—as well as the very nature of how the human brain processes language.



See Swathi Kiran’s preliminary work on brain mapping at www.bu.edu/sargent/bilingual.

Student Experience

REAL Relief



BEYOND OBSERVATION, BEYOND THEORETICAL DISCUSSIONS. AN ON-CAMPUS SPORTS MEDICINE CENTER HAS STUDENTS BRINGING RELIEF TO REAL PATIENTS.

By Rachel Johnson

Icing the inflamed arches of an office worker with plantar fasciitis. Throwing a ball to an athlete with a fracture to help him retrain muscles. Student clinical interns at BU’s Ryan Center for Sports Medicine & Rehabilitation—a professional physical therapy and rehab unit servicing thousands of patients each year—are given real cases and taught how to give real relief right from the start.

Doctor of physical therapy student Kevin Mao (’10) is no different; he chose the Ryan Center for the second of his four student clinical experiences.



“WE LEARN ABOUT THESE INJURIES IN CLASS, BUT WHEN WE SEE THEM IN PERSON, THAT’S WHEN IT ALL MAKES SENSE.”
KEVIN MAO

As students progress through their placements, they’re allowed to get more involved in patient care—after spending a semester watching from the sidelines at an acute care hospital, Mao was ready to test his skills.

“At other places,” says Mao, “it’s been mostly observation, since at this stage, we’re still novices. At the Ryan Center, we’re getting hands-on experience.

“In terms of setting, patient cases at the center are mostly outpatient orthopedic... treating everyday injuries, work-related injuries, athletic injuries. And we help them with that.”

Another benefit for students at the on-campus clinical center is the opportunity to develop close working relationships with the physical therapists on staff. Jon Rogers (’10) says that the center’s ties to the University encourage a blending of classroom and clinical training. “Several of the therapists there are lab instructors who know us,” he says, “so if we had a really cool case that we had studied in a lab and a similar case came into the center, we could see it in practice on a patient.”

Rogers admits that working alongside classroom instructors at the center can make the work more demanding, but it also offers students more practical opportunities. “The instructors know what we know, what we’ve done in lab,” he says. “They also know how to challenge us to practice what we’ve learned in class, and then go beyond that.”

Clinical Associate Professor Julie Starr puts it another way: “The student cannot get away with, ‘Oh, we haven’t

Grad student clinical interns Kevin Mao (left) and Jon Rogers at BU’s Ryan Center for Sports Medicine & Rehabilitation

learned that yet.” Like the rest of the physical therapy faculty, Starr continues to work in the field (she spends one day a week at Boston’s Beth Israel Deaconess Medical Center) and says the close attention of leading professionals contributes to an exam pass rate that’s hit 100 percent for the past three years. Starr also notes that all students surveyed by the program’s accreditation agency had a job within six months of graduation.

“Many of the faculty here are board-certified specialists,” says Starr. “We also pull in great physical therapists for labs, bringing in clinicians from all over Boston, so students get a lot of close observation and teaching from area clinicians.”

Starr says it’s all about turning “really good students” into “really good therapists.” And that, agrees Mao, is what his time at the Ryan Center has been all about.

“The training at Sargent, that’s what I want to do,” says Mao, “it’s what I came to school for. The Ryan Center lets us see how the business works. It’s a good learning environment to get to see all types of patients. We learn about these injuries in class, but when we see them in person, that’s when it all makes sense.”



Take a closer look at BU’s Doctor of Physical Therapy Program at www.bu.edu/sargent/dpt.

illiteracy

IS still a major problem in U.S. schools	IS NOT always correctly diagnosed	REQUIRES a radical new approach
1	2	3

Press 1, 2, or 3 to give your answer.
(They're all correct.)



READING WORDS? NO PROBLEM. IT'S MAKING SENSE OF STRINGS OF THEM THAT GIVES SO MANY MIDDLE AND HIGH SCHOOL KIDS TROUBLE. WITH A NEW COMPUTERIZED TEST, GLORIA WATERS HELPS THEIR TEACHERS FIGURE OUT WHY.

By Patrick L. Kennedy

Hear tier... Reportize... Factual

No, this isn't TV's *Colbert Report*, whose parodic pundit espouses "truthiness" and other fanciful news values. It's a literacy test, one of a battery developed by Gloria Waters, dean and professor of speech, language & hearing sciences. In the opening salvo of questions you click "yes" or "no," depending on whether the screen presents a real or nonsense word.

Shoon? No. *Lork?* No. *Rate?* Ah-ah! Yes.

Nite. No, with apologies to sign-painters everywhere.

Boit. Perhaps in France, but here? No.

In subsequent exercises, you'll match words to pictures; pick synonyms (*laborious* = *difficult* rather than *difficulty*); decide whether words are related (*Clear* and *clarified*? Sure. *Best* and *bestial*? No); and decide whether sentences (*The man washed herself.*) make sense. Eventually, you'll read passages about the Bastille, Gullah culture, and the manriki (a ninjutsu weapon), and answer questions based on them.

The test battery was administered to about a thousand public middle and high school students in Boston during the past two years. New York students took a further refined version of the battery in spring 2009.

Waters's methodical work is helping schools pinpoint kids' literacy obstacles as never before. And they could use the support.

Only 31 percent of eighth-graders in the United States are proficient readers, according to the U.S. Department of Education (DOE). In 2009, eighth-graders scored just four points higher on federal reading tests than their predecessors did in 1971.

Encouraged that the scores have at least *risen* four points? Not so fast. Consider that in 1971, factories still powered America's economy. As today's kids graduate without mastering reading, they enter the workforce "woefully ill-prepared" for the 21st-century economy and "unable to write effective business communication, read analytically, or solve problems," employers report in trade publications.

"American kids do pretty well, actually, through fourth grade," says Catherine Snow, a Harvard literacy expert and the Boston field site director for the Strategic Education Research Partnership Institute (SERP). "It's at seventh and tenth grade that they look very bad in international comparisons... They're then facing new tasks of reading that are more complicated: reading for content, reading expository text in science and social studies." At this stage, students shouldn't be "reading word by word."

To figure out where the kids' problems lie—and, therefore, how to attack those problems—SERP administered multiple literacy batteries, including Waters's, to Boston Public Schools students in 2007 and 2008.

"It goes all the way back to the original question I had as a clinical psychologist when I started to work with kids who had learning disabilities," says Waters. "Can we take things we've learned from cognitive psychology and apply them in a diagnostic battery? So that if teachers know a child has a reading problem, they can find out why."

The dean is also a prolific researcher in sentence processing and psycholinguistics. For three decades, she and her husband and lab collaborator David Caplan—a Massachusetts General Hospital behavioral neurologist with a PhD in linguistics—have used neuroimaging and other techniques to study "which areas of the brain support different aspects of language processing," says Waters, a bilingual Montreal native. Their work may benefit victims of stroke, Parkinson's, and Alzheimer's disease.

That research has informed their work in adolescent literacy. In 2005, Waters and Caplan received a \$1.2 million DOE grant to develop a test battery to assess middle- and high-schoolers' weaknesses across the different skills involved in reading comprehension.

With its range of tests on simple words and complex passages—all chosen very carefully for their various linguistic



"CAN WE TAKE THINGS WE'VE LEARNED FROM COGNITIVE PSYCHOLOGY AND APPLY THEM IN A DIAGNOSTIC BATTERY? SO THAT IF TEACHERS KNOW A CHILD HAS A READING PROBLEM, THEY CAN FIND OUT WHY."
GLORIA WATERS

properties—the battery yields the answers to several key questions, says Waters. "What is it the students are having difficulty with? Do they understand words that have a simple morphology or structure, and not words that have a more complex structure? Do they understand sentences that have simple syntactic structures, but not complex? Do they understand stories where they can get the main idea, but they really don't get the microstructure of the story?"

The computerized battery also measures reading speed. A skilled reader reads automatically, rather than decoding words one at a time, Waters says. Furthermore, the students later take an audio version of the same test. "So you get a sense whether this is a general language problem the child has, or something very specific to reading."

After analyzing the results, Waters and colleagues present recommendations to the schools. For example, she says, "One of the things we've noticed is that a lot of students have difficulty with individual words when they're words that are morphologically complex—words made up of other words." So they prescribe "teaching students about vocabulary, about relationships between words—things that are critical to understanding text."

"It was really helpful," says Boston school principal Andrew Bott. In his seven years leading the Rogers Middle School in Hyde Park, Bott says the battery is "the only one I've experienced that differentiates among the literacy skills that kids need to develop. To have a battery that tells you about phonemic issues as well as fluency, vocabulary, comprehension—all in an assessment that you get results from really quickly—is invaluable."

Waters and her colleagues continue to calibrate the tests, and in spring 2009 they took the battery to East Syracuse, New York, where 1,300 of the district's middle- and high-school students took it. "A huge data pool," she says. "The results show that kids' ability to deal with complex structures is the most important predictor of their ability to read text—and to do well on high-stakes exams."

Ultimately, Waters's aim is a web-based battery available to schools across the country. But East Syracuse is a great step forward. "It's a rich data set," says the dean, "one people will be analyzing for a long time to come."

Communication Breakdown

and the Health Care Gap

By Andrew Thurston



MANY KIDS FACE AN UPHILL BATTLE WITH ASTHMA; COULD BETTER COMMUNICATION HELP THEM WIN THE FIGHT?

Sheila is 46 and facing a 51A Care and Protection Report—child abuse charges. Her four kids all have severe chronic asthma, but Sheila refuses to follow their doctor's repeated medication advice, ignoring preventative measures in favor of rescue inhalers. The children wheeze, they miss school, they often wind up in the ER, but when ten-year-old John overdoses on his rescue medication and his heart rate tips the scale, the Department of Children and Families steps in and hits Sheila with the 51A.

Clinical Professor of Occupational Therapy Ellen Cohn cuts away from Sheila's story: "That's one framing of this particular patient's scenario," says Cohn. Now it's time for another: Why did the doctor keep giving advice without delving into Sheila's life outside of the clinic?

Cohn is helping to finish up two studies on how patients and doctors talk to each other, and believes a communication breakdown could be spurring our nation's yawning health care gap. The disparities are stark and, as African-Americans, Sheila's kids aren't alone in fighting an unfair battle when it comes to managing their asthma: 44 percent of Hispanic and 34 percent of black children underuse their asthma controller medication; in white children that figure stands at 22 percent.

Along with other researchers from schools of public health, medicine, and health science, Cohn looked at veterans with hypertension and parents of children with asthma. Their two studies included interviews with patients and doctors, and recorded clinical consultations; the asthma project also finished with a nationwide telephone survey of parental attitudes.

For a flavor of what they uncovered, here's another take on that 51A:

Sheila is 46 and lives in a rough part of town; she's out of work and fiercely protective of the two teenagers and younger twins she's raising on her own. After a recent killing in the neighborhood, she keeps a close eye on her kids as they play outside. She hates the toll asthma takes on her children's lives but says she knows what makes them comfortable and is ever vigilant with rescue medications. Sheila doesn't believe the preventative medications help her kids, as their asthma symptoms come and go.

"Here's one presentation of a mother who's protective and caring," says Cohn, whose research colleagues interviewed Sheila and her doctor, "versus the other perspective where she's considered abusive.

"By understanding her daily routines and behaviors, we had a different understanding of who she is. That understanding shifts the task in the clinical encounter—it's not about educating Sheila about the need for asthma medication, rather it's about trying to understand her worldview and coming to a collaborative understanding of how she can give her children the appropriate medication in the context of her life."

Cohn and her colleagues discovered that doctors are trying to impart biomedical knowledge and recommendations without taking into account everything else that's going on in their patients' lives. Cohn refers to "explanatory models" and "daily lived experiences"—occupational therapist-speak for the things that make us tick, from what we think about illness to our cultural values and day-to-day routines and activities.

According to Cohn, the researchers noticed that patients generally fall into one of a handful of explanatory models when it comes to understanding asthma. One of the most common is the chronic model: they realize the condition isn't going away and are more likely to accept that a medication regimen will help them, or their child. Another is called intermittent: they believe asthma, like its symptoms, comes and goes, and—like Sheila—concentrate on rescue, rather than preventative medications. If doctors can pinpoint a patient's explanatory model—as well as the daily routines that influence how and when a patient takes medication—they should be able to reduce medication underuse and improve patient health. A tough task with appointments that are over in a flash.

"The practitioner in a very, very short time has to figure out if this person is able to follow through with the recommended procedure," says Cohn.

The research team concluded that addressing those explanatory models could narrow some of the ethnic and socioeconomic health care disparities. However, Barbara Bokhour, a co-investigator and associate professor of health policy & management at BU School of Public Health, warns against pigeonholing people based on race.

"It's less to do with saying, 'OK, African-Americans think X or Latinos think Y,' as it is finding ways for providers to access that information from everybody, and know that their belief system, their experience of illness, plays into what they do."

Bokhour adds that when the researchers listened in on patient and doctor interactions, they often heard "providers miss opportunities to address what are considered patient-centered aspects of care." That opportunity could be something as simple as asking patients why they skipped their medication.

It's an aspect of the health care journey that may've been overlooked if the research team hadn't taken the unusual step of inviting an occupational therapist on board: "A lot of what we know about health disparities comes from studies that use quantitative, epidemiological approaches, so we look more at trends, at health outcomes, rather than the subjective experience with these health disparities," says Dharma Cortes,

What Needs to Change?

"It's not just about access to care. We're trying to understand people's perceptions of illness and how that might be different from practitioners'... We have to address the science of the disease, but we also have to address the social situation and context."

Ellen Cohn



Photo by Lucia Grochowska Littlefield

"My goal is that there are support staff who can get more in depth into issues of daily lived experience and explanatory models [and address] those kinds of issues that are so important to patients in managing their chronic illness."

Barbara Bokhour



Photo courtesy of Barbara Bokhour

"Good or bad health does not happen in isolation; it's embedded in the daily experiences, in the social context in which people live... More and more, we're looking at, 'what are the public health policies in place in our society that are making people sick?'"

Dharma Cortes



Photo by Josué Ramirez

another of the investigators and an instructor at Cambridge Health Alliance and Harvard School of Medicine.

Next up for the research team, says Cohn, is likely to be "an intervention study to look at the ways in which we might train practitioners differently to consider some of these daily lived experiences and how they might do that in the context of the constraints of the health care system."

For Sheila, that should mean a doctor she can work with and a torn-up 51A; for her son John, it could be the start of a childhood full of running.

WEB Extra

Ellen Cohn is also bringing her perspective on daily lived experiences to studies of veterans with hypertension. Read the latest at <http://people.bu.edu/ecohn>.

FAMILIES & AUTISM

AUTISM DOESN'T JUST IMPACT FAMILIES DURING CHILDHOOD. FINALLY, SOMETHING IS BEING DONE TO HELP THEM PREPARE FOR A LIFETIME OF CARING.

By Sheryl Flatow



“What will happen when my parents are gone?”

That question begins to haunt many teenage siblings of individuals with autism spectrum disorders (ASDs). Caring for a person with autism is often a lifetime proposition, but, until recently, little attention was paid to the effect that ASDs have on the family unit.

Leading that shift has been Gael Orsmond, associate professor in the Department of Occupational Therapy. A developmental and clinical psychologist, she's co-director and co-investigator of a large-scale longitudinal study, funded by the National Institute on Aging, that examines the long-term impact of caregiving on family members and explores how autism evolves from adolescence to adulthood.

“Do they get better?” says Orsmond. “Are there other conditions that occur? When we began this study, nobody had looked at what happens to people with autism in adulthood, and how family members adapt over time. The focus had always been on childhood.”

The study was launched in 1999 in partnership with the University of Wisconsin-Madison and has observed 405 families divided between Massachusetts and Wisconsin. When the project began, the age range of those with autism was 10 to 53 years old; roughly two-thirds were adolescents and young adults. “It was harder to find adults than we anticipated,” says Orsmond. “They're out there, but some of them were never properly diagnosed.”

Every 18 months, comprehensive in-home interviews have been conducted with the primary caregiver, almost always the mother. “The interview focuses on the symptoms of the son or daughter with autism, so that we can track the disorder over time,” says Orsmond. The study seeks to determine whether there are discernable changes: in eye contact, the ability to have a conversation, social impairment, repetitive behaviors. “The mother also completes a set of questionnaires ahead of time,” she says, “which mostly address her well-being.”

Orsmond received an additional grant from the National Institute of Child Health and

Human Development to collect data from siblings between the ages of 12 and 18, to see how well they cope with their family situation.

“I wanted to focus on adolescence because it's such a crucial time for well-being,” she says. “It's a given that a person with a disability can create stress within a family. But research shows that when a child has autism, other family members are more likely than the general population to show mild, sub-threshold impairments. They might have social difficulties that couldn't be diagnosed as autism: somebody who has difficulty making friends, for instance, or who has hobbies that are really intense. So I wanted to look at whether siblings were having problems, and whether those problems were due to the environment, or a genetic component, or perhaps a combination.”

Research revealed that siblings who are most likely to have depressive symptoms are those with these sub-threshold symptoms combined with environmental stress, such as recurring disruptive behavior from the child with autism. “It took those two things together to impact siblings,” she says. “It wasn't just one or the other.”

The findings so far provide some encouraging news to families. The rates of nonclinical depression in siblings of individuals with autism are no worse than in those of typical adolescents in the general population. And although many siblings point out that their parents spend a good deal less time with them because their brother or sister requires so much attention, they express little resentment as adults. One respondent said, “It taught us tolerance and unconditional love and selflessness to see how our parents cared for our brother.” Another commented, “It has probably brought us all closer together.”

And people with autism do show some improvement as they mature. “Symptoms tend to decrease in their severity over time, especially the repetitive behaviors that are most stressful to families,” says Orsmond. But the ability to make friends remains elusive.

Orsmond hopes that the findings of the principal study, which is funded through 2012, will help families of individuals with autism understand what to expect over time. “We share >



“You make sacrifices. You do without things.”

See next page for more family stories.



“I would give my brother anything. I would love to have him with me.”

See next page for more family stories.

> some of our findings with them every six months,” she says. But Orsmond would like the research to have an even wider impact.

“We hope to see an improvement in services and support as we get our data out there. We publish a lot in scholarly journals, and we also try to get this information to the people who have the power to make changes. Unfortunately, in this economic climate where services are being cut, that is not happening now. But it is very much one of our goals. Families need so much support. Siblings want information. We hear things like, ‘How do I talk with my family about future planning?’ ‘What should I expect when my parents are gone,’ ‘I don’t know how to work with services.’ So part of our job is raising issues, and figuring out what kinds of intervention or support or services there are. There is still so much to learn.”

“I WANTED TO FOCUS ON ADOLESCENCE BECAUSE IT’S SUCH A CRUCIAL TIME FOR WELL-BEING... RESEARCH SHOWS THAT WHEN A CHILD HAS AUTISM, OTHER FAMILY MEMBERS ARE MORE LIKELY THAN THE GENERAL POPULATION TO SHOW MILD, SUB-THRESHOLD IMPAIRMENTS.”

GAEL ORSMOND



FAMILY STORIES OF AUTISM

HOW LIFE CHANGED—OR DIDN’T—FOR BROTHERS AND SISTERS OF SIBLINGS WITH AUTISM

Childhood: “I felt very protective of my sister while we were growing up. I tried to help my parents keep the household running and spend time with my sister. I had more responsibility than most of my friends my age. But it was responsibility I chose to take on myself.”

Community Acceptance: “My mother was very progressive-thinking, inclusive, and dedicated to trying to help my brother overcome his disability. Unfortunately, the rest of society can’t fulfill this standard for him.”

Relationships: “I know I can’t marry anyone who won’t be supportive and accepting of the fact that one day I/we will be responsible for my sister.”

Starting a Family: “I am terrified to have a child with a disability such as my brother’s. I don’t think I could handle it. Genetics counseling before planning pregnancy is definitely a necessity.”

A Different Life: “You don’t do things as a family as much as other families do. You make sacrifices. You do without things. But in the end, you’re stronger, closer, more vulnerable, more honest, a little more responsible.”

The Future: “I would give my brother anything. I would love to have him with me, but he needs constant supervision and structure that can be better provided at a residential care setting. I also want to give my children (in the future) all I have, and, if he was with us, I know that would be difficult, if not impossible.”

Taken from: *Adolescents and Adults with Autism: A Study of Family Care-giving*, “Reflections from Adult Siblings who have a Brother or Sister with an Autism Spectrum Disorder.”



WEB Extra

Read the autism study research reports and personal stories of living with autism at www.bu.edu/sargent/autism.

Student Experience

The PRE-MED Path Less Traveled



MOST STUDENTS TAKE A STANDARD PATH TO MEDICAL SCHOOL. AT BU SARGENT COLLEGE, THEY GET THE CHANCE TO MIX THINGS UP A LITTLE.

By Rachel Johnson

Gross. Human. Anatomy.

When BU Sargent College alumni who’ve gone on to medical school are asked about their standout Sargent experience, most reply in those three words.

“The gross anatomy class is probably the biggest draw,” says Judith Schotland, associate professor and director of programs in Human Physiology and Applied Anatomy & Physiology. “Where else are you going to have the chance to work with cadavers as an undergrad?”

“Sargent is not a typical pre-med program,” says Jack Naggar (’07, MED’11). He went from Sargent to med school as part of the Modular Medical Integrated Curriculum (MMEDIC), an accelerated program that enables students to be accepted to BU School of Medicine as sophomores and begin their MD studies—including a pre-med stint with gross human anatomy—while still undergrads.

The truth is, undergrads rarely have such a chance, which shows why

so many students choose to transfer into Sargent’s human physiology major, which fulfills all pre-med requirements. While the program starts out with 20–30 students, by senior year it has often quadrupled in size.

“Even students from other schools at the University hear about the course and want to take it,” says Schotland. “And I’ve had so many former students write to me about what a help the class was; one student told me he’d just gotten the highest grade ever on the med school anatomy class upper extremity exam. Having that background, it’s incredibly beneficial for medical school study.”

Dave Young (’06, MED’10) has seen the program from both sides of the classroom; a former Sargent student, he’s been a teaching fellow in the Gross Anatomy Lab for the last four years and is now completing a residency in family medicine. “My comfort with anatomy as a whole was an advantage starting out in medical school,” he says. “And I know that background will serve as an asset in my medical career.”

Naggar agrees: “It’s easy to get lost in the rapid pace of med school,” he says. He originally planned to study physical therapy, but a freshmen-year research internship in molecular cardiology changed his career path.

“It helped shape my decision to go to medical school,” he says. “Once I began my internship, I applied to the MMEDIC program. It allowed me to

Dave Young (left) and Jack Naggar at Boston Medical Center.

take classes that were more interesting, more demanding. Already being accepted to medical school, I had the freedom to not worry as much, to focus on challenging myself.” Naggar has continued his work in molecular cardiology and recently presented his research at a conference in New Orleans.

Young says that the Sargent experience helped in large part because students are actively encouraged to try out different disciplines—athletic training, nutrition, human physiology, and so on—before focusing on one, to find that perfect fit. And that diverse background helps them out in later life, whether they choose medicine, physical therapy, or another path altogether. “My nutrition and exercise background from Sargent will be integral to any potential health career,” he says.

“You get to experience a bit of everything,” adds Naggar. “I don’t think you can do that anywhere else. That’s special for Sargent; it’s a great experience for us.”

WEB Extra

See what else is offered for pre-med students at www.bu.edu/sargent/pre-med.

ADDING A SPRING TO SENIORS' STEPS



A RESEARCHER'S OWN BATTLE WITH ARTHRITIS HAS MADE HER DETERMINED TO HELP SENIORS ADD A LITTLE SHINE TO THEIR GOLDEN YEARS.

By Pamela Cooley

"These aren't exactly my golden years—they're more like my rusty ones," says Irene, 77, as she gingerly alights from her car after sliding it into a parking space in Boston. "I have bad knees now, and I'm more afraid of falling than I used to be."

Irene holds down a full-time job, lives unassisted, and enjoys overall good health and an active social life. But as she approaches her eighties, she's found that even parking her car can be a complex task: "I have to make sure to find a level surface to park on so I don't have to step up when I get out of the car," she explains. Like many seniors, Irene finds it increasingly difficult to negotiate barriers—including steep stairs, uneven sidewalks, and poorly lit public areas—as she goes about the business of everyday life. And that's what Julie Keysor, associate professor and physical therapist, is helping to change.

"My interest has always been figuring out how to keep elders—and to some extent, middle-aged adults—active and involved in their lives, despite the chronic conditions they have," says Keysor. "If an environment is supportive to the extent that it does not present barriers to people who have functional limitations, then, in theory, they should be able to participate in their life roles."

Keysor is careful to distinguish between life roles—maintaining a home, job, and social life and engaging in community activities, for example—and functional tasks, which constitute most people's everyday routines.

"A function, as I'm defining it, is walking across the room, climbing stairs, getting out of a chair. Clearly, people need to do these things in order to be involved in their bigger life roles," she says. "But, can they also leave the house and engage in social activities in the community? Can they prepare and do all the things necessary to have a social engagement in their home? Can they physically navigate and negotiate public transportation, if they have to? It's this bigger picture that I'm most interested in."

A veteran of six surgeries due to bilateral knee arthritis resulting from an injury, Keysor's own experience with disability and rehabilitation led to her interest in helping people better manage chronic conditions. "I felt the medical system didn't really help me figure out how to live with my arthritis; my guess was that others have felt that too," she says.

Keysor used that motivation to pursue a doctorate in public health and develop a measurement instrument called the Home and Community Environment Survey, a self-report

"MY GOAL IS TO HELP PEOPLE STAY ACTIVE IN THEIR LIFE ROLES—IN THEIR COMMUNITY, IN THEIR SOCIAL ENGAGEMENT, IN THEIR ABILITY TO MAINTAIN THEIR HOMES."

JULIE KEYSOR

assessment tool for older adults to help them identify and characterize their environment. Through the survey, Keysor draws attention to the barriers (uneven sidewalks) and facilitators (public transportation) that affect daily life and the ability of elders, particularly

those with disabilities, to live it as fully as possible. According to the survey, seniors who face a high number of mobility barriers in their community have double the odds of reporting limitations in daily activities.

Keysor is also the principal investigator of a five-year longitudinal study of 442 people, mostly older adults, with or at risk for knee osteoarthritis, funded by the Arthritis Foundation and an NIH fellowship award. Keysor and her research teams will look at the risk factors, ranging from biomechanical to environment, that leave some more at risk of disability than others. Keysor's results will also feed into a larger NIH-funded project—investigators hope their broad reach will leave them better placed than researchers in previous smaller studies to find ways to prevent arthritis disease progression. With some estimates suggesting that more than half of all seniors suffer from osteoarthritis—12 percent alone battle knee osteoarthritis—positive findings that help limit the disease's spread and impact would bring relief to millions.

Although Keysor hopes the work will also further establish the relationship between the environment and functioning with disability, she says that's just one piece of a larger puzzle, taking in other factors such as socioeconomic situations and personal attitudes.

"The target is to keep people engaged and help them do what they want to do," says Keysor. "That's what we mean by participation and health professionals need to figure out how to help people do this."

WEB Extra

Watch a Boston-area senior talk about navigating city life at www.bu.edu/sargent/barriers.



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A NEW TREATMENT IS ENABLING PATIENTS TO STAND AGAIN AFTER PARALYZING SPINAL CORD INJURIES.

By Corinne Steinbrenner

Standing Tall with a Spinal Cord Injury



Karen Hutchinson (far left) watches David Jones as therapists help him to walk.

The four trainers know David Jones has arrived for today’s therapy session before he even comes through the door. They can hear the determined sound of his crutches against the linoleum in the hallway.

After 20 minutes of warm-ups and stretching, Jones—who is recovering from a paralyzing spinal cord injury suffered in a skiing accident in 2007—is walking rapidly on a treadmill, his crutches cast aside. He wears a body harness attached to a hoist that supports 40 percent of his bodyweight. One trainer sits in front of him at a computer, a second stands behind him guiding the movement of his hips, a third guides his left leg, and a fourth guides his right. As Jones takes a step, the trainers at his legs pull his knee and foot forward into the natural walking pattern he has difficulty achieving on his own.

This therapy technique, known as locomotor training, is being used, studied, and improved at BU’s teaching affiliate hospital, Boston Medical Center (BMC), Massachusetts, and at the six other sites around the country that belong to the Christopher and Dana Reeve Foundation’s NeuroRecovery Network.

The trainers guiding Jones through his grueling hour on the treadmill learned their basic locomotor training skills from BU Sargent College Clinical Associate Professor Karen Hutchinson. She helped BMC apply for the grant that allowed it to join the NeuroRecovery Network and now works as a consultant to BMC’s locomotor training program. Hutchinson introduces new trainers to locomotor training techniques, and she analyzes data along with other researchers in the NeuroRecovery Network who are evaluating the efficacy of locomotor training for patients like Jones with incomplete spinal cord injuries.

The task of Jones’s trainers is to reproduce the sensory cues his nervous system would feel if he were walking entirely on his own. “To do that, you put your hands in specific places,” Hutchinson explains. “So when the patient is in swing, your manual contacts are on flexor muscle groups—groups that would flex and shorten the limb so it could come through during swing. And when the patient is in stance, your manual cues are on extensor tendons, and you try to stimulate those tendons to be active in the right phase of gait.”

The trainer sitting behind the computer has an equally important role—dictating the speed of the treadmill and the amount of the patient’s weight the harness is supporting. “It’s a fine line,” Hutchinson says, “because if you take away too much weight, then the patient gets no more sensory cues. So the most load a person can take and still have a good walking pattern is where you want to train.”

Locomotor training is physically exhausting for the patient and for the trainers (Hutchinson and graduate student Genevieve Olivier, ’09, recently completed a study of the toll the training takes on trainers’ bodies), and that’s one of the reasons Hutchinson—a proud Massachusetts native—was determined to bring locomotor training to New England.

“Boston people are gritty. The mentality here is perfect for this,” she says. “My feeling was, if you want people to give 150 percent, the clinicians here, the patients here, are going to do that.”

“BOSTON PEOPLE ARE GRITTY. THE MENTALITY HERE IS PERFECT FOR THIS. MY FEELING WAS, IF YOU WANT PEOPLE TO GIVE 150 PERCENT, THE CLINICIANS HERE, THE PATIENTS HERE, ARE GOING TO DO THAT.”
KAREN HUTCHINSON



And the patients who stick with the program are seeing results. Many of those who enter the program in wheelchairs actually leave months later on their own two feet, Hutchinson says, and patients who, like Jones, enter the program already able to walk, greatly increase their walking speed and stamina. Exactly how much any particular patient can expect to benefit from locomotor training, however, is still an open question.

That’s why Hutchinson and her colleagues in the NeuroRecovery Network gather reams of data about their patients and their progress and then hold monthly conference calls to discuss their interpretations of the data. If they can establish the extent to which locomotor training increases patients’ function and improves their all-around health, she says, they’ll be able to convince insurance companies to fully reimburse its high cost, which will make the therapy far more accessible.

Knowing that her work could bring life-changing therapy to the millions of people now living with paralysis, Hutchinson says, gives her a sense of purpose and makes the work a joy. As a doctoral student in the early 1990s, she conducted experimental locomotor training on laboratory rats. While the lab work was fascinating, she says, her passion has always been for clinical work. She recalls thinking during her graduate studies, “That’s nice how the rats got better, but I want to see how the people get better.”

The data she’s now poring over with her NeuroRecovery Network colleagues is revealing exactly that, she says. And so are the increasingly confident sounds of Jones’s footsteps in the hallway.



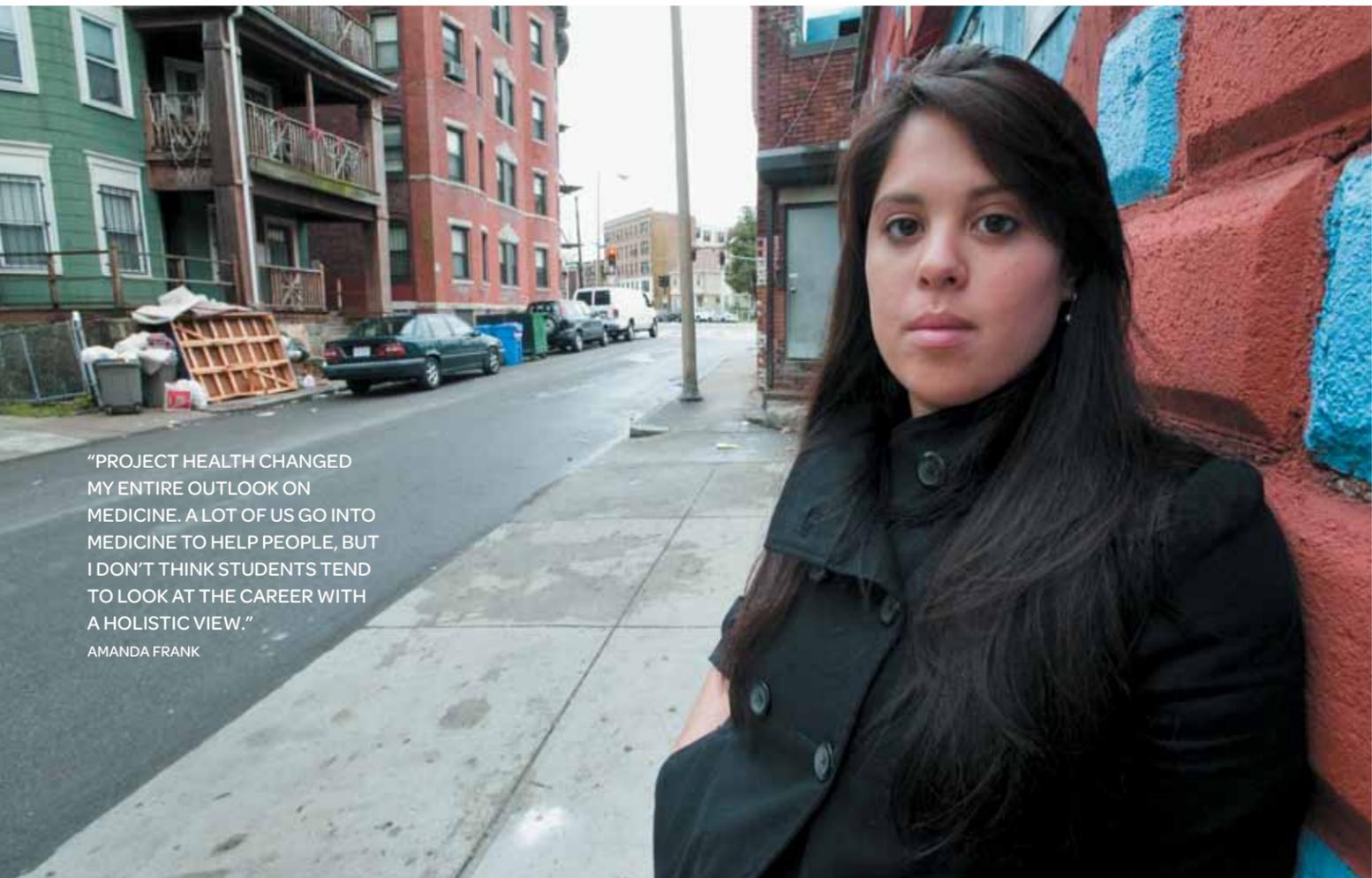
 WEB Extra

You can see more images from David Jones’s rehab session at www.bu.edu/sargent/walk.

MEDICINE CAN'T DO EVERYTHING. IF A PATIENT DOESN'T HAVE A FIXED HOME OR A GUARANTEED MEAL, A DIFFERENT KIND OF PRESCRIPTION IS IN ORDER. BU UNDERGRADUATE VOLUNTEERS, INCLUDING SARGENT COLLEGE STUDENTS, ARE CONNECTING LOW-INCOME RESIDENTS TO BASIC RESOURCES AND GIVING THEM A FIGHTING CHANCE FOR A HEALTHY LIFE.

By Maggie Bucholt and Andrew Thurston

More than Health Care



"PROJECT HEALTH CHANGED MY ENTIRE OUTLOOK ON MEDICINE. A LOT OF US GO INTO MEDICINE TO HELP PEOPLE, BUT I DON'T THINK STUDENTS TEND TO LOOK AT THE CAREER WITH A HOLISTIC VIEW."

AMANDA FRANK

Amanda Frank in Boston's Dorchester neighborhood.

Amanda Frank ('10) had volunteered to do a little patient outreach, but she couldn't help reaching a little further. When families came into the BU-affiliated Boston Medical Center (BMC) for treatment, Frank was asked to step in to see if they needed help with anything else—heating bills, food stamps, child care. Her first patient needed them all. And work. Frank decided to let the patient take her part-time job.

"She was in dire need of help," says Frank. "She was living on less than \$100 a month. I was also a home health aid and my employer was always looking for more help; I was going home for the holiday and I thought, 'Well, let her take my job.'"

Frank is a volunteer with Project Health, a national outreach program that places undergraduates in inner-city health clinics to help patients access essential resources, such as housing or utility bill assistance.

Their work allows medical teams and social workers to focus on more complex issues like substance abuse, mental health, and domestic abuse, although environmental factors are no less important to good health. "You can't prescribe antibiotics for an ear infection and expect good results if the family is living in a car," says Sutton Kiplinger, executive director of Project Health, Boston. "Medicine can only do so much."

Today, approximately 25 Boston University undergraduates volunteer with Project Health a minimum of six hours a week. In the spring 2009 semester, there were 75 applications from Boston University students for just 10 open Project Health volunteer slots.

"The student interest at BU has been incredible," says Kiplinger. "We've been able to get a strong volunteer corps specifically positioned for the patient population."

Such interest encouraged Project Health to expand its presence in Boston in 2008; Frank was chosen to run a second patient outreach program at the Upham's Corner Health Center in Boston's Dorchester neighborhood. She now leads a team of eight multilingual volunteer undergraduates (Frank herself speaks Spanish and "a few Chinese dialects," she adds).

"It's a very intimate setting for volunteers to get in contact with their clients," says Frank. "Upham's Corner is overwhelmed with the number of clients they have and we're there to relieve them to some extent."

In the current difficult economy, demand for Project Health's services is rising. Since January 2009, the number of families served has remained the same, but each family is facing three or four issues instead of one or two, says Kiplinger.

Frank adds that despite the rising tide of problems, the volunteers aren't interested in handing out short-term fixes: "A big part of Project Health is to empower people to lift themselves out of the devastation they're in and to tell them, 'We didn't fix your problems; we helped *you* fix your problems.'"

The fall 2008 addition of a follow-up office at BU Sargent College where students can make private calls to patients, as well as state and community agencies, has helped volunteers foster long-term relationships with their clients.

"In the beginning, I had one client who said, 'Are you just going to take my number and never call me again?'" remem-



Undergraduates in the Project Health office at BU Sargent College.

bers Frank. "I think when they see our dedication to the program and to them, they get more motivated."

Students also use the on-campus space to unwind. Mandatory reflection sessions give volunteers a chance to discuss their cases and put issues in perspective. For Sarah Hodge ('12), a volunteer at the BMC site, a Sargent office reflection session was instrumental in helping her reconcile her disappointment and worry about a client whose phone was disconnected and who was not responding to letters. On the upside, Hodge related a positive experience dealing with a young father whom she had helped register for General Educational Development (GED) classes at Roxbury Community College, Massachusetts; he subsequently passed the first of five GED test sections.

The patients aren't the only ones enjoying life-changing benefits, according to Jean Peteet, clinical assistant professor at BU Sargent College: "Project Health gives students real-life experiences," she says. "They understand what it's like for someone who has MassHealth insurance to access services, and they gain communication skills with people of many different ethnic backgrounds."

As she prepares for a career as a nurse practitioner, Frank says her work with Project Health has completely reshaped her perspective. "Project Health changed my entire outlook on medicine," says Frank. "A lot of us go into medicine to help people, but I don't think students tend to look at the career with a holistic view."

"A lot of us think of it as, 'OK, someone's sick and I'll help them get better,' but I can honestly say I never really thought of the other factors that go into health care and maintaining a healthy lifestyle."

Changing Lives

Over a five-month period in 2008, Project Health volunteers at Boston Medical Center helped:

205 families secure housing, including Section 8 and market-rate units, as well as shelters;

154 clients enroll children in day care, after-school, and Head Start programs;

135 clients access food stamps, food pantries, dollar-a-bag programs, or farmers' markets.



WEB Extra

Read more about Project Health at BU at www.bu.edu/sargent/project-health.

A PILOT PROGRAM IS GIVING ATHLETES IN AN UNDERSERVED HIGH SCHOOL PRO-LEVEL MEDICAL SUPPORT; IT'S ALSO GIVING UNDERGRADUATES THE CHANCE TO STEP OFF THE SIDELINES.

By Maggie Bucholt

Big League Care for Underserved Schools



Thomas Dodge and Chelsea High School student Michelle Le.

When an NFL or MLB superstar hits the injury comeback trail, a swarm of therapists, doctors, and athletic trainers descends on their prized asset. Until BU Sargent College stepped in, the kids at Chelsea High School, just outside of Boston, were not quite so lucky—a computer desk sandwiched between lockers was their athletic training “room.”

Now, an inventive clinical practicum being tried out in Chelsea is giving the kids a touch of star treatment. The BU Sargent College program places undergraduate athletic training students in a local school to give on-the-spot professional medical advice to injured teenage athletes. Those backing the scheme say it could be the first step toward a broader public school program. One year into its test run at Chelsea High School, the practicum is also giving Sargent students a new avenue for hands-on learning.

“Our athletic training students take what they learn in the morning in class and apply it to a real-life situation in the afternoon,” says Chad Clements, clinical associate professor and coordinator of clinical education.

Starting in the fall 2008 term, when the program was launched, four Sargent sophomores attended Chelsea High School games and sports events, sitting on the sidelines with coaches, while monitoring players, tending to cramped calves, and splinting broken arms and sprained ankles. Working under the guidance of a licensed athletic trainer, they checked breathing and pulse and blood pressure rates, calmed injured athletes, and reminded players about hydration.

Michael Amato (‘11) says he enjoyed putting his studies to use: “I felt as if I was doing something worthwhile with my education. We were the first line of defense for the athletes and that felt good.”

At the financially challenged high school, a return-to-play decision may have to be balanced against a football player’s ability to continue working at his after-school job, which helps support his family: “Often a player won’t say anything,” says Thomas Dodge, clinical assistant professor of athletic training, who supervised the undergraduates. “That’s when we step up and say, ‘Let’s sit down and make sure you’re OK.’ They don’t want to come out of the game.”

The Sargent team also assisted with the rehabilitation of injuries, as with the captain of the school’s Red Devils football team, Sabahutin Omeragic, who was diagnosed with a sprained knee. During his recovery process, the students stretched, iced, and wrapped his knee, and he was able to play in the next game.

Not that everything proved quite as straightforward. At one of the opening football games, Amato and fellow Sargent student Sarah Robertson (‘11) ran onto the field for their first experience with an acute injury: they helped splint the broken forearm of a player on the opposing team. Despite its less rugged reputation, soccer also presented some injuries that forced the students to act fast. Robertson assisted with the sprained ankle of soccer player Michelle Le, 16, and activated the Emergency Action Plan that Sargent students had drawn up; Le was transported by ambulance to a nearby hospital to rule out a fracture.



From left: Thomas Dodge tapes a student-athlete’s foot prior to a race; Sabahutin Omeragic, in white shirt, warms up with teammates.

“I probably would’ve kept playing if the athletic trainers weren’t there,” says Le, who is interested in pursuing an athletic training career. “At the hospital, the doctor in the ER was amazed at the splint and asked who did the work. I told him it was our athletic trainers.”

Chelsea High Principal Joseph Mullaney was thrilled with the Sargent team being present at soccer games and track meets, as well as at football games, and the trust that developed between the parties. Building a long-term relationship with Sargent is uppermost on his mind, not only for the obvious benefits, but because Sargent undergraduates are good role models.

“Don’t get me wrong, athletics are an important part of students’ growth,” says Mullaney. “But we’re also looking for ways to have the academics in the forefront, for them to consider their future beyond high school.”

That mentoring role was an unexpected benefit of the program, says Clinical Associate Professor Mark Laursen: “The BU students are very close to their age, just a couple of years removed from high school, and I think it’s allowed the students at Chelsea to see a peer who’s engaged in college learning and in health care.”

Laursen says they hope to do more in coming years to encourage high school students to picture themselves in college.

“We’re going to look for opportunities to bring students who are interested in the health care professions over to campus to see the labs, sit in on classes, and explore athletic training and other health professions,” he says.

Plans are also under way for an expanded core program at Chelsea High School and to explore replicating the success at other schools. According to Clements, of the 20 public high schools in Boston, Cambridge, and Chelsea that have athletic teams, only three have athletic trainers. At Chelsea, the scheme has grown to include a Sargent graduate student, licensed in athletic training, and a sports medicine physician from BU-affiliated Boston Medical Center.

“Having an athletic trainer on hand sends a message to students that we care about them,” says Mullaney. “The athletic trainers did a phenomenal job of preparing students for the games and assisting when there were injuries.”



See how the athletes at Chelsea High School are getting on, at www.bu.edu/sargent/athletes.

A Tale of Two Countries

NEUROREHABILITATION EXPERTS ARE JUMPSTARTING CENTRAL AMERICAN ACCESS TO BREAKTHROUGH U.S. RESEARCH.

By Kara Lashley



Clockwise from top left: Picaya volcano in southern Guatemala, Jean Peteet (left) and Guatemalan physical therapist Patycle Jongo, Mariano Gálvez University students, course participants, Oscar Gallardo. Photos courtesy of Jean Peteet.

“This may seem tough, but you’ve got to practice,” the physical therapist says as she confines her patient’s good arm to a sling. Forcing him to use the arm affected by a recent stroke, she looks on as he struggles to pick up dominoes, drop balls into a basket, and repeat a battery of other exercises. Five days a week, six hours a day, he devotes himself to this intense new treatment, called constraint-induced movement therapy. It’s arduous (and often frustrating), but the therapist is right: In a matter of weeks, the patient is feeding and dressing himself again, well on the way to recovery.

That, at least, might be the treatment program in the United States.

Now imagine that the same patient lives in Guatemala. During one of his infrequent sessions, he sits passively as the physical therapist moves the affected arm. (She isn’t familiar with constraint-induced therapy, as new research is mainly only available in English.) At home, the patient’s family does almost everything for him. He has little hope of being able to care for himself again.

Physical therapists and patients in Guatemala are up against some daunting challenges, acknowledges Jean Peteet, clinical assistant professor of physical therapy. But thanks to a new

partnership she’s orchestrated between BU Sargent College and Mariano Gálvez University, the prognosis in Guatemala for people with neurological injuries may be improving.

In March 2009, Peteet and Associate Director of Clinical Care in the Center for Neurorehabilitation Terry Ellis brought nearly 200 colleagues in Guatemala City up-to-date on the most promising methods for treating neurological injury. Accompanied by physical therapy clinical doctoral students Amy Pasternak (’00, ’01, ’09) and Alma Ramirez-Phelipa (’09), and physical therapist Oscar Gallardo (’03), their two-day presentation—*Neurological Rehabilitation: Where Have We Been? Where Are We Now?*—focused on the idea of neuroplasticity, or the brain’s potential to recover after neurological injury.

In constraint-induced therapy, for example, repeated movements of the affected limb activate new neural pathways, compensating for the damaged part of the brain. The key to recovery, research shows, is frequent, heavy doses of therapy—“way more than we once thought was necessary,” says Ellis, who is also a clinical associate professor at Sargent.

“When we learn to play an instrument or become a good athlete, we

repeat and repeat and repeat the task,” explains Peteet. Similarly, “the best therapy happens when somebody practices and practices.”

Based on enthusiastic feedback from course attendees, including physical therapy students, faculty, and practitioners, Peteet is working to develop a second seminar—this one covering treatment for specific neurological disorders, such as Parkinson’s disease. “There’s lots of opportunity for continued collaboration and evolution of their practice,” says Ellis.

American therapists, too, must do more to engage patients in high doses of challenging therapy, both Ellis and Peteet point out. “Sometimes patients think that if you have some shiny machine, that’s the best,” Peteet says. “That’s easier than to wonder, ‘What do I need to do?’”

Presented with the possibility of dramatic recovery, however, patients in both the U.S. and Guatemala may soon be repeating the same mantra: Practice makes better.

WEB Extra

Check out some of the latest advances from BU Sargent College’s Center for Neurorehabilitation at www.bu.edu/sargent/neurorehab.

Grant Awards

BU SARGENT COLLEGE RECEIVED \$7,681,828 IN RESEARCH FUNDING IN 2008–2009. HERE’S A SAMPLE OF SOME OF OUR PROJECTS AND THE AGENCIES SUPPORTING THEM.

Principal Investigator	Title of Project	Agency	Funds Awarded 2008–2009
Helen Barbas, professor of health sciences	Prefrontal Anatomic Pathways In Executive Control	National Institute of Neurological Disorders and Stroke (NINDS)	\$354,116
Helen Barbas	Organization of Prefrontal Feedback Circuits	National Institute of Mental Health (NIMH)	\$344,546
Helen Barbas and Basilis Zikopoulos, research assistant professor	Architecture of Myelinated Axons Linking Frontal Cortical Areas	Autism Speaks	\$55,000
Sharon Cermak, professor of occupational therapy	Training Long-Term LEND Neurodevelopmental Disabilities	Health Resources and Services Administration (HRSA)	\$14,680
Kee Chan, professor of health sciences	IPA: MultiVISN Implementation of a Program to Improve HIV Screening and Testing	Dept. of Veterans Affairs	\$28,591
Jeffry Coady, assistant professor of speech, language & hearing sciences	Lexical Influences on Nonword Repetition by Children with and without SLI	National Institute on Deafness and Other Communication Disorders (NIDCD)	\$81,250
Ellen Cohn, clinical professor of occupational therapy	IPA: Culture and Communications in Hypertension Management	Dept. of Veterans Affairs	\$16,474
Wendy Coster, associate professor of occupational therapy	Development of Measures of Participation and Environment for Children with Disabilities	Dept. of Education	\$195,360
L. Clarke Cox, clinical associate professor of speech, language & hearing sciences	Hearing Acuity, Cognitive Aging, and Memory for Speech	National Institute on Aging (NIA)	\$10,253
Terry Ellis, clinical associate professor of physical therapy	Unveiling the Natural History of Quality of Life and Mobility Decline in Persons with Parkinson’s Disease: A Prospective Cohort Study	Davis Phinney Foundation	\$32,000
Marianne Farkas, director of training, Center for Psychiatric Rehabilitation	Innovative Knowledge Dissemination and Utilization for Disability and Professional Organizations and Stakeholders	Dept. of Education	\$499,947
Marianne Farkas	Peer Support for University Students with Psychiatric Disabilities (NAMI Support Technical Assistance & Resource Center subcontract)	Health & Human Services (HSS)/Substance Abuse and Mental Health Services Administration (SAMHSA)	\$39,565

Principal Investigator	Title of Project	Agency	Funds Awarded 2008-2009
Marianne Farkas	Research and Training on Disabilities in Rural Communities (University of Montana subcontract)	Dept. of Education	\$10,017
Mahasweta Girgenrath, assistant professor of health sciences	A Combinatorial Strategy to Treat Congenital Muscular Dystrophy	National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)	\$178,750
Mahasweta Girgenrath	A Combinatorial Strategy to Treat the Pathology of Congenital Muscular Dystrophy	Muscular Dystrophy Association (MDA)	\$45,000
Norman Hursh, associate professor of rehabilitation counseling	Boston Connects Model of Student Support: Expanding Technical Assistance and Evaluation (Boston College subcontract)	Mathile Family Foundation	\$33,879
Norman Hursh	Boston Connects Consortium for Counseling Services: A Whole School Approach to Counseling Services	Boston Public Schools	\$30,000
Susan Kandarian, professor of health sciences	Regulation of Gene Expression in Skeletal Muscle: NF-kB Signaling in Atrophy	HHS/National Institutes of Health (NIH)/NIAMS	\$342,388
Susan Kandarian	Identification of NF-kappaB Target Genes in Skeletal Muscle During Cachexia	HHS/NIH/NIAMS	\$171,194
Julie Keysor, associate professor of physical therapy	Disability Risk Factors Among Older Adults with Knee Arthritis	Arthritis Foundation	\$85,500
Gerald Kidd Jr., professor of speech, language & hearing sciences	Central Factors in Auditory Masking (in conjunction with Hearing Research Center)	NIDCD	\$444,205
Gerald Kidd Jr.	Spatial Hearing, Attention and Informational Masking in Speech Perspective	Dept. of Defense, Air Force	\$298,032
Gerald Kidd Jr.	Core Center Grant—Sound-Field Laboratory (Core 1)	NIDCD	\$188,802
Swathi Kiran, associate professor of speech, language & hearing sciences	Semantic Feature Analysis in the Treatment of Lexical Retrieval Deficits in Spanish-English and French-English Bilingual Aphasia	American Speech Language Hearing Foundation	\$50,000
Larry Kohn, coordinator of development, Center for Psychiatric Rehabilitation	Training for the Future (Commonwealth of Massachusetts/Rehabilitation Commission subcontract)	Dept. of Education	\$77,000
Melanie Matthies, professor of speech, language & hearing sciences	Effects of Hearing Status on Adult Speech Production	NIDCD	\$34,552
Kathleen Morgan, professor of health sciences	Dynamics of the Vascular Smooth Muscle Cytoskeleton	National Heart, Lung, and Blood Institute (NHLBI)	\$1,749,580
Kathleen Morgan	Subcellular Organization of Signaling in Smooth Muscle	NHLBI	\$394,469
Kathleen Morgan	Regulation of Contraction of Blood Vessels	NHLBI	\$346,679
Gael Orsmond, associate professor of occupational therapy	Impact of Parenting Adolescents and Adults with Autism (University Of Wisconsin subcontract)	NIH	\$143,953

Principal Investigator	Title of Project	Agency	Funds Awarded 2008-2009
Paula Quatromoni, associate professor of health science	Evaluating IMOVE: An Environmental Intervention to Promote Healthy Eating in Middle-School Children from Massachusetts Communities at High Risk for Childhood Obesity	Charles Hood Foundation	\$75,000
Maria Restrepo-Toro, Center for Psychiatric Rehabilitation	Center for Capacity Building on Minorities with Disabilities Research (University of Illinois, Chicago, subcontract)	Dept. of Education	\$3,732
E. Sally Rogers, director of research activities, Center for Psychiatric Rehabilitation	RRTC on Recovery and Recovery-Oriented Psychiatric Rehabilitation for Persons with Long-Term Mental Illness	Dept. of Education	\$750,000
E. Sally Rogers	Instrument to Measure Recovery Promoting Competence Among Spanish Speaking Mental Health Providers	Dept. of Education	\$149,953
Zlatka Russinova, senior research associate, Center for Psychiatric Rehabilitation	Advanced Research Training Program in Psychiatric Rehabilitation	Dept. of Education	\$149,994
Eliot Saltzman, associate professor in physical therapy & athletic training	Collaborative Research: Landmark-Based Robust Speech Recognition Using Prosody-Guided Models of Speech	National Science Foundation	\$23,121
Robert Wagenaar, professor of physical therapy & athletic training	Body-Area Instrumentation (Lift Monitor) for Avoidance of Workplace Injury (in conjunction with Center for Information and Systems Engineering)	The Hartford Fire Ins. Co.	\$78,442
Robert Wagenaar	Continuous Monitoring of Functional Activities in the Home and Community-Based Setting (Boston Medical Center subcontract)	NIA	\$73,125
Gloria Waters, dean and professor of speech, language & hearing sciences	Functional Neuroimaging Studies of Syntactic Processing (Massachusetts General Hospital subcontract)	NIDCD	\$64,677
Dudley Allen Sargent Research Fund			
The Dudley Allen Sargent Research Fund helps graduate students, faculty, and alumni of BU Sargent College meet the expenses of research projects. Initiated in 1966 by the Class of 1921, and supported by contributions from alumni and friends, as well as by indirect funds from sponsored research, this fund helps foster innovation in health care research. Listed below are the 2009 recipients.			
Ellen Cohn, clinical professor of occupational therapy, and Gail Orsmond, associate professor of occupational therapy	Understanding Friendships of Adolescents with an Autism Spectrum Disorder: In Their Own Voices		
Roberta Durschlag, director of programs in nutrition and clinical assistant professor	Nutritional Status of Participants in the Greater Boston Jewish Family and Children's Service Food Pantry Program		
Swathi Kiran, associate professor of speech, language & hearing sciences	Neural Correlates of Lexical Semantic Treatment		
Galia Moran, Center for Psychiatric Rehabilitation	An Investigation of Recovery and Growth Processes among Mental Health Peer-Providers with Different Levels of Work Intensity		
Mary Palaima, clinical associate professor of physical therapy	Evidence-Based Practice: Physical Therapist Perspectives on Academic Preparation and Clinical Practice		

OUR FACULTY'S RESEARCH REACHES AUDIENCES ACROSS THE GLOBE. HERE'S A SELECTION OF PUBLICATIONS AND ARTICLES WRITTEN BY BU SARGENT COLLEGE FACULTY DURING 2008-2009.

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Hoistad, M. and **Barbas, H.** "Sequence of Information Processing for Emotions Through Pathways Linking Temporal and Insular Cortices with the Amygdala." *NeuroImage*, 40, 1016-1033 (2008).

Berger, S. and Porell, F. "The Association between Low Vision and Function." *Journal of Aging and Health*, 20, 504-525 (2008).

Starkey, C. A., **Brown, S. D.**, and Ryan, J. *Examination and Diagnosis of Orthopedic Injuries*. Philadelphia: FA Davis (in press).

Mainela-Arnold, E. M., Evans, J. L., and **Coady, J. A.** "Lexical Representation in Children with SLI: Evidence From a Frequency Manipulated Gating Task." *Journal of Speech, Language, and Hearing Research*, 51, 381-393 (2008).

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Gallun, F. J., **Durlach, N. I.**, Colburn, H. S., Shinn-Cunningham, B. G., Best, V., **Mason, C. R.**, and **Kidd, G. Jr.** "The Extent to Which a Position-Based Explanation Accounts for Binaural Release from Informational Masking." *Journal of the Acoustical Society of America*, 124, 439-449 (2008).

Evenson, M. E. "Fieldwork: The Transition from Student to Professional." In E. B. Crepeau, **E. S. Cohn**, and B. A. B. Schell (Eds.), *Willard and Spackman's Occupational Therapy, 11th ed.*, Chapter 26, pp 252-261. Philadelphia, PA: Lippincott, Williams and Wilkins (2009).

Heislein, D. M., Shervin, N., and Rubash, H. E. "Physical Rehabilitation after Total Knee Arthroplasty." In Magee, Zachazewski, Quillin (Eds.) *Pathology and Intervention in Musculoskeletal Rehabilitation*. St. Louis: Elsevier Saunders (2009).

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Jacobs, K., Hudak, S., and McGiffert, J. "Computer-Related Posture and Musculoskeletal Discomfort in Middle School Students." *WORK: A Journal of Prevention, Assessment and Rehabilitation*, 32, 275-283 (2009).

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Kiran, S. "Typicality of Inanimate Category Exemplars in Aphasia Treatment: Further Evidence for Semantic Complexity." *Journal of Speech, Language, and Hearing Research*, 51, 1550-1568 (2008).

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Singh, L., Nestor, S. S., and Bortfeld, H. "Overcoming Effects of Variation on Infant Word Recognition: Influences on Word Familiarity." *Infancy*, 13(1) (2008).

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Kee Chan



Wendy Coster



Terry Ellis



Karen Jacobs



Melanie Matthies



Paula Quatromoni



Joan Salge-Blake

Award-Winning Faculty and Students

HERE WE OFFER A SELECTION OF THE AWARDS AND HONORS GIVEN TO OUR FACULTY AND STUDENTS IN 2008–2009 FOR THEIR PROFESSIONAL CONTRIBUTIONS, COMMITMENT TO SERVICE, AND ACADEMIC EXCELLENCE.

FACULTY AWARDS

Clinical Assistant Professor **Sue Berger** received a Whitney R. Powers Award for Teaching Excellence. Berger was also elected to the Roster of Fellows of the American Occupational Therapy Association.

Assistant Professor **Kee Chan** was awarded a 2009 Institute of System Science and Complexity Training fellowship, sponsored by NIH and the University of Michigan.

Professor **Wendy Coster** received the 2009 Sargent College Faculty Award of Merit.

Clinical Associate Professor **Diane Dalton** received a Whitney R. Powers Award for Teaching Excellence.

Clinical Associate Professor **Terry Ellis** was awarded a Building Interdisciplinary Research Careers in Women's Health fellowship through Boston Medical Center's Center of Excellence in Women's Health. Ellis also received the Clinical Excellence in Teaching Award from the American Physical Therapy Association, Neurology Section, in February 2009.

Clinical Professor **Karen Jacobs** was given the Award of Merit from the Canadian Association for Occupational Therapists. Jacobs also received the 2009 Twiness Award by the Sargent College Alumni Board.

Associate Professor **Melanie Matthies** received the Editors' Awards in both speech and hearing. The awards were presented at the American Speech-Language-Hearing Association's 2008 national convention in Chicago, Ill.

Assistant Professor **Paula Quatromoni** was selected as media spokesperson on childhood obesity for the American Heart Association. Quatromoni was also named Advocacy Captain for the American Heart Association obesity campaign, *You're the Cure*.

Clinical Associate Professor **Joan Salge-Blake** was named the Massachusetts Dietetics Association Outstanding Dietitian. She was also selected by the American Dietetic Association as a national media spokesperson.

OUTSTANDING SENIOR AWARDS



BU Sargent College's outstanding seniors (from left to right): Veronica Mitko, Kendra Gunnell, Ben Schanker, Rachel Kunkler, Adam Soliman, Rhea-Mari Saldanha, Matt DeWolf, Aliza Alter, Chris Ilacqua, Katelyn Even, and Jonathan Suen.

PROFESSIONAL CONTRIBUTION AWARD

Aliza Alter, Katelyn Even, and Veronica Mitko received the Professional Contribution Award, an honor given annually to students who show great professional potential through scholarship, research, clinical experience, and community programs.

About the winners: Aliza Alter was a tutor fellow at the BU Educational Resource Center, a high school dance teacher, and camp specialist for children with special needs. Katelyn Even interned and worked with McKesson Health Solutions, and was a Boston-area EMT, a youth soccer referee, and part of a program to organize science experiments for underprivileged youth. Veronica Mitko served as an intern at the Boston Public Health Commission, a program coordinator for the Freshman/Transfer Résumé Advising Program, Habitat for Humanity volunteer, and a member of the Boston Medical Reserve Corps.

TWINESS AWARD

Matt DeWolf and Rhea-Mari Saldanha received the Twiness Award, presented by an honor society first established by the Class of 1921 to recognize seniors who exemplify service, loyalty, thoughtfulness, and excellence of scholarship.

About the winners: Matt DeWolf was co-president of the peer counseling program, a teaching and research assistant, and a BU Educational Resource Center tutor. Rhea-Mari Saldanha volunteered at Massachusetts General Hospital (MGH), served as president of the National Student Speech, Language, and Hearing Association, and was a teaching assistant and peer counselor.

COMMUNITY SERVICE AWARD

Kendra Gunnell, Rachel Kunkler, Adam Soliman, and Jonathan Suen were given the Community Service Award for students who are actively involved in volunteering outside the University. The annual award honors those using skills they've attained through their education and who show an outstanding ability to represent the ideals of BU Sargent College.

About the winners: Kendra Gunnell volunteered at Mother Teresa's Home for the Destitute and Dying in India; back in Boston, she was an intern at Children's Hospital. Rachel Kunkler volunteered with Brookline Medical Reserve Corps and at the MGH Center for Addiction Medicine and Boston's Beacon Hospice. Adam Soliman was a service leader with Team Tobati, supporting education and health efforts in poor, rural communities in Paraguay. Jonathan Suen worked as a teaching assistant at a school for the deaf and joined safe sex awareness projects as a member of the Virus and Infection Prevention Crew.

STUDENT ACTIVITY AWARD

Chris Ilacqua and Lizabeth Metzger were presented with the Student Activity Award, which recognizes students who make strong contributions to extra-curricular activities.

About the winners: An undergraduate laboratory assistant and peer counselor, Chris Ilacqua was also a student advisor and student council vice president. Lizabeth Metzger was a founding member of the Women's Resource Center and served as a Girl Scouts of America troop leader.

2009 BERNARD KUTNER AWARD



ENRICHING THE EXPERIENCE

Wunderkind doesn't quite cover it for Ben Schanker ('09). The winner of BU Sargent College's Bernard Kutner Award—given to a senior with exceptional health care leadership potential—and just one of 30 students nationwide to earn a Jack Kent Cooke Foundation scholarship, Schanker has a résumé someone twice his age would be proud of.

As well as earning degrees in human physiology and biology in his four years at BU, he's served on the boards of the University's Public Health Association and Bioethics Society. That was all squeezed in along with volunteering in Boston and Costa Rica, genetic testing research, publishing an article in *The American Journal of Bioethics*, and playing gigs at BU's Acoustic Café. And yet his modesty almost caused him to miss out on the Kutner Award, BU Sargent College's most prestigious—everyone knew and respected Schanker, but nobody quite knew just how involved he was.

"I think coming to college and having all these resources around you is really an opportunity people take for granted a lot of the time," says Schanker, now a medical student, of his time at BU. "I just wanted to make the best of it and do whatever I could to enrich the experience for fellow classmates as well.

"I was trying to pack in as much as possible, but I don't feel as if I missed out on anything; I really feel I gained as much as I could."



Watch Ben Schanker's valedictorian address to the BU Sargent College community at www.bu.edu/sargent/schanker.

BU Sargent College: At a Glance

WHO WE ARE

Students	Undergraduate	Graduate
Number of full-time students (as of spring 2009)	869	305
Average SAT	1263	n/a
Average GRE	n/a	1200
Faculty		
Full-time	58	
Part-time	44	
Alumni	14,316 in 53 countries	
Clinical Sites	1,400 in all 50 states and 4 countries	



PROGRAMS OF STUDY

Applied Anatomy & Physiology
 Athletic Training
 Audiology
 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 Speech, Language & Hearing Sciences and MS in Speech-Language Pathology
 Combined BS/MS in Therapeutic Studies and Occupational Therapy

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

Most of our professional graduate programs are ranked within the top 15 percent in the country. Specific rankings include:

- **Occupational Therapy Program** ranked number 1 (tied) out of 152 programs
- **Physical Therapy Program** ranked number 24 out of 199 programs
- **Speech-Language Pathology Program** ranked number 25 out of 244 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 (figures for past three years):

Nutrition	99%
Occupational Therapy	97%
Physical Therapy	100%
Speech-Language Pathology	100%

About Us

Boston University College of Health & Rehabilitation Sciences: Sargent College has been preparing health care leaders and defining health care leadership for 128 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. The curriculum also includes an important fieldwork component, providing students in every major with substantive clinical experience. Clinical internships are available at 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.

See Stories You'll Want to Share

Our story doesn't end here. There are more than 1,200 students and faculty at BU Sargent College, and they're all doing great things.

Visit www.bu.edu/sargent to watch students bring the College to life in **video slideshows**, read about how our research is changing lives, or find out how our clinical centers are giving patients real relief.

www.bu.edu/sargent

Shonali Gupta dishes up cooking classes in occupational therapy.



Scott Leonard gets down and dirty in a pre-med ER internship.



Alex Hanson finds ways of making speech therapy fun and exciting for kids.



Chris Stockpile tests his physical therapy skills on a BU hockey team.



Karen Korley prepares to return to Ghana to help prevent the spread of HIV.





Boston University College of Health
& Rehabilitation Sciences: Sargent College

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Get in Touch

If you'd like to learn more about BU Sargent College, we'd like to hear from you. To request more information, speak with a professor or student in your program of interest, make an appointment to visit the campus, or find out more about degree programs, financial aid, and degree requirements, please contact us:

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