BOSTON UNIVERSITY SCHOOL OF MEDICINE

Campus Alumni News

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WE TOOK A HARD LOOK AT OUR CURRICULUM FOR THE 21ST CENTURY. AND MADE IT EVEN BETTER.

CREATING DR. RIGHT

BOSTON UNIVERSITY

Message From The Dean

DEAR FRIENDS,

Albert Einstein once noted, "The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking." At the School of Medicine, the process of our thinking about the curriculum, for both MDs and PhDs, has undergone a transformation. As you will read in this issue, the MD curriculum has evolved over seven years based both on national perspectives on medical education and on BU-specific educational initiatives. Our educational programs more closely reflect our patients' current health care needs.

The classic model of medical education for the past century (two years of basic science followed by two years of clinical clerkships and electives) has given way to early clinical experiences and the integration of basic science didactic sessions into the third and fourth year; today we are as likely to use small group discussions as large lectures. We continue to teach the core biomedical sciences—human anatomy has not changed for a hundred thousand years or so. But today, as students do their dissections, they also learn radiology by studying the CT scans of the cadavers.

Students also see their first patients within a week of starting medical school and start learning how to interview them. Students may practice clinical skills with standardized patients (who definitely note whether they wash their hands, introduce themselves, and make eye contact) before venturing to the clinics to conduct their first physical examinations, and can practice hearing heart sounds with simulators that mimic mitral valve stenosis or a heart gallop rhythm with the turn of a dial. Before they care for their first patients in anesthesiology, they intubate mannequins in the Clinical Skills and Simulation Center until they can skillfully (and confidently) do the procedure rapidly.

Our faculty members are deeply invested in finding ways to present material that facilitates learning; at any given time they are involved in a number of studies on educational interventions, the results of which they present and publish. Students often participate in these studies and sometimes contribute to their design, ensuring that the faculty stays attuned to the student experience and their perceptions.

Dr. Deborah Vaughan, professor of anatomy and neurobiology and a good example of our dynamic and progressive faculty, is featured in this issue. Dr. Vaughan has significantly modified the histology curriculum and studied the effects of the modifications. She is a true academician and scholar with an intense love of science and teaching and great respect for students.

You are probably aware of sequestration and its cuts to Medicare and the budget of the National Institutes of Health, from which we receive hundreds of millions of dollars of grant support. We already have felt the impact of these reductions to our mission of teaching, research, and clinical care; the pace of important research is slowing and we are jeopardizing the careers of the next generation of leaders in science and medicine. We have enacted budgetary adjustments and operational strategies to mitigate the loss of funding as we actively collaborate with our colleagues nationally to let Washington know how devastating the reductions will be to the public health and scientific inquiry.

We greatly appreciate the generosity of the School's alumni and friends who continue to support our research projects, particularly at times like these when research budgets are endangered. Class of 1965 graduates Douglas and Donna Barnard have contributed to the School for almost four decades, and we are pleased to share their story in this issue.

Thank you for your interest in and commitment to BUSM. With your suggestions, advice, and support, we continue to educate outstanding physicians and make progress in important research.

Best regards,

Karen Antman, MD
Provost, Medical Campus
Dean, School of Medicine
Professor of Medicine

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Maria Pantages Ober
Director of Communications

Mary Hopkins
Publications Manager

DESIGN & PRODUCTION
Boston University Creative Services

CONTRIBUTING WRITERS
Lisa Brown, Leslie Friday, Mary Hopkins, Holly Lindner

PHOTOGRAPHY
BU Photography, Boston University School of Medicine Educational Media Center, Frank Curran, Betty Yang '15, and Gina Orlando.

Please direct any questions or comments to:
Mary Hopkins
Communications Office
Boston University Medical Campus
85 East Newton Street, M420
Boston, MA 02118

P 617-638-8491 | F 617-638-8044 | E mhopkin@bu.edu

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Child Care Services Come to BUMC

CHILD CARE SERVICES: KRISTINA MCKAY YOUNG

In December 2012, child care services became available on the BU Medical Campus (BUMC). Located on the ground floor of the new medical student residence at 815 Albany Street, the center provides child care slots in the early education program that are available to Medical Campus employees and students, members of the BUMC Residency Programs, BU Charles River Campus employees, and Boston Medical Center employees. The program is run by Little Sprouts, which was established in 1982 and currently has 16 early education schools across Massachusetts and New Hampshire. The Little Sprouts philosophy focuses on teaching children critical social-emotional skills—including problem-solving and independence—through interactive learning and collaborative play to help them develop a lifelong love of learning. Little Sprouts takes a child-centered, individualized approach to education; children are actively engaged in their learning, and their interests, learning styles, and preferences are considered in every day's planning. The US Department of Education has honored the Little Sprouts program with its Early Reading First, Preschool Centers of Educational Excellence Award for nine consecutive years.

For more on Little Sprouts, visit www.littlesprouts.com. For specific information about the program being offered on the BU Medical Campus, please call 877-977-7688.

"After two decades of exploring child care options for the Boston University Medical Campus, we are pleased to be able to offer this service to members of our community," said Dean Karen Antman, MD. "Housing the program in our beautiful new student residence is an added plus for the children being cared for and for the students living in the building." ■

BU Elected to Association of American Universities

The Association of American Universities (AAU) has elected Boston University to membership. A nonprofit organization founded in 1900 to advance the international standing of US research universities, the association consists of the 62 leading public and private research universities in the United States and Canada.

"The decision by the AAU's current members to add Boston University to their ranks is a tangible validation of the quality and impact of our doctoral research programs and of the research and scholarship of our faculty," said President Robert Brown in announcing the election to the University community. "This news is a major milestone in Boston University's history."

AAU extended the invitation to Boston University following an in-depth review of the University's research and academic programs by its Membership Committee. "Boston University is an outstanding institution that belongs in AAU by virtue of the strength of its research and academic programs," AAU President Hunter R. Rawlings said. "AAU universities play an essential role in America's research enterprise and in educating the nation's young scientists, engineers, and scholars. Boston University is a welcome addition to the ranks of these leading research universities."

The other Massachusetts-based members are Harvard University, the Massachusetts Institute of Technology, and Brandeis University. The AAU focuses on issues critical to research-intensive institutions, such as research funding and policy, and the direction and quality of graduate and undergraduate education. You can view the list of AAU's current membership at www.aau.edu. ■

Dean Karen Antman, MD, congratulates Class of 2013 AOA inductee Anunita Garg.

Thirty Class of 2013 BUSM students were recognized for their leadership, character, community service, and professionalism as inductees into the national medical honor society Alpha Omega Alpha (AOA). Also inducted was BUSM faculty member Gregory Grillone, MD, associate professor and vice chair of the Department of Otolaryngology—Head and Neck Surgery; and two alumni, orthopedic surgeon Timothy Foster, MD '86, and dermatologist Keyvan Nouri, MD '93. Three housestaff inductees from Boston Medical Center, Jonathan Hatoun, MD; Nora Lee, MD; and Victoria Pimentel, MD, were recognized as well.

AOA is dedicated to the belief that the medical profession's quality of patient care is improved by recognizing high educational achievement, honoring gifted teaching, encouraging the development of leaders in academia and the community, supporting the ideals of humanism, and promoting service to others.

Alumnus Appointed to Dean's Advisory Board

Pedram Salimpour, MD '00, has been named a member of the BUSM Dean's Advisory Board (DAB). DAB members serve three-year renewable terms and actively participate in medical school strategic planning and external relations initiatives.

DAB members are leaders in medicine, technology, business, and many other sectors of society. They share a passion for basic science, clinical research, and supporting BUSM. Board members are uniquely positioned to help advance the School and its students, scientists, and clinicians.

"Service as a board member is the culmination of personal and professional aspirations. It is my hope that together with fellow board members and the leadership of Dean Karen Antman, we will leave a legacy of discovery and prosperity for BUSM," said Salimpour.

Salimpour is CEO and cofounder of Champion Health Enterprises, a company focused on the creation of novel health ecosystems for Native American tribes and their business entities. He is cofounder of CareNex Health Services, a health care technology and client-services organization specializing in neonatal and perinatal disease management programs, now Wellpoint. In 2007, Salimpour cofounded Plymouth Health and acquired a 306-bed hospital in San Diego, California. From 2001 to 2005, he served as executive vice president and cofounder of NexCare Collaborative, a not-for-profit serving the health care needs of underserved children and families in Southern California.

"Through his contributions to the science of medicine and the policies that govern health care, Dr. Pedram Salimpour has created an environment of better health outcomes and better health care access in California," said Antonio R. Villaraigosa, mayor of Los Angeles. "He has, among other contributions, been instrumental in the success and enrollment growth of such children's health programs as Healthy Families and Healthy Kids."

President-elect of the Los Angeles County Medical Association, Salimpour is a member of the boards of directors of the University of California, Los Angeles (UCLA) Health Services Alumni Association (School of Public Health), and a founding board member of the School of Medicine at the University of California, Riverside. He is an adjunct professor of health and human services at the Center on Human Aging at San Diego State University and an associate professor of pediatrics at the University of California, Riverside School of Medicine.

Salimpour completed his residency at the University of Southern California Medical Center's Keck School of Medicine and received his Master's of Public Health at the UCLA School of Public Health.

BUSM joins forces to meet veterans' health care needs

BUSM has become part of the Joining Forces Initiative, a collaboration with the White House, the Association of American Medical Colleges (AAMC), and more than 125 medical schools designed to improve medical education on issues affecting military personnel—such as post-traumatic stress disorder (PTSD) and traumatic brain injury (TBI)—and train physicians to meet the health care needs of veterans and their families.

The effort provides veterans and their families with health care opportunities and support. BUSM and VA Boston Healthcare System (VABHS) have developed a specialized curriculum focused on post-deployment mental health and neurological issues; this elective addresses the unique needs of military personnel. The program is designed to educate medical and graduate students on post-deployment mental health and neurological issues to ensure that they are skilled in recognizing and treating both the physical and psychological effects of war.

During the last year, the School hosted a number of lectures and training opportunities on the pathophysiology, clinical presentation, and treatment of military injuries. Special Forces Major Gerald DePold, PA, spoke about the Special Forces Medic system for evaluating and managing head injuries, and nationally renowned neurologist Douglas Katz, MD, lectured on TBI and neuro-rehabilitation. Noted BU researcher and codirector of the BU Center for the Study of Traumatic Encepholopathy

> The effort provides veterans and their families with health care opportunities and support.

Ann McKee, MD, lectured on chronic traumatic encephalopathy (CTE) and the impact of blast injuries on neuropathology. There have been additional lectures on PTSD, depression, and substance abuse.

In conjunction with Naval Week last June, BUSM and VABHS cosponsored an inaugural PTSD and TBI conference featuring poster presentations on cutting-edge PTSD and CTE research conducted at area medical institutions. Rear Admiral Elaine Wagner and James Kelly, MD, presented "The Naval Response to PTSD and TBI." With one hundred-plus participants and more than 35 posters, the experience served to foster the Joining Forces educational initiatives and bring together researchers, educational leaders, and students.

BUSM also assists with the dissemination of clinical knowledge through online lecture postings on the Joining Forces iCollaborative site. ■

APPOINTMENTS

ANGELA JACKSON, MD, APPOINTED ASSOCIATE DEAN, STUDENT AFFAIRS

Angela Jackson, MD, was appointed associate dean for student affairs effective December 1, 2012. Dr. Jackson succeeds Phyllis Carr, MD, who has served in the position since 2001.

An accomplished medical educator with two decades of experience in teaching and training program administration, Dr. Jackson has focused on health policy, primary care education, and skill development for clinical

teachers. She directed the internal medicine Primary Care Training Program for 14 years, developing innovative curricula focused on caring for the urban underserved and preparing residents to assume leadership roles in health care. She has been a valued mentor for dozens of chief residents, residents, and students, and is recognized locally and nationally for "teaching teachers"—chief residents and faculty.

In 2010, Health and Human Services Secretary Kathleen Sebelius appointed Dr. Jackson to the Advisory Committee on Training in Primary Care Medicine and Dentistry as an advisor on policy and program development for the Health Resources and Services Administration (HRSA). Dr. Jackson also chairs the Health Policy Education Subcommittee for the Society of General Internal Medicine and is active in Graduate Medical Education reform legislation.

Dr. Jackson has been the principal investigator of HRSA-funded Title VII training grants and recently was awarded a Josiah Macy Foundation/Institute for Medicine as a Profession grant to implement a medical student curriculum linking advocacy and professionalism. She was co-principal investigator for a National Institutes of Health NIDA Center of Excellence for Physician Education grant to develop a prescription drug abuse module for preceptors. As assistant dean of academic affairs, she developed new BUSM clinical teaching sites.

A member of the BUSM community since 1993, Dr. Jackson is an associate professor of medicine. A graduate of the Medical College of Pennsylvania in Philadelphia, she completed her residency at the former Boston City Hospital, now Boston Medical Center. She has an active primary care practice at Boston Medical Center. In 2011 and 2012 she was named a "Top Doc" by *Boston Magazine* for her work in internal medicine.

HEMANT ROY, MD, NAMED CHIEF, SECTION OF GASTROENTEROLOGY

Hemant Roy, MD, has been appointed chief of the Section of Gastroenterology in the Department of Medicine at BUSM and Boston Medical Center effective January 1, 2013. Dr. Roy most recently served as the Duckworth

Professor of Cancer Research, director of research and vice chair of Northshore University Health System, and clinical associate professor of medicine at the University of Chicago Pritzker School of Medicine.

A recognized authority on colon cancer screening and prevention, Dr. Roy has received numerous honors including career development awards through the American Society of Clinical Oncology and the Glaxo Institute of Digestive Health. He is a primary member and a principal investigator of the National Cancer Institute's Early Detection Research Network (EDRN) and holds a number of National Institutes of Health grants on the clinical applications of biophotonics. His expertise in biomarkers has been recognized with a charter membership to the Cancer Biomarker Study Section, and he also served as a deputy editor for the *Archives of Internal Medicine*.

Dr. Roy received his undergraduate degree from Vanderbilt University (summa cum laude, Phi Beta Kappa) and his medical degree with distinction from Northwestern University Feinberg School of Medicine. He completed his medical training at Beth Israel Hospital in Boston and a three-year fellowship in gastroenterology at the University of Chicago. ■

Meet Nemo, created by BUSM Class of 2015 students Betty Yang, Sweta Bodepudi, and Carolyn Smith-Lin following the January blizzard of the same name. Photo courtesy of Betty Yang.

Respecting Students

Deborah Vaughan: Teacher, Mentor, Leader

Not much slows down Deborah Vaughan. The longtime BU School of Medicine (BUSM) professor of anatomy and neurobiology joyfully puts in 12-to-14-hour days teaching and advising current students as well as interviewing and selecting students for admission to the School. She also designed and maintained her department's website for five years before a professional web editor took it over. A veteran of traditional teaching methods, Vaughan welcomes new technologies that advance teaching and learning and leads several School and University committees tasked with determining the best technology tools.

VERNON DOUCETTE

Vaughan has received every major teaching award at BUSM. Her great respect for students is the hallmark of her academic engagement: "I tell new faculty that the first thing you must have is respect for the students," she says. "Respect for who they are, for their time, and respect for what they are asked to accomplish."

While diverse learning styles is a relatively new phenomenon in education theory, Vaughan has been adjusting her teaching methods to accommodate students for a very long time. "I am very organized, and when I become too rigid in my teaching presentations to someone who is a random thinker, they can become frustrated," she says. "I realized many years ago that to be successful with students I needed to try a variety of ways of communicating. Now I work to help other faculty members use the most appropriate methods and encourage them to hone their skills in this way."

Mark Moss, PhD, a member of the Department of Anatomy and Neurobiology since 1982 and department chair for 15 years, has known Vaughan for a good portion of her academic career. "Dr. Vaughan is the consummate educator," he says. "Her ability to make subject matter interesting and relevant and to convey information in an efficient and durable manner—coupled with her commitment to the discipline and professionalism—is unparalleled. Her prowess as an educator has been recognized by her colleagues and students with eight teaching awards, including the Stanley Robbins award, the most prestigious conferred by the School of Medicine."

Vaughan never planned to teach or work in the field of human medicine. "As a child, I wanted to be a veterinarian, but women just didn't go into that field then," she recalls. "And frankly, I was from a family where women weren't expected to aspire to a career."

As a high school student in Concord, New Hampshire, she trained horses for dressage events and taught equitation. "Once I was asked if I aspired to be a teacher and I said no, but then I recalled that from about the ninth grade, I was teaching horses to perform very specific movements and people the skills to read and communicate nonverbally with the horses," she says.

Vaughan attended the University of Vermont as an undergraduate in a medical tech program majoring in biology. "While it became apparent that I enjoyed science and research, I didn't want to go into medicine because I am one of those people who feel uncomfortable around sick people and in hospitals," she says.

She completed her PhD in biology at Boston University in 1971 and a post-doctoral fellowship in neuroanatomy with Alan Peters, then chair of the BUSM Department of Anatomy. In 1972, she joined an interdisciplinary program project on aging and the nervous system (headed by F. Marott Sinex, chair of the Department of Biochemistry from 1957 to 1977) focusing on neuroscience and connective tissue and the effects of advancing age.

"At that time, aging research was not very highly thought of," says Vaughan. "Our work was one of the first to apply the rigor of quantitative science to this area, and the project, now focusing on anatomy and behavior, is in its fortieth year of research. We made significant contributions to early aging studies." Vaughan eventually studied peripheral nerve regeneration under her own National Institutes of Health (NIH) grant, focusing on how advancing age affects the ability of neurons to regenerate peripheral axons.

In 1996, Peters asked Vaughan to direct the histology courses for the anatomy and neurobiology department, which meant giving up her research to focus on teaching—and she's been engaged by it ever

since. "I love to see the student who gets excited by the beauty of medicine . . . who can go from viewing the vocabulary of black dots to nuclei and cytoplasm when they see something on their computer screen that clicks for them." She cites the student who hands her a journal article that he or she now understands because of the vocabulary and concepts learned in Vaughan's class and from her lectures, and the one who recently sent her a link to a website featuring dinner plates with histological designs on them that both agreed were beautiful.

Vaughan notes the changes in medical student demographics and medical education. "Twenty-five years ago, our students were mainly male Caucasian with a very intense premedical education that included comparative anatomy, embryology, and physiology," she says. "With a homogeneous, pre-trained student population, faculty could be laboratory based and lecture on their research, which didn't necessarily have much to do with the context of the course they were teaching.

"Now that we have recognized our population of physicians should be a more diverse group socioeconomically, by gender, academic background, race, and religion, we have to be more professional in our approach to teaching. We have to know about different learning styles, about the neurobiology of learning, and how the information we are teaching will be used clinically." She also emphasizes the richness that comes from having a diverse student population and the effect it has on faculty, students, and—most importantly—the patients who will be cared for by these physicians.

Continually thinking of ways to improve her teaching, Vaughan revamped the process by which histology is taught at BUSM. "Back in the mid-90s, we decided to hold labs before lectures so that the students would know the vocabulary and would have invested some time in the material before coming to the lecture," she says. "They would be familiar with the microscopic images, making them better prepared for the lecture and allowing class time to be spent talking about the clinical relevance of what they had been looking at and studying."

Vaughan has been a leader in adopting innovative technology that advances teaching and learning. She notes that virtual microscopy, whereby digitized microscope slides can be manipulated as if in a microscope but are viewed on a computer, has revolutionized histology; any number of students can view slides independently from anyplace, enabling them to study together more easily. "With virtual microscopy, students can take a screenshot, email it to me, and then get their questions answered quickly," she says. She also cites technologies like the audience response system that offers immediate feedback to faculty on how well students understand their lectures, and Blackboard, the learning management system where faculty can manage all of their course materials online and students can access them anytime. "So many of these technologies involve opportunities for self-study producing lifelong learners, which is what we want our students to be," she says. She also pioneered the adoption of computer-based examinations for the pre-clerkship years of medical school.

At the same time, she is cautious about technology—students no longer have to attend class as all lectures are videotaped—and worries that they are losing some face-to-face communication skills by missing the facial expressions and body language so important to the practicing clinician: "They tend to interact in a virtual way, so my concern is that technology is allowing them to miss out on an important aspect of our complete education. We can't force them to come to class, so my current push is to encourage our faculty members to make our lectures value added—give them spontaneity, make them interactive, and provide some clinical context that excites discussion."

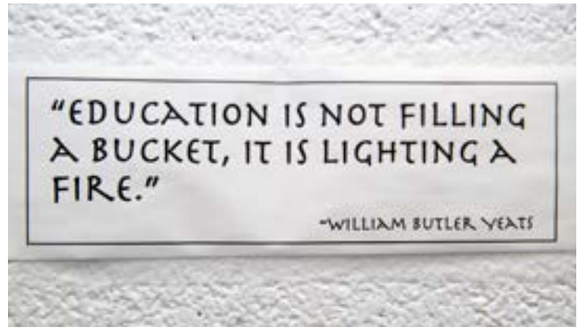
What she does must be working, as students rate her very highly. "This is an amazingly well-run course," writes a student evaluating Vaughan's class. "I never thought histology would be even remotely interesting, and somehow Dr. Vaughan made the topic not only interesting but relevant to our future practice." Another writes, "Dr. Vaughan is amazing, and a very devoted and knowledgeable professor."

Vaughan credits BUSM with supporting and promoting faculty dedicated to teaching. "This demonstrates a true commitment to the mission of medical education," she says.

She is also highly regarded by her colleagues. "Debbie Vaughan is an exceptional person, a wonderful colleague, and an outstanding educator," says Jarrett Rushmore, PhD, assistant professor of anatomy and neurobiology. "Her effectiveness as a professor comes in part because she is willing to work harder than anyone for her students. She is constantly adapting and improving her teaching, and she incorporates new thinking and technology to that end. I think what really makes her a first-rate professor is that she fundamentally believes that education is not simply about imparting knowledge, but lies more in challenging students (and colleagues) to be more than they are. She has high and clearly stated expectations of her students—she gives them the tools to achieve their goals and guides them with devotion and unflagging energy. Her students invariably find that over the course of the semester, they are able to achieve at levels they did not think previously possible, and they are better for having taken her course."

Vaughan credits BUSM with supporting and promoting faculty dedicated to teaching. "This demonstrates a true commitment to the mission of medical education," she says. "We have some faculty who are hired solely as educators and whose research focuses on medical education, and others, like me, who have been allowed to retire our research to teach full time." She notes that almost every basic science department has full-time educators as their course directors: "We are available to serve on the committees, we mentor new teachers, keep up with technology, and give direction to this high quality product that is a BUSM education."

VERNON DOUCETTE



When Vaughan is not teaching or mentoring, she is reviewing applications and interviewing potential students. A member of the Admissions Committee for 17 years and an assistant dean of admissions for 10, Vaughan is extremely familiar with the student body. "I know how exceptional our students are, and faculty need to understand the breadth of experience they have and how accomplished they are," she says. "In all fairness, we also have to be explicit about our expectations and realize that understanding doesn't come easily and immediately to everyone at the same pace." She also worked for 10 years with the Admissions Office and IT to develop and implement an automated admissions information management system.

"Over the last decade, BUSM has taken a lead role, at the national level, in advancing a program of holistic review of all applicants, and Dr. Vaughan has been a key member of the leadership team," says Robert Witzburg, MD, BUSM associate dean for admissions. "She is a role model, and we all have developed great respect for her integrity, her commitment, and her ability to find innovative solutions to complex problems."

Vaughan is always in great demand. In addition to her many other activities, she serves on the BUSM Student Services and Medical Education Committees, is an advisor in the Academy of Advisors, and chairs the Pre-clerkship Curriculum Subcommittee. She has also served as thesis advisor in the Master of Medical Sciences Program for the Division of Graduate Medical Sciences, has been a PhD research committee member for 11 students, and serves on the MD-PhD Steering Committee and the Planning Committee for the Neuroscience of Education Program. Her all-University commitments include co-chairing the Teaching and Learning Technologies Governance Committee and membership in the University Committee on Student Life and Policies.

She has high and clearly stated expectations of her students—she gives them the tools to achieve their goals and guides them with devotion and unflagging energy.

"I have known Debbie Vaughan for 17 years," says Doug Hughes, MD, associate dean for academic affairs. "She is a luminary who has graciously mentored generations of both medical students and junior faculty. Debbie's modesty is matched only by her brilliance."

Vaughan says she has remained at BU for 40 years because she feels she is in sync with the philosophy of the institution: "I love the attitude of doing your best for others, the quality of the students, and my colleagues. This is one very satisfying job, and I thoroughly enjoy it." ■

CREATING DR. RIGHT

What does it mean to educate physicians and scientists? This question is central to medical and science education theory and design. What is to be taught and learned—the curriculum—provides the framework for the education process. The rapid expansion of technology in the past two decades has vastly changed both medical practice and how clinical and basic science research is carried out.

CYDNEY SCOTT

Drs. Hughes and Hyman

At Boston University School of Medicine and its Division of Graduate Medical Sciences (GMS), changes in educating future physicians and scientists to accommodate this new reality are reflected in curriculum revisions and enhancement of both the medical and doctoral degrees. Key to these changes is integrating knowledge fields and interdisciplinary approaches to teaching and learning.

The Integrated Curriculum—Preparing 21st-Century Clinicians

> *The lifelong practitioner of medicine needs to apply an integrated understanding of contemporary medicine in a professional manner to the care of the individual within the patient's personal, cultural, socioeconomic, and health care system context.*

Clinical Skills Curricula for Undergraduate Medical Education, Association of American Colleges Task Force on Clinical Skills Education of Medical Students

The explosion of medical knowledge and technology advances, and the re-evaluation of the physician's role in patient care and the patient's role in his/her own care has catalyzed the implementation of curricular changes in medical student education. The information and technology physicians must master to prevent and treat disease continually advance, requiring new approaches to preparing physicians for caring for patients.

The changing nature of the nation's health care system as well as the growing diversity of the US population—which is reflected in the corresponding growing diversity of the medical student population—adds to the need for new educational strategies to provide effective learning opportunities and structures to support lifelong learning.

Traditionally, undergraduate medical education has been divided along the lines of two years of pre-clinical acquisition of discipline-based, basic science knowledge lacking in clinical context, while the third and fourth years are spent in clinical rotations not explicitly linked to previously learned basic science. Medical students could enter their clerkship years with little clinical experience and few clinical skills—not the optimal situation for the students or their patients.

Recognizing these limitations and the shift in teaching and learning theory and practice, BUSM began a curriculum reform initiative more than seven years ago that continues as a dynamic process to offer students learning opportunities to present medical knowledge that is clinically relevant starting on the first week and spanning the four years of their medical education.

"We have worked hard to bring horizontal and vertical integration of the curriculum, incorporating greater clinical experiences and training in the first two pre-clerkship years and reintroducing core basic sciences in the two years of formal clinical training," says Douglas Hughes, MD, associate dean for academic affairs and professor of psychiatry. "Horizontal integration brings together the traditional disciplines with topics discussed across courses and vertical integration of basic science with early clinical experience and ongoing inclusion of science in the clerkship years.

"The integrated model prepares students to be lifelong learners, increases their understanding of biological principles and their clinical context, promotes teamwork among the different health care disciplines, and better utilizes technology to support learning," adds Hughes, who is also the Ramsey Professor of Medicine.

The disciplines of gross anatomy, histology, human behavior in medicine, biochemistry, physiology, genetics, neuroscience, endocrinology, and immunology remain the core of the first-year curriculum, but faculty incorporate the clinical relevance of the material with case-based discussions in both lectures and small groups. Direct patient contact is offered in the Introduction to Clinical Medicine course, where students learn interviewing and physical exam skills.

"The clinical exposure first year is fantastic, and the strong focus on clinical skills in addition to the strenuous academic program is part of what drew me to BU," says Thomas Dohle, a first-year student. "Overcoming my initial discomfort early on with some aspects of patient interaction has made me much more confident. Introduction to Clinical Medicine is my weekly reminder of why I'm going into medicine. It's easy to get bogged down with the massive amount of information that first-year medical students have to learn, so having a weekly chance to actually interact with patients and develop the interpersonal skills that we will need as physicians is great."

Introduced in 2008, the second-year curriculum, Disease and Therapy (DRx), treats the pathophysiology and treatment of disease in an integrated, organ-based course along with the continuation of clinical medicine and integrated problems courses. Modules address diseases of the cardiovascular system; lungs, kidneys, joints, and connective tissue; the gastrointestinal system; the endocrine and reproductive organs; skin; and the nervous system and psychiatric disorders; and oncology is taught in conjunction with hematology. Health law, policy, and management systems are incorporated throughout this curriculum.

Curriculum reform continues as a dynamic process to offer students learning opportunities that are clinically relevant starting on the first week and spanning the four years of their medical education.

Both clinical and preclinical faculty members teach DRx, emphasizing case-based discussions and online case-based exercises, workshops with clinical faculty, and discussions with patients. Clinical skills training in patient interviewing, history-taking, and physical examination at Boston Medical Center and other clinical sites continues in the second year. Students practice clinical skills with standardized patients and undergo end-of-the-year evaluations by clinical faculty.

The required clerkships in third year are now aligned to maximize continuity and clinical relevance. Pediatrics and ob-gyn are offered back to back, and family medicine and psychiatry overlap as well, while surgery and radiology are linked, as are medicine and neurology. Fourth year remains dedicated to electives, with opportunities for experience with global health programs and underserved populations.

"An integrated approach to medical education makes sense on many levels as the models of disease and treatment that we begin to build throughout first- and second-year training are based on an integration of our knowledge of physiology, pathology, pharmacology, microbiology, etc.," says second-year student Justin McCool. "The integrated DRx curriculum facilitates building these models by presenting the essential elements of disease and treatment as a complete picture rather than a single piece of a large and complex puzzle."

To keep a check on how effective the curriculum is at preparing BUSM students for medical practice, certain metrics are tracked. Hughes notes that the first-attempt pass rate for the Step 1 of the US Medical Licensing Examination (USMLE) increased from 90 percent four years ago to 98 percent last year and for Step 2 of the USMLE, students have a 99 percent pass rate on the first try. In the senior survey, graduating students now indicate a much higher satisfaction with their basic science and clinical courses as well as with their overall education and the School.

"One of the most important metrics we use to evaluate our medical education program is the survey of residency directors of our graduates in their first year of residency," says Hughes. "Our students are performing very well and are highly rated as good doctors by these directors. This is a great endorsement of what we are doing."

In addition to curricular changes to create a more cohesive and effective experience for students, the School has identified teaching faculty and recruited teaching scholars whose major responsibility is teaching and who have the expertise and command of learning theory to best communicate with students.

"We now have an educator track along with clinician and research tracks to advancement," says Dean Karen Antman, MD. "This makes education an equal partner with research and clinical endeavors, bringing greater resources to our academic program and the students' experience. Excellence in teaching is recognized and rewarded."

"You may have an expert in a certain field who is a researcher or even clinician who lectures to scientists and world leaders, but is not used to lecturing in an introductory way. They likely are not the most effective teachers," notes Hughes. "Ten years ago, psychiatry had about 30 faculty members lecturing to the students. Now we have five dedicated teachers across the four years who are more connected to the students and are invested in the learning process. We get to know students and their strengths and weaknesses."

Hughes notes that these full-time educators who arc over the whole curriculum can more easily identify gaps and minimize redundancies. Teaching faculty are also clerkship directors, which adds to a more seamless meshing of clinical science and clinical skill application. Evaluation is key to all changes and advances in the teaching and learning experience at BUSM. With the implementation of an online evaluation system, every six weeks students can evaluate faculty and courses, facilitating adjustments in real time and avoiding missed opportunities for teaching and learning.

"We are in the vanguard," says Hughes. "But we must be vigilant and adaptive, as medical education does not exist in a vacuum. It is a dynamic enterprise."

CYDNEY SCOTT

Training the Next Generation of Scientists: Foundations in Biomedical Sciences

Several years ago Linda Hyman, PhD, associate provost of the Division of Graduate Medical Sciences, asked GMS program directors and course managers to create a more integrated and interdisciplinary learning experience for graduate students in many of the PhD programs.

"Science today is driven by interdisciplinary programs and research," says Hyman. "The imperative behind this undertaking has been to create a curriculum based on the foundational principles that are inherent in our graduate program, grow the sense of community in our graduate student body, and have a more efficient interdisciplinary way of teaching and learning." The result is a core curriculum named Foundations in Biomedical Sciences (FIBS).

There are 14 doctoral programs of study in GMS, each with its own independent curriculum. This requires students to have a foundation of knowledge of other disciplines. For example, a student in the Genetics and Genomics Program is required to have a foundation in biochemistry, while students in the Department of Biochemistry need a basic understanding of the principles of immunology and genetics. According to Hyman, the program evaluation opened a debate about what concepts of biomedical science are essential for all doctoral students to know, regardless of what discipline they ultimately choose.

During an 18-month period, the Curriculum Revision Committee met weekly to discuss and determine the structure of the curriculum. "We looked at myriad frameworks, like what the National Institutes of Health organize around, how key textbooks are structured, and what curricular strategies colleagues in our peer institutions were using," says Karen Symes, PhD, co-director of FIBS, an associate professor of biochemistry and assistant dean of student affairs. "We kept at it until we ended up at a place that reflected the needs and values of this institution. We are training the next generation of scientists, not just textbook learners. That was a major driving force behind this change."

"We had these separate discipline-based courses that no longer mirrored how science is actually done," says Shoumita Dasgupta, PhD, codirector of FIBS and an associate professor and the program's director of graduate studies in genetics and genomics. "Modern science is interdisciplinary. We work in teams and people need to be able to cross disciplines and be familiar with the specific nature of experiments and inquiry within those other disciplines."

The FIBS curriculum is an integrated modular program of core competencies designed for first-year doctoral students. It serves as a foundation for their doctoral education and encourages students to think in an interdisciplinary fashion by coordinating content across courses, programs, and departments. It is also designed to reduce redundancy in course content, decrease lecture hours, and promote collegiality among doctoral students.

There are four core modules in the first year—three in the fall and one in the spring—along with a choice of three additional modules consisting of electives that allow students to take an integrated course in another discipline. The modules begin with biochemistry and biophysics in Module I; the structure and function of the genome and how to access and use it follows in Module II; Module III deals with cellular organization; and Module IV focuses on the mechanisms of cell communication, progressing from individual cells to multicellular organisms. Three optional modules examine human metabolism and the impact its dysregulation has on disease; the study of diseases from the physiological standpoint; and translational genomics looking at technology and how it is utilized in the laboratory.

Each module has two course directors from different disciplines who attend every lecture and evaluate each module at its completion. Their extensive involvement supports greater integration of the critical knowledge graduate students are required to master and is a key feature of the program.

"Opening the channels of communication has been very important," says Dasgupta. "Previously, courses were offered by a department or by a program with a single course director who operated almost unilaterally to meet the needs of only that program's students. With the new foundations curriculum, we have a core group of course directors across the disciplines who regularly interact and communicate to address the needs of all of our students as beginning scientists."

Designed to be challenging and interactive, the modular structure can be modified to adapt to individual or program needs, and each includes a critical thinking component facilitated by small group sessions and workshops. The revisions have also aided in greater experimentation around curriculum and increased small group interaction and problem solving.

The small group sessions are led by senior students, giving them teaching experience not previously possible. "We have built in opportunities for seniors to work with FIBS students," says Dasgupta. "An important goal has been to mentor scholarly activities, so we developed a teaching fellowship for students to teach in the modules. The interaction between juniors and seniors has been highly beneficial for both groups, and this year, for example, Module II has five sections with a student facilitator in each."

Along with faculty advisor cooperation, department chairs have been highly supportive of the revision process and its outcome. "We were asking a lot of their faculty, and this process has been a major time commitment," says Dasgupta.

Dasgupta and Symes are developing a feedback process for program directors and faculty to communicate their assessment of the effectiveness of the new curriculum to help ensure that the foundations model meets the needs of the students as well as the requirements of the various disciplines. An additional benefit of the core curriculum is a greater sense of community among the students with the increased opportunities for interaction and more shared experiences.

Hyman also sees this as an opportunity to enhance recruitment. "The revised curriculum sends a message to prospective students that BU has a graduate science program that is focused on the best way to teach scientific knowledge, invest in student achievement, and help students take their knowledge to the next level." ■

BUSM **Research**

$2.5 Million Addiction Training Grant Awarded by Burroughs Wellcome Fund

Researchers from the BU Schools of Medicine and Public Health have been awarded a five-year, $2.5 million training grant by the Burroughs Wellcome Fund to support specialized, multidisciplinary PhD training for addiction scientists.

Lindsay Farrer, PhD, professor of medicine, neurology, ophthalmology, and genetics and genomics and chief of biomedical genetics at BU School of Medicine (BUSM), and Timothy Heeren, professor of biostatistics at BU School of Public Health (BUSPH), will lead the Transformative Training Program in Addiction Science (TTPAS). Farrer codirects the nation's largest genetics study of cocaine, opiates, alcohol, and nicotine addiction among Caucasians and African Americans. Heeren is currently studying the effects of maternal cocaine use on child development and the impact of alcohol addiction on HIV treatment outcomes.

"Addictions to smoking, alcohol, and illicit drugs are among the nation's most critical public health and societal problems," the proposal summary says. "The genetic vulnerability, environmental exposures, and individual behaviors that contribute to the brain dysfunction and compulsive tendencies that mark addiction make it one of the most complicated diseases to study and treat.

"Some researchers, especially at Boston University, have developed multidisciplinary collaborations, but training addiction scientists still proceeds in disciplinary silos, preventing emergence of the broad skill set needed for genuine breakthroughs. TTPAS will prepare investigators to apply diverse approaches to addiction research using tools from bench science, medicine, population studies, statistics, and computational biology."

TTPAS will have three core components: a biweekly seminar focusing on how different disciplines approach a similar issue on addiction; multiple mentors from different disciplines for each trainee and multidisciplinary dissertation committees; and a clinical module enabling trainees to interact with people in addiction treatment and recovery. To facilitate effective communication, the program includes a concentrated effort to achieve student diversity and to assure that all trainees have a thorough understanding of the intellectual bases, techniques, and languages of reporting in all the disciplines.

TTPAS will prepare investigators to apply diverse approaches to addiction research using tools from bench science, medicine, population studies, statistics, and computational biology.

The coleaders will be supported by a large group of established BU addiction scientists in medicine, psychology, neuroscience, pharmacology, biology, psychiatry, social work, engineering, biostatistics, informatics, health services research, and public health who are already linked through multidisciplinary faculty seminars.

BU faculty investigators currently direct more than 50 funded addiction-related research projects, including pharmacological and neurocognitive mechanisms regulating drug withdrawal and relapse in animal models; the relationship between long-term alcohol abuse and decrements in brain structure and cognitive-emotional functioning; and the efficacy of pharmacological treatments of alcoholism in a clinic population.

The Burroughs Wellcome Fund is an independent private foundation dedicated to advancing the biomedical sciences by supporting research and other scientific and educational activities. Within this broad mission, the fund has two primary goals: To help scientists develop as independent investigators early in their careers, and to advance fields in the basic biomedical sciences that are undervalued or in need of encouragement. ■

Research in Brief

■ Largest case series of CTE published introduces four-stage disease classification

Investigators at the BU Center for the Study of Traumatic Encephalopathy (CSTE) and the Veterans Affairs Boston Healthcare System, in collaboration with the Sports Legacy Institute (SLI), have described 68 new cases of chronic traumatic encephalopathy (CTE) among deceased athletes and military veterans whose brains and spinal cords were donated to the VA CSTE Brain Bank. Of the 68 cases, 34 were former professional football players, nine had played only college football, and six had played only high school football. The results, published in the December issue of the scientific journal *Brain*, represent the largest case series of CTE published to date, doubling the number of published CTE cases internationally.

Investigators have described **68 new cases** of CTE among deceased athletes and military veterans.

Ann McKee, MD, BUSM professor of neuropathology and director of the Neuropathology Service for VA New England Healthcare System and co-director of the CSTE, led the study, which is the first to characterize the pathology of the disease into four stages of severity.

CTE is a degenerative brain disease associated with repeated brain trauma—including concussions and multiple subconcussive exposures such as those in contact sports and military combat—and appears to be slowly progressive in most individuals. In the early stages, CTE is characterized by the presence of abnormal deposits of a protein called tau in the form of neurofibrillary tangles, glial tangles, and neuropil threads throughout the brain; these tau lesions eventually lead to brain cell death. Currently, CTE can only be diagnosed postmortem.

The report provides specific pathological criteria for the diagnosis of CTE and divides CTE into four stages of disease. "This study extends our knowledge concerning the spectrum of the clinical and pathological abnormalities associated with CTE," said McKee, who also is director of the Brain Banks for BU's Alzheimer's Disease Center and the CSTE, which are based at the Bedford VA Medical Center in Bedford, Massachusetts. "However, further studies are needed to investigate critical aspects of this trauma-induced neurodegeneration, including the incidence and prevalence of CTE; whether the symptoms of CTE are distinctive from other conditions; how genetics influence susceptibility or resistance to CTE; and whether other environmental exposures play an additive role in the development of CTE."

■ Potential of Differentiated iPS Cells in Cell Therapy without Immune Rejection Shown

A study by BUSM researchers showed that tissues derived from induced pluripotent stem (iPS) cells in an experimental model were not rejected when transplanted back into genetically identical recipients. The study, published online in *Cell Stem Cell*, demonstrates the potential of utilizing iPS cells to develop cell types that could offer treatment for a wide range of conditions—including diabetes, and liver and lung diseases—without the barrier of immune rejection. Ashleigh Boyd, DPhil, and Neil Rodrigues, DPhil, the study's senior authors, are assistant professors of dermatology at BUSM and researchers at the Center for Regenerative Medicine (CReM) at BU and Boston Medical Center (BMC). By returning them to a stem cell state using genetic manipulation, iPS cells can be developed from adult cell types, such as skin or blood. The study results suggest that using patient-specific iPS cells should overcome issues of immune rejection in transplantation, which will be a significant problem for potential embryonic stem cell-derived therapies. Immune rejection in transplantation is treated clinically by immunosuppressive drugs, but they can have serious side effects, including the risk of developing cancer. "If the use of immunosuppressive drugs can be avoided, as may be the case for patient-specific, iPS cell-based therapies, it would be preferable. Our results are very promising, and future work should be directed at assessing whether tissues derived from human iPS cells will similarly lack immunogenicity," said Boyd. Research reported in this release was supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health (NIH).

Using patient-specific iPS cells should overcome issues of immune rejection in transplantation.

■ Genetic Variants' Role in Increasing Parkinson's Disease Risk Studied

BUSM investigators have led the first genome-wide evaluation of genetic variants associated with Parkinson's disease (PD). The study, which is published online in *PLOS ONE*, points to the involvement of specific genes and alterations in their expression as influencing the risk for developing PD.

A recent paper by the PD Genome-Wide Association Study Consortium (PDGC) confirmed that an increased risk for PD was seen in individuals with genetic variants in or near the genes SNCA, MAPT, GAK/DGKQ, HLA, and RIT2, but the mechanism behind the increased risk was not determined.

"One possible effect of the variants would be to change the manner in which a gene is expressed in the brain, leading to increased risk of PD," said Jeanne Latourelle, DSc, BUSM assistant professor of neurology and lead author of the study.

The researchers examined the relationship between PD-associated genetic variants and levels of gene expression in brain samples. "The identification of the specific altered genes in PD opens opportunities to further study them in model organisms or cell lines with the goal of identifying drugs which may rectify the defects as treatment for PD," said Richard H. Myers, PhD, BUSM professor of neurology, the study's principal investigator and senior author.

This study was funded by the Cogan Family Foundation, the Bumpus Foundation, and the National Institute of Neurological Disorders and Stroke (NINDS).

Heavily Indebted Medical Students Choosing Primary Care Careers Face Greater Financial Challenges

BUSM and the Association of American Medical Colleges (AAMC) researchers have determined that heavily indebted medical students choosing primary care careers will experience difficulty paying their student debt unless they consider alternative strategies to support repayment. These findings appear online in *Academic Medicine*, the peer-reviewed journal of the AAMC.

86 percent of medical school graduates had education debt at graduation averaging $161,290, the highest total to date.

Most medical school graduates have education debt, the average amount of which is increasing. In 2011, 86 percent had education debt at graduation averaging $161,290, the highest total to date. Among the indebted graduates, 23 percent of those at private medical schools graduated with loans of $250,000 or more.

The authors used comprehensive financial-planning software developed by Lawrence Kotlikoff, PhD, professor of economics at BU, and other economists to model the annual finances for a fictional physician's household to compare the impact of various debt levels, repayment plans, and living expenses across three specialties.

"Our results show that student debt levels have become so high that a growing number of students will struggle on a primary care salary alone to repay educational loans and still have enough left over to cover other routine household expenses," notes senior author John Wiecha, MD, MPH, associate professor of family medicine and an assistant dean for academic affairs at BUSM.

Partial funding for this study was provided by a Primary Care Training grant (#D56HP10305-03-00) from the Health Resources and Services Administration, US Department of Health and Human Services.

The study, published in *Genome Medicine*, also demonstrates the potential impact of using genomic technologies to identify new possible treatments for diseases using existing drugs and compounds.

Potential Key to Halting Emphysema Progression, Reversing Damage Identified

A study led by BUSM researchers has shown that a compound used in some skin creams may halt the progression of emphysema and reverse some of the damage caused by the disease. When the compound Gly-His-Lys (GHK) was applied to lung cells from patients with emphysema, normal gene activity in altered cells was restored and damaged aspects of cellular function were repaired. GHK is a natural peptide found in human plasma, but the amount present decreases with age.

The study, published in *Genome Medicine*, also demonstrates the potential impact of using genomic technologies to identify new possible treatments for diseases using existing drugs and compounds.

Chronic obstructive pulmonary disease (COPD) is a chronic, progressive lung disease that comprises emphysema, small airway obstruction, and/or chronic bronchitis and leads to the loss of lung function. Currently there is no cure and no effective therapies to reduce the rate of lung function decline that occurs as the disease progresses.

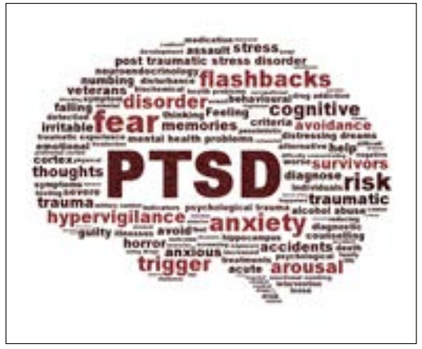
"Our study results showed that the way genes were affected by the compound GHK, a drug identified in the 1970s, was the complete opposite of the pattern we had seen in the cells damaged by emphysema," said Marc Lenburg, PhD, BUSM associate professor in computational biomedicine and bioinformatics and one of the study's senior authors.

Research reported in this published article was supported by the National Heart, Lung, and Blood Institute (NHLBI) and through the NIH Boston University Clinical and Translational Science Institute. Researchers from the University of British Columbia, the University Medical Center Groningen (Netherlands), and the University of Pennsylvania also collaborated on this study.

New Gene Linked to PTSD Identified

Investigators at BUSM and Veterans Affairs (VA) Boston Healthcare System have identified a new gene linked to post-traumatic stress disorder. The findings, published online in *Molecular Psychiatry*, indicate that a gene known to play a role in protecting brain cells from the damaging effects of stress may also be involved in the development of PTSD.

The study reports the first positive results of a genome-wide association study (GWAS) of PTSD and suggests that variations in the retinoid-related orphan receptor alpha (RORA) gene are linked to the development of PTSD.



Mark W. Miller, PhD, BUSM associate professor and a clinical research psychologist in the National Center for PTSD at VA Boston Healthcare System, was the study's principal investigator. Mark Logue, PhD, BUSM research assistant professor of biomedical genetic, and Clinton Baldwin, PhD, BUSM professor of biomedical genetics, were co-first authors of the paper.

Previous GWAS studies have linked the RORA gene to other psychiatric conditions, including attention-deficit hyperactivity disorder, bipolar disorder, autism, and depression.

"Like PTSD, all of these conditions have been linked to alterations in brain functioning, so it is particularly interesting that one of the primary functions of RORA is to protect brain cells from the damaging effects of oxidative stress, hypoxia, and inflammation," said Miller. "These results suggest that individuals with the RORA risk variant are more likely to develop PTSD following trauma exposure and point to a new avenue for research on how the brain responds to trauma."

The study was supported by the National Institute of Mental Health of the National Institutes of Health and a grant from the Department of Veterans Affairs.

Gene Linking Cataracts and Alzheimer's Disease Identified

BUSM and BUSPH investigators have identified a gene linking age-related cataracts and Alzheimer's disease. The findings, published online in *PLOS ONE*, contribute to the growing body of evidence showing that these two diseases, both associated with increasing age, may share common etiologic factors.

Gyungah Jun, PhD, from the departments of medicine, ophthalmology, and biostatistics at BUSM and BUSPH, served as the study's lead author.

Using the Framingham Offspring Eye Study cohort, investigators looked at brain magnetic resonance imaging (MRI) findings on or after 10 years from the original eye exam and concluded that there was a significant correlation between a quantitative measure of cortical cataract and several Alzheimer's disease-related measures of brain degeneration, in particular volume of the temporal horn, a brain structure that is progressively enlarged in patients with Alzheimer's disease.

"Though much work remains to be done, a link between cataracts and Alzheimer's disease supports the idea of a systemic rather than brain-limited focus for processes leading to Alzheimer's disease," said Lindsay A. Farrer, PhD, BUSM professor of medicine, neurology, ophthalmology, genetics & genomics, epidemiology, and biostatistics, chief of the Biomedical Genetics Section, and the study's senior author. "This study gives us hope that we are moving toward earlier diagnosis and new treatment targets for this debilitating disease."

"This study gives us hope that we are moving toward earlier diagnosis and new treatment targets for this debilitating disease."

This study was supported by grants from the National Institute on Aging for investigated-initiated projects and the Boston University Alzheimer Disease Center, National Institute of General Medical Science, Wellcome Trust, Medical Research Council, Canadian Institutes of Health Research, Alzheimer Society of Ontario, and Ontario Research Fund.

Pathology of Huntington's Disease Identified

A study led by BUSM researchers provides fresh insight into the impact that Huntington's disease (HD) has on the brain. The findings, published online in *Neurology*, pinpoint areas of the brain most affected by the disease and open the door to understanding

why some people experience milder forms of the disease than others.

This study, which is the largest to date of brains specific to Huntington's disease, is the product of a nearly 30-year collaboration between the lead investigators at BUSM and their colleagues at the McLean Brain Tissue Resource Center, Massachusetts General Hospital, and Columbia University.

Investigators examined 664 autopsy brain samples with HD that were donated to the McLean Brain Bank. They discovered that HD primarily damages the brain in two areas and identified extraordinary variation in the extent of cell death in different brain regions. "There are tremendous differences in how people with Huntington's disease are affected," said Richard Myers, PhD, BUSM professor of neurology and the study's lead/corresponding author. "Some people with the disease have more difficulty with motor control than with their cognitive function, while others suffer more from cognitive disability than motor control issues."

When studying these differences, the investigators noted that the cell death in the striatum is heavily driven by the effects of variations in the Huntington gene itself, while effects on the cortex were minimally affected by the HD gene and are thus likely to be a consequence of other, unidentified causes. Importantly, the study showed that some people with HD experienced remarkably less neuronal cell death than others.

"While there is just one genetic defect that causes Huntington's disease, the disease affects different parts of the brain in very different ways in different people," said Myers. "For the first time, we can measure these differences with a very fine level of detail and hopefully identify what is preventing brain cell death in some individuals with HD."

This research was supported by the National Institute of Neurological Disorders and Stroke and the Jerry McDonald Huntington's Disease Research Fund.

Adenosine Receptor's Role in Regulating High-Fat, Diet-Induced Obesity and Type 2 Diabetes

BUSM researchers have demonstrated that the A2b-type adenosine receptor, A2bAR, plays a significant role in the regulation of high-fat, high-cholesterol, diet-induced symptoms of type 2 diabetes. The findings, which are published online in *PLOS ONE*, also identify A2bAR as a potential target for the treatment of type 2 diabetes.

Diets that are high in fat and cholesterol induce changes in how the body regulates blood glucose levels. Exercise induces an increased production of adenosine, a metabolite produced naturally by cells. A2bAR, a naturally occurring protein receptor found in the cell membrane, is activated by adenosine. This receptor is known to play an important role in regulating inflammation, which is associated with type 2 diabetes and obesity.

A novel link also was identified between the expression of A2bAR, insulin receptor substrate 2

(IRS-2), and insulin signaling. The results showed that the level of IRS-2, a protein that has previously been shown to mediate the effect of insulin, was impaired in tissues of the experimental model lacking A2bAR, causing higher concentrations of blood glucose. When A2bAR was activated in the control group using a pharmacologic agent with a diet high in fat and cholesterol, the level of IRS-2 was upregulated, lowering blood glucose.

"The pharmacologic activation of A2bAR demonstrated its newly identified role in signaling down to regulate the levels of IRS-2, which then improved the signs of high-fat, diet-induced type 2 diabetes," said Katya Ravid, DSc/PhD, BUSM professor of medicine and biochemistry and director of the Evans Center for Interdisciplinary Biomedical Research at BUSM, who led this study. "Our work suggests the important role of A2bAR in maintaining the level of IRS-2, a regulator of glucose and insulin homeostasis."

This study was funded in part by the National Heart, Lung, and Blood Institute.

"This data demonstrates a very high prevalence of MRI-detected osteoarthritis features in knees with no X-ray evidence of the disease."

MRI Use in Osteoarthritis Studied

A BUSM study shows that magnetic resonance imaging detected a high prevalence of abnormalities associated with knee osteoarthritis in middle-aged and elderly patients that had no evidence of knee osteoarthritis in X-ray images.

Prior studies have shown that only half of those with knee pain will have X-ray evidence of osteoarthritis. This study looked at how to further evaluate a patient's knee pain if X-rays don't show evidence of osteoarthritis. It also looked at whether MRI, in these cases, is of clinical value.

"This data demonstrates a very high prevalence of MRI-detected osteoarthritis features in knees with no X-ray evidence of the disease," said Ali Guermazi, MD, PhD, BUSM professor of radiology and chief of Musculoskeletal Imaging at Boston Medical Center, who led this study in collaboration with researchers from Lund University in Sweden, Brigham and Women's Hospital in Boston, and Klinikum Augsburg in Germany. The findings are published online in *BMJ*. The researchers note that MRI would be too expensive to perform as a routine imaging investigation.

This research study was supported by grants from the National Institute on Aging, the National Institute of Arthritis and Musculoskeletal and Skin Diseases, and the Arthritis Foundation.

Overdose Education and Nasal Naloxone Distribution Found to Reduce Opioid Overdose Deaths

Training bystanders to recognize and respond to drug overdoses can significantly reduce the number of fatalities, finds a study published online at *BMJ*.

A team of researchers from BUSM, BUSPH, and BMC, in collaboration with the Massachusetts Department of Public Health (MDPH), set out to evaluate the impact of overdose education and naloxone distribution (OEND) programs between 2006 and 2009.

From 1996 to 2010, over 50,000 potential bystanders were trained by OEND programs in the United States, resulting in **more than 10,000 opioid overdose rescues.**

OEND programs train drug users, their families and friends, and potential bystanders to prevent, recognize, and respond to opioid overdoses. OEND participants are trained to recognize signs of overdose, seek help, rescue breathe, use naloxone (a drug that reverses the effects of opioid overdose), and stay with victims.

From 1996 to 2010, over 50,000 potential bystanders were trained by OEND programs in the United States, resulting in more than 10,000 opioid overdose rescues, but their impact on death rates and hospital use had not been examined in controlled studies.

After adjusting for factors such as age, sex, ethnicity, poverty, "doctor shopping" for prescription opioids, and addiction treatment, researchers found a significant reduction in opioid-related overdose deaths in communities where OEND was implemented compared with those where it was not. There appeared to be a dose-related impact, where the higher the cumulative rate of OEND implementation, the greater the reduction in death rates. "This study provides observational evidence that by training potential bystanders to prevent, recognize, and respond to opioid overdoses, OEND is an effective public intervention," the study concludes.

New Drug Target for Multiple Sclerosis and Alzheimer's Disease

Led by Carmela Abraham, PhD, professor of biochemistry, along with Cidi Chen, PhD, and other collaborators, BUSM researchers report that the protein Klotho plays an important role in the health of myelin, the insulating material allowing for the rapid communication between nerve cells. These findings, which appear online in the *Journal of Neuroscience*, may lead to new therapies for multiple sclerosis (MS) and Alzheimer's disease (AD), in which white matter abnormalities are also common but have been largely ignored.

In MS, the myelin is attacked by the immune system and may not be completely restored by myelin-producing cells (mature oligodendrocytes). The researchers discovered that the addition of Klotho protein to immature oligodendrocytes causes them to mature and manufacture proteins needed for the production of healthy myelin.

"These results, taken together, indicate that Klotho could become a drug target for multiple sclerosis and other white matter diseases, including AD," explained Abraham.

Abraham and her colleagues have identified, and are working on optimizing, a number of small molecules that could form the basis for the development of therapeutic drugs, which would increase the amount of Klotho protein in the brain. As shown by other research groups, since Klotho is not only an age but also a tumor suppressor, interventions with Klotho-enhancing drugs may solve some of the most treatment-resistant human ailments.

Funding for this study was provided by grants from the National Institute on Aging and the Alzheimer's Drug Discovery Foundation. ■

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FACULTY News


Benjamin Wolozin, PhD


Matthew Nugent, PhD

Awards

Benjamin Wolozin, PhD, BUSM professor of pharmacology and neurology, and **Matthew Nugent, PhD,** BUSM professor of biochemistry, ophthalmology and biomedical engineering, have been awarded grants from the American Health Assistance Foundation (AHAF) to study age-related degenerative diseases. This marks the first time in more than a decade that BUSM has received an AHAF grant.

The AHAF is a nonprofit organization that funds early-stage research on Alzheimer's disease. The foundation seeks to eradicate age-related degenerative diseases by advancing research seeking causes, prevention, treatment, and cures; promoting positive behaviors to combat these diseases; and facilitating the public's efforts to assist those who are affected.

Wolozin was awarded a two-year, $150,000 grant to research RNA binding proteins (RBPs) in Alzheimer's disease. RBPs regulate the conversion of messenger RNA into protein through the formation of complexes called RNA granules. Cellular stresses induce formation of a particular type of complex, termed stress granules (SG). By examining SGs, Wolozin has identified a new consequence of Alzheimer's disease. In this project he will investigate how these SGs might contribute to the causes of the disease.

Nugent, who was awarded a two-year, $100,000 grant, will research macular degeneration. Excess vascular endothelial growth factor (VEGF), a protein that stimulates blood vessel growth, has been shown to be a major cause of unwanted vessel growth into the retina in wet age-related macular degeneration (AMD), a disease of the retina that is the leading cause of blindness in Americans age 65 and older. The wet, or more elevated, form of this disease accounts for 90 percent of all blindness from AMD. Nugent and his team propose to identify new ways that VEGF activity is naturally controlled by interactions with the protein fibronectin, so that this pathway can be targeted for a more effective treatment for wet AMD.

Honors

Gregory Antoine, MD, BUSM associate professor of surgery and otolaryngology and chief of plastic and reconstructive surgery at Boston Medical Center (BMC), was elected to the National Medical Association (NMA) Board of Trustees. The NMA's mission is to advance the art and science of medicine for people of African descent through education, advocacy, and health policy to promote health and wellness, eliminate health disparities, and sustain physician viability. Antoine will represent Region 1, which includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Puerto Rico, Rhode Island, Vermont, and the US Virgin Islands. Antoine is the first African American plastic surgeon to head a division of plastic and reconstructive surgery at a non-historically black medical school in the US.

Richard Babayan, MD, BUSM professor and chair of urology and chief of the Department of Urology at Boston Medical Center, was elected president of the Massachusetts Association of Practicing Urologists (MAPU) at the American Urological Association annual meeting. He will serve a two-year term as president and assume responsibility for the association's operations and activities, presiding over the Board of Directors' meetings and serving as the society's chief spokesperson.

Edward Bernstein, MD, BUSM professor of emergency medicine and an emergency medicine physician at BMC and vice chair of academic affairs, has been named the recipient of the 2012 Jerome Klein Award for Physician Excellence by a senior committee of BMC and BUSM physicians. Established to honor Jerome Klein, MD, for his 50 years of service to the hospital, the award is given to a physician who mirrors Klein's commitment as a mentor, leader, teacher, researcher, and clinician. Bernstein has dedicated his career to incorporating public health into emergency medicine with a special focus on interventions to reduce substance abuse.


Gregory Antoine, MD


Richard Babayan, MD


Edward Bernstein, MD


James Feldman, MD, MPH


Barbara Gilchrest, MD


James A. Hamilton, PhD


Terence M. Keane, PhD


Ann Rasmusson, MD


Jennifer Vasterling, PhD


Richard D. Wainford, PhD

James Feldman, MD, MPH, BUSM professor of emergency medicine and vice chair for research in the department of emergency medicine at BMC, has been honored with the Mark E. Weinstein, MD, Award by the Metropolitan Boston Emergency Medical Services Council (MBEMSC). Presented at the Twelfth Annual Region IV EMS Awards Ceremony, the award recognizes outstanding dedication and commitment to the Metropolitan Boston Emergency Medical Services Region. Feldman was president of the Massachusetts College of Emergency Physicians from 2008 to 2009 and currently chairs the committee on the Quality of Medical Practice for the Massachusetts Medical Society.

Barbara Gilchrest, MD, BUSM professor and chair emeritus of the Department of Dermatology, has been named a 2012 Charter Fellow of the National Academy of Inventors (NAI). Elected by their peers, this year's charter fellows represent 98 innovators from 54 universities and nonprofit research institutes. This professional distinction is accorded to academic inventors who have demonstrated a highly prolific spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on quality of life, economic development, and the welfare of society. Gilchrest has clinical and laboratory-based research interests in skin aging and pigmentation and has published extensively based on her pioneering work in these fields.

James A. Hamilton, PhD, BUSM professor of physiology, biophysics, and radiology, and research professor of medicine; and professor of biomedical engineering at the College of Engineering, was named a 2012 Massachusetts Academy of Sciences Fellow. Hamilton was elected by his peers to the prestigious community of scientists, engineers, research physicians, and others who are deeply concerned about science and science education in the commonwealth. His work focuses on fatty acid metabolism-related diseases like heart disease, diabetes, and obesity, with the goal of developing novel approaches to treatment. Hamilton also serves as director of the High Field Nuclear Magnetic Resonance (NMR) Spectroscopy and MR Imaging Core at BU.

Terence M. Keane, PhD, BUSM professor and vice chair of psychiatry, was honored with the 2012 Harold Hildreth Award for Distinguished Public Service by the American Psychological Association (APA). Presented at the APA annual meeting, the award is the highest honor for public service given by the APA division of public sector psychologists. Keane was recognized for his contributions toward improving the diagnosis and treatment of post-traumatic stress disorder (PTSD), and his success in spreading this knowledge, which has had an impact on public-sector mental health care delivery. Keane was also selected for the Distinguished Scientific Contributions to Clinical Psychology Award, the highest award for science by the Society of Clinical Psychology of the American Psychological Association. Keane, director of the Behavioral Science Division of the National Center for PTSD and associate chief of staff for research and development at VA Boston Healthcare System, is an international leader in the field of traumatic stress.

Ann Rasmusson, MD, BUSM associate professor of psychiatry and psychiatrist and neuroendocrinologist at the VA Boston Healthcare System and the National Center for PTSD, and **Jennifer Vasterling, PhD,** BUSM professor of psychiatry, clinical investigator, and chief of psychology at the VA Boston Healthcare System and the National Center for PTSD, have been named to a consortium that will investigate better ways to treat and diagnose post-traumatic stress disorder. Draper Laboratory, a not-for-profit engineering research and development organization dedicated to solving national problems in national security, space systems, biomedical systems, and

energy, formed this consortium of nationally recognized PTSD experts to improve diagnostic tools and treatment outcomes for the disorder. Rasmusson will lead the selection and development of methods for testing and measuring biomarkers from blood, cerebrospinal fluid, or other sources that characterize the function of an individual's stress response system, both at rest and when activated by general or trauma-related stressors. Vasterling will lead the effort to integrate neurocognitive data, which includes measures such as memory, attention, and other thinking skills that pertain to brain functioning.

Richard D. Wainford, PhD, assistant professor in the Departments of Pharmacology & Experimental Therapeutics and Medicine, Division of Cardiovascular Medicine, and a member of the Whitaker Cardiovascular Institute at BUSM, has been nominated as a Fellow of the American Heart Association affiliated with the Council for High Blood Pressure Research for his professional accomplishments and outstanding basic science research in the field of hypertension. Wainford was honored with other newly elected Fellows at the High Blood Pressure Research 2012 Scientific Session in Washington, DC. He also was selected as the recipient of the 2012 Dean Franklin Young Investigator Award by the American Physiological Society (APS), which recognized him at the Experimental Biology annual meeting. As the recipient, Wainford received an institutional grant providing BUSM with a $20,000 Data Sciences International Instrumentation Starter Kit.

Wainford joined the BUSM faculty in September of 2011. His research focuses on the central neural control of fluid and electrolyte homeostasis and blood pressure regulation. The major goal of his research is identifying the underlying pathophysiology of and potential treatments for hypertension. Current studies concern the role of central G-alpha subunit protein gated pathways in mediating the neural control of kidney function and systemic arterial blood pressure. ■

Addressing Unhealthy Alcohol Use in Primary Care

(Springer, 2013)
Editor: **Richard Saitz MD, MPH, FACP, FASAM**

Professor of Medicine & Epidemiology
Director, Clinical Addiction Research and Education (CARE) Unit

Section of General Internal Medicine
Boston University Schools of Medicine & Public Health

While there is a wealth of published information on addiction medicine, the psychological aspects of alcohol abuse, and behavioral medicine with regard to addiction, virtually none of the existing resources were written with the primary care provider in mind. *Addressing Unhealthy Alcohol Use in Primary Care* is a reference for primary care clinicians who are confronted daily by patients with these problems and who wish to successfully address these issues in their practice. Focusing on the literature and science relevant to practicing providers, this book covers the range of interventions appropriate for this setting. Topics include assessment, brief counseling interventions, pharmacotherapy, referrals to both specialty care and Alcoholics Anonymous (and other self-help programs), psychiatric co-morbidity and other drug use, and other information specific to the needs of the primary care clinician. The vast majority of people with health risks and consequences related to alcohol use receive little to no attention from health care providers, despite the fact that alcohol is a leading cause of early preventable death. This book is a guide to identifying and addressing unhealthy alcohol use in the hope of improving the lives of patients.

➜ In Memoriam

Kathleen Bennett, MD '84, assistant professor of medicine in the Section of General Internal Medicine, died November 23, 2012, after a long battle with breast cancer. A BUSM alumna of the Class of 1984 and a member of the BUSM faculty since 1989, Dr. Bennett was a leader in health care administration at the Neighborhood Health Plan, Boston Medical Center HealthNet Plan, and, most recently, as chief medical officer at Senior Whole Health. She also had a primary care practice at Upham's Corner Health Center, where she'd cared for patients since her residency years.

She completed her internship in family medicine at Cook County Hospital in Chicago and her internal medicine residency at the former Boston City Hospital (BCH), now Boston Medical Center, where she served as chief medical resident. After completing her training, she served as assistant program director and later program director for the Department of Internal Medicine residency program and assistant director of medicine at BCH.

Very highly regarded by her patients and colleagues, Dr. Bennett was an excellent clinician, a fierce patient advocate, and a gifted teacher. She graciously shared the story of dealing with her cancer in Grand Rounds for the Department of Medicine, offering a rare and candid perspective of interacting with the medical system as a patient.

She is survived by her life partner, Sharon Hanson, her mother, two brothers, and a sister.

Students

The smiles tell the story for Class of 2013 members who successfully matched at the hospitals of their choice.

FRANK CURRAN

From New Hampshire to Hawaii and Canada to Texas, the Class of 2013 Matches for Postgraduate Training

Along with their friends and families, members of the Class of 2013 awaited the stroke of noon on March 15 in a very crowded Hiebert Lounge. Every year at medical schools across the country, Match Day fills the air with anticipation and excitement. With the countdown complete and cameras flashing, these doctors-in-waiting learned of their residency placements.

A special Match Day cake awaiting the surgical skills and digestive systems of the soon-to-be doctors of the Class of 2013.

"On behalf of the 8,000 BUSM alumni across the country, I congratulate you on the successful completion of your medical education."
— Jean Ramsey, MD, associate dean for alumni affairs

"It was a short three-and-a-half years ago that the faculty welcomed you to the study of medicine at the White Coat Ceremony, and we look forward to welcoming you to the practice of medicine at Commencement," said Dean Karen Antman, MD. "You have matched from New Hampshire to Hawaii and Canada to Texas, and the good news is that we get to keep 15 of you here at Boston Medical Center. Congratulations on all of your hard work and achievements."

Twenty-three percent of the class will enter internal medicine residency; 11 percent in family medicine, and 10 percent each in pediatrics and obstetrics and gynecology. Nine percent of the class will train in emergency medicine.

Acting for the first time in her capacity as associate dean for student affairs at a Match Day, Angela Jackson, MD, told the class it was a privilege to share such an important event in their lives with them. After congratulating the class, Phyllis Carr, MD, former associate dean for student affairs, noted their special capacity for caring for each other and announced that the class had chosen Bill Hammond as their class speaker.

"On behalf of the 8,000 BUSM alumni across the country, I congratulate you on the successful completion of your medical education," said Jean Ramsey, MD, associate dean for alumni affairs. "We look forward to welcoming you to the BUSM Alumni Association at Commencement and getting to know you better as our colleagues and fellow graduates." ■

Twelve of the 15 members of the Class of 2013 who matched at Boston Medical Center proudly display their National Residency Matching Program letters.

FRANK CURRAN

Brian Currie '15

Summer in Ecuador:

A Culturally and Clinically Enriching Experience

Brian Currie '15 spent five weeks in Ecuador last summer in an intensive program that provides health care to poor and medically disadvantaged communities in that country through the Cinterandes Foundation. The nonprofit foundation promotes health and provides health care to some of Ecuardor's most disadvantaged communities.

"Beyond the opportunities to rotate through hospitals and regional health clinics, what really caught my attention about this program was the Mobile Surgery Unit," says Currie. "When it came time to plan my summer, this program was a clear choice—it was an ideal fusion of my fascination with surgery, desire to improve my medical Spanish, and interest in making health care accessible to underserved patient populations.

"I chose to spend five weeks in the Cinterandes program, thinking this would allow enough time to acclimate to the language and culture so I could make the most of my clinical experiences. However, I discovered during my first week at the hospital that there is a big leap between conversational acumen and proficiency with medical terminology, even after two semesters of medical Spanish electives at BU. They must have found my stumbling attempts endearing because I soon transitioned from being a lost dog that was permitted to tag along to an active participant. Under their tutelage, coupled with my constant references to a Spanish/English dictionary, I eventually got the hang of it.

"At the regional hospital I was able to observe approximately eight to 10 different procedures per day encompassing nearly the full spectrum of surgical interventions. One that stands out in my mind was an emergency Cesarean section for a woman who had been in labor for an entire week. Although the details were sparse, I learned that her delay in coming to the hospital was simply out of necessity (travel issues, other responsibilities, etc.). I was stunned, even more so because the doctor explaining the case was entirely not surprised by the events.

"To complement the hospital-based surgery experience, I also spent a significant amount of time in the emergency department in a more hands-on capacity, shadowing doctors and interns, assisting with procedures, and suturing patients when necessary. There was one patient who came in following a car accident with a lacerated hand and arm. The cuts were so deep on his hand that his skin was hanging in flaps and his white tendons were bare. While an intern attended to the more serious portions, I sutured much of his hand and arm in the midst of a busy ER at three in the morning.

"Although the clinical exposure was excellent, there was a relative dearth of funding, especially for free service hospitals like this one. Supplies and infrastructure were large issues; compared to how hospitals operate in the US, they managed to function on a shoestring budget. Many commonplace items, whose disposable versions would be routinely discarded here, were sterilized and reused.

"Operating out of a modified van, the Cinterandes Mobile Surgery Unit performs procedures in general, urological, gynecological, reconstructive, and ophthalmologic surgery in 17 of the 24 Ecuadorian provinces. The most salient and rewarding portion of my clinical placements was the mobile surgery trip. We traveled to the town of El Guabo and in the span of three days, performed 18 surgeries within the confines of our van. In addition to placing IV lines, applying local anesthetics, inducing general anesthesia, monitoring vitals, and maintaining the surgical suite, I was able to scrub in, assist, and close on my share of the surgeries. My fellow students and I were also entrusted with the postoperative care of our respective patients, which included speaking to their family members. Family and community are very important in Ecuador, and most patients had a constant stream of visitors. Grateful for our efforts, the community center provided us with enormous amounts of food—whether it was a snack between procedures or scheduled meals throughout the day—and a celebratory event on our final night. Their warmth and sincerity was a common theme in many of my interactions with local community members, in contrast to the sometimes stilted customs and mannerisms back in the US. It was the most culturally and clinically enriching experience of my entire trip." ■

"Supplies and infrastructure were large issues; compared to how hospitals operate in the US, they managed to function on a shoestring budget. Many commonplace items, whose disposable versions would be routinely discarded here, were sterilized and reused."

Medicine with a Mission

MED students team up with Boston Health Care for the Homeless

Jerry Savory, who is homeless, has had a hard life. The 57-year-old with a salt-and-pepper beard and a broken nose has struggled with alcoholism and drug abuse since he was a teen and suffered from seizures since he was in an accident at the age of 25. And, he's still recovering from being hit by a car two years ago.

Medical issues like these would spell misery for anyone, but for homeless people, a group whose mortality rate is at least four times that of the general population, the misery is compounded. Savory considers himself lucky, however, in one regard: he is treated regularly at the Boston Health Care for the Homeless Program (BHCHP), which is staffed in part by first- and second-year School of Medicine student volunteers.

"Every time I've been here, every time I leave, I be all right," Savory says slowly, his brow furrowing as he sits in a BHCHP exam room.

Raagini Jawa '14 (center) and Sai Konda '15 examine Sampson Samuel, a Boston Health Care for the Homeless patient.

CYDNEY SCOTT

Savory was one of several patients examined late one night by BUSM students enrolled in the Homeless Health Immersion Experience, a noncredit, service-learning program started last spring by two medical students interested in gaining early clinical experience and exposure to a vastly underserved population.

"BU medical students don't really have much experience with the homeless population," says Raagini Jawa '14, who cofounded the elective program with Alec Peniche '14. "This is a great way for them to understand a different subset of ailments and issues."

Jawa and Peniche developed the program with Suzanne Sarfaty, MD '88, BUSM assistant dean of academic affairs and director of international health programs and an associate professor, and with BHCHP doctors Jennifer Brody, MD, and Mardge Cohen, MD, who agreed to supervise the students.

The pilot program was launched last spring, with 12 first-year and 12 second-year students working in pairs and rotating through an outpatient clinic and a respite center on a monthly basis. While the first group gained valuable patient interviewing skills, the second practiced physical examination techniques and acted as friendly mentors to their less-experienced peers. After each exam, the students presented a patient's case to Brody or Cohen, who gave them pointers on technique and explained how homelessness influenced the patients' medical conditions.

The Boston Public Health Commission reports that in 2011, nearly 6,650 people were homeless in Boston, and just over half of them were single adults living on the street, in shelters, in transitional housing, or in treatment facilities.

Since the full-fledged program launched in September, Jawa and Peniche have expanded it to include BHCHP-affiliated medical residents who give mini-lectures to students about issues related to homelessness and health care. The cofounders also partnered with the BUSM student-run Outreach Van Project, a mobile unit that serves the homeless population once a week in East Boston.

The Boston Public Health Commission reports that in 2011, nearly 6,650 people were homeless in Boston, and just over half of them were single adults living on the street, in shelters, in transitional housing, or in treatment facilities. James O'Connell, MD, the BUSM assistant professor of medicine who founded BHCHP in 1984, puts the number higher; he believes that 25,000 Bostonians are homeless for some period of time each year. His organization serves more than 11,000 people a year through street outreach or at its Albany Street headquarters, which has a pharmacy, a dental office, an outpatient clinic, and a 104-bed medical respite center.

Hours after closing time for most doctors, Cohen sits in a BHCHP exam room with three medical students who just saw their first patients. "The idea was for you to feel comfortable learning about someone who has a lot of vulnerabilities," she says. "Knowing how to care for, and care about, the most vulnerable attests to the type of person you are. Many medical students do not want to take care of such people. You will see that it's an incredibly gratifying experience." Cohen then asks the students to present their patients' cases.

Nahiris Bahamon '15 and Stephanie Donatelli '15 take turns describing the condition of a 46-year-old male. He's a self-described alcoholic with neuropathy, acid reflux, arthritis, and a long history of personal tragedy. Both his parents were alcoholics. One brother, a drug user, died of AIDS. Another died of cirrhosis. His firstborn died of SIDS. He has a history of depression and anxiety, and although he'd been sober for two years, he wants to return to detox after a recent relapse.

"He's very self-aware," Donatelli says. "We didn't even have to ask that many questions."

Cohen laughs. "Your empathy shows, which is very important," she says. "He elicits that in us." She discusses the impact personal trauma has on health, the genetics of alcoholism, and the post-traumatic stress disorder the patient likely suffers from because of his child's early death. "Do you think that could be someone you know?" she asks. "Or do you think it happened to him because it was going to happen?"

Bahamon reviews the patient's complicated life history and suggests that "he was set up for failure." Donatelli agrees, adding that each time he rallied, something beyond his control knocked him down.

Cohen emphasizes the importance of being there for a patient when he falls, as many times as he falls, and to look for small victories in his daily life—like the desire to get treatment for alcoholism. "Hopefully he'll go into a program and stay," she says.

Across the hall in another exam room, Savory is pleased to have a warm meal and a place to stay for the next few days. He's uncannily calm about the ill turns his life has taken and draws from a deep well of faith—something he says his grandmother instilled in him as a kid attending church every Sunday. ■

This article first appeared in BU Today.

Medical Student Research Showcased at Symposium

Awards Presented for Best Basic Science, Clinical Science, and Medical Education Research

The Hiebert Lounge was filled with posters on February 6, as the annual Medical Student Summer Research Program (MSSRP) symposium was held to showcase student research. Students received awards for the best basic science, clinical science, and medical education research posters.

The MSSRP offers first-year Boston University medical students scholarships to complete eight-week research projects with a BUMC faculty member. During the summer of 2012, 27 students participated in the program.

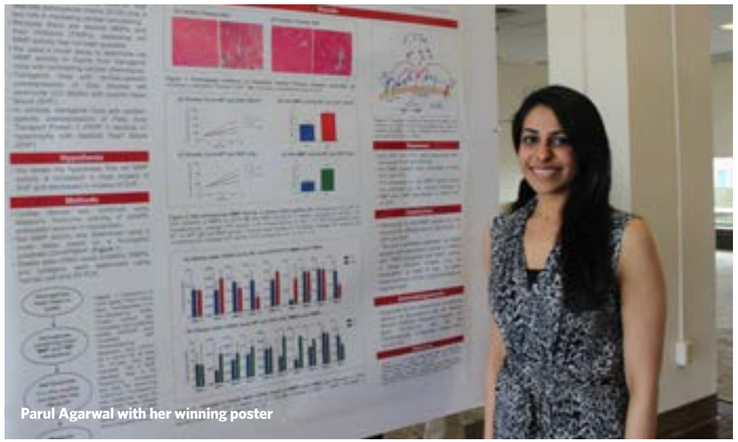
"The MSSRP supports students who want to engage in rigorous research that enriches their academic and clinical experiences," says Suzanne Sarfaty, MD '88, assistant dean for academic affairs and the program's director. "Many of these students go on to publish their research or present it at national meetings."

The awards are named in honor of Jerome Serchuck, a longtime MSSRP donor who has given generously to the program since its official establishment in the summer of 2000, when 15 members of the BUSM Class of 2003 undertook research in various BUMC departments. The first Serchuck Awards were presented in 2007 and the program continues to flourish as a direct result of his ongoing support and generosity.

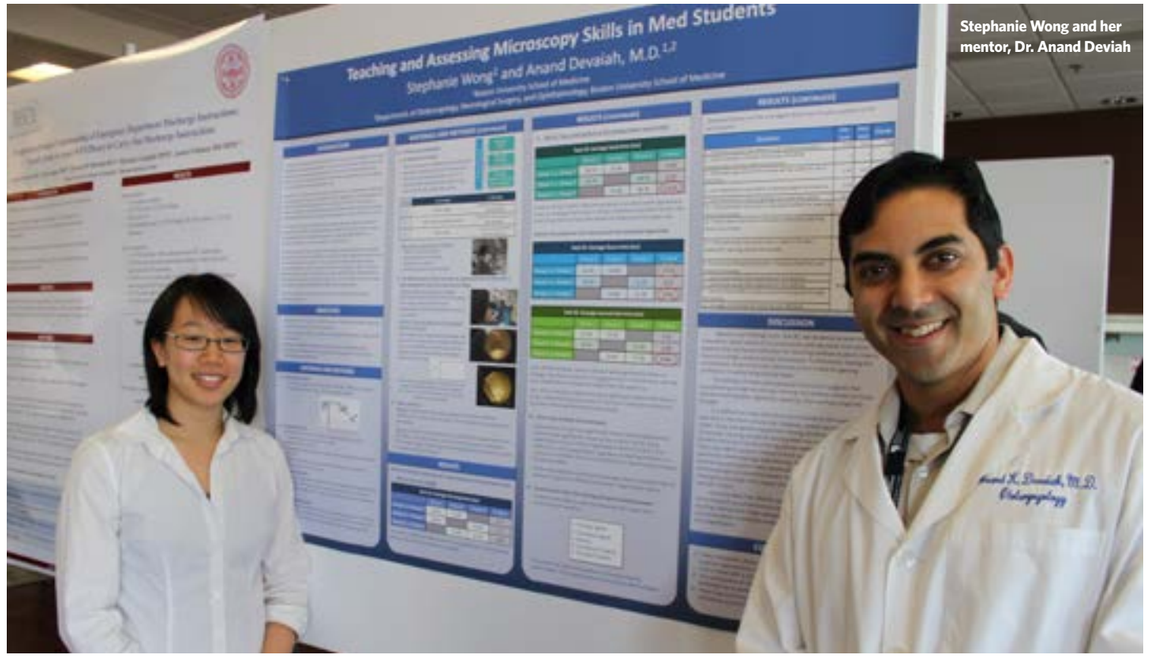
"We are deeply grateful to the Serchuck family for their continued, generous commitment to the program and the advancement of our medical students," said Sarfaty. "Also key to the success of the program is the support of departments and the dedicated work of faculty who guide the research—this program would not be possible without them."

Arthur Stucchi, PhD, research associate professor in the Department of Surgery, has mentored more than 25 medical students since 1998. "The MSSRP affords students the opportunity to broaden their critical and analytical thinking skills and to gain a deeper appreciation of the importance of the medical and scientific literature in making informed decisions," he says.

Parul Agarwal won the award for best basic science poster for her research on "Increased Myocardial Matrix Metalloproteinase Activity in Mice with Systolic and Diastolic Heart Failure," and Kevin Barrette took honorable mention for basic science poster for "Connexin 43 (Cx43) Upregulation Protects Retinal Endothelial Cells Against High Glucose Insult." Best clinical science poster went to Divya Ahuja for "The Impact of Race, Primary Language, Marital Status, and Insurance Type on Mortality in Breast and Prostate Cancer Patients," and Luke Stevens



Parul Agarwal with her winning poster



Stephanie Wong and her mentor, Dr. Anand Deviah

earned honorable mention for "Evaluation of Patient Understanding of Emergency Department Discharge Instructions: Use of a Scale to Assess Self-Efficacy to Carry Out Discharge Instructions."

Stephanie Wong won the first Serchuck Award to recognize medical education research for "Teaching and Assessing Microscopy Skills in Med Students."

"The MSSRP let me explore a branch of research I had never even considered before, which was medical education research," said Wong. "This was especially meaningful, not only because it expanded my experience and education as a medical student, but also because I discovered that I really enjoy it. Receiving the Serchuck Award for medical education research was a doubly happy surprise. I think it highlights a growing focus on the field—it's not a branch of research many are aware of, but it is vitally important and directly relevant to medical students."

Miriam Segura-Harrison won honorable mention for a medical education poster for "Religion and Public Health: Developing a Novel Curriculum."

"Early research experience is invaluable to medical students. Some discover that research is not for them, and others are hooked and redirect their life work," notes Dean Karen Antman, MD. "Students not only learn about themselves but also how hard it is to generate quality research, and they gain a critical perspective to guide them in reading scientific and clinical studies. The Medical Student Summer Research Program is an excellent example of the significant academic, research, and clinical opportunities available to our students." ■

Biomolecular Pharmacology Grad Student Honored by American Physiological Society

Casey Carmichael, a second-year graduate student in the doctoral program in biomolecular pharmacology, has been chosen to receive the 2013 Caroline tum Suden/Frances Hellebrandt Professional Opportunity Award from the American Physiological Society (APS). The award is one of three based on abstract submissions offered by the APS for graduate students and postdoctoral fellows. Carmichael was selected by the Women in Physiology Committee from 154 applicants for her work, "A role for Gai2 proteins in the acute neural control of blood pressure."

Carmichael researches under the mentorship of Richard D. Wainford, PhD, an assistant professor in the Departments of Pharmacology & Experimental Therapeutics and Medicine, Division of Cardiovascular Medicine, and a member of the Whitaker Cardiovascular Institute. She is a member of the Laboratory of Cardio-Renal Research, where her work focuses on understanding the central neural aspects of blood pressure regulation to identify the pathophysiology and potential treatments for hypertension. ■


Casey Carmichael

Francis Kim '14 Honored with National Leadership Award by AMA Foundation

Third-year BUSM student Francis Kim has been named a recipient of the American Medical Association (AMA) Foundation's 2013 Leadership Award. Recipients are recognized for demonstrating outstanding nonclinical leadership skills in advocacy, community service, and education. The award provides medical students, residents/fellows, and early career physicians from around the country with special training to develop their skills as future leaders in medicine and community affairs.

Kim plans to pursue a surgical career that combines clinical practice, research, and health policy; his interests are in health care disparities and quality improvement. While at BUSM, Kim has been active with the American Medical Association and the Massachusetts Medical Society, serving as chapter cochair, authoring several resolutions, and participating in national and statewide community service projects.

As a college student at Harvard University, Kim served as a program coordinator for the Health Leads' Boston-based STRIVE program, which mentors and advocates for inner-city adolescents with sickle cell disease. While conducting research for his master's thesis, he served as the Research Fellow in Operation Smile's weeklong inaugural burns mission trip to Mumbai, India, which provided no-cost reconstructive surgeries to burn patients from the slums of Mumbai. Published in peer-reviewed literature, Kim's ongoing research focuses on determining effective and sustainable measures to decrease global burn morbidity and mortality.

Recipients are recognized for demonstrating outstanding nonclinical leadership skills in advocacy, community service, and education.

"We are proud to have students who are committed to community service and to patients locally and globally," said Dean Karen Antman, MD. "This is a great honor." ■


Francis Kim

Inaugural Mary T. Walsh Memorial Student Achievement Award

On December 12, Nathan Myers, a third-year student in the Department of Physiology & Biophysics, received the first Mary T. Walsh Memorial Student Achievement Award, established by the department to honor the memory of Dr. Walsh, a 20-year member of physiology and biophysics who died unexpectedly in 2004. A biochemist, Walsh was the soul of the graduate program. She was a student advisor and mentor, and also a protector and friend; her wisdom, patience, and guidance were invaluable to both students and faculty alike.

Nathan Myers receiving the Mary T. Walsh Memorial Student Achievement Award from David Atkinson, PhD, chair of the Department of Physiology & Biophysics.

Giving

Gratitude for Guidance and Support, Alumni Couple Gives Back to BUSM


Donna '65 and Douglas Barnard '65

For almost four decades, BUSM graduates of the Class of 1965 Donna and Doug Barnard have continually given to the School of Medicine. They have also funded a scholarship at the School and recently established a charitable remainder trust to benefit the new student residence on campus.

"Medical school is very expensive now," says Doug. "We must continue to train good doctors, and if our donations can help in any small way to offset some of this cost, we are grateful. Doctors need to concentrate on being good physicians and not constantly worry about their future because of financial commitments over which they have had no control.

"To have a student residence is about as good as it can get for a medical student. They can now live on campus, close to class and the hospital. They can enjoy socializing with other students while in an atmosphere where studies are important to everyone."

The Barnards met each other at the first BUSM social event held for incoming medical students. They got married within the year and had a baby daughter the next.

"Six months later Donna lost her dad and her financial support," recalls Doug. "My dad was supporting a son at Dartmouth, as he had supported me at Washington & Lee University. He could not afford to support both medical school and college tuitions. At this point we were on our own financially.

"With the medical school's backing, we decided to take a year off, earn some money, and try to come back the following year to complete our education. BUSM helped both of us obtain jobs within the medical community—we organized babysitting as best we could and were able to return to school the following year. At that point, we still needed financial help. The School was more than willing to work with us and gave us scholarships and loans that allowed us to continue."

The couple went on to graduate and complete their internships as well as have a second child, a son. To this day, they're not sure how they made it through that internship year.

"When we were in trouble financially and emotionally with our own lives, BUSM provided guidance and support for us," Donna says. "Apparently they saw two struggling young medical students who were willing to sacrifice themselves with a purpose in mind. They gave us the opportunity to succeed."

Following his internship, Doug completed an anesthesia residency at the Chelsea Naval Hospital and then spent a year in Vietnam with the Marines. Upon returning home, he continued as a staff anesthesiologist at Chelsea Naval Hospital, and Donna entered a three-year oncology and hematology fellowship at BUSM. Seven years after graduation from medical school and with their training complete, Donna helped to found a practice with an oncology hematology group and Doug left the Navy and moved to private practice north of Boston.

"To give something back is very important to both of us," says Doug. "When we give to BUSM, we know the money is being used for a worthwhile purpose, and one that we can relate to. This is not true of many charities."

"We are forever grateful for the help we received from BUSM," Donna adds. "It took us ten years to pay back the loans. Now we can give some scholarship aid to other students who may share our goals. The planned gift is a way to assure us of a small annuity for our lifetime and to be sure BUSM is the eventual recipient of our gift."

"The Barnards have never forgotten what it is like to struggle to achieve personal and professional goals," notes Dean Karen Antman, MD. "BUSM was there for them at a crucial time in their lives, and they returned that early support many times over in the following decades. The School of Medicine and our students are truly fortunate for the outstanding generosity of this dedicated alumni couple." ■

For more information on making a planned gift contact: BUSM Development Office at busmdev@bu.edu or 617-638-4570 or www.bu.edu/supportingbusm.

Saying Thank You in Person

Annual Dean's Club Dinner brings leadership donors together


1.


2.

The Dean's Club Dinner gives Dean Antman the opportunity to personally thank BUSM's generous donors on behalf of the School. The gathering at the Taj Boston hotel in October brought together many Dean's Advisory Board members, alumni, parents, faculty, staff, and friends of the School. The Dean's Club, initiated in 1973 by the BUSM Alumni Association, recognizes individuals who make unrestricted annual gifts of $1,500 or more.

1. Lorraine Witzburg and Associate Dean for Admissions Robert Witzburg '77 with Marcia Edelstein Herrmann '78 and Dr. Jeffrey Herrmann.
2. Dean Karen Antman and husband, Dr. Elliott Antman.

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Please contact the BUSM Development Office at busmdev@bu.edu or 617-638-4570, or visit **www.bu.edu/supportingbusm**.

1. Dean's Advisory Board member Adrienne Penta Lissner and husband, Dan Lissner, dancing to the music of G. Andrew Maness' Four Guys in Tuxes at the Dean's Club Dinner in October at the Taj Boston hotel.
2. Howard Green '85; Joanne Green, DDS; Maria DiChiara; and Alumni Association Director David DiChiara '84 connecting during the reception prior to the Dean's Club Dinner.
3. Attending the Dean's Club Dinner are Sophia Catrambone, Associate Dean for Alumni Affairs Jean Ramsey '90, and Richard Catrambone '92.

Alumni

NEWS

DEAR ALUMNI AND FRIENDS,
Keeping alumni connected to the School of Medicine is the most important mission of the Alumni Association of BUSM. We look forward to getting out and meeting with alumni and friends of the School at receptions in New York City and Washington, DC, in June. We also are pleased to have the opportunity to get together with young alumni—our future leaders—in September. If you live in or are planning to visit any of these places, please check our Calendar of Events for dates, times, and locations. Along with Dean Antman, I hope to see you at one of these events.

As we face major cuts to the NIH budget that will affect our research mission and cuts to health care programs that will affect our clinical sites, I would like to thank you for your generosity to the School's Annual Fund. If you have not already made your gift, please use the enclosed envelope or go to our online contribution site at https://www.bu.edu/alumni-forms/forms/med/BUSMcontribution.html. Annual funds help support School operations and give Dean Antman the flexibility to direct funding to the most pressing priorities. Your gift counts and is greatly appreciated.

Best regards,

Jean E. Ramsey

Jean E. Ramsey, MD '90, MPH '08
Associate Dean for Alumni Affairs
Associate Professor, Ophthalmology and Pediatrics
Vice Chair of Education and Program Director

FRANK CURRAN

Alumni Association Honors Two Alumni with Distinguished Alumnus Awards

Robert N. Golden, MD '79, is dean of the School of Medicine and Public Health and vice chancellor for medical affairs at the University of Wisconsin-Madison. He is also the Robert Turell Professor in Medical Leadership and a professor of psychiatry.

Dr. Golden received his BA cum laude with honors in psychology from Yale in 1975. He completed an internship, residency, and chief residency in psychiatry at the University of North Carolina (UNC). He was a medical staff fellow in the Clinical Pharmacology Section of the National Institute of Mental Health Intramural Research Program. In 1985, he returned to UNC-Chapel Hill, where he served as the founding director of both the Clinical Psychobiology & Pharmacology Research

(continued on next page)

PHONATHONS 2013

Our deepest appreciation goes out to alumni for their philanthropic support, and to the alumni and student volunteers listed below who willingly give their time.

Jade Anderson '16
Roberta Apfel '62
David Bailen '67
Frederick Berrien '68
Erin Brooks '13
Stacy Brown '13
Mauro Caffarelli '15
Nina Capiro '15
Amanda Chu '14
Matthew Cohen '13
Liz Dooling '65
Don Grande '73
Marcia Herrmann '78
Arthur Ho '15
Edward Krukonis '63
Monica Lee '15
Sara Li '14
Kristen Lindgren '11
Matt McAdams '15
Rachel Morgan '16
Prachi Nene '16
Thiago Oliveira '15
Burt Perlmutter '63
Kate Phaneuf '88
Peter Pochi '55
Jean Ramsey '90
Rounak Rawal '13
Miriam Ruiz '16
Sunjay Sethi '16
Graham Snyder '05
Jasmine Wang '15
Mitchell Wice '15
Stephanie Wong '15
Betty Yang '15
Jen Xiao '16

During two fall evenings, Phonathon volunteers seeking philanthropic support for the medical school contacted more than 400 alumni across the country. Student volunteers say they are grateful to have the chance to glean pearls of wisdom from graduates as far back as 1942 right up to 2012, in different types of specialties, clinical and academic settings, and parts of the country. In return, alumni get to hear firsthand the positive impact alumni giving makes on the lives of so many.

1. Seasoned Phonathoners David Bailen '67, Don Grande '73, and Liz Dooling '65 set the tone for an evening of calling by getting an early start. Alumni volunteers reach out to fellow classmates and enjoy mini-reunions with colleagues.
2. Student and alumni volunteers secured more than $131,000 in pledges from 124 graduates over two nights of calling.

Training Program and the Electroconvulsive Therapy Service, and as associate director of the General Clinical Research Center and the Mental Health Clinical Research Center. From 1994 through 2005 he served as chair of the Department of Psychiatry at UNC School of Medicine, and in 2004 he assumed the additional role of vice dean at UNC School of Medicine. In 2006 he became the ninth dean of the School of Medicine and Public Health and the vice chancellor for medical affairs at the University of Wisconsin-Madison.

Golden's research and clinical interests focus on psychobiological and psychopharmacologic aspects of mood and anxiety disorders. He has published more than 200 papers, chapters, and books, and more than 190 research abstracts. He has served as field editor for clinical psychobiology for *Neuropsychopharmacology*, and currently is associate editor for *Psychosomatic Medicine*.

He has served on the Board of Regents of the American College of Psychiatrists and is a director of the American Board of Psychiatry and Neurology. His honors include selection as a Ginsburg Fellow of the Group for the Advancement of Psychiatry, a Laughlin Fellow of the American College of Psychiatrists, a Jefferson Pilot Fellow in Academic Medicine, the 1993 Eugene Hargrove Mental Health Research Award, listing in *The Best Doctors in America*, designation as "Teacher of the Year" by the UNC psychiatry residents on four occasions, the 2003 Mood Disorders Research Award from the American College of Psychiatrists, appointment as the inaugural Stuart Bondurant Distinguished Professor at the University of North Carolina at Chapel Hill, and the 2010 Distinguished Medical Alumnus Award from the UNC School of Medicine.

Andrew S. Levey, MD '76 is the Gerald J. and Dorothy R. Friedman Professor of Medicine at Tufts University School of Medicine and chief of the William B. Schwartz Division of Nephrology at Tufts Medical Center. He received his BA with honors from the University of Chicago. He completed his residency training in internal medicine at Montefiore Hospital and Medical Center Residency Program in Social Medicine in New York in 1979, and a fellowship in nephrology at New England Medical Center (now Tufts Medical Center) in Boston in 1981.

An authority on chronic kidney disease (CKD), he was director of the dialysis unit at Tufts Medical Center and Dialysis Clinic, Inc. from 1981 to 1990.

His research interests include measurement and estimation of kidney function, epidemiology of CKD, treatments to slow the progression of CKD, cardiovascular disease in CKD, nutrition in CKD, and assessment of outcomes in patients treated by dialysis and kidney transplantation. He was the principal nephrologist coinvestigator for the NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases)–sponsored Modification of Diet and Renal Disease (MDRD) Study.

Known for his work on clinical practice guidelines in CKD, he led the National Kidney Foundation (NKF) Task Force on Cardiovascular Disease in 1998, chaired two NKF Kidney Disease Outcome Quality Initiative (KDOQI) Work Groups, and has led three Kidney Disease Improving Global Outcomes (KDIGO) conferences. He was director of the Tufts Center on Guideline Development and Implementation from 2003 until 2011.

Levey directs the research fellowship-training program in the Division of Nephrology at Tufts and is principal investigator of the division's 15-year NIDDK grant (T32). He is editor-in-chief of the *American Journal of Kidney Diseases*. Levey received the Distinguished Faculty Award from Tufts University School of Medicine in 2004. The National Kidney Foundation has honored him with the President's Award in 1998, the Garabed Eknoyan Award in 2002, and the David W. Hume Award in 2011. ■

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1942 Abraham Kaye of Boca Raton, Florida, writes, "Retired since 1987."

1950 G. Robert Baler of Boston, Massachusetts, reports, "I am still active medically supervising the residents and seeing patients at the Dermatology Department at BUSM and Boston Medical Center."

1953 Hamer Lacey of Gloucester, Massachusetts, writes, "My first wife died on our 50th anniversary. I will be celebrating my 10th anniversary with Charlotte Fish. We live in Gloucester, and we have double fun, traveling a lot!"

1957 Howard C. Beane of Camp Hill, Pennsylvania, writes, "Since retirement I have bicycled more than 121,000 miles, covering 30 foreign countries and every state except Alaska, averaging more than 1,000 miles per year."

Gilbert A. Norwood of Beverly, Massachusetts, reports, "Retired but busy playing lots of trumpet in various bands. Mentoring at BUSM in IP course. Fun!"

1962 John P. Cloherty of Westwood, Massachusetts, writes, "Still working at Boston Children's Hospital and Brigham and Women's Hospital."

1963 Michael G. Hirsh of Rochester, New York, has been promoted to clinical professor of pediatrics.

1966 Paul A. Gitman of Manhasset Hills, New York, writes, "Traveling as much as possible photographing the world (gitman.shutterfly.com) and enjoying family and grandchildren."

Carol A. Milchenski and **Herbert L. Rothman** of Weston, Florida, write "Our daughter, Victoria, graduate of BU School of Dental Medicine, had a beautiful baby boy July 20, 2012. Name: Ben Garner Jenkins."

1969 Jack Ferlinz of Saginaw, Michigan, writes, "I was elected president of the medical hospitality activities of Hospital Hospitality House (in Saginaw) for mid-Michigan. I am clinical professor of medicine and expert of the Community Research Institutional Review Board."

Kenneth C. Spengler Jr. of Exeter, New Hampshire, writes, "Still practicing part time as officer of orthopaedics for CORE Orthopaedics in Exeter, New Hampshire. In summer, spend as much time as possible on Prince Edward Island in Canada."

1973 Evan E. Mortimer of Palmetto, Florida, reports, "Retired in 2010 from the Department of Health and Mental Hygiene, where I was medical director of family planning and reproductive health for the state of Maryland."

1980 Richard I. Rothstein of Etna, New Hampshire, was appointed as the Joseph M. Huber Professor of Medicine and chair of the Department of Medicine for the Geisel School of Medicine at Dartmouth. He served as the section chief of gastroenterology and hepatology for 15 years. Under his leadership, the section developed centers of excellence in gastrointestinal and liver disorders and endoscopy. His research has included developing less invasive endoscopic therapies for the management of gastroesophageal reflux disease, Barrett's esophagus, and obesity. He is considered a pioneer in the evolving field of natural orifice translumenal endoscopic surgery (NOTES), and is evaluating the role of robotics in endoscopy. He is a principal investigator in the Norris Cotton Cancer Center, studying the effect of dietary supplements to prevent gastrointestinal cancer.

"I am honored to be selected as the chair of the Department of Medicine," says Rothstein. "At this time of rapid changes in health care delivery, our department is superbly positioned to lead and demonstrate how our evolving local, regional, and national collaborations will continue to enhance our patient care, research and education efforts." Actively involved in professional education and leadership development, Rothstein served as associate dean for continuing medical education and is a professor of surgery at the Geisel School of Medicine.

1981 Richard J. Quigg Jr. of Hinsdale, Illinois, has been named the inaugural Arthur M. Morris chair in nephrology and chief of the Division of Nephrology at the University of Buffalo School of Medicine and Biomedical Sciences. An internationally regarded researcher of glomerular diseases, Quigg previously served as a professor of medicine at the University of Chicago, where he


Richard J. Quigg Jr. '81

was chief of the Section of Nephrology and director of its Functional Genomics Facility. "Dr. Quigg's recruitment will lead to development of basic research in the Division of Nephrology as well as growth in clinical and translational research, along with expansion of clinical programs in nephrology and continued excellence in the fellowship training program," said Anne B. Curtis, MD, Charles and Mary Bauer Professor and chair of medicine.

1982 Phyllis A. Kephart of Pratsburg, New York, writes, "I fulfilled number one on my personal bucket list this year (2012) when I climbed Mt. Kilamanjaro in February/March and went on safari to Ngorongoro Crater and the Serengeti. Quite an adventure!"

1986 Richard Iorio of Boxford, Masachusetts, was appointed as the William and Susan Jaffe Professor of

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Orthopaedic Surgery and chief, Division of Adult Reconstructive Surgery at New York University Langone Medical Center. An undergraduate at Harvard College, he completed his residency at Hahnemann University Hospital in Philadelphia and his postdoctoral fellowship at Columbia-Presbyterian Medical Center's Hip and Knee Service. He was professor of orthopaedic surgery at Boston University and director of adult reconstruction surgery, Department of Orthopaedic Surgery, at the Lahey Clinic Medical Center in Burlington, Massachusetts. He has also served as chair of the American Orthopaedic Association's exchange fellowship committee, past-president of the New England Orthopaedic Society, and former education committee chair and executive board member of the Knee Society. A frequent speaker at medical conferences and symposia, Iorio is the current and past recipient of several NIH, Agency for Healthcare Research and Quality, and private grants. He has published extensively on clinical outcomes and health care cost effectiveness, and his research has appeared in peer-reviewed journals such as the *Journal of Bone and Joint Surgery, Clinical Orthopaedics and Related Research*, and the *Journal of Arthroplasty*. As chief of the division, he oversees the Department of Orthopaedic Surgery's total joint replacement programs and clinical research studies.


John G. Byrne '87

1987 **John G. Byrne** of Nashville, Tennessee, has been named chief of the Division of Cardiac Surgery at Brigham and Women's Hospital, effective April 2013. He served as chair of cardiac surgery at Vanderbilt University Medical Center in Tennessee, trained at Brigham and Women's Hospital in Boston and at hospitals affiliated with the University of Illinois. He was the Brigham's chief resident of cardiothoracic surgery and associate chief of cardiac surgery when he left for Vanderbilt in 2004.

While at Vanderbilt, he built a "hybrid" operating room, combining a standard operating setup with new imaging technologies; the Brigham subsequently built its own in 2008. Byrne's research focus includes determining which patients are most likely to benefit from major heart procedures and testing outcomes of the newest approaches to surgery.


Jeffrey S. Heier '89

1989 **Jeffrey S. Heier** of North Reading, Massachusetts, has been named a member of the Scientific Advisory Board of Ohr Pharmaceuticals, Inc. A prominent ophthalmologist of Ophthalmic Consultants of Boston and one of the leading retinal clinical researchers in the country for new treatments in exudative and non-exudative macular degeneration, diabetic macular edema, venous occlusive disease, vitreoretinal surgical techniques and instrumentation, and diagnostic imaging of the retina, he will advise the company on its clinical programs and regulatory strategy. He also provides strategic guidance to support the development of Squalamine in multiple neovascular ophthalmic clinical indications comprised of leading retinal ophthalmology experts to assist in advancing the Squalamine eye drop program through clinical efficacy trials.

1992 **Jondavid Pollock** of Wheeling, West Virginia, writes "Twin daughters, Ariel Eve and Netunya Isabel, graduate from Columbia University this year. Looking at med schools, and we hope they consider BUSM. Little sister Samara Elise just in her sophomore year at Columbia, so she has time. Best to all."


Andrew M. Doolittle '99

1999 **Andrew M. Doolittle** of Winchester, Massachusetts, was welcomed to the medical staff at Winchester Hospital.

A graduate of Colby College in Waterville, Maine, he earned a Health Professions Scholarship Program (HPSP) scholarship through the US Army and graduated a member of Alpha Omega Alpha medical honor society. Following an internship in general surgery and a residency in otolaryngology at Walter Reed Army Medical Center, he was assigned to Womack Army Medical Center at Fort Bragg, North Carolina. He served as the chief of otolaryngology-head and neck surgery at Womack and went into private practice in Rockingham, North Carolina, before beginning practice at Ear, Nose, and Throat Consultants in Woburn and Winchester, Massachusetts. He is board certified in sleep medicine. ■

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➜ In Memoriam

1939 • **Nicholas J. Fiumara** of Belmont, Massachusetts, on June 29, 2012, at the age of 99. He was a member of the Massachusetts Department of Public Health for more than 43 years, where, as director in the Division of Communicable and Venereal Diseases, he encouraged the use of private medical facilities as sites for public health clinics and assigned regionally based epidemiologists to provide local outbreak and disease prevention programs. He also established the practice of universal distribution of vaccines in Massachusetts, resulting in the commonwealth being a national leader in child immunization rates. A nationally renowned teacher and practitioner in the fields of infectious disease, venereal disease, and dermatology, he received the Massachusetts Medical Society's Henry Ingersoll Bowditch Award for Excellence in Public Health. He is predeceased by his wife, Sylvia C. (Ponte) Fiumara and is survived by his daughter.

1942 • **Elizabeth A. Gregory** of Arlington, Massachusetts, on October 30, 2012, at the age of 95.

A pediatrician in Arlington for more than 43 years, she was a fellow of the American Academy of Pediatrics and a diplomate of the American Board of Pediatrics who treated more than 10,000 children. As a member of the Harvard Medical School faculty, she was a cofounder of the Armenian American Medical Association and served as advisor to the Armenian Health Alliance and as coordinator for Medical Outreach after the 1988 earthquake in Armenia. She received the Arlington Chamber of Commerce Award in 1990 for service to the town and the Humanitarian Award from the Boston University School of Medicine in 1992. She is survived by her brother, her nephew, two nieces, a grandniece, and two grandnephews.

1943 • **Robert C. Rainie** of Concord, New Hampshire, on October 8, 2012, at the age of 92.

A fellow of the American College of Physicians, he was president of the New Hampshire Medical Society, the New Hampshire Diabetes Association, and the New Hampshire Heart Association. He also served as medical director of Havenwood, a diplomat of the American Board of Internal Medicine, and chief medical consultant for the state of New Hampshire Disability Determination Services-VR. He received numerous awards over the years from medical, musical, and philanthropic organizations, including the A. H. Robins Community Service Award from the New Hampshire Medical Society in 1987. He was a US Army veteran of World War II and also served in the Korean War with the Air Force. He is survived by his wife of 68 years, Dora (Dode) Merino, three children, a grandson, three step-grandchildren, and six step-great-grandchildren.

1952 • **Arnold L. Abrams** of Lexington, Massachusetts, on December 27, 2012, at the age of 85. A psychiatrist, he spent more than 50 years in public service working for the Commonwealth of Massachusetts as a regional administrator and assistant superintendent of the Department of Mental Health. He practiced at the University of Massachusetts Worcester, Westborough State Hospital, Brandeis University, and privately. He also taught at Tufts University School of Medicine and the University of Massachusetts Medical School. He served in the US Navy during WWII. He is survived by his wife of 59 years, Fern Shader Abrams, three children, and 10 grandchildren.

James O. S. Murray Jr. of Kingston, North Carolina, on November 1, 2012, at the age of 86. A retired surgeon, he served as chief health officer of Imperial County, California. He was chief of staff at Imperial County Hospital and El Centro Community Hospital and chief of surgery at El Centro Community Hospital. He is survived by two sons, two daughters, four grandchildren, and two great-grandchildren.

1954 • **Raphael B. Reider** of San Francisco, California, on December 30, at the age of 87. A cardiologist, he established a private practice in San Francisco and was chief of City Physician Services for the City and County of San Francisco from 1960 to 1976 and district medical consultant for the State Department of Rehabilitation from 1965 to 2000. He retired from medicine in 2000. He is survived by his wife, Freda, three sons, and five grandchildren.

1956 • **Sumner Berkovich** of Cumberland, Maine, on January 6, 2013, at the age of 85. A noted medical researcher and pediatrician, he served as clinical associate professor of pediatrics for Tufts University Medical School and the University of Vermont Medical School. He was a National Science Foundation fellow in Research Division of Infectious Diseases, Children's Hospital Medical Center in Boston, and research fellow in medicine at Harvard Medical School. He had a pediatric practice in Portland, Maine. He served in the US Army as a radio intercept operator. He is survived by his wife of 61 years, Barbara, and three daughters.

1957 • **Arthur J. Kavanagh Jr.** of Salem, Massachusetts, on December 8, 2012, at the age of 84.

An obstetrician and gynecologic surgeon, he joined the US Navy, interned at Chelsea Naval Hospital,

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and served two years at the Public Health Service in Norfolk, Virginia. He practiced at Salem Hospital, and the former J.B. Thomas Hospital (Peabody), Lynn Hospital, and Mary A. Alley Hospital in Marblehead. He was a Fellow of the American College of Surgeons and a clinical instructor at Tufts University School of Medicine. He had a master's in science in bacteriology from the University of Massachusetts and a master's of public health in health education from Harvard School of Public Health. In addition to his wife of 62 years, Theresa (Murphy) Kavanagh, he is survived by five children and nine grandchildren.

Marvin E. Neipris of Chelsea, Massachusetts, on October 22, 2011, at the age of 78. A surgeon, he served as a clinical instructor of surgery at BUSM and senior staff member and trustee at Malden Hospital in Malden, Massachusetts, and was medical director of quality assurance. He was a captain in the US Army from 1959 to 1961. He is survived by his wife, Jean (Dinerstein-Mendall) Neipris, three daughters, four stepchildren, and six grandchildren.

1958 • Richard D. Zonis of Paradise Valley, Arizona, on September 4, 2012, at the age of 79. A fellow of the American Academy of Otolaryngology, Head and Neck Surgery (HNS), he was in private practice in Scottsdale, Arizona, and an active member of the American Medical Association. He served on the Forum for Medical Affairs, including a term as president, and the Arizona Medical Board, including terms as chairman and chief medical consultant, and was chairman of the Maricopa County Medical Society. He served as vice president of the Maricopa Foundation for Medical Care and secretary and president of the Arizona Society of Otolaryngology HNS, and chief of staff at Scottsdale Memorial Hospital. He is survived by his wife of 56 years, Bunny, two daughters, and four grandchildren.

1959 • Frank C. Gazzaniga of Granite Bay, California, on March 21, 2012, at the age of 83. A specialist in internal medicine, he practiced in both Boston and West Virginia before joining Kaiser Permanente in Sacramento, California. He served as a US Army MP in Korea prior to attending medical school. He is survived by his wife of more than 52 years, Florence I. Gazzaniga.

1960 • Richard R. Smith of Hingham, Massachusetts, on April 13, 2012, at the age of 78. Along with two other physicians, he formed one of the largest OB-GYN practices on the South Shore, now known as South Shore Women's Health, which was one of the first to incorporate midwifery as an alternative concept in women's health care. He is survived by four sons, a daughter, and seven grandchildren.

1961 • Joseph A. Baron Jr. of Stuart, Florida, on May 2, 2012. A urologist, he had a practice in Framingham, Massachusetts. As president of the medical staff at Metrowest Medical Center, he also served on the Board of Trustees and was a member of the Boston Surgical Society and a fellow of the American College of Surgeons. He served in the US Marine Corps during the Korean War and was awarded a Purple Heart, The Presidential Citation, the Korean War Medal & Ribbon, and the United Nations and National Defense Citation and ribbon. He was preceded in death by his wife, Mary (Shea) Baron.

1963 • Allan R. MacLeod of St. Augustine, Florida, on June 19, 2012, at the age of 86. He practiced in Manchester, Massachusetts, from 1965 to 1987, after which he relocated to St. Augustine. He was a member of the American Medical Association. He is survived by his wife, Dorothy, two sons, a daughter, six grandchildren, and six great-grandchildren.

1966 • John J. Barrett of Goshen, Connecticut, on December 23, 2011, at the age of 74. An anesthesiologist at Charlotte Hungerford Hospital, he volunteered with humanitarian medical relief groups in Haiti and India and was an active member of the Winsted Area Peace Action Group. He served in the medical corps of the US Air Force in Nakon Phanom, Thailand. He is survived by his wife of 32 years, Cynthia Martin Barrett, two daughters, a son, and three grandchildren.

1975 • Joseph E. Paris of Marietta, Georgia, on September 6, 2012, at the age of 71. An internist, he served as medical director of the Georgia Department of Corrections. At the time of his death, he was working part time at Clayton and Douglas County jails in the HIV and Infectious Disease Clinic and at the DeKalb County Public Health Department HIV Clinic. A founding member and president of the Society of Correctional Physicians, he also served as president of the Florida Chapter of the American Correctional Health Services Administration, as member of the executive committee on Correctional Health Care, and chair of the policy and standards committee for the National Commission on Correctional Health Care. Having served as chairman of the outpatient department at Reception and Medical Center in Lake Butler, Florida, he was the medical executive director at Union Correction Institute and medical director at North Florida Reception and Medical Center. He is survived by this wife, Mary, three daughters, a son, and three grandchildren.

1984 • Kathleen Bennett of Weymouth, Massachusetts, on November 23, 2012, at the age of 56. (See Faculty News.)

1991 • Michael Macari of Bronxville, New York, on July 27, 2012, at the age of 47. A radiologist, he was a professor of radiology and surgery at the New York University Langone Medical Center. He served as section chief of abdominal imaging and vice chair of operations and was an active member of over a dozen committees focusing on admissions, quality assurance, and more.

A prolific researcher, Macari focused on imaging studies of the colon, small bowel, and pancreas, along with creating new techniques to lower radiation dose in patients undergoing various abdominal procedures. He helped to develop and evaluate tools and techniques to improve patient acceptance of polyp detection with computed tomography (CT) colonography and was actively involved in developing applications of dual energy multidetector CT in the abdomen. He was an active member of several radiology professional organizations and served on the editorial boards of five peer-reviewed journals, including *Radiology*. A well-known national and international lecturer, he devoted a significant amount of time to teaching and mentoring medical students and residents. He is survived by his wife, Kimberley (Terry), and a son. ■

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Calendar

2013–2014

MAY 17	**GMS/MAMS Commencement** George Sherman Union • Friday, May 17, 2013
MAY 18	**BUSM Commencement** Agganis Arena • Saturday, May 18, 2013
MAY 19	**All-University Commencement** Nickerson Field • Sunday, May 19, 2013
JUNE 3	**Boston University Reception featuring BUSM Dean Karen Antman, MD, Chicago, IL** Monday, June 3, 2013
JUNE 10	**Alumni Reception, Washington, DC** Hosted by Dr. and Mrs. Joseph Fastow '70 • Monday, June 10, 2013
JUNE 12	**Joel and Barbara Alpert Professor of Pediatrics Installation** Hiebert Lounge • Wednesday, June 12, 2013
JUNE 18	**Alumni Reception, New York, NY** Hosted by Dr. and Mrs. Simon Parisier '61 • Tuesday, June 18, 2013
JUNE 19	**Alumni Reception, Long Island, NY** Hosted by Dr. and Mrs. Guy Mintz '84 • Wednesday, June 19, 2013
JULY 27	**BUSM Reception, Los Angeles, CA** Hosted by Dr. and Mrs. John Cohen BUSM (Parents) '16 Saturday, July 27, 2013
AUG. 5	**White Coat Ceremony** Talbot Green • Monday, August 5, 2013
SEPT. 11	**Young Alumni/Future Leaders** Taj Boston Hotel • Wednesday, September 11, 2013
OCT.	**BUSM Department of Surgery Reception at the American College of Surgeons 99th Clinical Congress, Washington, DC** October 2013
OCT. 24	**Annual Scholarship Donor Dinner with Dean's Advisory Board Members** • Thursday, October 24, 2013
OCT. 25	**Dean's Advisory Board Meeting** Friday, October 25, 2013
OCT. 26	**Dean's Club Dinner** Taj Boston Hotel • Saturday, October 26, 2013

Boston University School of Medicine

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2013 Winner of the BU Metcalf Cup and Prize for Excellence in Teaching

Deborah Vaughan, PhD

BUSM professor of anatomy and neurobiology Dr. Deborah Vaughan has been selected by the Metcalf Committee to receive the University's highest teaching honor, the Metcalf Cup and Prize for Excellence in Teaching. The award will be presented at the 2013 All-University Commencement on May 19.

The Metcalf Cup and $10,000 Prize for Excellence in Teaching was established in 1973 by a gift from the late Dr. Arthur G. B. Metcalf to create "a systematic procedure for the review of the quality of teaching at Boston University and the identification and advancement of those members of the faculty who excel as teachers."

Read about Dr. Vaughan on page 6.

VERNON DOUCETTE