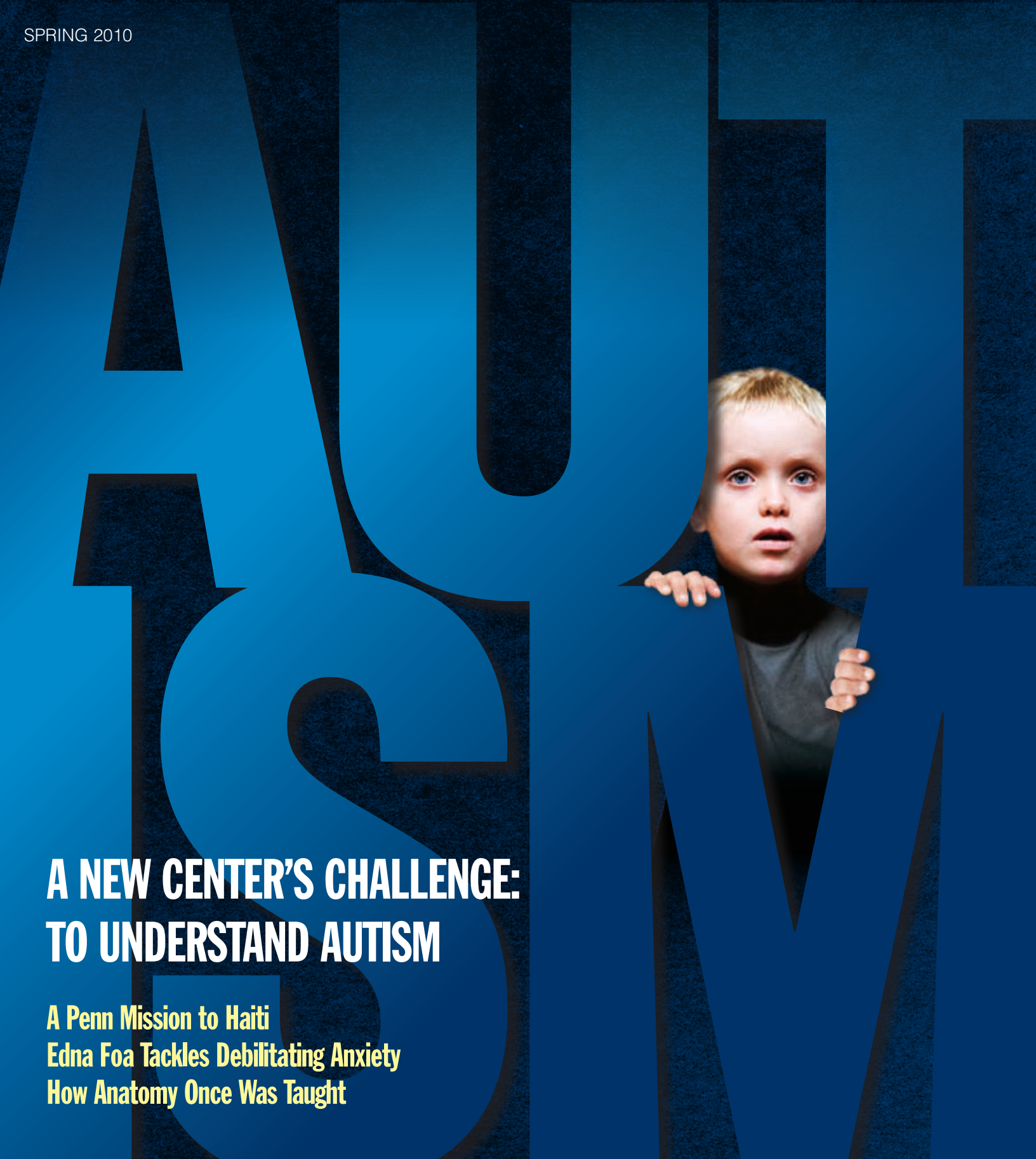


PENN Medicine

SPRING 2010



A NEW CENTER'S CHALLENGE: TO UNDERSTAND AUTISM

**A Penn Mission to Haiti
Edna Foa Tackles Debilitating Anxiety
How Anatomy Once Was Taught**

Innovation vs. The Status Quo

Innovation has been medicine's best friend. The status quo, at various times embodied by medical and societal traditions, the Food and Drug Administration, and other slow-moving shapers of opinion and policy, is most often the enemy. Or at least the obstacle that must be overcome.

That, in simplified form, was the message of David Brailer, M.D., G.M.E. '91, Ph.D. '92, head of Health Evolution Partners, an investment company. Brailer was the first national coordinator of health-care information, appointed by President George W. Bush in 2004. At Penn, in addition to taking his residency, Brailer was a fellow in general medicine and a Robert Wood Johnson Clinical Fellow. He wrote his dissertation on how hospitals could substantially lower costs and error rates, earning his Ph.D. degree from the Wharton School in 1992. Until 2003, Brailer was chairman and CEO of CareScience, a leader in developing electronic information systems to improve care. As Gail Morrison, M.D. '71, G.M.E. '76, vice dean for education, put it while introducing Brailer at a recent campus event, he has been "driving positive change in health care" for a long time.

The occasion was a lecture in entrepreneurship endowed by Mitchell Blutt, M.D. '82, M.B.A. '87, a trustee of Penn Medicine. Brailer's theme was "Innovation and the Failure of Health Reform." Before focusing on the topic, Brailer acknowledged Blutt, who was in attendance, as a trailblazing entrepreneur in combining health and business. Brailer also acknowledged the location, Medical Alumni Hall in the Maloney Building. "When I came into this room, I had shudders down my spine." He recalled being in the crowded hall during his medical train-

ing, when Larry Early, M.D., then chair of the Department of Medicine, threw a question at him about renal failure. "Those memories do *not* go away."

Brailer began by emphasizing the remarkable increase in life expectancy over the last 100 years. In 1900, the average lifespan was 47 years; in 1967, it was 66 ½ years. Recently, the Centers for Disease Control and Prevention announced that a child born in 2000 had a greater than 50 percent chance of living beyond 100. In addition, Brailer noted, we live today "in a safer and saner society." The primary reason, he argued, is innovation in health care. Brailer cited the discovery and development of penicillin, insulin, dialysis, ventilators, and CT scans, as well as changes in practice such as neonatal screening, early cancer detection, evidence-based medicine, and informed consent. "There is not another industry . . . that has an output that actually changes the human equation."

A Delicate Equilibrium

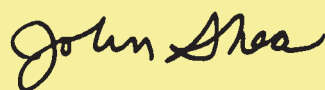
But for Brailer, there are still important innovations to come. "In my opinion, the great life-saver of the 21st century will be the HIT revolution." At present, Brailer continued, "we are living through both the pain and the promise" of health information technology. He expects the centerpiece of that revolution to be the Nationwide Health Information Network, which will be able to consolidate all the data that are known about a patient, in a secure fashion, but accessible for use in clinical decisions.

Often, these advances and innovations – whether in health or art or

other fields – are achieved through the efforts of people who persist through indifference, ridicule, or even disdain. Some innovators have an insight very early on (Brailer's example from the world of art was Picasso, a "conceptual innovator"); others reach their peak after much trial and error (Cezanne), exemplifying "durability." It takes what Brailer called "a delicate equilibrium" for innovators to survive and be productive, especially when they are attempting to change a scientific paradigm. "Old ideas," he said, "push back." In Brailer's view, we must create a culture in which innovators "have some remote chance of surviving, but not too much, because they'll get lazy."

Bringing his talk around to health-care reform, Brailer argued that Americans want to protect health care and want it to be fair, but are concerned that "inept policy will kill this innovation machine." He noted that the American Medical Association unloaded its stock in tobacco companies in the 1980s – but the Federal government continued to subsidize tobacco production until 2004, in effect cutting the price of a pack of cigarettes in half. "It's just mind-boggling!" Policy, he claimed is slow – "inertial." "Policy protects the status quo, even when it's sometimes a pretty bad status quo." It took a long time for life-saving devices like seatbelts to become policy. Similarly, the F.D.A. kept insulin pumps off the market for seven years.

As Brailer sees it, Congress cannot take action on health reform, cannot take bold steps, while the American public is divided. In such an environment, "our culture of innovation is at real risk." In particular, he saw a risk for the biotech industry. But he ended his talk by expressing the hope that some people in the room would be the next conceptual innovators or the next dogged experimentalists – two different but essential kinds of entrepreneurs. ■





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THE NEW ARSENAL

By Martha Ledger

Despite a sharp rise in media attention in recent years, there is no cure yet for autism – or even a significant understanding of its causes. The Center for Autism Research, which brings together experts from Penn Medicine and The Children’s Hospital of Philadelphia, integrates a variety of investigative and clinical specialties to better understand and treat a complex neurological disorder.

A MISSION TO HAITI

By Sally Sapega

After the earthquake struck Haiti in January, a nine-member team from Penn flew to the ravaged nation to provide urgent care. For two weeks, working without the modern technology they were used to, the doctors and nurses were continually impressed by the people they treated. “How are they able to smile and stay gracious under such strain?”

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Looking Back – and Ahead

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A CALMING INFLUENCE *By Thomas W. Durso*

Edna Foa, Ph.D., a professor of clinical psychology in Penn’s Department of Psychiatry, is hailed as a pioneer in the research and treatment of severe anxiety disorders. Prolonged exposure therapy, which Foa developed, leads patients to acknowledge the trauma they have tried so hard to avoid. The technique helps them to “disconfirm” their exaggerated fears.

HOW ANATOMY WAS TAUGHT *By John Shea*

For the first time, Pennsylvania Hospital is exhibiting, as a group, 16 pastel drawings by the 18th-century medical illustrator Jan van Rymsdyk. The drawings were sent to Benjamin Franklin in 1762 for use in teaching anatomy to aspiring practitioners of “Physic and Surgery.”

PROTON THERAPY: A POWERFUL NEW TOOL FOR TREATING CANCER

Newly opened on the medical campus, the Roberts Proton Therapy Center is said to be the largest and most advanced facility for proton therapy in the world. Its first patients were treated for prostate cancer; since then, the medical staff has treated those with brain tumors and other cancers. The center combines power and precision in treatment.

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Setting the Transition in Motion

On March 17, Arthur H. Rubenstein, M.B.,B.Ch., announced that he would step down from his positions as dean of the University of Pennsylvania School of Medicine and executive vice president of the University of Pennsylvania for the Health System when his second five-year term ends on June 30, 2011. Writing to the members of the board of Penn Medicine, Amy Gutmann, Ph.D., the University's president, noted that the transition "will mark the conclusion of ten enormously successful and productive years that have immeasurably strengthened Penn Medicine and thus the University." She added that the dean's announcement will allow the University "to plan for his succession in the wisest possible way."

Gutmann elaborated on the high standards for the next dean/executive vice president: he or she "must be academically eminent, administratively experienced, and clinically knowledgeable, with an unwavering ethical compass, the highest aspirations for the future of Penn Medicine, and a demonstrated commitment and ability to encourage faculty and staff collaboration and to collaborate with the University's deans and senior leadership."

A significant step in the planning was establishing a committee to advise the president. It will be chaired by Vincent Price, Ph.D., provost of the University and the Steven H. Chaffee Professor of Communication and Political Science. In addition to several members of the medical faculty, the committee includes two deans of other Penn schools, administrators, and students. The consulting firm of Isaacson, Miller will assist the committee.

The committee welcomes – and will keep in the strictest confidence – nominations and suggestions from all members of the University community. For fullest consideration, communications should be received, preferably in elec-

tronic form, no later than May 31, 2010, and may be addressed to the committee's staff, Stephen Steinberg (sps@upenn.edu) or Adam Michaels (adampm@upenn.edu); or, preferably, to Mr. John Isaacson, managing director of Isaacson, Miller. He can be reached at 1875 Connecticut Avenue, N.W., Suite 710, Washington, DC 20009, or at 3978@imsearch.com.

(For more, see "The Last Word," inside back cover.)

A Rise in the Ranks

The University of Pennsylvania School of Medicine is ranked #2 among the nation's research-oriented medical schools, according to the annual survey by *U.S. News & World Report*. That is one position higher than last year's ranking. It is also the 13th straight year that Penn's School has been ranked in the nation's top five in that category. According to the survey of the nation's 126 fully accredited medical schools, Harvard University was rated first and Johns Hopkins University third.

Penn ranked among the nation's top five medical schools in four areas of specialty training, including Drug/Alcohol Abuse (#4), Internal Medicine (#4), Pediatrics (#2), and Women's Health (#3). In addition, Penn's Ph.D. specialty program in immunology and infectious disease was ranked 7th. The School of Medicine also ranked #7 among medical schools focused on primary care.

The criteria to determine the top medical schools for research and primary care included quality assessment, research activity, faculty resources, and student selectivity.

A Collaboration Against Alzheimer's Disease

In March, the University of Pennsylvania and AstraZeneca, the global pharmaceutical company, announced a new



Photo by Daniel Burke

Thumbs Up for Match Day

Thursday, March 18, was fraught with significance for 145 members of the Class of 2010. It was Match Day, when they would find out at last where they would be taking their residencies. As it turned out, about 45 percent of Penn's graduating students will be doing their initial training in primary care, reflecting a national trend in which a higher percentage of students chose such areas as internal medicine, pediatrics, and family medicine.

One of the Penn students who chose pediatrics is Joseph Picoraro. As he reported for the Department of Communications, "Match Day was as billed: full of anticipation, anxiety, exhilara-

collaborative research agreement. The goal is to bridge the transition from drug discovery to development. At first, the collaboration will focus on generating new drug candidates for treating Alzheimer's disease. In AD, the formation of amyloid plaques and neurofibrillary tangles is thought to contribute to the destruction of nerve cells in the brain. The scientists will focus on the protein tau, the crucial component of tangles in AD.

Penn Medicine's Center for Neurodegenerative Disease Research will provide rapid



Photo by Daniel Burke

tion, elation, disappointment, and of course plenty of tears of both varieties. . . . When my name was called, I experienced that sudden lack of coordination that occasionally descends when one is about to undergo a transformational experience.” But the news was good: He matched to the Children’s Hospital of Philadelphia, his top choice.

Also matching at Children’s Hospital in pediatrics was Madeline Renny, seen at left with her fiancé, Adam Lessler, who matched in emergency medicine at HUP. They had participated in the Couples Match. Jane Nathanson, being congratulated by her parents, also matched at Children’s Hospital.

access to unique state-of-the-art drug-compound screening assays and knowledge of the biology of tau, which was first characterized for its role in dementias by Penn Medicine’s Virginia M.-Y. Lee, Ph.D., M.B.A., director of the center, and John Trojanowski, M.D., Ph.D., director of the Institute on Aging. AstraZeneca scientists will supply basic research with access to the technologies and skills required to discover and develop new drug molecules.

The agreement also contains potential royalties and milestone payments if the

collaboration leads to clinical development and eventual world-wide marketing of therapies for targeting tau in Alzheimer’s disease. AstraZeneca has exclusive access to drug-compound intellectual property and study data for any commercial purposes from research performed under this agreement.

Lee, Trojanowski, and Kurt Brunden, Ph.D., director of drug discovery, will lead the Center for Neurodegenerative Disease Research component.

Concussions: Not So Mild After All

At the 2010 American Association for the Advancement of Science meeting in San Diego in February, Douglas Smith, M.D., presented findings on the molecular mechanism at play in mild traumatic brain injury (mTBI), commonly known as concussions. Smith is director of the Center for Brain Injury and Repair and the Robert A. Groff Professor of Teaching and Research in Neurosurgery.

Although mTBI affects more than 1 million people each year in the United States, it is generally ignored as a major health issue. As Smith and other researchers are discovering, however, this “mild” form of injury induces neurological and cognitive problems that persist in many of these patients.



Douglas Smith, M.D.

Little is known about how mTBI affects nerve cells and connections in the brain – or about clinical outcomes after such injuries. Using advanced neuroimaging techniques, Smith and his Penn Medicine colleagues have begun to amass data from human and animal studies on mTBI at 2-4 days after injury. They have found distinct changes throughout the white matter in the brain. In addition, they identified protein markers of brain pathology after mTBI in the blood of mTBI patients.

Smith and his team propose a potential molecular mechanism to explain their findings. Specifically, they found that the stretching and disconnecting of nerve-cell axons after mTBI induces problems in the sodium channels found on the surface of neurons.

“This is not inconsequential,” says Smith. “Indeed, the observation that brain pathology can be detected after a concussion calls for much more extensive efforts to prevent, diagnose, and treat mild traumatic brain injury.”

Smith was a frequent source of information for Philadelphia reporters when Brian Westbrook, the leading running back for the Philadelphia Eagles, suffered two concussions during the last N.F.L. season. Smith said that he didn’t think a player who had suffered a concussion should continue to play football. As he told *The Philadelphia Inquirer*, “This isn’t a bad knee or a bad hip. This is huge. This is who you are.”

– Karen Kreeger

Honors and Awards

P. J. Brennan, M.D., senior vice president and chief medical officer for Penn’s Health System, received the Lifetime Achievement Award from the Centers for Disease Control and Prevention. He was recognized for his “selfless contributions toward the elimination of healthcare-asso-

ciated infections and leadership in guiding national health policy.” Brennan is one of only 14 experts in infectious diseases who advise the U.S. Department of Health and Human Services and the CDC.

Brennan also received the Commitment of Excellence Award from the University of Pennsylvania, given by the University Life Division for outstanding commitment and effort in the face of unusual and extremely challenging situations at Penn. In Brennan’s case, he was recognized for “providing extraordinary, unprecedented public health service to the community,” in particular during a pandemic flu outbreak and a meningitis outbreak.

Trevor M. Penning, Ph.D., professor of pharmacology, biochemistry and biophysics, and obstetrics and gynecology, has received the 2010 N.P.A. Distinguished Service Award. Presented by the National Postdoctoral Association, the award recognizes Penning’s “profound



and sustained contribution to improving the postdoctoral training experience.” Penning, director of the Center of Excellence in Environmental Toxicology, was founding director of Penn’s Office of Biomedical Postdoctoral Programs, which has been a model for programs elsewhere. He has also served on the N.P.A.’s advisory board.



Garry Scheib, executive director of the Hospital of the University of Pennsylvania and COO of the Health System, has received the Grassroots Champion Award from the American Hospital Association and the Hospital & Healthsystem Association of Pennsylvania. The award recognizes leaders who most effectively educate elected officials about how major issues affect their hospitals’ vital role in the community and who do an exemplary job in broadening the base of community support for their hospitals. The award is presented to only one individual from each state.

Judy A. Shea, Ph.D., professor of medicine, received the 2009 FOCUS Award for the Advancement of Women in Medicine. She was honored for her extraordinary advocacy for women and junior faculty at Penn Medicine. Shea



is associate dean for medical education research and director of the Office of Evaluation and Assessment. She works with faculty and fellows to design and evaluate research projects and directs the evaluation of the medical school’s curriculum and teaching.

Two Honors for Communications

The Department of Communications received two honors in the annual Awards of Excellence program of the Association of American Medical Colleges. The awards “acknowledge the most creative and effective approaches used to promote academic medicine.” **Holly Auer, M.B.E.**, senior medical communications officer, received the Award of Excellence for special projects, programs, or campaigns in the category of public relations. The challenge was to educate people about how to act when they witness a cardiac arrest and how to advocate for family members to get the best medical care if they suffer an arrest. Press placements included a documentary on the National Geographic Channel; appearance in a CNN documentary; and cover stories in *Popular Science* and *Forbes*.

Lisa J. Bain, M.A., received an Honorable Mention in the Robert G. Fenley Writing Category for solicited articles. Bain, a free-lance writer, wrote “A Difficult Path to Clarity” for *Penn Medicine* (Summer 2008). In it, she looked at a clinical study that compared two drugs for treating age-related macular degeneration – and explored why the study faced obstructions from the pharmaceutical industry.

Fellows Three

Three faculty members in Penn’s School of Medicine have been elected Fellows of the American Association for

the Advancement of Science. They were recognized for their contributions to science and technology at the Fellows Forum in February. The new Fellows received a certificate and a blue and gold rosette as a symbol of their distinguished accomplishments. The School of Medicine recipients are:

- * Norman Hecht, Ph.D., the William Shippen Jr. Professor of Human Reproduction in the Department of Obstetrics and Gynecology.
- * Erle S. Robertson, Ph.D., professor of microbiology and director of the tumor virology program in the Abramson Cancer Center.
- * Susan Ross, Ph.D., professor of microbiology and director of Biomedical Graduate Studies.

Transitions

Armando Chardiet, who joined Penn Medicine in 2003 as chief advancement officer, has accepted a new position as chair of institutional relations and development at the Cleveland Clinic.

Kate Griffo, currently the deputy chief advancement officer, will succeed him, effective June 1, 2010.



Chardiet and his team have doubled annual fundraising totals and, together with the faculty, have so far raised nearly \$800 million of a \$1 billion goal as part of the University's "Making History Campaign." Under Chardiet, Penn Medicine has significantly increased the level of alumni giving.

Griffo, who joined Penn in 1993, has held several important development roles. She has worked directly with the Abramson Cancer Center, where she led internal efforts to support the Abramson's \$100 million naming gift.

Jonathan A. Raper, Ph.D., is serving as interim chair of the Department of Neuroscience. A member of the department since 1992, he served as interim chair once before. Raper's chief research interest is developmental neurobiology, especially axon guidance. He serves as an ad hoc reviewer for the National Institutes of Health and has received both the Scholar Award and the Investigator Award from the McKnight Foundation.

Raper succeeds **Irwin B. Levitan, Ph.D.**, who became chair of Penn's department in 1999. Levitan has joined Jefferson Medical College of Thomas Jefferson University as chair of its new Department of Neuroscience and director of the Farber Institute for Neurosciences.

Patricia G. Sullivan, Ph.D., formerly associate vice president of clinical development for the Health System, was named vice president of quality and patient safety. In her new role, she is responsible for efforts to reduce clinical risks – a primary UPHS initiative. She will work with the chief medical officers and chief nursing officers of Penn's hospitals to integrate the work of the clinical unit-based leadership teams with such essential services as patient safety, outcomes, and regulatory affairs. The teams, which consist of a physician, nurse, and

Find Out More About Penn Medicine

Every day, the nation's news media cover Penn Medicine's achievements and report on the faculty's and staff's expert commentary on current topics in health and medicine. Through "Penn Medicine in the News," a daily or weekly e-mail compiled by the Department of Communications, you can receive a quick and informative overview of these newsworthy media placements. It also provides a summary of the day's medical and health-care news compiled from the nation's leading media. Another option is *Benchmarks*, a periodic e-newsletter highlighting research in basic science at Penn Medicine that has been featured in the news. Sign up for both e-newsletters at <http://pennmedicine.org/in-the-news>.



quality coordinator, work to improve coordination of care through interdisciplinary rounding and reducing variations in practice. Sullivan is completing her term as president of the American Heart Association of Southeastern Pennsylvania.

Letters

Health Care Reform and Medical Liability

I write to comment on the article by Ralph W. Muller in the recent issue of *Penn Medicine* [Winter 2009/2010].

There is no mention of tort reform, and I would submit there can be no health-care reform without significant tort reform. . . . Mr. Muller quotes the health-care system in the United Kingdom and Germany and Canada. The article implies that these systems are successful when, in fact, particularly in the United Kingdom and Canada, the health-care systems are a total catastrophe. There is absolutely nothing to recommend them, except that they are politically desirable, because by and large the populations of these countries are in good health, and it is only when they need significant health care that the systems simply fall apart.

But there is one thing that is certain, and that is that in all these countries there is no medical liability problem whatsoever. Suing the doctor or the hospital is just not done. . . .

Re: the arguments disputing the conclusions of the Dartmouth health plan. It would have been nice to mention the tremendous work of Dr. Richard Cooper that has really not received the recognition and welcome from the Obama administration that the Dartmouth plan has. As a matter of fact, if the Dartmouth plan is funded by the over \$18 billion that is awarded the Institute of Medicine . . . it will achieve the exact opposite of what the Obama administration wishes to accomplish, and that is better care for the poor and disadvantaged minorities. . . .

Once again, the University of Pennsylvania school of medicine is providing leadership and great research for the entire medical community. This makes all graduates very proud.

Louis Keeler, M.D. '58

The editor replies:

Dr. Cooper was featured in that issue's Editor's Note, speaking out against the push to penalize urban hospitals that spend more on patients, especially Medicare patients.

Advocating for Primary-Care Physicians

The Editor's Note, "Some Strong Words about Health Care Reform," in the last issue of *Penn Medicine* certainly invites comment. I am terribly disappointed in the disparaging and pejorative manner in which those of us who have chosen a career in primary-care medicine were treated by faculty of my alma mater. . . . One cannot inform a meaningful discussion about reforming health care, with an emphasis on primary-care medicine, when no one actively practicing primary care, as *their principal activity*, is a seated panelist. . . .

In the primary-care setting, illness care and wellness care are inextricably linked. To propagate this artificial separation only further fragments health-care delivery in a system already acknowledged to often have no one at the helm. . . . Patients' health-care needs, preventative or otherwise, should not be compartmentalized. . . . A primary-care health-care model needs *both* primary-care physicians *and* mid-level providers; advanced practice registered nurses and physician assistants working side by side to meet the nation's primary health-care needs. Finally, to quote Dr. Cooper, "the more you encourage physicians and deter them from becoming qualified specialists, the more you harm the future health of this country." With all due respect to Dr. Cooper, specialty care, which is clearly the principal mission at Penn, includes the specialty of Family Medicine. The American Board of Family Medicine is a member of the American Board of Medical Specialties. . . .

The commercial health-care insurance industry is largely responsible for develop-

ing the preventative/wellness construct. Additionally, HEDIS metrics, although important performance measures of success in delivering preventative, early detection, and chronic disease care, are nonetheless used by the managed-care industry as tools for self-promotion and to grow market share. The jury is still out on the latest and rapidly growing health-care payment model of high-deductible health plans and health savings accounts. This model does indeed bring patients in to the clinician for a preventative/wellness exam that is 100% covered with no co-pay or applicable deductible. However, the minute an issue is identified and needs to be addressed, that "diagnosis" becomes the patient's financial responsibility. This generates confusion and conflict within the clinician/patient relationship. Excepting the Medicare HMO model as an attempt to manage care for the elderly or disabled, traditional Medicare is a reimbursement free-for-all and commercial health insurance is a highly competitive industry where the goal is maintenance of market share.

Dr. Arthur Caplan comments, "The only response I've seen from primary-care doctors right now to current problems is the creation of boutique and concierge medical practices – an innovation which cuts back on access to primary care and forces you to pay a bounty" to receive it. I personally agree 100% with his assessment of boutique and concierge practices. These practices are contrary to our obligation to social justice and expanding access to primary care. But these are minuscule in number. . . dwarfed by the true response of the primary-care clinician community to improve the delivery of primary care. To cite just a few examples:

- * The Primary Care Information Project (PCIP) of N.Y.C. seeks to improve population health through health information technology and data exchange. The program supports the adoption and use of electronic health records among

primary-care providers in New York City's underserved communities.

* Forty-six percent of U.S. primary-care physicians use electronic health records, according to a Commonwealth Fund survey. . . .

I am Division Chair of Family Medicine for the largest primary-care group in Connecticut, ProHealth Physicians Inc. We serve 350,000 residents in over 75 locations providing adult, pediatric, and ancillary services. We have invested over \$12 million to deploy a fully functional electronic health record in all sites. Our goal is to lead the way for the improved delivery of primary-care health services and to foster coordinated care with our specialty colleagues and affiliated hospitals through electronic data interchange.

Dr. Mary Naylor expressed our best hope for the future of health-care delivery; a team-based approach involving communication and collaboration. The "team" is the patient, provider, and institution. I hope that we can reconfigure our health-care priorities to emphasize the importance of the clinician-patient therapeutic relationship, evidence-based use of our resources for intervention, and accountability for our health-care decisions. In this manner we will successfully make the best value decisions with and for our patients.

H. Andrew Selinger, M.D. '83.

Dr. Cooper replies:

Primary Care, Workforce Realities, and the Social Imperative

Dr. Selinger has described the critical nature of primary care and the complex role of generalist physicians in sustaining it. And, echoing thoughts that Fred Tauber and I expressed in *Academic Medicine* five years ago, he reminds us that physicians must be concerned not only with diagnosing and treating disease but with the social and psychological dimensions of their patients. Accepting all of this, my

comments at the recent School of Nursing symposium were intended to focus on the reality that there simply will be too few physicians to do it all. Tasks and roles historically associated with physicians will have to be distributed among generalists and specialists and between physicians and nonphysician clinicians. Wellness, prevention, and treatment need not be compartmentalized, but they will necessarily be provided by teams.

Given these realities, how should we deploy our future physician workforce? Should half of all physicians be primary-care physicians, as widely proposed?

Dr. Selinger provided insights in his description of ProHealth Physicians

“Tasks and roles historically associated with physicians will have to be distributed among generalists and specialists – and between physicians and nonphysician clinicians.”

Inc., his practice group. He and his 180 generalist colleagues care for 350,000 patients, one-tenth of Connecticut's population. In workforce parlance, that's 52 per 100,000. State-wide, the ratio is even higher – about 70/100,000. So how does ProHealth do it? One way is by including 50 NPs and PAs in their practice, which brings the ratio closer to Connecticut's average. And in Connecticut, NPs may diagnose, treat, and prescribe independently, so long as they maintain a collaborative relationship with a physician. The second way was by purchasing a modern information system, at a cost of \$65,000 per physician. Teamwork and information management have allowed ProHealth physicians to practice effi-

ciently and to meet the spectrum of their patients' biopsychosocial needs.

Can ProHealth be a model for the nation? If ProHealth were the norm, we would need about 200,000 generalists, fewer than the number currently practicing. As I said at our symposium, training more will simply worsen the already deepening shortages of specialists. But I raised a cautionary note. I said that modern medicine works best for people like those at the symposium – well educated and insured. What about the 15% in Connecticut who are on Medicaid and the 10% who are uninsured? Not so good. While most of ProHealth's physicians currently accept new patients, only half accept new Medicare patients and only one in five accepts new Medicaid patients. Yet it's Medicaid patients and their low-income neighbors whose needs are greatest, so great that they increase national health-care spending by about one-third.

So we have half a loaf. Dr. Selinger has shown us a better way to do primary care for ProHealth's spectrum of patients, using fewer generalists, more nonphysician clinicians, and modern information systems. But if we fail to train enough specialists, there will be too few even for them. And if our nation continues to put the poorest among us last, we will never bridle health-care spending.

Richard A. Cooper, M.D.
Professor of Medicine

Dr. Caplan replies:

Dr. Selinger and I would seem to agree about the rapid rise in boutique and concierge practice and its threat to equitable access to care. My point was merely to point out that should the growth continue at the same pace, it will create a moral problem.

Arthur L. Caplan, Ph.D.
The Emanuel & Robert Hart Director,
Center for Bioethics

The



These paintings and drawings are part of a gallery in the Center for Autism Research, featuring art by children along the autism spectrum. Clockwise from the bottom right: "Big Heart" by Lucas Hurford, 9 years old at the time; "I Fly," Lucas Hurford; "Under the Apricot Tree," Miles Williams, 7; and "Friend," Sam Di Andrea, 12.

New Arsenal

By Martha Ledger

Photographs by Tommy Leonardi

The Center for Autism Research integrates a variety of investigative and clinical specialties to better understand and treat a complex neurological disorder. Despite much media attention in recent years, scientists acknowledge that, at present, there is no cure for autism or even a significant understanding of its causes.

You meet the children before you meet the specialists. Not in person, but through 50 or so paintings — all nicely framed, each labeled with a child's name, age, and interests. They fill the walls of a long narrow gallery that opens into the Center for Autism Research. Each work of art is a channel of communication with a kid who finds it hard or even impossible to make verbal conversation. Some talk is cheery; some somber. In one painting, the message is a whirr of color; in another, the child speaks through meticulously executed imaginary creatures. Each statement is distinctly individual.

Autism itself, more precisely called autism spectrum disorder (ASD), takes hugely varied forms. Two-thirds of autistic people have some level of mental retardation, and “some people with autism have IQs of 160 and are going to Yale,” says Robert T. Schultz, Ph.D., professor of pediatrics at Penn Medicine. Two years ago, he left Yale to become the founding director of the center, located on Market Street near the Penn campus.

What autistic children have in common, explains Schultz, are “domains of impairment,” and an autistic child can have symptoms in some or all domains. The defining symptom, perhaps, is an inability for normal social interaction. “An extreme aloneness from practically the beginning of life” is how Leo Kanner, a Johns Hopkins University psychiatrist, first characterized the disorder, in 1943. Deficits in language and communication often bolster this isolation. Autistic children may also have unnaturally restricted interests — like memorizing train schedules or calculating what day of the week any date falls on. They often exhibit repetitive behaviors — like hand-flapping or head-banging.

Kanner's scholarly publication didn't cause much stir. Nor did a paper by Hans Asperger, who in Austria in 1944 described the high-functioning form of autism that now bears his name. It wasn't until the 1970s, when Josh Greenfeld began a trilogy of books about his son Noah and the family was interviewed

on *60 Minutes*, that autism really entered public consciousness.

Nowadays, everyone has heard of it. Karl Taro Greenfeld, Josh's son and the author of the 2009 memoir *Boy Alone*, a book about being Noah's sibling, described autism as “among the most financially successful and mediagenic diseases ever.”

The buzz is partly fueled by what appears to be an increase in the prevalence of ASD. Statistics from the Centers for Disease Control and Prevention illustrate a dramatic rise across the nation. The Centers estimate an average of one in every 91 children aged 3 to 17 is being diagnosed with ASD, up from one in every 150. (Pennsylvania recently issued the final report of its autism census project, which anticipates a sharp growth in the number of residents living with ASD. That growth will make necessary increased funding and policy changes. One of the authors of the report is Penn Medicine's David S. Mandell, Sc.D., whom we will meet later.)

Unfortunately, the lion's share of attention has had little to do with evidence-



Robert T. Schultz, Ph.D., is founding director of the Center for Autism Research.



Edward S. Brodtkin, M.D., uses mouse models to study social behavior and also works with people who have social learning disorders. Here he confers with Ashley Guthrie, in the Biological Basis of Behavior program.

based medicine. Some parents whose children developed normally at first but then regressed have claimed that vaccines or their mercury preservatives caused the disorder. Properly conducted studies — and many have been done — have shown no link between vaccines or mercury and autism. Quite the contrary, after mercury was removed from vaccines, the rates of autism in carefully monitored test areas actually increased. In a series of cases known as the Omnibus Autism Proceedings, judges appointed by the U.S. Court of Federal Claims reviewed a vast amount of published scientific material, heard testimony by experts in all relevant fields, and in February 2009 rejected the claim that vaccines or mercury had caused the plaintiffs' autism.

Resources and press have also been squandered on unproven treatments whose "successes" cannot be replicated. Among

these are chelation (the chemical removal of heavy metals from the body), special diets (adding megavitamins or eliminating wheat, barley, rye, and dairy products), and assisted communication (a technique in which a helper supports the autistic child's hand over an alphabet so that the child can spell out his or her thoughts).

At present, there is no cure for autism or even a significant understanding of its causes. Genetics are known to play a role, and scientists expect that multiple genes (most of which have not yet been identified) are involved. They also think environmental factors figure into the picture, and these, too, remain unidentified.

Schultz expects that the Center for Autism Research (CAR), a merger of multi-disciplinary investigative talent from the Children's Hospital of Philadelphia (CHOP) and Penn Medicine, will be a breakthrough enterprise. It certainly

won't fail for lack of his energy. When a staff meeting and then a run across campus to advocate for a researcher's promotion cuts into our interview time, he stays after work to talk, which he does at breakneck speed. His kid calls. His wife calls. He juggles all of us handily.

Schultz organized CAR quickly. Arriving in October 2007, he had the center formally inaugurated by April of 2008. "There were tremendous strengths here," Schultz says, naming experts in neurobiology, genetics and magnetoencephalography. "What was missing was a center of gravity for those strengths," he continues, and a means of integrating research and clinical resources.

An amalgam of 15 already well-funded researchers, plus post-docs, clinicians, and staff of 34, the center now has more than \$10 million in grants on its own. According to Schultz, who, as a former president of the International Society for Autism Research, is familiar with all the strong autism programs worldwide, "We're in the top three. We've got it all going on here."

An autism specialist at Yale agrees. The center "has emerged as one of the very best interdisciplinary programs in the country," says Matthew W. State, M.D., Ph.D., associate professor of genetics and co-director of the Program on Neurogenetics at Yale University School of Medicine. "I think it sets the bar now for interdisciplinary studies of children with autism." State, a former colleague of Schultz, adds, "We were absolutely devastated to lose Bob Schultz from Yale."

The center's newly funded proposals integrate everyone's studies, and Schultz has put in place yet another vital piece of the research puzzle. "Autism is so heterogeneous that to understand its causes, you have to have big samples," he says. He wants data on 2,000 children with the disorder, and the CAR model is designed around this research need. The

center will diagnose children for free, and the diagnostic data will feed into its research protocols.

“The real power,” Schultz says, “is in having the same kids you do neuropsychological testing on have the MRI, diffusion tensor imaging, magnetoencephalography, the genetic screen, and the behavioral interventions. Then you can ask, across these different kinds of measurements, what are the [points] of integration, how can we deepen our understanding of the causes and the course of autism, and how can we change that course?”

“CAR is the best possible place regionally for parents to get rigorous, state-of-the-art diagnoses for their children,” he asserts. Evaluations include IQ testing, language testing, various kinds of neuroimaging, and DNA screening. Parents are matched with specially trained psychologists or social workers who explain diagnoses and go out into the schools — where most treatment for children with autism takes place — to advocate for each child’s individual educational plan. Elsewhere, parents typically pay \$5,000 for a diagnosis that is much less complete and lacks the out-of-office services.

Diagnostic evaluations began in 2008, and Schultz hopes to get the center’s numbers up quickly. Meanwhile, for DNA samples, geneticists at CAR have used other data banks, specifically the Center for Applied Genomics at the Children’s Hospital, where CAR researcher Hakon Hakonarson, M.D., Ph.D., is director, and the Autism Genetic Resource Exchange (administered by Autism Speaks, the nation’s largest autism advocacy organization), where another CAR researcher, Maja Bucan, Ph.D., professor of genetics at Penn Medicine, is chair of the steering committee.

Last year saw the publication of three significant papers in autism genetics under the joint auspices of Hakonarson and geneticist Gerard D. Schellenberg, Ph.D.,

professor of pathology and laboratory medicine at Penn Medicine. The research behind these papers was selected by *Time* Magazine as one of the Top 10 medical breakthroughs of 2009.

Two of the three were published in *Nature* online (April 28, 2009). One

Recent findings related to synapses reinforce a commonly held theory that autism is a disorder of connectivity in the brain. Brain scans show “an absence of synchronized activity across systems that should be synchronized.”

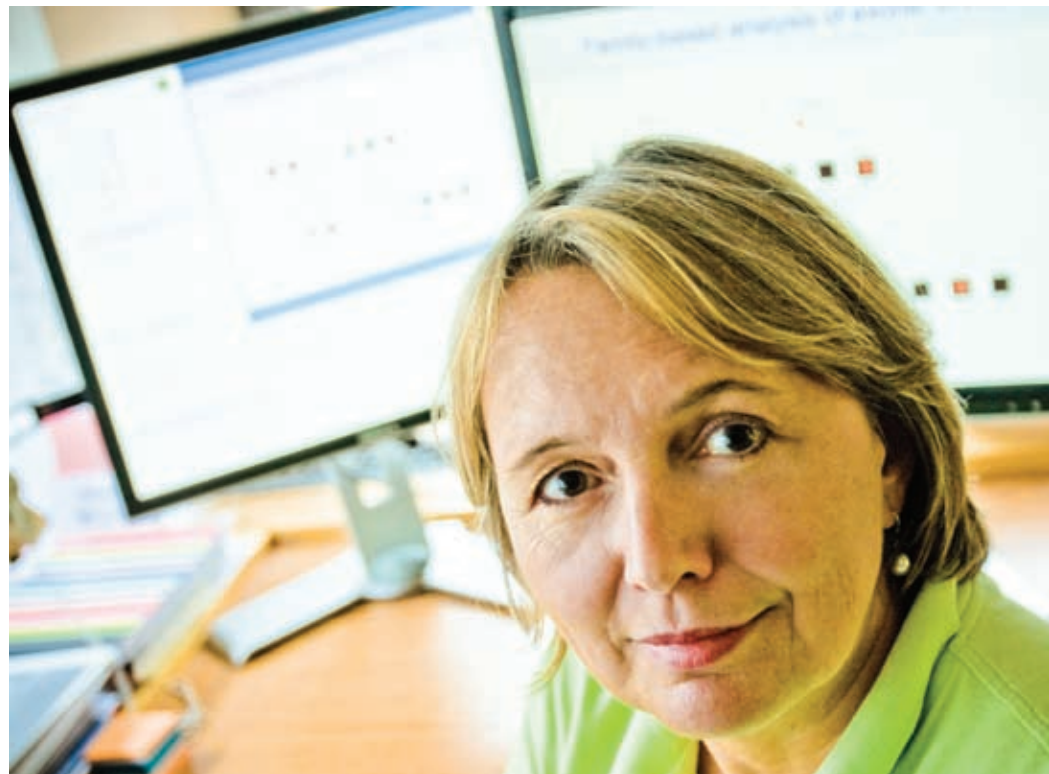
identified a commonly occurring genetic variant — the first to be discovered — that confers a risk of autism. The other described 13 genetic duplications or deletions, known as copy number

variations (CNVs), that occurred more frequently in autistic people than in a healthy control group. The common variant is located on chromosome 5, between two genes that encode cell-adhesion molecules important for synapse formation and maintenance. Some of the newly found CNVs target genes that encode ubiquitins, a class of enzymes that degrade proteins in the synapse and help eliminate connections.

According to Schultz, the findings related to synapses reinforce a commonly held theory that autism is a disorder of connectivity in the brain. “If you look at fMRIs,” Schultz says, “over and over again, you find an absence of synchronized activity across systems that should be synchronized.” (Although dysfunctional synapses may be involved in some forms of autism, scientists also expect to find aberrations in other pathways.)

Bucan (pronounced BOOCH-n) is the first author of the third paper, which appeared in the June 2009 issue of *PLoS Genetics*. It identified 27 genomic areas in autistic people that contain rare variations not found in the general population. These are CNVs that specifically af-

According to Maja Bucan, professor of genetics, “Genetic analysis now depends on huge amounts of data” — and collaboration.



fect protein-coding parts of the genome.

Scientists originally thought they would find more common variants than rare ones. “We’re now thinking that rare variants might cause a bigger portion of autism and probably confer a lot of risk,” says Schultz. “In some cases, a rare duplication or mutation might actually be the cause of the disorder.”

CAR is now in the midst of a four-year, highly integrated study funded with \$4.7 million through the Pennsylvania Department of Health’s tobacco settlement money. With the grant, Hakonarson continues to search for common variants, Bucan for rare ones. The children being diagnosed at CAR enlarge both geneticists’ samples. The center’s children will also supply a more diverse cohort, an advantage because the recently published findings had subjects and controls of European ancestry only.

Schultz and David Mandell, an epidemiologist who serves as associate director of CAR and assistant professor in psychiatry at Penn Medicine, have already gone to work on Hakonarson’s common variant. They checked its presence against scores given to 545 autistic children for their ability to communicate, tendency toward repetitive behaviors, and social skills. According to preliminary findings, having the variant showed some relation to social dysfunction. At the same time, there was no correlation with other traits.

More precise measurements of social-information processing are needed to make this correlation useful, says Schultz. Social awareness develops as a sequence of stages, he explains. “First you have to attend to social things and be rewarded by them. Then you have to perceive the social event. You have to be able to judge non-verbal behaviors. You have to read faces and facial expressions. This allows you to build an understanding of what another person is thinking and feeling.” Schultz wants to determine if there’s a specific part of this flow that

is more correlated than others with the newly found risk factor.

Through the Department of Health grant, Mandell is characterizing the various stages of social processing by tracking the eye movements of autistic children as they watch social interactions in videos and through other studies. He’s also developing more refined measures for repetitive behaviors and language processing. If scientists can reliably match dysfunctional behaviors to genetic variants, children can be screened early on and get the behavioral interventions they need most.

“Parents of autistic children were desperate for their kids to get intensive, behavioral interventions.” Such training breaks down complex actions into small parts and rewards the children when they master each part.

Mandell entered autism research about eight years ago when the City of Philadelphia requested a review of its mental health expenditures. Officials wanted to know why some children were costing hundreds of thousands of dollars a year. Half of the most expensive 100 children, he discovered, had diagnoses of autism.

“I did what I’d never yet done during my research career,” Mandell recalls. “I got out from behind my computer and talked to families.” He found them qualitatively different from families who are dealing with other psychiatric disorders. “Parents of autistic children were desper-

ate for their kids to get intensive, behavioral interventions,” he says. This training, which breaks down complex actions into small parts and rewards mastery of each part, is the current standard of care for autistic children.

Here’s how it works. An intervention that helps develop a response to language might consist of a trainer placing four pictures of different animals on the table and asking the child to pick out the elephant. “The child doesn’t care about the picture,” Mandell explains, “but he does care about the bag of M&Ms that the trainer is holding. The trainer first gets the child to sit in a chair and rewards this behavior with an M&M. Next the child will be rewarded for paying attention to the activity. There’s another M&M for picking out the picture of the elephant, and another for handing it over. The reward might be praise or high fives or being tickled. Part of the challenge for the trainer is finding the right reinforcement for each child.” Interventions for a multitude of deficits can involve 25 to 30 hours a week of one-on-one work.

Mandell, whose CAR office overlooks a slice of Philadelphia and whose shelves are cheerfully decorated with *Where the Wild Things Are* sculptures, a Miss Piggy diorama, and a pyramid of Play Doh containers, is now studying how behavioral interventions are delivered in the special-education classrooms of Philadelphia’s public schools. Called the Autism Instructional Methods Survey (AIMS), it is the largest randomized study of behavioral interventions ever done. Two curricula are being tested in 52 classrooms, kindergarten through second grade. But beyond that, Mandell is tracking what kinds of support teachers need to use these specialized curricula productively.

“Traditionally,” he explains, “we develop and test curricula in university settings with state-of-the-art clinicians – and, not surprisingly, they work.” They

tend to work less well or not at all in real classrooms, he adds. Mandell hopes to change this pattern through system-wide teacher training, continuing support for teachers, and the development of a core of trainers within the public school system who will keep the program going after the research project is completed.

Mandell plans to have 100 children from AIMS also participate in some of CAR's research protocols. They would join children who are diagnosed at the center in getting DNA screening and brain imaging. "Typically, only 50 percent of autistic children improve their ability to communicate and interact socially as a result of behavioral interventions," he says. DNA screening could help pinpoint which risk variants the children are more likely to overcome. Imaging could provide answers to some basic science questions about the workings of the brain.

Imaging is Schultz's area of expertise. Through structural MRIs, researchers have found that the autistic brain is about 5 percent larger than a typically developing brain and that the increase begins at 12 month of age – exactly when symptoms of autism first appear. Using functional MRIs, Schultz has found another significant difference. During fMRIs, as typically developing children identify faces or facial expressions, their brains show activation in the amygdala and fusiform gyrus. Face identification produces little or no activation in these areas in autistic children, although they show normal activation in tests requiring the identification of objects.

Schultz's working model is that autistic children probably have a deficit in the amygdala-fusiform gyrus network. The amygdala alerts you that something is socially or emotionally important and that you should pay attention to it. It tells the fusiform gyrus through feedback-feedforward connections to process what you're seeing at some deeper level. "It's what lets



David Mandell, Sc.D., is studying how behavioral interventions are delivered in the special-education classrooms of Philadelphia's public schools.

typically developing kids become experts in people," he says, "whereas kids with autism might become experts in train schedules or calendar calculations."

Schultz posits an important role, as well, for the frontal lobes that plan, organize, and inhibit impulses, because this part of the brain has a lot of connections to the areas that are underactive in autistic people. If training in face identification and facial expression makes the amygdala and fusiform gyrus more active, he thinks it might be because the frontal lobes are managing them better. As he puts it, "If it were just underperforming areas getting better, it begs the question of why they were underperforming in the first place." Schultz anticipates that imaging AIMS children before and after a year of behavioral interventions will give him an exceptional window into compensatory cerebral processes.

Other insights into autism will come from animal models. CAR researcher Edward S. Brodtkin, M.D., assistant professor of psychiatry, has been studying social behaviors in an inbred mouse strain (BALB/cJ) that is characteristically not very social. "It's not an autistic mouse," Brodtkin explains in a sleek laboratory building on the new eastern front of Penn's campus, his office window filled by a colorful mu-

ral on a nearby building. "It just exhibits a natural variation in social behavior. Whatever is causing its lack of sociability," he says, "could have nothing to do with any ASD, or it could have something to do with a small subset of it."

Brodtkin, whose speech is simultaneously keen and calm, thinks of all social interaction as a double-edged sword — sometimes rewarding, sometimes anxiety-provoking — and suggests that perhaps the balance in autism spectrum disorder is tilted away from reward and more toward aversion. "If we break things down this way," he says, "we can start to model some of it in mice and get a better understanding of the neurobiological circuitry involved."

Under the Department of Health grant, Brodtkin and Ted Abel, Ph.D., professor of biology and CAR researcher, are studying brain and behavior development in mice with mutations in the area of the newly found common variant.

Unlike Alzheimer's disease, where many brain banks can supply tissue samples, there is very little human tissue available for neuropathological studies of autism. The disorder is diagnosed in childhood, and the children grow up and live out a normal life span. Animal



Robert Schultz demonstrates a mock MRI that helps children on the autistic spectrum become used to such scanning devices. With him is Janelle Letzen, a research assistant.

models offer a unique opportunity to study related brain tissue at a molecular and cellular level, allowing scientists, for example, to actually look at the structure of a malfunctioning synapse.

Brodkin's work with Penn Medicine's Adult Social Learning Disorders program keeps him people-oriented. It also makes him a special advocate for those with Asperger's syndrome whom the program serves, and who, he points out, don't think of themselves as needing to be cured. "We're not just trying to find the gene and fix them," he says. "We want to be able to help them with the things they want to be helped with. And if we can get to the root of the problem, we'll be in a better position to help."

CAR is coming at "the problem" in a collaborative way, because there is no other meaningful way. Schultz: "Science is more complicated than it ever was. The questions that we're asking now are deeper questions. And I think we're all recognizing the value of multidisciplinary research, because it's wholly impossible for any one person to be a geneticist, a neuroimager, an expert clinician, and an epidemiologist."

As a geneticist, Bucan has long considered collaborations a necessity in her own work, which she explains to me on a "not normal day" in the south part of campus that is home to most of Penn's biomedical research. She works with mice models as well as the human genome and had been called that morning to the animal facility to do an emergency cleanup. "No one else knew how," she says. A very professional-looking black suit hangs on a peg in her office, but she's in work clothes, a tad flushed from rushing back to meet me. This same morning, a station in her lab had sprung a leak, and two burly maintenance workers have now sealed it and are vacuuming the area.

"Genetic analysis now depends on huge amounts of data," she explains, wholly focused on the interview, "and this requires new methods, which the statistical geneticists and computational biologists have developed for us, and huge data bases, which the computer science department across the street helps us with."

That there could be even deeper collaboration was just a wish of hers in 2006, when she, Brodkin, Abel, Timothy P.

Roberts, Ph.D. (professor of radiology at Penn Medicine and vice chair of research in radiology at CHOP), and Anthony Rostain, M.D., M.A. (professor of psychiatry) organized a retreat on autism for the PENN/CHOP community. According to the program, their goal was "to assess the standing of our institutions [and] our potential for organizing new collaborative initiatives." Mandell was among several PENN/CHOP presenters. Schultz was one of the invited speakers.

The Allerton Foundation had just funded a chair at CHOP dedicated to autism research, and it was suddenly possible to recruit a basic scientist and develop a center. "By getting together, it was easier to recruit Bob Schultz," Bucan says. "My sense was it's better to come to the place where colleagues are already willing to collaborate."

She had great intuition, but there's also something resolute about Maja Bucan that helps make things happen.

On another "not normal day" just three weeks earlier, she was on a train to New York. She'd just submitted a grant proposal for which, she tells me, "I read every article ever written on autism." The man sitting next to her — "incredibly" — began reading an article about autism on his laptop, and Bucan immediately realized that she had never seen this article before. When she asked if he could send it to her, he said he had written it and she would find it in *Time* magazine in just two days.

The man was Karl Taro Greenfeld, Noah's sibling, who was traveling to various cities on a book tour for *Boy Alone*. They talked, and long before they reached New York, Greenfeld perceived how passionate Bucan is about her work. He inscribed a gift copy of his book for her, writing, "To Maja, Keep Faith."

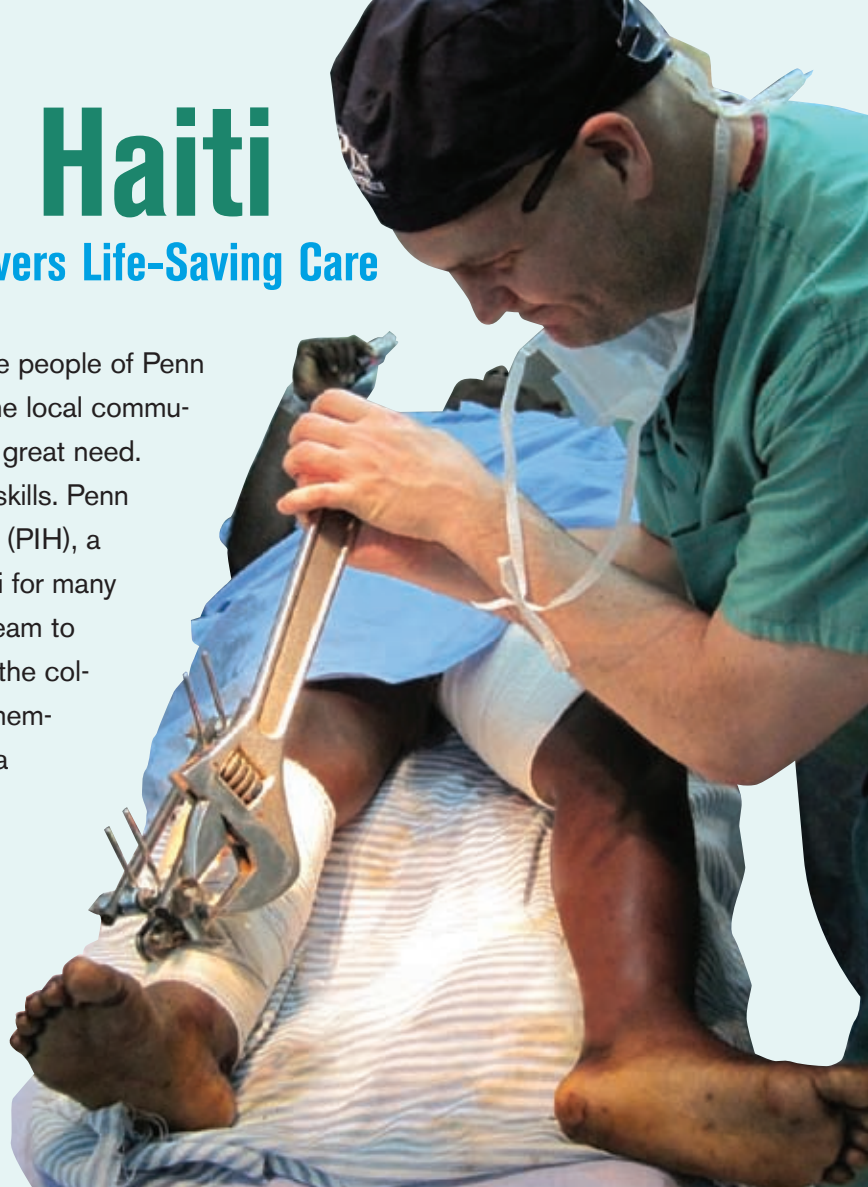
It's a good bet that she will — that they all will. ♥

A Mission to Haiti

The “Penn Medicine One” Team Delivers Life-Saving Care

When the earthquake devastated Haiti in January, the people of Penn Medicine were quick to expand their service beyond the local communities and to offer help to a more distant community in great need. Hundreds of staff members volunteered their medical skills. Penn Medicine found a well-placed ally in Partners in Health (PIH), a global relief organization that has been working in Haiti for many years. What was needed immediately was a surgical team to deal with the devastating crush injuries brought on by the collapse of buildings. In the space of a few days, a nine-member team – Penn Medicine One – was assembled for a two-week mission to provide urgent medical care.

The team returned home on Sunday, February 7, tired but thankful that they could help the Haitian people. What follows is an account – often in their own words – of the challenges the Penn team faced, how they helped, and how the experience changed them.



Derek Dombroski, M.D., an orthopaedic surgery resident, tightens an external fixator to stabilize a patient's fracture.



Tent City: home for the first night.

MONDAY, JANUARY 25: “People were out everywhere on the streets as they are afraid to sleep in their homes. . . . Devastation is everywhere. While some buildings are standing, every block has damaged houses, some are just piles of rubble.”

These were the scenes Michael Ashburn, M.D., M.P.H., professor of anesthesiology and critical care, described as he and other members of the Penn

(dubbed “Tent City”), a secure area that provided accommodations for American medical teams working with PIH. “Home for the night,” wrote Samir Mehta, M.D., assistant professor of orthopaedic surgery. Early the next morning, the group – and its 1,200 pounds of medical supplies – traveled nearly three hours to their destination, a medical complex in Cange. Operated and supported by Partners in

Health, the medical facilities included a 120-bed hospital, a church used as a surgical ward, and an ER that consisted of an entranceway and a single room. Following a tour of the hospital, Mehta noted the newcomers’ “disbelief of what these people have endured so far, disbelief of the injuries sustained, and disbelief of the conditions here.”

The group’s sleeping quarters were down a long flight of steps which, Amy Kim, R.N., of Surgical Critical Care, wryly noted, “never got easier to climb.” Although they shared a single shower, the accommodations were better than



Members of Penn Medicine One

Front row: Azura Ahmad, R.N., OR Nursing and Peri-Operative Care; Babak Sarani, M.D., Surgery; Amy Kim, R.N., Surgical Critical Care; Erica Domingo, R.N., Critical Care. Back row: Derek Dombroski, M.D., Orthopaedic Surgery; Malcolm Waddell, OR Technical Specialist; Samir Mehta, M.D., Orthopaedic Surgery; Michael Ashburn, M.D., Anesthesiology and Critical Care; Thomas Floyd, M.D., Anesthesiology and Critical Care.

expected . . . and more comfortable than Tent City.

Located about 20 miles outside of Port-au-Prince, Cange was spared the brunt of the earthquake's damage, but that didn't lessen the influx of injured patients. Wrote Babak Sarani, M.D., assistant professor of surgery and the team's medical director, "90 percent (at least) have orthopaedic injuries and of those, the majority are open. It is staggering." On the first day's rounds alone, they scheduled more than 40 cases.

WEDNESDAY, JANUARY 27: The hospital had only two ORs. In their first full surgical day, the two OR teams (orthopaedic and general) performed 13 cases. "I am stunned at the turnover time. Post-operative recovery is at the bedside for all of a few minutes to at most an hour," Mehta reported. "Between cases, our wait time is less than 15 minutes – enough time to write orders and plan for the next case."

The vast majority of the patients required skin grafting for soft tissue wounds, many of which were grossly infected from recent amputations that had not yet been closed. Given the enormous number of crush injuries, "people

just didn't have time to deal with skin grafting," wrote Sarani. What made things worse was that the grafting often required removing more of the affected limb. "It's hard for these patients to mentally accept that they need to come back in, that their amputation needs help."

Because the hospital wards were spread throughout the complex, the transport staff carried most patients to and from various locations – including up and down many steps – on canvas stretchers. "These guys are patient and treat the patients with kindness," wrote Ashburn, M.D., director of Penn's team. "A very impressive group of men . . . strong, too."

FRIDAY, JANUARY 29: The hospital was soon at twice the normal patient count, admitting 10-15 patients a day. Consults with Penn colleagues were difficult without modern technology but the team improvised: They would take photos of x-rays or wounds and then e-mail them. "This is working out rather well," Ashburn reported.

The team quickly established a daily routine, beginning with rounds at 6:30 a.m. "They are, in some ways, lightning rounds," Mehta wrote. "It is hard to keep track of all the patients, their wounds, their stories, and even their management plan at times."



The Friendship House served as a place to eat, discuss cases, and relax. Left to right: Domingo, Kim, Ahmad, and Waddell.



Top left: Without access to a light box, Samir Mehta, M.D., uses natural light to get a better look at a patient's x-ray. Below: With the addition of mattresses, a church in Cange became a surgical ward.



OR cases started by 9:30 a.m. and often continued till 7:00 or 8:00 at night. Team members squeezed in their two daily meals – breakfast and lunch/dinner – when possible. “The end-of-the-day shower hits the spot . . . although there is no hot water,” wrote Sarani.

Kim and Erica Domingo, R.N., worked as a team to provide post-op care. Limited by the lack of technology, they had to rely only on a blood-pressure cuff and pulse oxymeters. “Initially we had culture shock because there were no monitors but it soon became instinctual,” Kim said. “You learned a lot just looking at a patient's face. Pain is universal.”

Often, it was only the unit's charge nurse who was available to help with patient care . . . and with translating. “Sometimes it came down to just being there for them, holding their hand,” Domingo said. “It was a very humbling experience.”



Closer to Home

Within days of the earthquake that ravaged Haiti in January, the Hospital of the University of Pennsylvania provided 500 pounds of pain medications, anesthetics, and medical supplies to relief workers in the capital of Port-au-Prince. Roger Band, M.D., assistant professor of emergency medicine at Penn Medicine, also serves as medical director for developing world travel for the Clinton Foundation and as personal physician to former president Bill Clinton. When he learned that Clinton was soon heading to Haiti in a cargo plane large enough to hold supplies, Band turned to the leaders of HUP for help. They responded at once, and Band and several members of the HUP administration, Materials Management, Pharmacy, and Emergency Medicine scrambled to collect the supplies. Then Band drove the supplies to Newark International Airport and accompanied them to their Haiti destination. He flew back to Philadelphia that same day. The following week, Band made a similar trip.

During the same early days of the earthquake's aftermath, three Haitian women, a 4-year-old child, and his father



Naomi Rosenberg

were flown to Philadelphia. The three women, all suffering from severe crush injuries, were brought to HUP and the child and his father to The Children's Hospital. Ultimately, the women required amputations to save their lives. Once they were medically cleared, they were brought to Good Shepherd Penn Partners to continue their recovery and to receive prosthetic limbs.

This emergency trip to HUP would not have been possible without the efforts of

Naomi Rosenberg. A second-year Penn medical student, she is also a member of Partners in Health, a global network that seeks to bring medical services to impoverished communities. During her work for the organization before she started medical school, Rosenberg had learned Creole. Seeking help for the injured women, she contacted Richard Shannon, M.D., chair of Penn's Department of Medicine. Together, they were able to overcome several administrative and legal barriers to get the patients to HUP. "If the patients had stayed in Haiti, it is very clear that they would have died," said Shannon, who has spent time in Haiti on medical missions.

Rosenberg's efforts continued after the Haitian women reached HUP. "Naomi has been tirelessly devoted to caring for the patients – and families of those patients – who have arrived here from Haiti," said Band. "She spent countless hours coordinating the transfer of these patients to Penn and has gone to extraordinary lengths to address their every personal, medical, and social need."

MONDAY, FEBRUARY 1: Three weeks after the earthquake, both the patients and staff were weary. According to Ashburn, "Many have undergone several operations. Each time they wake up they have lost (literally) another piece of themselves. Tears flow easily and for good reason."

The open wounds were so serious that a surgeon and anesthesiologist performed dressing rounds together. "We are doing our best to use sedation as much as we safely can," Ashburn reported. "Many of these folks have been experiencing 3 weeks of pain on top of the earthquake. They have simply had enough and do not tolerate painful procedures anymore."

Some of their patients were children whose trauma was made worse because

they had lost loved ones. Ashburn described a 12-year-old girl with a femur fracture who, "when waking from her procedure, called out for her momma, a term recognizable in any language. The response, which we have heard before, was 'Her momma is dead.'"

FRIDAY, FEBRUARY 5: After 11 days and 75 surgical cases, the team prepared to leave Cange . . . and Haiti. They were continually impressed by the Haitian people – the staff, the patients, and the families. "The people are nothing short of gracious, trusting, benevolent and extremely polite," Sarani wrote. "How are they able to smile and stay gracious under such strain?"

The team had been in "HUP mode"

from the start, working long hours to reduce infections, morbidity, and suffering. But they wondered what would happen when they departed. "Who will take care of them, who will pack their wounds . . . check for infection," Mehta wrote. "I am worried."

He and his colleagues left behind most of what they brought but he also hoped that "we've left a little more than just material goods. I know that a part of me has been totally changed by this experience."

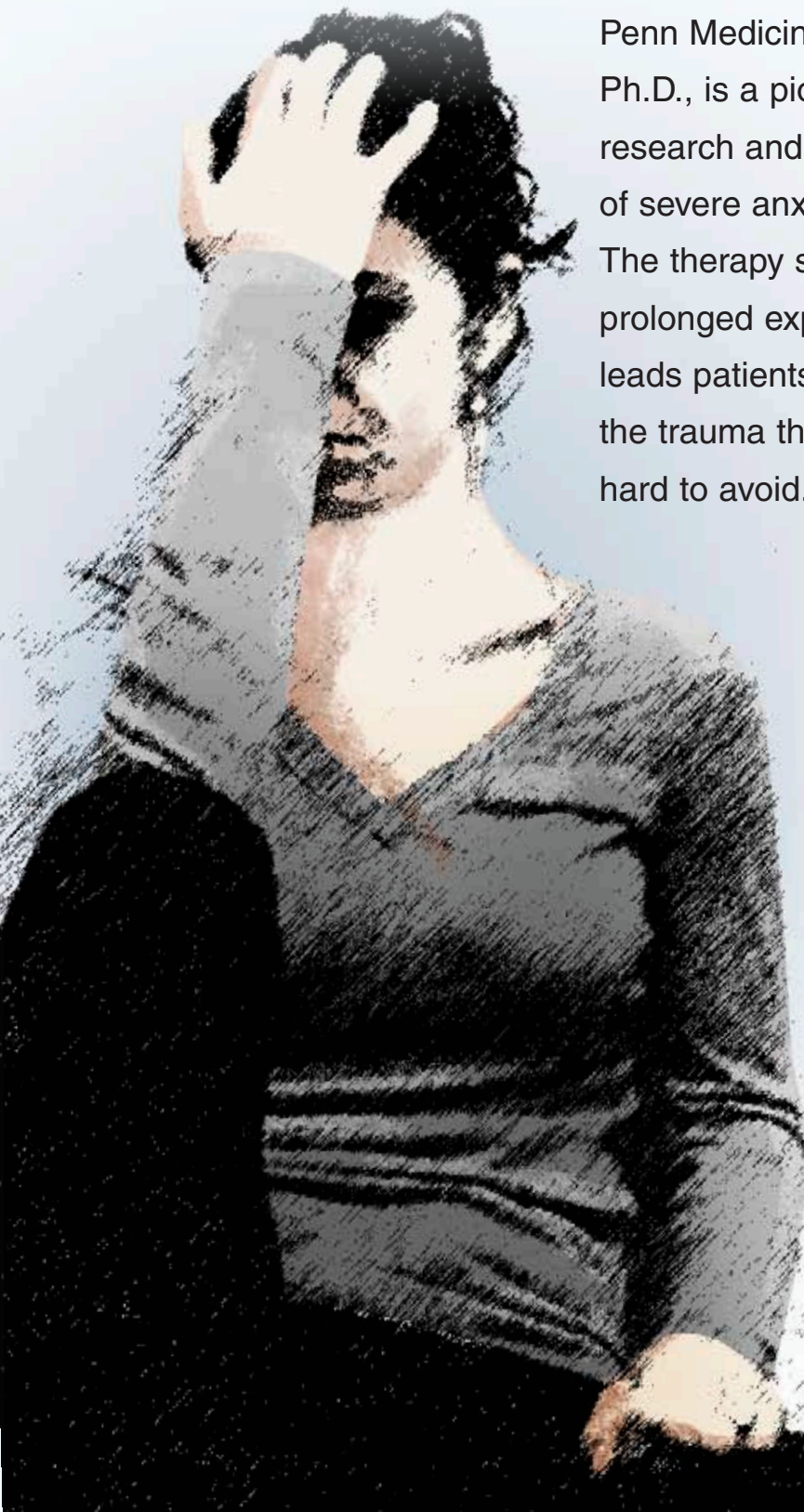
Before leaving Cange, the team heard from Dr. Maxie, chief of the Cange hospital: "God brought you to us. You have been wonderful. You are now part of Haiti."

As Ashburn noted, "We could ask for nothing more." ■ – Sally Sapega

A CALMING INFLUENCE

By Thomas W. Durso

Penn Medicine's Edna Foa, Ph.D., is a pioneer in the research and treatment of severe anxiety disorders. The therapy she developed, prolonged exposure therapy, leads patients to acknowledge the trauma they have tried so hard to avoid.



Photographs by Candace diCarlo

On a rainy day about 15 years ago, Edna Foa was involved in an automobile accident. She was not seriously injured, but her car was totaled. Understandably, the accident gave Foa quite a scare and, for a while afterward, driving frightened her.

Frightened as she was, however, Foa did not stop driving.

“It was interesting for me to watch myself, because I immediately rented a car and continued to drive and went back to work.”

Not everyone is so resilient. Many drivers return to their cars following a serious accident and, beset by the memories of their trauma, find themselves unable to function in traffic. Others never even make it back behind the wheel.

Typically, Foa examines responses to such traumas not in herself but in others. A professor of clinical psychology in psychiatry in Penn’s Department of Psychiatry, she serves as director of the Center for the Treatment and Study of Anxiety (CTSA). In that role, she oversees a world-renowned facility that researches such conditions as post-traumatic stress disorder, obsessive-compulsive disorder, and social anxiety. In addition to treating patients of all ages, the Center’s faculty also trains professionals in the field of mental health in the use of effective treatments for those disorders. In the process she has become a towering figure in her field, contributing significantly to science’s understanding of anxiety.

In many cases, Foa’s work was in nascent fields, which helped her to develop an enormous influence among both researchers and clinicians. She was an early proponent of studying the conditions she sought to treat, a practice that allowed her to develop remarkably effective therapies across a variety of disorders.

“From the beginning, we were focused on developing evidence-based treatment even before the concept of evidence-based treatment was as popular as it is now,” Foa notes. “I thought it was a better

strategy to combine an open clinic with a research clinic.”

The center got its start in 1979, when Foa was at Temple University’s behavioral therapy unit. She won a grant from the National Institute of Mental Health (N.I.M.H.) to study and treat obsessive-compulsive disorder, and with that funding, Foa set up her own shop. She hired a staff and launched CTSA, which she moved to Penn a decade ago.

Over the last 30 years, CTSA has evolved considerably. From a small clinic comparing the effectiveness of cognitive

experiences at the time,” she says. “I thought about the more general idea: People are faced with very distressing events — relatives die, you lose people — so what’s the mechanism and process of recovery?”

To explore such complex issues, Foa had to find victims who were suffering psychologically in the aftermath of trauma. At first, she considered studying people who had been in traffic accidents, but worried that with so many of them engaged in litigation, they could not be trusted not to exaggerate their symptoms in order to win in court. Looking for more trustworthy data, she turned to a

EDNA FOA DISCOVERED THAT THE PSYCHOLOGICAL SYMPTOMS RAPE VICTIMS SUFFERED WERE EERILY SIMILAR TO THOSE EXPERIENCED BY COMBAT VETERANS: FLASHBACKS AND NIGHTMARES THAT MADE THEM “EXPERIENCE” THE EVENTS AGAIN; EMOTIONAL NUMBNESS AND FEAR OF PLACES THAT REMINDED THEM OF THEIR TRAUMA; AND ANGRY OUTBURSTS AND DIFFICULTY SLEEPING AND CONCENTRATING.

behavioral therapy and medication in treating OCD, it has grown into a comprehensive research and clinical institution that investigates a wide spectrum of mental conditions. In particular, while the center has continued to study and treat OCD, it has developed a special expertise in helping people to overcome distressing experiences. The term *post-traumatic stress disorder* was coined not long before Foa received the center’s founding grant, and the field’s recognition as a legitimate condition coincided with her advancement as a researcher and clinician.

“Rape, war, combat, traffic accidents — I didn’t even think about them as traumatic

group that, despite horrific trauma, was receiving very little public acknowledgment of their suffering.

“At that time, so many years ago,” says Foa, “rape victims didn’t even want to come out and say they were raped, because the common reaction was, ‘Oh, you were raped? You must have wanted it or you did something to provoke it.’ So I started my work with rape victims.”

Foa secured more N.I.H.M. funding and began interviewing rape victims. She discovered that the psychological symptoms they suffered in the aftermath of their trauma were eerily similar to those experienced by people who had undergone other types of trauma.

The symptoms include “experiencing” the events again, through flashbacks and nightmares; avoidance symptoms, such as emotional numbness and fear of places that reminded the victims of their trauma; and increased arousal, such as angry outbursts and difficulty sleeping and concentrating. Whether the subject was a woman who had been assaulted or a soldier who had been confronted by war’s horrors, those with emotional and psychological issues in the months and years following presented in common ways.

In those early days of Foa’s research, few people were studying the issue, because it not yet been officially classified. It was while Foa was beginning her work that the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* was published. The book finally categorized the collection of symptoms Foa was researching and gave it the name *post-traumatic stress disorder*, helping to legitimize her work and spurring more researchers to begin exploring it.

For Foa, the similarity of symptoms was intriguing, but what really piqued her interest as a researcher was a deeper question.

“We know that most people who go through a traumatic event do not develop PTSD; they will recover,” she says. “You have a minority of people — it’s not a small minority and it depends on the kind of trauma; it may be 20 percent — who will develop chronic PTSD. One of the questions that is so important in PTSD, which is related to my original interest, is who develops and who *doesn’t* develop PTSD.”

What Foa and others discovered was that those most likely to develop post-traumatic stress disorder are people who engaged in avoidance. By emotionally locking away their trauma — by refusing to talk about it or even to go to places that remind them of it — they bypass the mechanisms of emotional processing

and healing. Equally important, they do not give themselves the chance, as Foa puts it, “to disconfirm their idea that the world is a dangerous place.”

“After a traumatic event,” she continues, for a while people say, ‘Oh, my God, the world is a dangerous place. You can die just in a minute. Many times, they also say that if they had only done something else, their trauma wouldn’t have happened, as if they have a sense of incompetence: ‘It’s my fault that I was raped.’”

On the other hand, those who acknowledge their trauma have a better chance of recovering from it. In Foa’s case, that meant getting right back into a car after her accident 15 years ago and continuing to drive.

“I still was frightened of driving,” she says, “but as I was driving one morning, I looked around and I didn’t see 500 cars around me. If I had stayed at home and didn’t drive, I would have been much more likely to develop PTSD.”

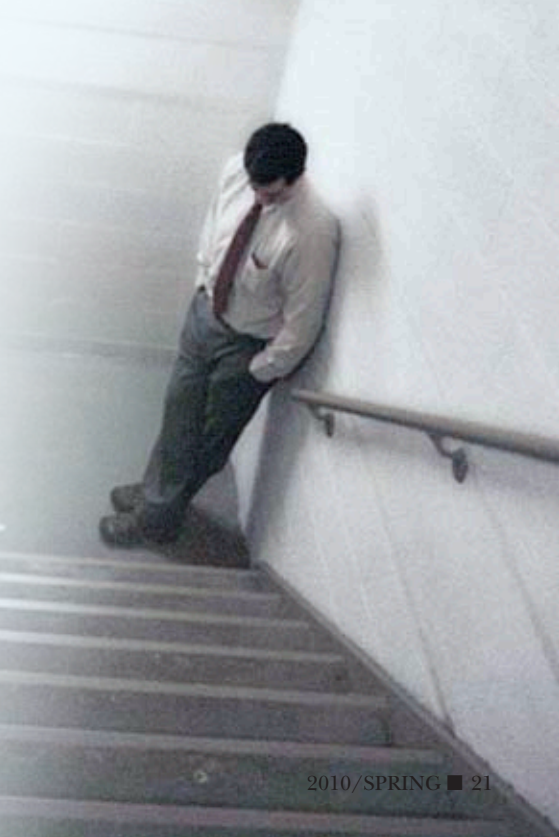
The Center’s dual emphases on research and clinical care have led Foa over the years to explore how these findings could be applied in the patient setting in order to help victims of trauma overcome their suffering. Grants from the National Institute of Drug Abuse, the National Institute on Alcohol Abuse and Alcoholism, and the National Institute of Mental Health have funded work aimed at assisting patients who revert to substance abuse in order to cope. More recently, the U.S. Department of Defense has funded a study to investigate how levels of the stress hormone cortisol are related to the risk of PTSD and to recovery.

Among Foa’s signature accomplishments is the development of “prolonged exposure therapy” to treat PTSD and its related symptoms. The therapy involves two techniques meant to tackle the crippling effects of avoidance. First, through so-called imaginal exposure, the patient revisits the memory of her trauma by

talking about it with her eyes closed. The therapist helps her to recall the entirety of the event, from the setting of the trauma to the emotions she felt at the time to virtually everything in between. In the process, the patient can discover beneficial memories that she had blocked out by avoiding other memories.

For example, one of Foa’s patients had been raped by nine men, including her boyfriend. Because the woman had refused to revisit the horror, for nearly a decade she berated herself for failing to tell the men who assaulted her that she was not enjoying the experience. And because these men had been her friends, the patient had reasoned, the rape was her own fault; surely they would have stopped if she had only said no. Through therapy, however, she finally went back and dug into what really had happened, and she discovered that in fact she *had* fought; in fact, she had even hurt some of the rapists.

Says Foa, “We tell patients a trauma is like a book in your head that you haven’t read for eight years or nine years, because every time you have a flashback the book opens and you read a paragraph and say,



'This is too painful.' So you close the book, and then another flashback comes and you read another paragraph and you close the book because it's too painful." Foa tells her patients, "We're going to read the book from the beginning to the end, and whatever you remember, we're going to put it out there, and then you're going to know what happened. It's as if you saw a scary movie: The first time you'd be scared, but if you saw it 16 times, you'd be bored, and that's what happens to them. They repeat the memory again and again and again, and then most of them say, 'Okay, I got it; I don't need to avoid it.'"

By engaging the trauma, most patients find that their shame and anger and self-loathing are unfounded and that the distress that befell them was not their fault.

The patient can learn to tell herself, as Foa puts it, "Even if I was dumb and did

something wrong, well, I don't need to be punished for the rest of my life."

The second technique in prolonged exposure therapy is to work with the patient to develop a list of places she has avoided since her trauma. From situations that are only slightly painful to her to those that she considers the most dangerous, the patient is assigned to visit these places – an experience that helps her to process the trauma.

Again, the technique helps them to "disconfirm" their fears. "They learn that the world is not as dangerous as all of that," says Foa. "Yes, it can be dangerous, but most of the time it's not."

It is not only rape victims who need such care. The Center for the Treatment and Study of Anxiety has treated scores of combat veterans who have developed PTSD. As with women who are sexually assaulted, these soldiers are treated with techniques that encourage them to recall their trauma, not to avoid it. Foa remembers a veteran who spent 20 years burdened with the memory of struggling to escape from a burning tank because his commanding officer, sitting above him, was blocking the exit. Unable to push out, he yanked his commander into the tank and scrambled out; for the next two decades, he believed he had killed his CO.

Prolonged exposure therapy finally enabled him to realize the truth of his escape.

"When he started to imagine what happened, he realized the commander must have been already dead, because otherwise why would he sit there in a tank that caught on fire?" Foa says. "He remembered that when he pulled the commander in, it was like pulling a dead body. Because he revisited this memory, he was able to say, 'I didn't kill him.'"

Foa's center is engaged in a variety of clinical studies to help people suffering from PTSD. One study aims to assist

smokers to quit; another involves treating people with both alcohol dependence and PTSD. While some observers had predicted that treating alcohol abuse and PTSD simultaneously would lead patients to increase their use of alcohol in order to deal with their traumatic memories, Foa points out that the opposite has occurred.

Foa's pioneering therapies have been extraordinarily successful. One study reported that prolonged exposure therapy produced "clinically significant improve-

EDNA FOA IS CREDITED WITH PROVIDING THE SCHOLARLY BASE FOR CLINICIANS WHO USE EXPOSURE THERAPY AND RESPONSE PREVENTION TO TREAT OBSESSIVE-COMPULSIVE DISORDER. "SHE ALMOST CREATED THE MODERN FIELD WE HAVE NOW."

ment" in approximately 80 percent of patients with chronic PTSD. The therapy has been used to treat survivors of rape, combat, disasters (such as the 2005 tsunami in Indonesia), traffic accidents, and child abuse. The CTSA is also working with the Veterans Administration to train its staff to use prolonged exposure therapy. An article in *National Journal Magazine* that reports on the U.S. military's new approaches to treating psychologically battered soldiers describes pro-



longed exposure as “Foa’s brainchild” and cites evidence for its success (November 2008). In 2001, the Substance Abuse and Mental Health Services Administration (SAMHSA) of the U.S. Department of Health and Human Services honored prolonged exposure therapy with an Exemplary Substance Abuse Prevention Program Award, and SAMHSA and the Center for Substance Abuse Prevention selected it as a Model Program to be followed across the nation.

Paula P. Schnurr, Ph.D., a research professor of psychiatry at Dartmouth Medical College and deputy executive director of the VA National Center for PTSD, says that when she launched a study to assess the treatment of women who seek care in the VA and to make recommendations on the most effective therapies, the prolonged exposure method had the most evidence supporting it.

“There are several types of very good treatments for PTSD,” she says, “but we thought Edna’s treatment would be especially appealing when thinking about testing in a large health-care system because it’s really simple treatment. It’s effective for PTSD and can be used for other disorders. Those factors made it more likely to be adopted by practitioners.”

Foa’s decades of work have earned her considerable respect from peers. The American Psychological Association, the International Society for Traumatic Stress Studies, Women Organized Against Rape, and the Association for the Advancement of Behavior Therapy are among the many organizations to have recognized her contributions with awards. Her honors include an honorary degree from the University of Basel in Switzerland. Foa’s work has also been noted in the popular press and magazines. In August 2009, *Elle* ran a substantial piece on therapy for trauma victims, much of it about Foa, the Center for the Treatment and Study of Anxiety, and the success her approach has had.

“I think I’m speaking for many when I say Edna is one of the single most important contributors to the understanding and treatment of PTSD,” Schnurr says. “Her body of work, which has focused mostly on treatment but also has addressed the research side, is really quite rich. It’s very solid and also practically useful. The thing that impresses me is that her work has such significance in the field of PTSD but also has similar significance in the treatment of other anxiety disorders.”

Barbara Rothbaum, Ph.D., a professor of psychiatry at Emory University School of Medicine, has collaborated with Foa since joining Foa’s team on her first PTSD grant in the mid-1980s. Rothbaum’s work is in obsessive-compulsive disorder, an area in which Foa’s contributions have been “seminal,” she says. In particular, while other clinicians had developed exposure and response prevention as a means of treating OCD, Rothbaum asserts that Foa provided the scholarly backbone to justify and propagate its use.

“She almost created the modern field we have now,” Rothbaum says. “Not a lot of work had been done. It was really Edna who started doing all the clinical research on exposure and response prevention and how it works with and without medication. OCD is a very awful disorder to have, and we’ve got good treatments that we know work, and we know a lot of that because of Edna’s contributions.”

How much suffering has Foa’s work helped to alleviate? It’s impossible to say, of course. In addition to those who have walked into the Center for the Treatment and Study of Anxiety beset by the ravaging demons of PTSD and walked out with quieted minds, countless patients around the world have been treated with techniques pioneered by Foa.

In a sense, Foa helped herself as well, informally applying her treatment model to herself in the days after her car accident. Just as she counsels patients to overcome avoidance by revisiting their traumas, she, too, reflected on what had happened on that rainy road 15 years ago.



“I think I became a better driver, too,” she says. “I was a little bit of a reckless driver before that. It was a rainy day and you could make all kind of excuses, but being careful I could have avoided the accident.”

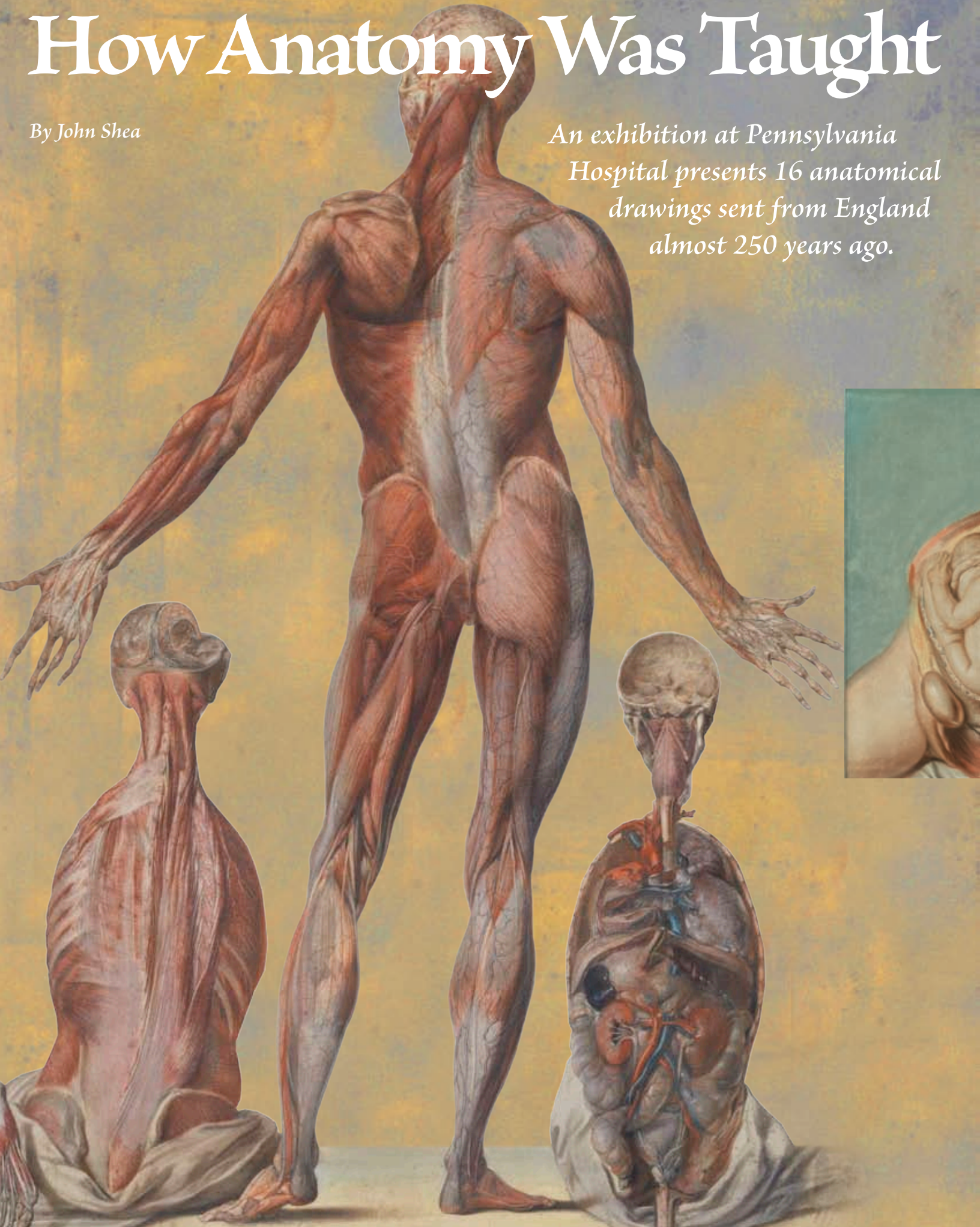
Yet another case of anxiety quelled in the wake of distress. ■

As we went to press, *Penn Medicine* has learned that Dr. Foa was named in the annual *TIME 100* issue as one of “the world’s most influential people.”

How Anatomy Was Taught

By John Shea

*An exhibition at Pennsylvania
Hospital presents 16 anatomical
drawings sent from England
almost 250 years ago.*



Would Jan van Rymsdyk, considered one of the finest medical illustrators in the world, draw any consolation from a new exhibition at Pennsylvania Hospital? Titled “From Pastels to PDAs: Medical Education from the 18th Century to the 21st Century,” the exhibition features 16 of van Rymsdyk’s meticulous drawings, done in the middle of the 18th century with pastels on paper. But the illustrator, we discover, had always set himself higher goals: he yearned to make a living as a portraitist.

Van Rymsdyk was born in the Netherlands and was working in London by 1750. One of his primary clients was William Hunter, the leading anatomist of his day. In this period, Benjamin Franklin urged bright young men from the colonies like John Morgan and William Shippen, the future founders of Penn’s medical school, to obtain their medical degrees at the University of Edinburgh. For a broader education, however, he also recommended they train in anatomy and

surgery at the private school in London’s Soho run by Hunter and his younger brother, John. Van Rymsdyk illustrated what is often considered William Hunter’s masterpiece, *Anatomia uteri umani gravidi* [*The anatomy of the human gravid uterus exhibited in figures*] (1774). But the artist did not feel appreciated by Hunter. As a reviewer of a book about van Rymsdyk put it, the illustrator “was reduced to slaving in a freezing Soho garret for the perfectionist William Hunter, drawing the putrid abortions and cadavers of destitute women.”¹ The irony is that van



Rymsdyk’s anatomical illustrations have outlasted most of the portraits painted by his contemporaries.

Right outside the entrance to Pennsylvania Hospital’s historic medical library, the 16 van Rymsdyk drawings owned by the hospital are on display together for the

"The knowledge of anatomy is of exceeding great use," wrote the donor, Dr. John Fothergill.

first time. How they came to the hospital is a story in itself, and as with many of the stories associated with Pennsylvania Hospital’s early years, Franklin plays a role.

The illustrations came courtesy of Dr. John Fothergill. He was one of the most famous physicians in London and a friend of both Franklin and Dr. Thomas Bond, the other founder of Pennsylvania Hospital. Franklin had met Fothergill in London, and the physician – a Quaker – became one of the staunchest supporters of the hospital and of medical education in the colonies. In *Doctor Franklin’s Medicine*, Stanley Finger, Ph.D., reports that Franklin, Fothergill, Morgan, and Shippen were able to exchange ideas about the future of American medical education while in London in 1760-61.² Knowing the value

of such detailed illustrations for teaching students, Fothergill sent them to Franklin in 1762. In a letter dated April 7 of that year, Fothergill wrote, “I need not tell thee that the knowledge of anatomy is of exceeding great use to Practionors [sic] in Physic and Surgery & that the means of procuring Subjects with you are not easy.”

According to Stacey Peeples, the archivist of Pennsylvania Hospital, Shippen used the drawings to teach his courses in anatomy. “The hospital was very inspired,” says Peeples. To support medical training, a library fund was established, and the hospital even had an agent in Europe to look for new texts and illustrations that could support medical education. (Today, Peeples notes, there are about 13,000 volumes in the hospital’s library, the bulk of them originating between 1750 and 1850.)

Van Rymsdyk’s drawings are highly detailed, showing flayed human figures. They include drawings of a man and a woman with a near-term fetus. As Peeples points out, “We don’t know who the people are,” and it is likely that the corpses were obtained “through less than legal means.” At the time, autopsies were generally frowned on. In fact, Stanley Finger notes the bad publicity that would result if the voluntary hospitals in London or Edinburgh were found to be performing autopsies; but the private schools of anatomy, like the one operated by William Hunter, were less affected by public opinion.

The exhibition is open to the public until December 2010. (<http://www.uphs.upenn.edu/paharc>). ■

¹William Schupbach, *Medical History*, October 1982, p. 484. Review of *Jan Van Rymsdyk, Medical Artist of the Eighteenth Century*, by John L. Thornton, Oleander Press, 1982.

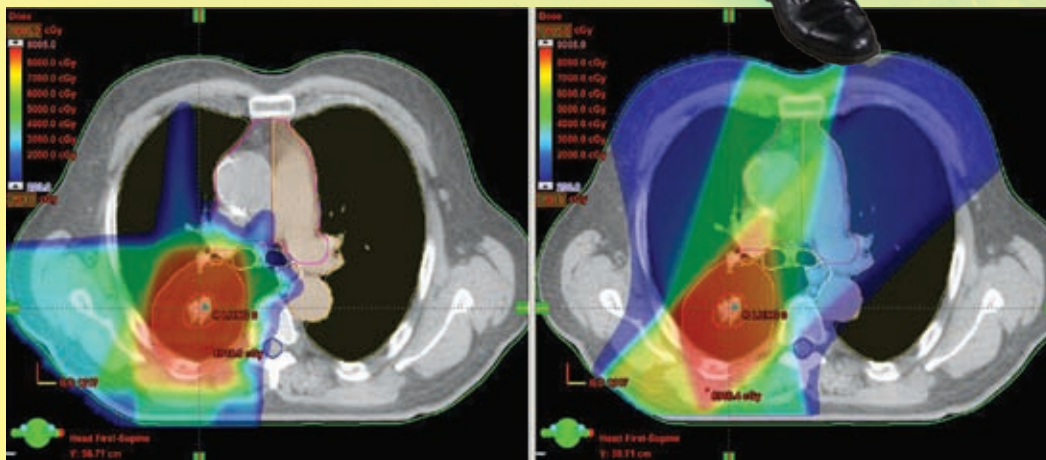
²*Doctor Franklin’s Medicine*, University of Pennsylvania Press, 2006.

PROTON THERAPY:

A Powerful New Tool for Treating Cancer

Some advances in medicine arrive on the scene rapidly, quietly, with little fanfare. That was certainly not the case with the coming of proton therapy to Philadelphia. Although the University trustees approved the construction of a proton therapy center in Fall 2006 and a \$15 million naming gift from the Roberts family was announced in December 2007, it would be another two years before the center would actually treat its first patient. Before that could happen, the single most important component of the center, the cyclotron to accelerate the atoms, had to make a 3,700-mile journey from Ion Beam Application, S.A., the manufacturer in Belgium, across the Atlantic to Philadelphia's Port Authority.

Much less radiation is delivered to healthy tissues – including the heart – surrounding a patient's lung tumor when treated with the precision of proton therapy (left) than with conventional radiation techniques.



Stephen Hahn, M.D., left, chairman of the Department of Radiation Oncology, and James Metz, M.D., the department's vice chair for clinical operations, stand in front of one of the gantries in the Roberts Proton Therapy Center.

In January 2008, the local news media followed the path of the cyclotron – actually, it was half of a cyclotron, the first of two deliveries – as it was transported on a specially constructed, 19-axle trailer truck to the future site of the Roberts Proton Therapy Center, on Convention Avenue, behind Penn Tower. Not only did the cyclotron have a police escort, it also had a group of mummies to welcome it in true Philly style. When put together, the particle accelerator weighed 220 tons, about the same as a 747 airliner.

The cyclotron is not the only massive component of the new center. The cyclotron is housed underground, out of sight of patients, but four of the treatment rooms hold a three-story, 90-ton gantry. These rotating steel structures move around the patient to direct the proton beams at any angle. The fifth treatment room uses a fixed beam.

More superlatives: the center has an area of 75,000 square feet. The proton beams, once accelerated, reach a speed of 100,000 miles per second as they travel from the cyclotron to the treatment rooms. The total cost was about \$140 million. Today, the Roberts Proton Therapy Center is said to be the largest and most advanced facility for proton therapy in the world, one of only six such centers associated with an academic medical center in the country. (It is part of Penn Medicine's Department of Radiation Oncology.) And as part of the Abramson Cancer Center in the Perelman Center for Advanced Medicine, the new center is close to many of the other comprehensive cancer services Penn Medicine provides.

According to James Metz, M.D., vice chair for clinical operations in the De-

partment of Radiation Oncology, the close connection to the larger institution is crucial: "To be most effective, proton therapy will be paired with other cutting-edge treatments. Our doctors don't just look at single type of cancer medicine, surgery, or radiation therapy – we combine several different treatments for each individual patient."

Two of the proton therapy's most distinctive advances are its precision and strength. "Proton therapy potentially represents the best of both worlds – delivering a high dose of radiation to tumors while at the same time limiting side effects to patients," says Stephen Hahn, M.D., chair of Radiation Oncology.

Penn's center is the only proton therapy

"PROTON THERAPY POTENTIALLY REPRESENTS THE BEST OF BOTH WORLDS – DELIVERING A HIGH DOSE OF RADIATION TO TUMORS WHILE AT THE SAME TIME LIMITING SIDE EFFECTS TO PATIENTS."

center in the world that uses a novel device called a multi-leaf collimator. Inside the treatment room, in the "nozzle" where the proton beam exits the beamline, the device precisely tunes the energy of the beam and shapes it to match the unique profile of the individual patient's tumor. In that way, the most effective dose can be delivered exactly where it is needed.

In addition to its primary mission of saving lives, the Roberts Proton Therapy Center has another purpose: to improve the treatment of cancer and to advance medical science through research. Because proton therapy is still a relatively new technique, its true potential and promise have yet to be fully explored. "We'll constantly look at integrating new technologies that will allow us to expand



In 2008, part of the 220-ton particle accelerator was lowered into its underground home.

the use of proton therapy to more types of cancers," says Zelig Tochner, M.D., the vice chairman for proton therapy in the Department of Radiation Oncology and the medical director of the proton facility.

Part of that effort will involve clinical trials that will provide new protocols to ultimately increase and enhance the effectiveness of proton therapy. Among other questions, the staff will also investigate which types of cancers are the most appropriate for proton therapy and why.

For patients, if a consultation points to proton therapy, the next step is to obtain a three-dimensional picture of the patient's tumor using CT, MRI, or PET scanning. These data are used to construct the filters and shields in the multi-leaf collimator. Depending on each patient's circumstances, the therapy usually runs from four to eight weeks, five days a week. In general, the patient is at the Roberts Center for about an hour each day, and the actual proton therapy session lasts about 20 minutes. There is no pain or discomfort during the procedure, very little noise, and no time spent inside small, confining spaces, as with some MRI scans.

The first patients to be treated with proton therapy had prostate cancer. In March, the center began to treat patients with brain tumors and other cancers. ♥



Development Matters

CREATING A LEGACY OF LEARNING

PENN MEDICINE DONORS MAKE GOOD

For medical students, the current economy is delivering a double whammy. As students and their families are less able to afford a medical education, donors likewise have less capacity to give now. Some of Penn Medicine's most loyal friends and alumni are focusing on planned giving as a meaningful way to address the nation's enduring need for good physicians. Dr. Richard "Buz" Cooper, an expert in health-care economics, stresses the need for more scholarships: "If there were more scholarship aid, it would mean more opportunities for low-income students to follow their dreams of becoming a physician. This is crucial because doctors, specifically general practitioners, strengthen the fabric of society."

An Unexpected Reversal

For Steve Miller, Class of 2012, and his family, 2009 brought the end of the family business. Miller Bros., a Baltimore women's clothing store that had been in the family for generations, opened its doors in 1897 and shut them for good last year. Fortunately for Steve, he was awarded the Henry A. Jordan, M.D. Endowed Scholarship.

"Because of this scholarship," says Steve, "I can study family medicine. I want to help people and make a difference, and now I can."

Steve is now \$120,000 less in debt and will not have to take out high-interest loans. This has cut down on the pressure of his medical school experience, allowing him to focus solely on his training. "Medical school is a sacrifice and I am gladly making it, but it is less of a pressure cooker when you have some help," he said.



Steve Miller, Class of 2012, in the city of Maracaibo, Venezuela, where from 2006-07 he worked in a children's hospital as a Fulbright Fellow.

Steve will always be thankful for his scholarship and is inspired by donors who support them: "I have nothing but respect for them. They are providing the freedom and the means to look forward to your career with peace of mind."



Miss Marjorie Ernest, CW '56, who recently made an irrevocable bequest to Penn Medicine, is shown here with Jeff Cohen, C '05, M.D. '09, and Katie McKeegan, Class of 2011, both recipients of her scholarships at the School of Medicine.

Marjorie Ernest: Shaping the Future of Medical Education at the School of Medicine

Marjorie Ernest, CW '56, values her special relationship with her scholarship students and often refers to her philanthropy as making a difference for future generations. It is similar to planting a tree. You give the tree attention and over the years it grows tall and strong. Miss Ernest is a loyal friend to the School of Medicine and has supported several priorities, including establishing two scholarships, a prize fund, and naming a small study area in the new medical education building in honor of two of her past scholarship students, Peter Hutchinson, M.D. '06 and Rebecca Hutchinson, M.D. '06.

The inspiration for her philanthropy started at an early age, as she observed her late father, Richard B. Ernest, C '13, M.D. '15, a renowned orthopaedic surgeon, always willing to go the extra mile for his patients.

"Watching my father treat his patients with skill and respect – his high standards and how they were so loyal to him was something that I valued and treasured," she says. "That special relationship between doctors and patients will continue to exist because of my ability to help my students attend the School of Medicine. It is these special relationships that I have come to treasure, and I love that I make a difference in their lives," she says. "I know my heart will always belong to the School of Medicine students."

Miss Ernest recently decided to create an irrevocable bequest to ensure that her generosity can continue to make a major

USE OF PLANNED GIFTS

impact on students. “I chose an irrevocable bequest because I wanted to make a statement about how much the School of Medicine means to me and to inspire others to do the same,” she says. “The gratitude I received from Dean Rubenstein and the students has been so meaningful to me. It is a wonderful way to leave a lasting legacy.”

Miss Ernest’s generosity will support scholarships at the School of Medicine, a fund in the Department of Orthopaedic Surgery, and a scholarship at the School of Arts and Sciences.

The Right Time

Drs. David and Kathy Guarnieri have always placed a great value on education. Recently, they decided to transform their deep appreciation into a scholarship fund that they established through an outright gift in addition to a bequest in their will.

“My wife and I feel like it is the right time to give back. We took stock of our lives and decided that we can make this commitment now,” says David Guarnieri, M.D. ’84. “Planned giving is a wonderful vehicle to give others the same opportunities we had – a foundation for success.”

Despite earning medical degrees from different schools, they readily agree that the University of Pennsylvania School of Medicine is a worthwhile investment.

“I would not be where I am without my degree from the School of Medicine,” says David. “It was a wonderful beginning for my profession.”

Adds Kathy, “We decided to make a planned gift, which we feel is a wonderful way to perpetuate our name and to help future generations of students at the School of Medicine.”

Planned Giving 101

More than \$76 million – representing more than 400 planned gifts – has been contributed to the Penn Medicine Campaign. For many donors, a bequest will be their largest contribution to benefit scholarships. Planned gifts are a way to create a lasting legacy and help our students pursue their dreams. Here are a couple of creative giving opportunities donors often choose:

Bequest: A bequest is a gift made through a will or living trust. Bequests can be made in the form of a specific gift of cash or property, or a percentage of the remainder of an estate or trust. The full amount of a bequest is usually deductible for estate tax purposes. The following language is approved as an effective bequest: *“I hereby give, devise, and bequeath to the Trustees of the University of Pennsylvania, a non-profit corporation organized and operating under the laws of the Commonwealth of Pennsylvania and located in Philadelphia, Pennsylvania, the sum of \$_____ [or percentage of your estate or specific description of the gift] to be used by Penn Medicine [describe purpose of gift here, if desired].”*

If you need assistance with specialized bequest language, please contact the Office of Planned Giving at 215-898-9486.

Charitable Gift Annuity: A charitable gift annuity is a contract between Penn and the donor. The donor receives a current income

tax deduction and a lifetime annuity payment. When the annuity terminates, the remaining funds go to the Penn program designated by the donor. A charitable gift annuity may have one or two beneficiaries and may be established with cash or securities.

You can learn more about planned gifts, including charitable remainder trusts, life insurance, and personal property by contacting Christine S. Ewan, J.D., director of Planned Giving, at 215-898-9486 or visiting www.plannedgiving.med.upenn.edu.

Please consider attending our planned giving seminar during Medical Alumni Weekend, May 14-16:

Building Blocks of a Tax-Wise Estate Plan, Friday, May 14, 3:15-4:15 p.m.

Estate planning is crucial to ensure that your assets are protected and handled appropriately. Hear an overview of common issues that arise in the estate-planning process, along with an explanation of the current status of the Federal Estate Tax and basic techniques for minimizing its impact.

Presenter: **Marcie Merz, J.D.**, executive director of Gift Planning and associate general counsel, University of Pennsylvania.
Location: Room 252, Biomedical Research Building
421 Curie Boulevard

CGAs: Creating a Win-Win

For some, a charitable gift annuity (CGA) is the best way to support Penn. CGAs provide tax exempt income during a donor's lifetime. Retired orthopaedic surgeon William Simon, M.D. '63, is a big proponent of the CGA. To celebrate his 30th reunion, he established a CGA benefitting the Medical Class of 1963 Scholarship Fund.

"It is so easy and anyone can do it," he says. "While I am alive, I designate a gift to the deserving charity, while at the same time, I receive guaranteed income for life."



Dean Arthur Rubenstein addresses attendees at the annual Charles Custis Harrison Society luncheon, hosted by the Medical Legacy Circle. Alumni and friends who support the future of Penn Medicine through their financial and estate planning become members of both of these societies. The benefits of membership include luncheons and symposiums designed especially for society members.

Dr. Simon's motivation for giving comes from his admiration for Penn students. "Penn students are extraordinary, and I wanted to do my part to guarantee that they succeed," he says. A love for Penn runs in the Simon family. Both of Dr. Simon's parents were Penn alumni, and his wife and daughter are graduates as well. They were especially proud when he made his gift supporting scholarships.

"It is a critical need and I am overjoyed that I can lend a hand," he says. "This was a simple way to help students achieve their goals, giving them a foundation for a brilliant career."

Recent Gifts

An additional distribution has brought the total contribution of the **Estate of Ralph M. Weaver, C '41, M.D. '44**, to more than \$10 million for medical scholarships.

With a \$2 million gift, **Margarita Louis-Dreyfus** has established the Robert and Margarita Louis-Dreyfus Endowed Associate Professorship in Chronic Lymphocytic Leukemia and Lymphoma Clinical Care and Research at the Abramson Cancer Center.

Mariann T. and Robert J. MacDonald have made a second leadership gift to Penn Medicine. Their \$5 million gift will name the Mariann and Robert MacDonald Women's Cancer Risk Evaluation Center at the Abramson Cancer Center. The gift will endow the directorship of the center and establish term funds for cancer genetics research and for community outreach and education, as well as fund the construction of dedicated space for the MacDonald Center in the Anne and Jerome Fisher Translational Research Center.

The Estate of Dr. Edward C. Raffensperger has contributed an initial distribution of \$1.5 million to the Mary Ames Raffensperger & Edward Cowell Raffensperger Scholarship Fund. This endowed fund provides financial aid for deserving medical students who are selected primarily on the basis of high academic standing and personal excellence.

The Hess Foundation contributed a \$1 million gift, directed by **Dr. Sankey V. Williams, G.M.E. '77, W.G. '77, and his wife Constance, W.G. '80**, to establish the Williams Fellows Fund, which will provide financial support to the Division of General Internal Medicine. The fund will be used to promote a sense of unity and community among the Division of General Internal Medicine and a select group of promising junior faculty members.

To make a gift to Penn Medicine, or for more information, please contact the **Office of Development and Alumni Relations**, 3535 Market Street, Suite 750, Philadelphia, PA 19104-3309, or call 215-898-0578.

CAMPAIGN UPDATE Your Gift Counts

Thanks to your generosity, the Penn Medicine campaign reached the three-quarters mark at the end of 2009. With \$484 million in gifts and receipts, the Propel Discovery initiative for research support has surpassed its \$400 million campaign goal.

Our educational priorities – scholarships and the new medical education center chief among them – are an important focus as we move into the final two years of the campaign.





Penn Medicine remembers our dear friend

HENRY A. JORDAN, M'62, RES'67

1936 – 2010

*Noted physician, devoted alumnus,
distinguished philanthropist, and beloved mentor.*

A STEADFAST CHAMPION OF PENN MEDICINE,
HIS LIFE'S WORK IS AN INSPIRATION TO US ALL.



Penn Medicine



Progress Notes

Send your progress notes to:

Andrea Pesce
Assistant Development Officer
PENN Medicine Development
and Alumni Relations
3535 Market Street, Suite 750
Philadelphia, PA 19104-3309

'70s

Roy W. Beck, M.D. '77, Ph.D., executive director of the Jaeb Center for Health Research in Tampa, received the 2009 Alfred W. Bressler Prize in Vision Science. The \$40,000 prize was awarded by the Jewish Guild for the Blind. The Jaeb Center has pioneered the use of clinical research networks, mostly funded by the National Eye Institute, to study and seek therapies in pediatric ophthalmology, cornea transplantation, diabetic retinopathy, juvenile diabetes, and herpetic keratitis. Beck is an adjunct professor of epidemiology and biostatistics at the University of South Florida.

Diane K. Jorkasky, M.D. '77, G.M.E.'83, was appointed senior vice president, head of development, and chief medical officer at Aileron Therapeutics. The biotechnology company discovered and is developing a novel class of therapeutics called stapled peptides. Jorkasky will lead and direct Aileron's activities in development, clinical research, and regulatory matters across multiple therapeutic areas. She joins Aileron after nearly a decade at Pfizer, where she most recently served as vice president of development and head of worldwide clinical research operations. In January 2008, she received a Women of Innovation award, sponsored by the Connecticut Technology Council. The awards recognize women in the workforce who are innovators, role models, and leaders in the technology, science, and engineering fields.

James M. Seltzer, M.D. '77, has joined Fallon Clinic's Allergy Department at Worcester Medical Center in Massachusetts. Formerly medical director of Indoor Hygienic Technologies

Corporation, an environmental consulting company, he is a Fellow of the American Academy of Allergy, Asthma, & Immunology, the American College of Allergy, Asthma, & Immunology, and the American Academy of Pediatrics.

'90s

Valerie Weber, M.D. '91, was appointed Founding Chairwoman of Medicine at Commonwealth Medical College in Scranton, Pa., which opened in August 2009. She oversees the development of education, research, practice models, and community partnerships for the newly established Department of Internal Medicine. She had been with the Geisinger Health System, where she served as director of General Internal Medicine and Geriatrics. A former president of the Association of Chiefs of General Internal Medicine, she is a Fellow of the American College of Physicians. Weber is also the author of *Menopause FAQs* (2007).

'00s

David Caron, M.D., G.M.E. '08, board-certified in pediatrics and internal medicine, opened Farrington Family Medical Center Granite Quarry in December. The North Carolina center's services include well-child care from newborns to teenagers, adult care, treatment of viruses and childhood diseases, school and sports physicals, geriatric care, annual exams, women's care, and treatment of minor injuries.

OBITUARIES

Donald F. Kent, M.D. '40, Maplewood, N.J., a retired physician; June 20, 2009. In 1945, returning from serving as an army physician in England, he established a general practice in Chatham. He also served as the high-school physician. He was also active in the community as a member of the Historical Society, Wheelmen's Society, and especially the Chatham Community Players, where he performed in many plays. In 1973, at the age

of 60, while continuing to care for his long-time patients, he took on a new career as founder and director of Overlook Hospital Family Practice Residency program. There he taught and mentored new doctors until his retirement in 1988. At the age of 82, he was the oldest person to receive a doctorate from Drew University. He then became a founding faculty member of a new doctoral program in medical humanities there. At the age of 95, he was still teaching a course in the history of medicine (which he alternated with one on the history of plagues) in the Fall 2008 semester.

Edward C. Raffensperger, M.D. '40, Philadelphia, emeritus professor of medicine at Penn; October 2, 2009. After completing his residency at the Graduate Hospital of the University of Pennsylvania, he served in the Air Force as a flight surgeon during World War II. Following his service, he took a fellowship in gastroenterology at the Graduate Hospital with Dr. Henry Bockus, considered by many to be the father of clinical gastroenterology. From 1948 to 1962, Raffensperger practiced at the Polyclinic in Harrisburg. He was then recruited to HUP to serve as the lead clinical gastroenterologist. In his tenure at Penn, Raffensperger held many positions, including chairman of the hospital's medical board and of the admissions committee of the School of Medicine. He became emeritus in 1985. Among his many awards were the Distinguished Alumni Award from his undergraduate alma mater, Dickinson College, where he also served as a trustee for many years. As a philanthropist, he and his wife, the late Mary Ames Raffensperger (a pioneer in rehabilitative medicine at the Children's Hospital of Philadelphia), established a generous fund in that area at Children's Hospital. At Penn, he established an endowment to support medical students.

Stephen T. Whelan, M.D. '40, Gladwyne, Pa., retired chief of dermatology at Delaware County Memorial Hospital; May 8, 2009. An adjunct professor at Penn Medicine, he had maintained a private practice for many years.

During World War II, he was an officer with the Public Health Service in the Panama Canal Zone.

Henry Abrams, M.D., G.M. '41, Philadelphia, a former otolaryngologist; January 25, 2009. He taught at Penn's medical school for 15 years. During World War II, he served as an eye surgeon with the U.S. Coast Guard, in Greenland and the Philippines.

H. Harvey Cooperman, M.D., G.M. '41, Deerfield Beach, Fla., a retired thoracic surgeon; April 25, 2009.

Donald B. Freshwater, M.D. '42, G.M.E. '49, Pasadena, Calif.; October 28, 2009. He received the Packard Prize in Internal Medicine from the School of Medicine in 1942, then completed his internship and residency as a Naval officer from 1943 to 1947. After additional training in neurosurgery and neurology in Chicago, he took a fellowship at Lahey Clinic in Boston. He moved to San Marino, Calif., where he joined a neurosurgical practice, then practiced at Hoag Hospital and Huntington Hospital until 1989. Freshwater also served as a clinical professor of neurosurgery at the University of Southern California and conducted research on brain tumors at Huntington Medical Research Institutes. In 1979, he served as president of the Western Neurosurgical Society.

George B. Patrick Jr., M.D. '42, Silver Spring, Md., a former family physician; October 6, 2007.

B. Milton Garfinkle Jr., M.D. '43, Boston, a former obstetrician and gynecologist; November 4, 2009.

Theodore S. Stashak, M.D. '43, G.M.E. '46, Santa Rosa, Calif., a retired obstetrician and gynecologist; November 8, 2009. In a career spanning 49 years, he delivered more than 10,000 babies. From 1941 to 1951, he served as a second lieutenant in the Medical Administrative Corps. According to one of his sons, Ted Stashak, he worked as a clinical instructor at the School of Medicine and received an award for teaching excellence. Moving west, he took a job with

Kaiser Permanente in Oakland. In 1949, he and his family moved to Santa Rosa, where he joined a practice with Dr. Alexis Maximov. In 1953, he bought a ranch in eastern Santa Rosa and stocked it with cattle and horses. For more than 50 years, Stashak rode with the Sonoma County Trail Blazers and was a member of the Reno Sierra riders more than 35 years. Stashak was also an outspoken conservative activist who had once served as president of the Sonoma County Taxpayers' Association.

Robert P. Bush, M.D. '44, G.M.E. '48, St. Paul, Minn.; July 27, 2009. He was director of Hamm Memorial Psychiatric Clinic from 1968 to 1985 and maintained a private psychiatric practice until his retirement.

Robert M. Day, M.D. '44, G.M.E. '53, Vero Beach, Fla., a retired ophthalmologist; October 28, 2009. A veteran of World War II, he served in the U.S. Army Medical Corps. He was a longtime professor and staff member at the Columbia Presbyterian Medical Center.

Howard P. Thomas Jr., M.D. '44, G.M. '48, Perkasie, Pa., retired head of pediatrics at Grand View Hospital in Sellersville; May 4, 2009. He had served in the U.S. Army Medical Corps.

E. Stanley P. Cope, M.D. '46, Palmerton, Pa., a retired physician on the staff of Palmerton Hospital; June 8, 2009. During the Korean War, he was a captain in the U.S. Army.

Anthony R. Galgano, M.D., G.M. '47, Port Angeles, Wash., a former radiologist; November 4, 2004.

Albert M. Kligman, Ph.D., M.D. '47, G.M.E. '51, Philadelphia, emeritus professor of dermatology at the University of Pennsylvania School of Medicine; February 9, 2010. Beginning as an assistant instructor of dermatology at Penn in 1948, he continued to see patients until 2007. The son of poor East European Jewish immigrants, Kligman grew up in Philadelphia. After receiving his B.S. degree at Pennsylvania State University, he earned a doctorate in botany

at Penn, where he specialized in mycology and wrote *Handbook of Mushroom Culture* – derived from his research in the mushroom houses at Kennett Square. His first wife, Dr. Beatrice Troyan, encouraged him to become a physician as well.

Although best known for the invention of topical tretinoin (Retin-A) for acne and photo-damaged skin, Kligman was also responsible for such advances as the Periodic Acid-Schiff stain for visualizing fungi in tissue, which earned him the American Academy of Dermatology's first prize for original research in 1950; his description of the human hair cycle, telogen effluvium (for which he also coined the term), and hot comb alopecia; his studies on the pathogenesis of acne vulgaris; the maximization test for identifying new contact allergens; and the coining of the terms "photoaging" and "cosmeceuticals." Many of his observations debunked popular myths, such as "chocolate causes acne." His research findings resulted in the publication of several fundamental texts – *Dermatology*, by Donald Pillsbury, Walter Shelley, and Albert Kligman, and *Acne: Morphogenesis and Treatment and Acne and Rosacea*, both by Gerd Plewig and Albert Kligman – and more than a thousand articles.

An innovative, captivating teacher, Kligman inspired generations of researchers and clinicians. Many young researchers from around the world came to train with him and went on to become prominent figures in the field. A member of the board of directors of the Society for Investigative Dermatology from 1957 to 1962, Kligman was its president in 1978 and received its highest honor, the Stephen Rothman Memorial Award, in 1976. In 1998, he received the Distinguished Graduate Award, the highest honor conferred by Penn's School of Medicine. Over the years, Kligman was awarded numerous honorary degrees.

Kligman conducted some of his research on skin at Holmsburg Prison in Pennsylvania, using prisoners who volunteered and were paid. In later years, he, Dow Chemical, and others were sued by former prisoners, but in 2002 a federal judge ruled that

the statute of limitations had expired. In 1998, Kligman stated that "my use of paid prisoners as research subjects in the 1950s and 1960s was in keeping with this nation's standard protocol for conducting scientific investigations at that time."

With his wife Lorraine, a Ph.D. in developmental biology and research professor of dermatology at Penn's School of Medicine, Kligman made many philanthropic gifts to help assure the future of education. These included donations to the College of Health and Human Development at Pennsylvania State University and scholarships for nursing candidates at its Mont Alto campus. In 1996, he created the Albert M. Kligman Travel Fellowships that have allowed more than 250 young scientists to attend the annual meetings of the Society for Investigative Dermatology. At Penn, the Kligmans have endowed the Albert M. Kligman Professorship, the Albert M. Kligman Dermatology Fund to support education and research, the Sandra Lazarus Professorship to support a bright young clinician, and an annual tuition fund for four University of Pennsylvania medical students.

Henry Mitchell, M.D. '47, Indiana, Pa., a retired pediatrician; August 30, 2009.

Joseph Rudolph, M.D., G.M.E. '48, Bridgeton, N.J., a retired pediatrician; July 2, 2003.

Clayton H. Schmidt, M.D. '48, Montgomery, Ala., a retired surgeon with the U.S. Air Force; May 25, 2009.

Virginia Wedern, M.D. '48, New Smyrna, a retired obstetrician and gynecologist; August 31, 2009. She took her residency at Elizabeth Steele Magee Hospital in Pittsburgh. For 30 years, she practiced and taught in New York City, where she was on the staff of the New York Hospital, Cornell Medical Center, Lennox Hospital, and French Hospital.

Kathleen K. Wendell, M.D., G.M.E. '48, Frederick, Pa., a former pediatrician; June 6, 2008.

Thomas E. Whitaker II, M.D. '48, Greenville, S.C., a retired radiologist; May 27, 2009.

Stewart A. Fish, M.D. '49, G.M.E. '53, Nacogdoches, Texas; January 1, 2006. He completed his residency in obstetrics and gynecology at Columbia Presbyterian Medical Center in New York and did a fellowship at Harvard Medical Center. He served on the faculty at the University of Texas Southwestern Medical School in Dallas, where he also had a private practice for six years. He then taught at the University of Arkansas and later served as professor and chairman at the University of Tennessee School of Medicine for nine years. In 1975, Fish moved to Nacogdoches, where he practiced at the Medical Center for more than 20 years.

John H. Selby, M.D., G.M. '49, Lubbock, Tex.; September 9, 2009. After completing his residency, he served as surgeon at the Portsmouth Naval Hospital from 1946 to 1948. He moved to Lubbock in 1952. He was board certified in cardiovascular surgery, thoracic surgery, and general surgery and performed both the first heart surgeries and the first operations on the lung in West Texas. His numerous honors included the Hippocratic Award of the Lubbock-Crosby-Garza County Medical Society. Before retiring in 1985, he was chief of surgery and chief of thoracic and cardiovascular surgery at Methodist Hospital; chief of staff and chief of surgery at Saint Mary of the Plains Hospital; and professor of surgery and thoracic surgery at Texas Tech University Medical School. He had also served as chairman of the Lubbock County Board of Health; chairman of the Lubbock City Board of Health; and director for Odyssey Health Care – Hospice.

Maurice M. Wicklund, M.D., G.M. '49, Canton, Mich., former radiologist; September 19, 2009. He completed his residency in radiology at St. Vincent's Hospital in Erie, Pa. He was awarded the Asiatic Pacific Service Medal with one Bronze Star, the American Theater Service Medal, and the World War II Victory Medal. After his discharge from active duty, he was commissioned in the Army Reserves. Wicklund retired from the Army Reserves in 1950 as a major. He subsequently moved to



Waterloo, Iowa, and practiced at Allen Hospital until his retirement in 1981. There he founded the hospital's radiological school for technicians.

Lawson H. Bowling Jr., M.D., G.M.E. '51, Marietta, Ga., who retired in 1996 after 20 years as a psychiatrist with the Ridgeview Institute in Smyrna, Ga.; October 31, 2009. He served as president of its medical staff from 1982 to 1983. Previously, he had been superintendent and medical director of the Georgia Regional Hospital in Atlanta and other facilities. Bowling was appointed an examiner by the American Board of Psychiatry. Elected a fellow of the American Psychiatric Association in 1956, he was also named a Life Fellow of the Georgia Psychiatric Association and a Distinguished Life Fellow by the American Psychiatric Association.

Carl J. Impellitier, M.D., G.M. '52, Las Cruces, N.M., a former thoracic surgeon; September 9, 2009.

George H. Lane, M.D., G.M.E. '52, Houston, Texas, a former orthopaedic surgeon; August 6, 2009. He entered private practice in Houston in 1955 and continued to practice until 1998. He was a former member of the executive committee of The Methodist Hospital. Lane was chief of the Polio and Spina Bifida Clinics at The Institute for Rehabilitation and Research from 1958 to 1975 and performed thousands of reconstructive surgical procedures on victims of those diseases. In 1962 he performed the first prosthetic total knee replacement in Houston and in 1967 the city's first total hip replacement.

L. Lee Lankford, M.D., G.M.E. '52, Dallas, Texas; August 16, 2009. After a stint as chief of the orthopaedic service at the Dallas VA Hospital, he established his practice of orthopaedic surgery. He served as clinical professor of orthopaedic surgery at the University of Texas Health Science Center of Dallas and director of the hand surgery service at Parkland Memorial Hospital. A former chairman of the American Society for Surgery of the Hand, he had

been president of the North Texas Chapter of Western Orthopedic Association.

Charles T. McCoy, M.D., G.M. '52, Hutchinson, Kansas; October 2, 2009. He was a resident surgeon in ophthalmology at Kansas City General Hospital, Kansas City, Mo., from 1952 to 1954 and was board certified by the American Board of Ophthalmology in 1957. He was a practicing ophthalmologist in Hutchinson from 1954 to 2001 and was on the attending staffs at Grace, St. Elizabeth's, and Hutchinson Hospitals. He was the Reno County coroner from 1999 to 2003.

David C. Miesch, M.D., G.M.E. '52, Paris, Texas, a retired internist; August 23, 2009.

Felix J. Muchlado, M.D., G.M. '52, Natrona Heights, Pa.; December 2, 2008. He had a practice in general ophthalmology in Natrona Heights. He had worked at Allegheny Valley Hospital, Butler Memorial Hospital, the Butler VA Hospital, and St. Barnabas Home in Gibsonia until his retirement in 1982.

Thomas R. Hedges Jr., M.D., G.M. '53, Moorestown, N.J., emeritus professor of ophthalmology at Penn; September 10, 2009. After completing his residency, he became a captain in the U.S. Army and served as chief of ophthalmology at the William Beaumont Army Medical Center until 1952. In 1954, Hedges started ophthalmology practices in Philadelphia and Moorestown, N.J. He established and ran the ophthalmology section at Pennsylvania Hospital for more than 30 years. At this time he was appointed to professor of ophthalmology in 1973. Hedges also taught at Cooper Hospital in Camden until his retirement in 2002. His research at Louis Coriell Laboratory in Camden on the effects of intracranial pressure on the optic nerve led to several papers in medical journals. He was a recipient of the Senior Honor Award of the American Academy of Ophthalmology and co-founder of the International Neuro-ophthalmology

Society. His portrait was installed in the Great Court of the Pennsylvania Hospital in 2005.

Richard S. Stemler, M.D. '53, Bainbridge Island, Wash., a retired internist; August 13, 2009.

Lewis D. Polk, M.D. '53, G.M.E. '56, Philadelphia, acting commissioner of the Philadelphia Department of Public Health from 1972 to 1981; October 24, 2009. From 1956 to 1960, he had a pediatric practice at Stenton Avenue and Washington Lane while working part time at a well-baby clinic for the Health Department. He earned a master's degree in public health from Johns Hopkins University in 1961 and was appointed director of the city's division of health protection in February 1964. In 1976, Polk became Philadelphia's face and voice after what came to be known as Legionnaires' disease struck a state convention of the American Legion at the hotel now called the Park Hyatt Philadelphia, killing 29 Legionnaires. Perhaps his most controversial job was carrying out the decision of Mayor Rizzo's administration to close the Philadelphia General Hospital.

From 1986 to 2003, Polk served as director of the Bucks County Health Department. He had been president of the American Academy of Health Administration, vice president of the American College of Preventive Medicine, a trustee of the U.S. Conference of City Health Officers, and president of the Pennsylvania Public Health Association. A member of the editorial board of *Clinical Pediatrics Journal*, he published more than 50 articles in the *Journal of the American Medical Association*, the *American Journal of Public Health*, and other publications. Among his honors were the Cristol Award from the Philadelphia County Medical Society and the Public Health Recognition Award from the College of Physicians of Philadelphia.

Leonard S. Danzig, M.D., G.M.E. '54, Little Silver, N.J., a retired physician; August 20, 2008.

Remer Young Clark Jr., M.D., G.M. '55, Marietta, Ga.; November 5, 2009. He opened his first

office in 1951 and made his last house call when he was 83 years old. He served as president of the Cobb County Medical Society and chief of staff on Kennestone Hospital.

Eliseo C. Comiso, M.D., G.M. '55, Yuba City, Calif., a former surgeon; September 3, 2009.

Henry Eisner, M.D. '55, G.M. '59, Philadelphia, a retired pediatrician and psychiatrist; July 4, 2009.

Zeb L. Burrell Jr., M.D., G.M. '56, Elberton, Ga.; June 2, 2009.

Joseph C. Mayer, M.D. '56, Long Beach, N.Y., a psychiatrist and psychoanalyst; June 14, 2009.

David V. Castner Jr., M.D., G.M. '58, Carlsbad, Calif., a retired senior navy captain in the Dental Corps and the district dental officer for the San Francisco region; May 21, 2009.

Harry J. Hurley Jr., M.D., G.M.E. '58, West Chester, Pa., a former clinical professor of dermatology in Penn's School of Medicine; July 26, 2009. He earned his medical degree from Thomas Jefferson University in 1949. A practicing dermatologist for more 50 years, Hurley had offices in Upper Darby and then in West Chester until his retirement in 2008. He began teaching at Penn in the 1950s, following his residency at HUP. His research with Dr. Walter Shelley, professor of dermatology, led to the development of the Hurley-Shelley axillary resection technique to surgically treat excessive underarm sweating. Hurley was the author or co-author of many professional articles and books, including the textbook *Dermatology*, written with Shelley. Hurley had been chief of dermatology at Hahnemann University Hospital (1959-1962) and Philadelphia General Hospital (1962-1973). In the 1960s, he was the founding president of the Pennsylvania Academy of Dermatology and had served as president of the American Dermatological Association and of the American Board of Dermatology.

Nelson Fernandez-Blasini, M.D., G.M. '60, Santurce, Puerto Rico; July 5, 2005. He specialized in otology.

J. Barnett Finkelstein, M.D. '60, Houston; October 26, 2009. He had worked at the University of Texas M. D. Anderson Hospital and Tumor Institute.

Ronald N. Zehner, M.D. '60, Modesto, Calif.; September 8, 2009. Following service as a flight surgeon in the U.S.A.F., he specialized in radiology in Los Angeles County-U.S.C. Medical Center. He was in private practice with Modesto Radiology Medical Group until retiring in 1997. He was a member of the American College of Radiology and the Radiological Society of North America.

Joseph Lehman, M.D., G.M.E. '61, Lubbock, Texas, a former dermatologist; July 31, 2009.

Clarence W. Jordahl Jr., M.D., G.M.E. '62, Milwaukee, former medical director at Northview Home in Waukesha; June 20, 2009.

John A. Kibelstis, M.D. '64, Allentown, Pa.; August 31, 2009. He had been a pulmonary specialist on staff at Lehigh Valley Health Network and Sacred Heart Hospital, Allentown, since 1973. From 1965 to 1973, he was a senior surgeon in the U. S. Public Health Service. A former president of the Lehigh County Medical Society, he had been president of the Lehigh Valley Hospital medical staff.

Ettore V. Liberace, M.D. '65, West Chester, Pa., a retired pathologist; August 21, 2009.

Vishnudev Pratt, M.D. '65, Woodridge, N.Y.; April 29, 2009. Formerly John Lockwood Pratt III, he conducted research into bone growth at Penn and patented a device to help understand cranial development. He served in the army at NATO headquarters in France and in the reserves in Virginia upon his return. While living in Philadelphia, he devoted himself to a wide range of philanthropic activities. With his wife,

Denny, he organized medical aid to Vietnam and helped rebuild Bach Mai Hospital in Hanoi in 1973. In 1976, he met Swami Muktananda, the Siddha Yoga meditation master, who bestowed his new name on him.

Roger A. Snyder, M.D. '65, G.M.E. '73, Fairfax, Va.; June 16, 2009. He had been a neurologist with Dominion Hospital, INOVA Alexandria Hospital, and INOVA Fair Oaks Hospital and also served as an expert witness.

David V. Heisterkamp, M.D., G.M.E. '68, Denver, a retired anesthesiologist; January 26, 2009. He served as a lieutenant commander in the U.S. Navy (1968-70).

George Pechstein, M.D., G.M. E. '68, Boyertown, Pa.; February 16, 2008. During his residency, he served three summers as the chief medical officer for the Grace Line. He was the chief of radiology at Pottstown Memorial Medical Center for 38 years and had a private radiology practice in Bryn Mawr.

Cynthia G. Keller Ayers, M.D., G.M.E. '69, Pittsburgh; November 4, 2009. In 2007 she became the first African-American to receive the Physician of the Year Award from Gateway Medical Society. In addition to her private practice, Ayers was medical director at LifeCare Hospital in Wilkinsburg and had administrative duties at Forbes Regional Hospital in Monroeville and West Penn Hospital in Bloomfield. She also was a regular public speaker at community events.

William C. Bergman, M.D. '72, San Francisco; August 8, 2009. He interned at Bellevue in New York and did his neurosurgical residency at the University of Miami. Stationed at Oak Knoll Naval Hospital in Oakland, he subsequently became chief of neurosurgery at Letterman Army Medical Center in the Presidio until its closing. During his post at Letterman, he participated in Desert Shield/Desert Storm and was instrumental in bringing a CT scanner to the battlefield. His next post was as consultant to the Surgeon General of the Army at Walter Reed Army Hospital in

Washington, D.C., during which he also served as director of neurosurgical research. He returned to the San Francisco Bay Area and became chief of neurosurgery at Santa Clara Valley Medical Center in San Jose. He was also Commander of the 352nd Command Support Hospital, achieving the rank of colonel. He retired from the medical center but continued to teach at San Francisco General Hospital.

Loretta J. Giuffra, M.D., G.M.E. '74, Little Egg Harbor, N.J., former long-time chair of physical medicine and rehabilitation at HUP and a three-time recipient of its best-teacher award; July 11, 2009. She had also been chair of the similar departments elsewhere and retired in 2001 from private practice with Schwing Rehabilitation Associates.

Chester A. Shadle, M.D. '75, Bethlehem, Pa., a retired radiologist; June 12, 2009. He had practiced most recently at Blue Mountain Healthcare System and the Women's Health Center in Allentown.

Malcolm G. Freeman, M.D., G.M.E. '77, Statham, Ga.; June 20, 2009. He was a physician and professor of gynecology and obstetrics at Emory University Medical School until his retirement.

Richard W. Tureck, M.D., G.M.E. '81, Bryn Mawr, Pa., professor of obstetrics and gynecology in the School of Medicine; October 28, 2009. He received his medical degree from Cornell University Medical College in 1975. After completing his internship and residency in obstetrics and gynecology, he came to Penn as a fellow in reproductive endocrinology and infertility. Tureck served as director of Penn's in-vitro fertilization program and embryo transfer program from 1982 to 1994, when he became a full professor. In 1983, the first IVF pregnancy in the tri-state area – which resulted in the successful birth of a baby girl – was achieved under his leadership. From 1994 to 2006, Tureck was director of reproductive surgery at HUP. A Fellow of the American College of Obstetrics and Gynecology, he

was also a member of the American Association for the Advancement of Science and several other professional societies.

FACULTY DEATHS

Henry Abrams, M.D. See Class of 1941.

Mildred Cohen, M.D., Philadelphia, the Benjamin Rush Emeritus Professor of Physiological Chemistry at Penn; October 12, 2009. After receiving her Ph.D. degree in physical chemistry from Columbia University in 1938, she did a postdoctoral fellowship at George Washington University and then took a position as research associate at Cornell Medical College. In 1946, when Cohn's husband, the late physicist Dr. Henry Primakoff, received a faculty appointment at Washington University in St. Louis, Cohn was offered a research position in the biochemistry laboratory of the Nobel Prize-winning husband and wife team of Gerty and Carl Cori. Cohn joined the faculty as an associate professor of biochemistry in 1958 and remained at Washington University until 1960, when she and her husband came to the University of Pennsylvania. Cohn joined the School of Medicine as an associate professor of biophysics and physical biochemistry and became a full professor the following year. In 1982, she was named the Benjamin Rush Professor of Physiological Chemistry. From 1982 to 1985, Cohn was a senior scientist at the Fox Chase Cancer Center. After officially retiring in 1985, she remained involved in the world of science and in the life of the University of Pennsylvania.

Throughout her career, Cohn overcame both gender and religious discrimination to have a profound impact on biochemistry and biophysics. She published more than 160 articles, including many seminal papers in her field. She was the first woman to be appointed to the board of the *Journal of Biological Chemistry*, where she served as editor for ten years, and she was the first woman to be elected president of the



American Society of Biological Chemistry (in 1978). Among her many honors, Cohn was elected to the National Academy of Sciences, the American Academy of Arts and Sciences, and the American Philosophical Society. She received the National Medal of Science in 1982; the citation read: "For pioneering the use of stable isotopic tracers and nuclear magnetic resonance spectroscopy in the study of mechanisms of enzymatic catalysis." Cohn was granted honorary doctorates from nine universities, including Penn in 1984 and the Weizmann Institute in Israel. Her most recent honor came on October 11, 2009, when she was inducted into the National Women's Hall of Fame.

Loretta Giuffra, M.D. See Class of 1974.

Jane M. Glick, Ph.D., Swarthmore, Pa., retired faculty administrator for the Cell & Molecular Biology Graduate Group in the School of Medicine; November 15, 2009. Glick earned her Ph.D. degree in biochemistry from Columbia University, then took postdoctoral fellowships at both the N.I.H. and Stanford University. She joined the Penn faculty in 1975 as a research assistant professor in the School of Dental Medicine, where she worked closely with Dr. Phoebe Leboy to understand the mechanisms of action of tRNA methyltransferases. Glick then moved to the Medical College of Pennsylvania, where she remained on the faculty until 1994, rising to the rank of professor of biochemistry. During this period she published extensively on lipid metabolism, focusing on the biochemical controls of cholesterol accumulation. In 1985, she was awarded the Lindback Teaching Award at the College.

In 1994, Glick joined Penn Medicine as a senior research investigator, then was named adjunct associate professor in cell and molecular biology. Part of her research served to increase understanding of why macrophages in the arterial wall accumulate cholesterol, becoming the classic "foam cells" that

form the bulk of plaque causing heart disease. She also played a key role in identifying and cloning endothelial lipase, a major regulator of HDL metabolism. In 1994, Glick became director of education in the Gene Therapy Program, which transformed into faculty administrator of the fledgling Cell and Molecular Biology Graduate Program within Biomedical Graduate Studies. She helped to transform the program into a national model of excellence by focusing on quality and advising.

Thomas R. Hedges Jr., M.D. See Class of 1953.

Harry J. Hurley Jr., M.D. See Class of 1958.

Sheldon Jacobson, M.D., former director of the emergency department; June 30, 2009. Trained in internal medicine and gastroenterology, Jacobson played an important role in the development of emergency medicine. In 1974, he created the Institute of Emergency Medicine at the Albert Einstein College of Medicine and established the first paramedic training program in New York City, which became a model throughout the nation. He joined Penn in 1979, and three years later became one of the early diplomates of the newly established American Board of Emergency Medicine. Jacobson was one of the founders of the Philadelphia Emergency Physicians Society and was one of the first emergency physicians to join the National Board of Medical Examiners. He returned to New York in 1994 to establish the academic department of emergency medicine at Mount Sinai School of Medicine and served as chairman until his death.

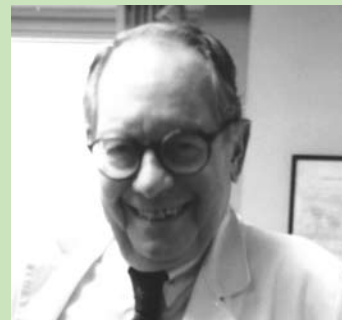
Albert M. Kligman, M.D. See Class of 1947.

Edward C. Raffensperger, M.D. See Class of 1940.

Richard W. Tureck, M.D. See Class of 1981.



A Legacy That Will Forever Foster Learning



W

hen he was a young boy, Edward Raffensperger, M.D. '40, asked his mother: "What would you do if you had a million dollars?" She answered immediately, "I'd give it away!"

Dr. Raffensperger often shared this story, pointing out that he heeded his mother's advice. When he passed away at the age of 95 in October 2009, Dr. Raffensperger's dedication and commitment to School of Medicine students were amply demonstrated. His bequest created the Mary Ames and Edward Cowell Raffensperger Scholarship Fund. This endowed fund carries the name of Dr. Raffensperger and his wife, a highly respected pediatrician, who died in 1983. She was herself a pioneer in medicine and she shared Dr. Raffensperger's devotion to student aid.

The majority of Dr. Raffensperger's estate was designated to the School of Medicine, ensuring that our brightest and most talented students continue to receive a stellar education. He frequently spoke of promoting excellence through Penn's students and this fund will fulfill his wish.

During his lifetime, Dr. Raffensperger left an indelible mark on his field of gastroenterology as well as on the School of Medicine. In 1962, he joined the staff of the Hospital of the University of Pennsylvania and quickly rose to the rank of full professor. He became emeritus professor in 1985. Known for his kindness and compassion, Dr. Raffensperger was much beloved by his patients, who filled his office with letters and gifts. He was also a loyal alumnus who fondly remembered the delight he felt when he learned that he had been accepted to the School of Medicine.

This affection for Penn and its students was deeply felt and steadfast. Through the vehicle of planned giving, Dr. Raffensperger wanted to make sure his generosity would benefit his beloved alma mater for years to come. He will always be remembered for this lasting legacy and the giving spirit that guided him throughout his rich life.

Dr. Raffensperger chose one of a multitude of creative gift opportunities that benefit both the School of Medicine and donors. As you plan your financial future, the Office of Planned Giving is ready to assist in developing an appropriate strategy to incorporate your charitable objectives. Contact Christine S. Ewan, J.D., director of Planned Giving, at 215-898-9486 or you can e-mail Christine at cewan@upenn.edu. For more information, please visit the web site at www.med.upenn.planyourlegacy.org.

Looking Back – and Ahead

As I have found over and over in my career, planning ahead is always the soundest course. In my very first column in *Penn Medicine* (Spring 2002), I wrote about the strategic plan our institution was then creating to set and meet our goals for the next several years. I noted that such planning – programmatic, financial, and operational – is essential to our continued success and evolution as an academic health system. It's also true that such systematic planning of that sort is useful for more focused areas as well, such as planning for a transition in leadership.

In March, after consulting with Amy Gutmann, Ph.D., president of the University of Pennsylvania, I reminded the Penn Medicine faculty, staff, and students that my appointment as dean of the School of Medicine and executive vice president of the University of Pennsylvania for the Health System will conclude in June of 2011. I also informed Dr. Gutmann that I intended to step down from my executive positions at that time and return to the medical faculty. Although that transition is more than a year in the future, I firmly believe that making my intentions clear will allow adequate time for a thorough national search for the next leader of Penn Medicine.

When I assumed my present positions in September of 2001, I had served as dean of Mount Sinai School of Medicine in New York for four years. Before that, I had spent 16 years as chair of the Department of Medicine at the University of Chicago School of Medicine. But becoming the leader of such a large, thriving, and historic institution as Penn Medicine was a significant step for me. I arrived on campus with some trepidation but even more enthusiasm. As I said at a press conference back then, for me the new position was a job made in heaven. I brought with me many plans, both short-range and long-range. Those plans were elaborated and strengthened through our



strategic planning, involving countless people at our institution.

Today, after nearly 10 years at Penn Medicine, I am humbled that we have achieved so many of my institutional goals and set others in motion. Among the bricks-and-mortar projects, we have seen wonderful new buildings for patient care. We have continued to be among the top recipients of research funding from the National Institutes of Health – and more recently have received many grants through the American Recovery and Reinvestment Act. Our annual ranking among medical schools in the *U.S. News & World Report* has never been higher.

These achievements were made possible by a very diverse group – our brilliant faculty, our committed staff, our exceptional students, our faithful alumni and donors, our tireless trustees, united through their commitment to making our institution the best possible home for research, education, and patient care. In particular, I want to thank Dr. Gutmann for her strong and wise counsel and her unwavering support of Penn Medicine.

But this is not a time to dwell on the past. I have no intention of slowing down, not while there are great things still to be achieved. The Perelman Center for Advanced Medicine now provides a state-of-the-art site to care for outpatients. Earlier this year, the Roberts Proton Therapy Center opened for patients seeking the most advanced, most precise form of radiation therapy. Ahead, we have the Translational Research Center (TRC), which

will tremendously enhance the integration of our basic science research and clinical mission. More and more, we are seeing the importance of speeding up the process of translating discoveries made in our labs into drugs and techniques that bring hope and relief to our patients. I am eager to see the Center open.

Another very important project that still needs all our support is what we have been calling the new “front door” for the School of Medicine. Every year since I've been dean, we've maintained our enviable ranking with literally thousands of the most competitive students wishing to become Penn Med graduates. But for years, we have realized that our present space for education must be renovated to live up to the promise of our pioneering curriculum, which continues to be second to none. Indeed, several of our peer institutions already have a superior physical environment in which to teach the evolving medical practice of our day, encourage teamwork among our students, and bridge the clinical and research experience. This capital project is one of my highest priorities.

By any standard, we have been successful in recruiting and retaining faculty members of exceptional quality. More recently, in conjunction with the University, we have enhanced our recruitment of interdisciplinary scholars as part of the Penn Integrates Knowledge (PIK) program. Seven of these scholars now have appointments in the School of Medicine, and we expect to appoint five more PIK Professorships in neuroscience in the coming years.

These are just some of the challenges and opportunities that lie ahead. For the next 14 months, I hope I can count on your continued support in ensuring Penn Medicine's pre-eminence as one of the world's leading academic medical centers. ♥

Arthur H. Rubenstein, M.B., B.Ch.
Executive Vice President of the University of Pennsylvania for the Health System;
Dean, School of Medicine

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Autism is very much in the news, but today there is still no cure for it and no significant understanding of its causes. The Center for Autism Research, which brings together experts from Penn Medicine and The Children's Hospital of Philadelphia, integrates a variety of specialties to better understand and treat a complex neurological disorder.