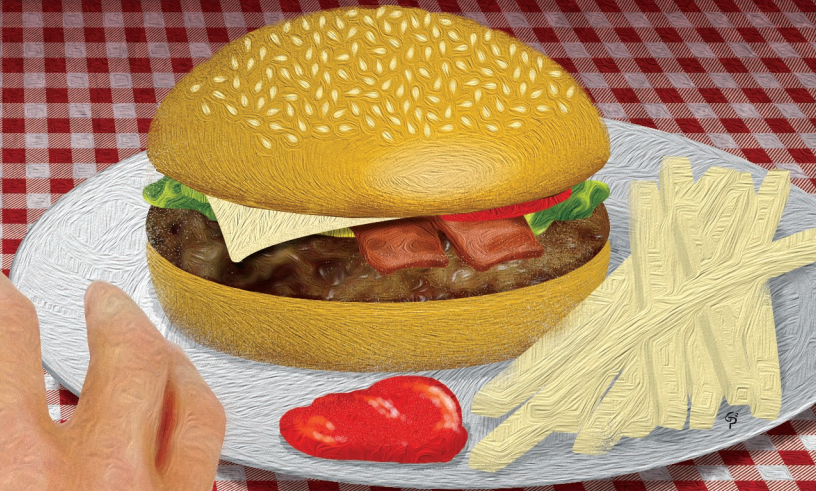


# PENN Medicine

SUMMER 2013



**CAN BEHAVIORAL  
ECONOMICS  
HELP PEOPLE  
LIVE HEALTHIER?**



**Fighting the Flu with Gene Therapy  
From Nephrology to Art History  
Medical Education Beyond  
the Classes and Books**

# Graduation 2013

A Time to Celebrate Accomplishments – and to Look Ahead

Photographs by Lifetouch National School Studios



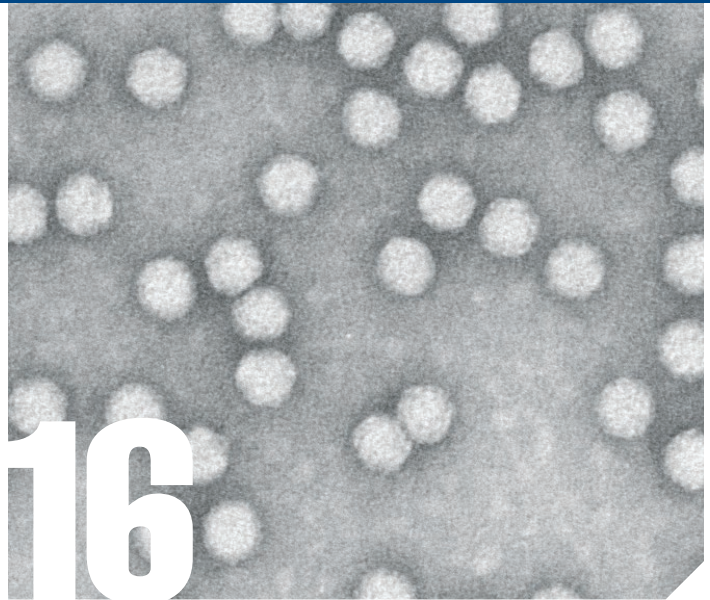


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## HOW TO GET PEOPLE TO LIVE HEALTHIER

By Carole Bernstein

Kevin Volpp, M.D., Ph.D., is the founding director of the Center for Health Incentives and Behavioral Economics, one of only two centers of its kind funded by the National Institutes of Health. Behavioral economics draws on principles from economics and psychology to look at how people make choices in complex contexts such as personal finances and health – and as Volpp points out, in those situations, “we often are our own worst enemies.”



# 16

## IN ANIMAL MODELS, NEW GENE THERAPY OFFERS BROAD PROTECTION AGAINST THE FLU

By Karen Kreeger

In animal models, a single dose of an adeno-associated virus (AAV) that expresses a broadly neutralizing flu antibody into the nasal passages gave them complete protection when exposed to lethal strains of H5N1 and H1N1 flu virus. James M. Wilson, M.D., Ph.D., senior author, says the study provides “critical proof-of-concept in animals.”

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## HEALTH CARE THAT'S NOT TAUGHT IN CLASSES OR BOOKS

By Lisa Tom

A new program, based at Puentes de Salud, seeks to teach medical and other students about the social determinants of health and to provide experience in caring for underserved populations.

The ways in which an individual's community, behavior, or livelihood influence health was a constant theme. Says one of the organizers, “It is a real community-university partnership.”



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## A MATTER OF DETAIL

By Jon Caroulis

Inspired by the meticulous technique of Michiel van Musscher, an overlooked Dutch artist of the 17th century, Robert Gerhardt, M.D. '70, tried to find out as much about him as he could. He even enrolled in Penn's School of Arts and Sciences. Today, Gerhardt is one of the leading experts on van Musscher and last year was responsible for organizing the first-ever exhibition of the artist's work.

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## Reprogramming Cells to Fight Diabetes

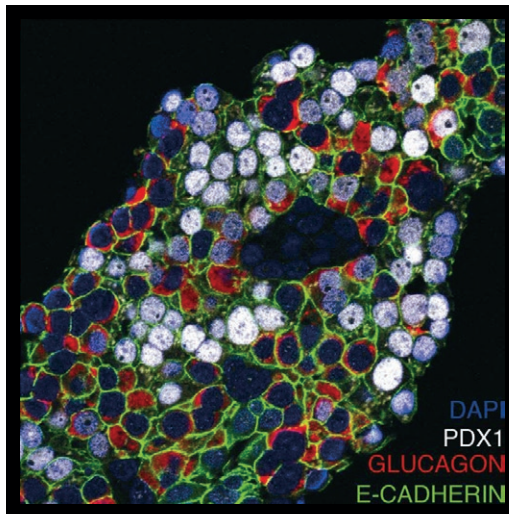
For years researchers have been searching for a way to treat diabetic patients by reactivating their insulin-producing beta cells, with limited success. The “reprogramming” of related alpha cells into beta cells may one day offer a novel and complementary approach for treating type 2 diabetes. According to a new study that appeared online in the *Journal of Clinical Investigation*, treating human and mouse cells with compounds that modify cell nuclear material called chromatin induced the expression of beta cell genes in alpha cells.

“This would be a win-win situation for diabetics – they would have more insulin-producing beta cells and there would be fewer glucagon-producing alpha cells,” says lead author Klaus H. Kaestner, Ph.D., professor of genetics and member of the Institute of Diabetes, Obesity and Metabolism. Type 2 diabetics not only lack insulin, but they also produce too much glucagon.

Both type 1 and type 2 diabetes are caused by insufficient numbers of insulin-producing beta cells. In theory, transplanting healthy beta cells – for type 1 diabetics in combination with immunosuppression to control autoimmunity – should halt the disease, yet researchers have not yet been able to generate these cells in the lab at high efficiency, whether from embryonic stem cells or by reprogramming mature cell types.

Alpha cells are another type of endocrine cell in the pancreas. They are responsible for synthesizing and secreting the peptide hormone glucagon, which elevates glucose levels in the blood.

“We treated human islet cells with a chemical that inhibits a protein that puts methyl chemical groups on histones,” says Kaestner. Among many other effects, he continued, the treatment leads to the removal of some histone modifications that



Nuria Bramswig, PSOM

The presence of beta-cell specific transcription factor PDX1 (white) indicates partial cell conversion.

affect gene expression. “We then found a high frequency of alpha cells that expressed beta-cell markers, and even produced some insulin, after drug treatment.”

Histones are protein complexes around which DNA strands are wrapped in a cell’s nucleus.

## Penn Tests Non-Invasive Treatment for Major Depression

Depression is one of the most common types of mental illness. Estimated to affect more than 17 million people in the United States, it can afflict anyone at any time. Depression can affect anything from sleeping and eating patterns to concentration and memory, and often occurs with other serious medical conditions, including heart disease, cancer, and stroke. While there are many effective therapies available for patients today – such as medications and talk therapy – depression may be resistant to these treatments.

In 2008, patients were granted a potential reprieve from this life-altering condition when the Food and Drug Administration approved the use of repetitive transcranial magnetic stimulation (rTMS, often referred to as TMS) for depression that resists treatment. TMS is a non-invasive technique that excites neu-

The team discovered that many genes in alpha cells are marked by modifications that either activate or repress histone. Included were many genes important in beta-cell function. In one state, when a certain gene is turned off, the gene can be readily activated by removing a modification that represses the histone.

“To some extent, human alpha cells appear to be in a ‘plastic’ epigenetic state,” explains Kaestner. “We reasoned we might use that to reprogram alpha cells towards the beta-cell phenotype to produce these much-needed insulin-producing cells.”

Co-authors are Nuria C. Bramswig, Logan Everett, Jonathan Schug, Chengyang Liu, Yanping Luo, and Ali Naji, all from Penn, and Markus Grompe, Craig Dorrell, and Philip R. Streeter from the Oregon Health & Science University. The Oregon group developed a panel of human

rons in the brain via magnetic pulses passed through the scalp. It is a safe and effective treatment that does not use drugs and has minimal side effects for patients with major depression who have not responded to other treatments. Penn’s Department of Psychiatry was at the forefront of researching the use of this breakthrough therapy for patients with major depression and continues to be a leading center utilizing this approach.

Penn Medicine is currently one of the first research sites in the country that is testing the effectiveness of another non-invasive, medication-free treatment called synchronized transcranial magnetic stimulation (sTMS). This is a new brain stimulation treatment that may also help alleviate symptoms of depression. The sTMS system uses low-energy, synchronized transcranial magnetic stimulation synchronized to an individual’s natural brain rhythms – that is different from the stronger, high-fre-

endocrine cell type-specific antibodies for cell sorting.

The research was supported by the National Institute of Diabetes and Digestive and Kidney Diseases and by the Beckman Research Center/NIDDK/Integrated Islet Distribution Program.

– Karen Kreeger

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## Telestroke Programs Increase “Golden Hour” Access to Stroke Care

Telestroke programs substantially improve access to life-saving stroke care, extending coverage to less populated areas in an effort to reduce disparities in access to stroke care. A new study by researchers from the Perelman School of Medicine, presented at the American Academy of Neurology’s annual meeting in March, found that telemedicine programs in Oregon pushed stroke coverage into previously uncovered,

less populated areas and expanded coverage by approximately 40 percent.

“Telestroke programs can reach patients in smaller communities and provide time-critical treatment to previously unreached people,” said the senior author of the study, Brendan G. Carr, M.D., M.S.H.P. ’08, assistant professor of emergency medicine, surgery, and epidemiology. “Increasing telestroke networks gives everyone a better chance of surviving a stroke, the fourth-leading cause of death in the United States.”

Previous research by Carr and colleagues found that only 54.5 percent of Oregon residents could reach a stroke center by ground within 60 minutes. The new study shows that, by employing telemedical systems in concert with in-person care, nearly 80 percent of residents had access to expert stroke care within one hour.

The study evaluated all hospitals in Oregon, finding that 43 percent of the population could reach a stroke center in

person within 60 minutes, 76 percent had telemedical access, 40 percent had access to both, and 20 percent had no access to stroke care within an hour. Researchers noted that in-person stroke care was clustered in urban areas, and while telestroke care was also available in urban centers, it also reached less populated areas with low rates of uninsured.

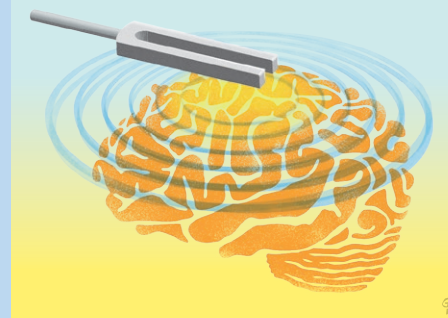
Locally, Penn Medicine extends stroke care to patients throughout the region through the multidisciplinary Penn NeuroRescue program. It uses telemedicine systems to bring expert consultations 24/7 to hospitals in distant locales (e.g., the Jersey Shore) and transfers those who need surgery and/or specialized neurointensive critical care to the Hospital of the University of Pennsylvania, the Philadelphia region’s first and only Comprehensive Stroke Center certified by the Joint Commission.

– Kim Menard

quency pulses used with traditional rTMS. Penn is one of only 16 sites in the country testing this new technology.

## Tailoring the Treatment

“sTMS is an exciting new development in psychiatry since it offers the potential for an additional non-pharmacological treatment for the disabling symptoms of depression,” says Mahendra Bhati, M.D., assistant professor of clinical psychiatry. Along with Michael Thase, M.D., professor of psychiatry and chief of the Division of Mood and Anxiety Disorders Treatment & Research Program, Bhati is researching the new treatment at Penn. “Many patients can’t tolerate medications and TMS can be an effective treatment for these patients,” Bhati explains. sTMS is unique when compared to other psychiatric treatments because it uses physiological markers of brain activity to tailor the treatment. This approach offers the hope of individualized



and potentially more effective treatment for the disabling and difficult-to-treat symptoms of depression.

How does the treatment work? Research has shown that the neuronal activity in the brains of people with depression shows abnormal brain rhythms in areas associated with depressive symptoms. sTMS therapy is based on the theory that the brain rhythms can be “tuned” to a normal resting rhythm using low energy magnetic fields synchronized to an individual’s brain activity. Researchers believe that this “tuning” will restore normal brain rhythms,

leading to a reduction of depression symptoms and an improved mood.

More research is needed to determine the safety and efficacy of sTMS, and the system has not yet been approved by the FDA. Data from preliminary studies have shown that sTMS can improve depressive symptoms in a significant number of patients. The continuing study at Penn and other sites seeks to confirm the findings from earlier studies and obtain FDA approval for treating depression.

“They also have plans to make the device portable so it can be used at home where you can plug into the wall and listen to a built-in mp3 player,” says Dr. Bhati. “It’s painless, relaxing, and a physiologically tailored treatment for depression. If it works, it may be a treatment patients can administer to themselves in the convenience of their own home.” In contrast, rTMS requires five visits a week to a doctor’s office.

– Jessica Mikulski

## Binge Eating Curbed by Deep Brain Stimulation in Animal Models

Applying Deep brain stimulation (DBS) in a precise region of the brain appears to reduce caloric intake and prompt weight loss in obese animal models, according to a new study led by researchers at the University of Pennsylvania. The study, reported in the *Journal of Neuroscience*, reinforces the theory that dopamine deficits are involved in increasing obesity-related behaviors such as binge eating. It also demonstrates that DBS can reverse this response via activation of the dopamine type-2 receptor.

“Based on this research, DBS may provide therapeutic relief to binge eating, a behavior commonly seen in obese humans, and frequently unresponsive to other approaches,” said senior author Tracy L. Bale, Ph.D., associate professor of neuroscience in Penn’s School of Veterinary Medicine and in the Perelman School of Medicine’s Department of Psychiatry. DBS is currently used to reduce tremors in Parkinson’s disease and is under investigation as a therapy for major depression and obsessive-compulsive disorder.

Nearly 50 percent of obese people binge eat, uncontrollably consuming highly caloric food within a short period of time. In this study, researchers targeted the nucleus accumbens, a small structure in the brain reward center known to be involved in addictive behaviors. Mice receiving the stimulation ate significantly less of the high-fat food than mice not receiving DBS. Following stimulation, mice did not compensate for the loss of calories by eating more. On days when the device was turned off, however, the mice resumed the binge eating.

Researchers also tested the long-term effects of DBS on obese mice that had been given unlimited access to high-fat food. During four days of continuous

stimulation, the obese mice consumed fewer calories, and their body weight dropped. These mice also showed improvement in their glucose sensitivity, which suggests a reversal of type 2 diabetes.

“These results are our best evidence yet that targeting the nucleus accumbens with DBS may be able to modify specific feeding behaviors linked to body weight changes and obesity,” Bale added.

“Once replicated in human clinical trials, DBS could rapidly become a treatment for people with obesity due to the extensive groundwork already established in other disease areas,” said lead author Casey Halpern, M.D., a resident in the Department of Neurosurgery of the Perelman School.

The study was funded by the National Institutes of Health (DA022605 and HL091911). In addition to Bale and Halpern, Penn experts included Anand Tekriwal from the College of Arts and Sciences, John Wolf from Neurosurgery, and Jeffrey Keating from Neurology. They were joined by colleagues in Psychology at the University of Buffalo.

– Kim Menard

## More Sleep Reduces Suicide Risk in Those with Insomnia

Researchers at the Perelman School of Medicine have found that more sleep is associated with a lower suicide risk in people with insomnia. The findings showed that among those with some risk of suicide – as exemplified by self-reports of suicidal thoughts – there was a 72 percent drop in the likelihood of moderate or high risk of suicide for every hour of sleep that persons reported getting at night.

The research team from Penn’s Behavioral Sleep Medicine research program merged and assessed data from two studies of insomnia that included 471 total subjects. Of the total subjects, 73 indicated suicide risk – 55 were classified as low suicide risk,

and 18 were classified as moderate or high risk. Using a statistical analysis, the authors determined that variations in suicide risk were successfully differentiated using how much sleep the subjects got. Increased sleep duration was associated with lower likelihood of moderate/high suicide risk.

The authors note that the results highlight the importance of sleep for our mental and physical well-being. Insomnia is a common disorder: about 1 in 3 Americans experiences symptoms at any given time, and about 1 in 10 Americans probably meets criteria for an insomnia disorder that should be treated. Insomnia has implications not only for health, functioning during the day, and quality of well-being, but it may also lead to increased risk of suicide.

The study was presented in June at SLEEP 2013, the annual meeting of the Associated Professional Sleep Societies.

Penn authors include Linden Oliver, M.A., Andrea Segal, Florida Priftanji, Michael Grandner, Ph.D., and Michael Perlis, Ph.D.

– Jessica Mikulski

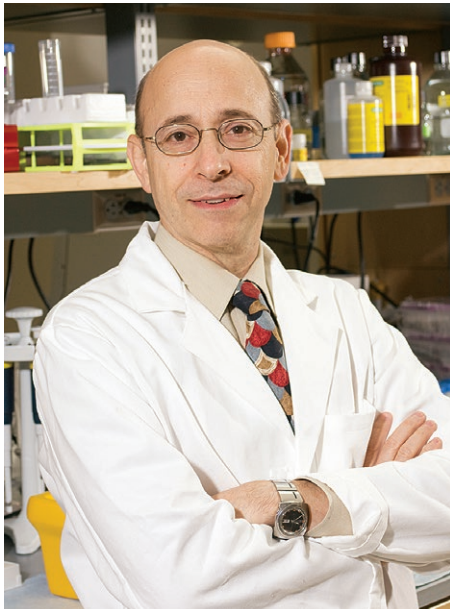
## Honors and Awards

David Artis, Ph.D., assistant professor of microbiology, received the AAI-BD Biosciences Investigator Award for outstanding, early-career research contributions to the field of immunology from the American Association of Immunologists. His research is focused on understanding the regulatory mechanisms that control immune cell homeostasis at the body’s barrier surfaces. Employing diverse models of microbial colonization, pathogen infection, and chronic inflammation, Artis examines how mammalian host genetics and signals derived from commensal microbial communities influence innate and adaptive immune responses in the skin, lung, and intestine.

Among his other honors, Artis has also received two major awards from the

Perelman School of Medicine: the Lady Barbara Colyton Prize for Autoimmune Research in 2011 and the Stanley N. Cohen Biomedical Research Award from Penn in 2012.

**Lance Becker, M.D.**, professor of emergency medicine and director of the Center for Resuscitation Science, received the



American Heart Association's 2012 Award for Lifetime Achievement in Cardiac Resuscitation Science. During his career, Becker has played important roles in disseminating automated external defibrillators into the public arena, expanding the science of CPR quality, and developing a training program in resuscitation. His research interests extend across the basic science laboratory from animal models of resuscitation into human therapies such as novel methods of inducing therapeutic hypothermia and using cardiac bypass following cardiac arrest. His cellular studies have helped define cellular reperfusion injury mechanisms, mitochondrial oxidant generation, signaling pathways, and new cellular cytoprotective strategies. He is an elected member of the Institute of Medicine of the National Academies.

### Gene Therapy Study Honored

A gene therapy study focused on finding a cure for a rare congenital blinding disease was recognized as one of the ten most outstanding clinical research projects of the year by the Clinical Research Forum (CRF). The study was led by **Jean Bennett, M.D., Ph.D.**, the F. M. Kirby Professor of Ophthalmology, and carried out in collaboration with Penn Medicine's **Albert M. Maguire, M.D.**, professor of ophthalmology, and **Katherine A. High, M.D.**, professor of pediatrics and director of the Center for Cellular and Molecular

Therapeutics at The Children's Hospital of Philadelphia. It was presented with the Distinguished Clinical Research Achievement Award, the second-highest honor given in the CRF's Annual Top 10 Clinical Research Achievement Awards. Award winners are cited as the most compelling examples of scientific innovation that results from the nation's investment in clinical research that can benefit human health and welfare.

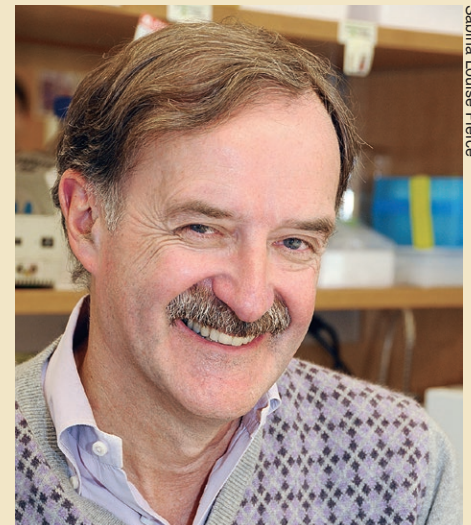
The results of the most recent phase of the study for Leber's Congenital Amaurosis at CHOP have led to the first Phase 3 gene-

### International Man: FitzGerald Garners Three Awards from Other Nations

**Garret FitzGerald, M.D.**, the McNeil Professor in Translational Medicine and Therapeutics and chair of the Department of Pharmacology, was named the 2012 recipient of the Louis and Arthur Lucian Award. He was cited for his ground-breaking work on cardiovascular disease. The award, given by McGill University in Montreal, consists of a \$60,000 (Canadian) prize and a one-to-two week professional visit to McGill to give a formal Lucian Lecture, to have interchanges with members of the McGill community, and possibly to undertake a research collaboration with McGill investigators in the field of circulatory diseases.

FitzGerald was also honored by the Swedish Academy of Pharmaceutical Sciences, with its 2013 Scheele Award. Named for the world-renowned Swedish chemist Carl Wilhelm Scheele, the award is given to prominent and internationally renowned scientists in the field of drug research. The recipients deliver a lecture in Stockholm.

FitzGerald, who is also director of the Institute for Translational Medicine and Therapeutics, takes an integrative approach to studying the mechanisms of drug ac-



Sabrina Louise Pierce

tion and is known internationally for his work on eicosanoids and related lipid mediators. His research contributed fundamentally to the development of low-dose aspirin as a preventive approach to heart disease. His group was the first to predict and then explain mechanistically the cardiovascular hazard from NSAIDs. His team has also contributed substantially to the understanding of the importance of peripheral clocks in the regulation of cardiovascular and metabolic function.

More recently, FitzGerald has also been awarded the 2013 Grand Prix Scientifique by the Institut de France. He shares the prize with Carlo Patrono, M.D., chairman of the Department of Pharmacology at the Catholic

Tommy Leonardi



Flashback: 16 years ago, Garret FitzGerald (middle) and Carlo Patrono (far left), then a visiting scholar, enjoyed a run along Penn's Locust Walk. With them, from left: Bianca Rocca, M.D., Ph.D., now at the Catholic University; Colin Funk, Ph.D., now at Queen's University, Ontario; and Daniel Rader, M.D., at Penn Medicine.

University in Rome. The award is based on the recommendation of the International Scientific Council of the Board of Directors of the Lefoulon-Delalande Foundation, Paris. Currently valued at 500,000 euros (\$650,000), the Grand Prix Lefoulon-Delalande is one of the largest prizes for scientific accomplishment and is considered the world's most prestigious prize for cardiovascular research.

FitzGerald and Patrono share the prize for their development of low-dose aspirin for the prevention of cardiovascular disease. Their work used novel approaches to assess the formation of short-lived fats in the body called prostaglandins that play a key role in the development of blood clotting. They

discovered how lower doses of aspirin than had been previously used to treat pain and inflammation act on blood cells called platelets to shut down their role in blocking arteries to cause heart attacks and strokes. Low-dose aspirin is now used for this purpose throughout the world and has saved the lives of tens of millions of people.

Noting his delight at receiving the honor, FitzGerald also pointed out that "it reflects the creativity, focus, and hard work of so many people with whom I have been privileged to work. It is a particular pleasure to share this prize with Carlo, with whom I have collaborated and competed, but, most importantly, shared a special friendship for more than 30 years."

therapy study in the United States and the first Phase 3 gene therapy study in the world for a non-lethal disorder. The researchers hope that the studies could lead to the first approved gene-therapy product in the United States.

"The data from our study has already been used to develop additional clinical trials for other blinding diseases," said Bennett. "There are two things that I think are really going to be important from this work: one, that we'll move forward with

this particular disease and get approval for the drug that we've been developing; and two, that this could ultimately lead to approved treatments for other currently untreatable conditions." The studies were published in 2012.

The Clinical Research Forum seeks to sustain and expand a group of talented, well-trained clinical investigators at all stages of career development and support comprehensive research capabilities within academic institutions.

In 2012, the Brain & Behavior Research Foundation funded more than 200 new promising ideas through its NARSAD Grants to identify the causes, improve treatments, and develop prevention strategies for mental illness. Of that group, the Foundation highlighted ten significant findings, including one by **Olivier Berton, Ph.D.**, assistant professor of psychiatry. His work was recognized in the category of Next Generation Therapies to reduce symptoms of illness and "retrain the brain." Berton and his team identified a cellular protein, HDAC6, that is linked to natural resiliency to stress, which points to a possible new treatment for anxiety disorders and depression. In a



recent *Journal of Neuroscience* paper, Berton's lab showed how HDCA6, a regulator of glucocorticoid receptors, may provide a path towards resilience to stress. The protein, which is particularly enriched in serotonin pathways as well as in other mood-regulatory regions in both mice and humans, is ideally distributed in the brain to mediate the effect of glucocorticoids on mood and emotions. HDAC6 likely does this by controlling the interactions between glucocorticoid receptors and hormones in these serotonin circuits.

**Stanley Goldfarb, M.D.**, professor of medicine in the Renal-Electrolyte and



Hypertension Division and associate dean for curriculum, is serving as the 61st president of the College of Physicians of Philadelphia. Established in 1787, the College of Physicians of Philadelphia is the oldest private medical society in the United States. John Morgan, founder of the Perelman School of Medicine, was also a founding member of the society. Throughout its 225 year history, the College has provided a place for both medical professionals and the general public to learn about medicine as both a science and as an art. During his two-year term as president, Goldfarb will serve as the volunteer Chairman of the Board of Trustees and oversee issues of governance for the society.

At the Perelman School of Medicine, Goldfarb supervises all aspects of the medical student curriculum and chairs the School of Medicine's Teaching Awards Committee, among other responsibilities. He has received numerous awards, including Penn's Lindback Award for Distinguished Teaching.

**Carl June, M.D.**, the Richard W. Vague Professor in Immunotherapy and director of translational research in Penn's Abramson Cancer Center, received the Philadelphia Award for 2012. He was honored for his extraordinary advancements in gene therapy aimed at treating HIV and cancer, specifically chronic lymphocytic leukemia and acute lymphoblastic leukemia. His team has engineered an innovative cancer-killing treatment that uses modified versions of patients' own immune cells to attack their tumors.

According to the chair of the board of trustees of the Philadelphia Award, Natalya Paquin, Esq., "The implications of this research are historic and may forever change the way physicians treat certain types of cancers around the world."

The new treatment approach is the result of more than two decades of effort



by June and his colleagues, dating back to his 21-year career as a physician-scientist in the U.S. Navy. It has been applied with remarkable success to both adult and pediatric leukemia patients, and offers the prospect of helping patients with other types of cancer, including those of the brain, lung, ovaries, pancreas, prostate, and breast.

At the ceremony, June asserted that "Translational medicine has to involve team science." He will share the \$25,000 in award money with his core team of five researchers. "

Earlier, June was named one of the recipients of the 2012 Ernest Beutler Lecture and Prize, presented by the American Society of Hematology. June shared the prize with Bruce R. Blazar, M.D., of the University of Minnesota, for their significant advances in the field of bone marrow transplantation and adoptive immunotherapy. The Beutler Lecture and Prize is a two-part lectureship that recognizes major translational advances related to a single topic. The award honors two individuals, one who has enabled advances in basic science and another for achievements in clinical science or translational research.

In their lecture, June and Blazar discussed the use of adoptive T-cell therapy as an emerging form of transfusion therapy that has potential to establish tolerance to hematopoietic or solid organs allografts, treat autoimmunity, and promote immunity to cancer and chronic infection.

**Virginia M.Y. Lee, Ph.D., M.B.A.**, and **John Q. Trojanowski, M.D., Ph.D.**, both professors of pathology and laboratory medicine, received the 2012 John Scott Award and \$12,000 for their contribution to research in the treatment of neurodegenerative diseases. The award was established by Scott, an Edinburgh druggist, who in the early 1800s set up a fund to award "ingenious men or women who make useful inventions." It is one of the oldest science prizes in the United States. The Board of Directors of City Trusts administers this trust. The ceremony was held at the American Philosophical Society.

Lee and Trojanowski are both professional and personal partners. Among other roles, Lee is the John H. Ware 3rd Professor in Alzheimer's Research and co-director of the Marian S. Ware Alzheimer Drug Discovery Program. She is also director of the Center for Neurodegenerative Disease Research. Trojanowski, the William Maul Measey-Truman G. Schnabel Jr., M.D., Professor of Geriatric Medicine and Gerontology, is director of the Institute on Aging and co-director of the Center for Neurodegenerative Disease Research.

Among the previous recipients of the award are Marie Curie, Thomas Edison, and Jonas Salk. Penn Medicine recipients have included Christian J. Lambertsen, M.D. '43, the late director of Penn's Institute for Environmental Medicine – 2010, for development of SCUBA gear.

**Peter C. Nowell, M.D. '52**, emeritus professor of pathology and laboratory medicine, was named one of three co-

winners of the Albany Medical Center Prize in Medicine and Biomedical Research. He was recognized for landmark research that helped transform the treatment of cancer. The \$500,000 award, one of the largest prizes in medicine and science in the United States, is given to those who have “altered the course of medical research.” This year, the prize recognizes groundbreaking research into the nature of cancer, which has led to the development of a new generation of cancer drugs, most notably Gleevec for chronic myeloid leukemia; unlike chemotherapy, Gleevec targets specific genetic defects that cause cancer.

**Victoria Rich, Ph.D.**, chief nurse executive of UPMC, was honored by the American Organization of Nurse Executives with its 2013 Prism Diversity



Award. The award recognizes an individual’s efforts to promote diversity within the nursing workforce and to enhance understanding of diversity issues through events or activities within a health-care facility or within the community. Rich, who has served in her position since 2002, has announced that she will be leaving at the end of the year.

**Brian L. Strom, M.D., M.P.H.**, the George S. Pepper Professor of Public Health and Preventive Medicine who serves as the medical school’s executive vice dean for institutional affairs, was named a 2013 Career Distinguished Investigator by the Association for Clinical and Translational Science and the American Federation for Medical Research. He was honored at the Translational Science 2013 meeting in Washington, D.C., for his “outstanding contributions to translational science from clinical use into public benefit and policy.” A nationally recognized leader in clinical research training and clinical epidemiology, Strom focuses on the field of pharmacoepidemiology, using epidemiologic methods to study drug use and effects in populations.

One of Strom’s specific contributions was cited: his pivotal work in getting the American Heart Association and the American Dental Association to reverse 50 years of guidelines and recommend against the use of antibiotics to prevent infective endocarditis, which had been a widespread practice.

Strom is also professor of biostatistics and epidemiology, of medicine, and of pharmacology.

**Paul M. Weinberg, M.D., G.M.E. ’70**, professor of pediatrics at the medical school and a pediatric cardiologist at The Children’s Hospital of Philadelphia, received the 2013 Distinguished Teacher Award from the American College of Cardiology. The annual award recognizes a fellow of the College for “innovative, outstanding teaching characteristics and compassionate qualities” that result in “major contributions to the field of cardiovascular medicine at the national and/or international level.” As director of the fellowship training program in pediatric cardiology at Children’s Hospital for the past 22 years, Weinberg has had a significant influence on many pediatric cardiologists



and cardiac surgeons. He conducts weekly teaching conferences on the structure of the heart and has frequently lectured on that topic at national and international meetings. He has made extensive contributions to the scientific literature, including numerous chapters in prominent cardiology textbooks.

Weinberg’s other teaching honors include the Robert Dunning Dripps Award for excellence in graduate medical education and the Blockley-Osler Teaching Award, as well as a Teacher of the Year Award from Children’s Hospital.

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## Two Are Chosen

Two Penn Medicine faculty members were named Fellows of the American Association for the Advancement of Science.

**Shelley Berger, Ph.D.**, is a Penn Integrates Knowledge Professor and the Daniel S. Och University Professor in the Department of Cell and Developmental Biology and Department of Genetics at the Perelman School of Medicine. She also has an appointment in the Department of Biology of the School of Arts and Sciences. Berger was elected for her seminal contributions toward elucidating the role of chromatin structure and the biochemistry of histones in eukaryotic gene regulation. Her research

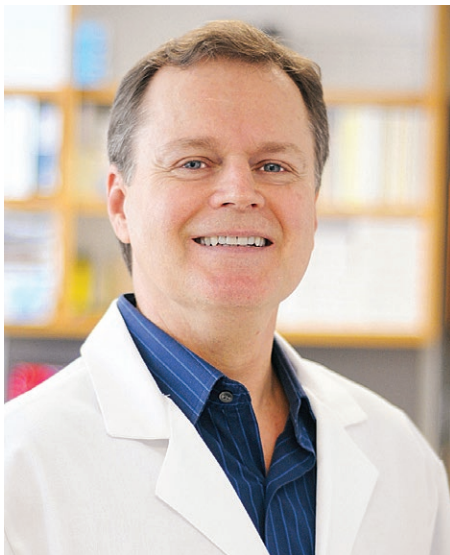
has been critical to the burgeoning field of epigenetics. Berger serves as director of the Penn Epigenetics Program.

**Reed Pyeritz, M.D.**, professor of medicine and director of Penn's Center for the Integration of Genetic Health Care Technologies, was elected for exemplary leadership as a distinguished investigator, educator, contributor to professional societies, and administrator in the field of human genetics research and its translation to care. His research focuses on two areas: Mendelian disorders of the cardiovascular system, especially those involving defects of connective tissue; and, ethical, legal, and social implications of human genetics.

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## Transitions

**John A. Dani, Ph.D.**, was named chair of the Department of Neuroscience, effective July 1. He will also serve as director of the Mahoney Institute of Neurosciences. Dani comes to Penn from Baylor College of Medicine in Houston, where he was professor of neuroscience. He held sec-



ondary appointments in Baylor's Menninger Department of Psychiatry and Behavioral Sciences and its Graduate Program in Translational Biology and Molecular Medicine and also served as

director of the Center on Addiction, Learning, and Memory.

Dani's research has focused on the shaping of behavior, addiction, learning, and memory, cutting across disciplinary lines. With longtime support from the National Institute of Neurological Disorders and Stroke and the National Institute of Drug Abuse, he has become one of the leaders in furthering the understanding of neural mechanisms of learning and memory that underlie addiction. In exploring the fundamental mechanisms that serve during the normal functioning of the brain, Dani and his laboratory have also probed how that functioning can be misdirected, as when commandeered by diseases or drugs during addiction.

After graduating *summa cum laude* from the College of Engineering at the University of Michigan, Dani earned his doctorate in physiology, with a minor in physical chemistry, at the University of Minnesota. He was a postdoctoral fellow with Dr. Bertil Hille at the University of Washington, then moved to the University of California at Los Angeles as a postdoctoral fellow with Dr. George Eisenman. After three years as a research associate scientist in molecular neurobiology at Yale University, Dani joined Baylor College of Medicine as an assistant professor in 1987. He advanced to professor in 1999.

Among Dr. Dani's many honors are the DeBakey Award for outstanding research from Baylor and the Jacob Javits Neuroscience Award, from the NIH. He currently serves on numerous editorial boards.

**Eve J. Higginbotham, S.M., M.D.**, has been named Vice Dean for Diversity and Inclusion in the Perelman School of Medicine, effective August 1. She will focus on enhancing diversity and multicultural inclusion within the academic, educational, and clinical missions of the medical school. Higginbotham is an academic physician with a robust track record as a forward-

thinking leader in the academic medical world and community.

Prior to joining Penn, Higginbotham served as a visiting scholar for health equity at the Association of American Medical Colleges in Washington, D.C. She has also held numerous academic leadership roles,



including senior vice president and executive dean for health sciences at Howard University. She has also served as chair of the Department of Ophthalmology and Visual Sciences at the University of Maryland School of Medicine in Baltimore.

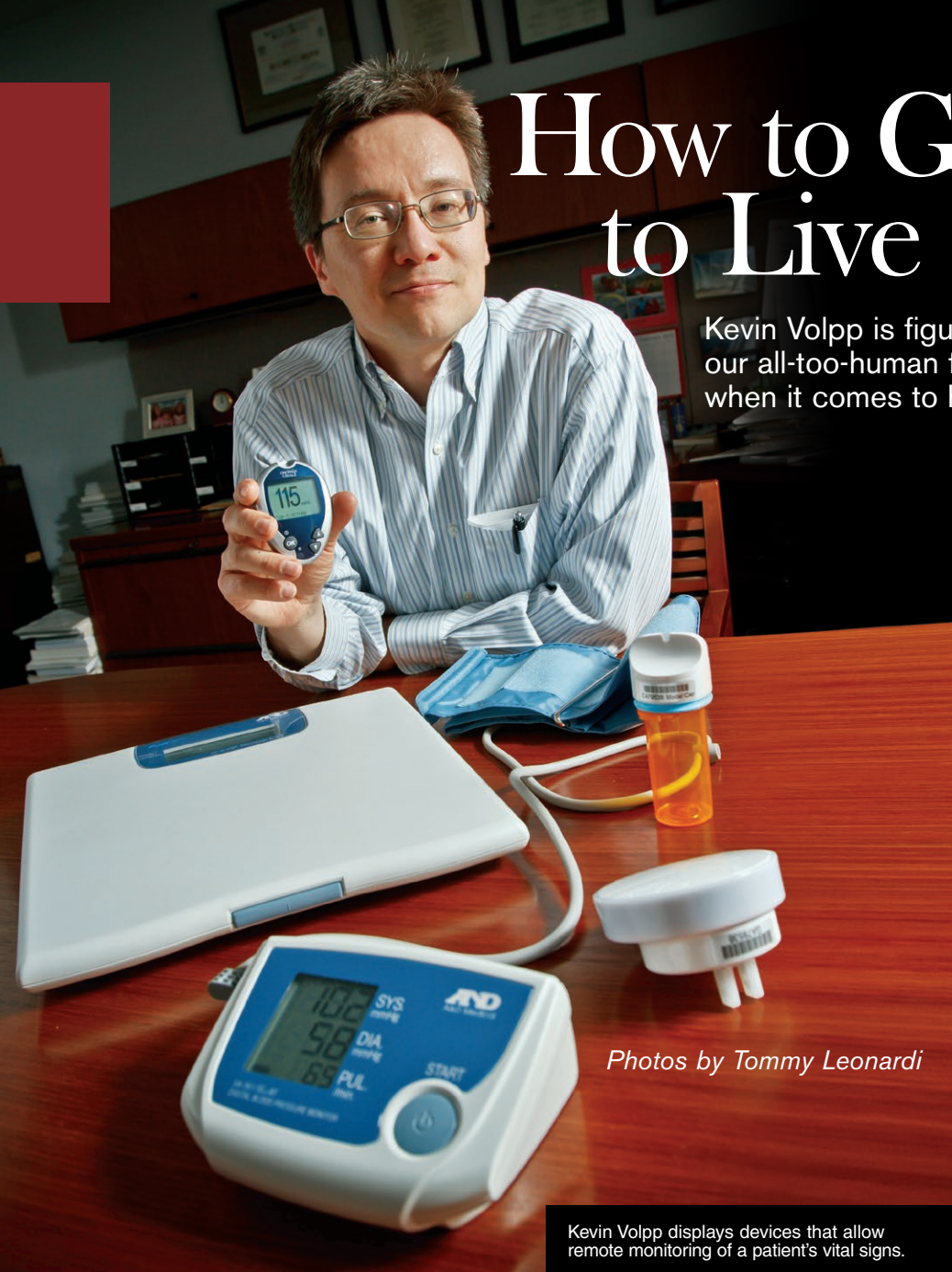
Higginbotham earned her S.B. and S.M. degrees in chemical engineering from the Massachusetts Institute of Technology and her medical degree from Harvard Medical School. She has published more than 100 peer-reviewed articles and co-edited four ophthalmology textbooks, and she has been a member of the editorial board of *JAMA Ophthalmology* (formerly for more than 10 years).

Dr. Higginbotham completed the Executive Leadership Program in Academic Medicine at Drexel University. She has been a member of the Institute of Medicine (IOM) since 2000 and was inducted into the American Academy of Arts and Sciences in Cambridge, Mass., in 2011. ♥

# How to Get People to Live Healthier

Kevin Volpp is figuring out how to turn some of our all-too-human failings to our own advantage when it comes to health.

By Carole Bernstein



Photos by Tommy Leonardi

Kevin Volpp displays devices that allow remote monitoring of a patient's vital signs.

“I have a number of patients who weigh 300 pounds or more,” says Kevin Volpp. “I think many of them have very good intentions and sincerely try to lose weight. But they come back time after time and they still weigh 300 pounds.”

To most physicians, this frustrating scenario probably sounds all too familiar. According to a study by Volpp and colleagues that appeared in *The Journal of the American Medical Association*, modifiable behaviors – habits that can be altered such as over-eating, smoking, and alco-

hol abuse – account for nearly one-third of all deaths in the U.S. (“Asymmetric Paternalism to Improve Health Behaviors,” by George Loewenstein, Ph.D., Troyen Brennan, M.D., J.D., M.P.H., and Kevin G. Volpp, M.D., Ph.D.) That is a staggering statistic. Another behavior that doctors have to grapple with: patients fail to take critical, life-preserving medicine. The same article stated that by one year after suffering a myocardial infarction, “nearly half of patients prescribed cholesterol-lowering medications have stopped taking them.” So, as medical science forges ahead

inventing new therapies for deadly diseases and conditions, many patients go on their merry way ignoring their doctors’ orders. The annual burden on the U.S. health-care system is, of course, huge.

Volpp earned both his M.D. degree and his Ph.D. degree in health-care management at the University of Pennsylvania, both in 1998. A professor of medicine in the Division of General Internal Medicine at the Perelman School of Medicine and a professor at the Wharton School, he says that when he became a clinician, it quickly became apparent to him how difficult it is to change patients’ self-destructive behaviors. Drawing on his dual training, he began searching for a non-traditional approach. “As a physician and a health economist, I realized that the way health care is financed is that it’s oriented toward treating people when they get sick as opposed to trying to keep them healthy. There’s very little in the way of programs covered by insurers that focus on improving health.”

That search led Volpp to become the founding director of the Center for Health Incentives and Behavioral Economics (CHIBE) at Penn’s Leonard Davis Institute of Health Economics. The center began in 2008 as a collaboration between University of Pennsylvania faculty and researchers at the Center for Behavioral Decision Research at Carnegie Mellon University. CHIBE was one of the first centers dedicated to implementing behavioral economics research in health, and it remains one of only two centers of its kind funded by the National Institutes of

Health. Behavioral economics draws on principles from economics and psychology to look at how people make choices in complex contexts such as personal finances and health.

Tucked away on an upper floor of Blockley Hall, the center generates an impressive array of research projects. Its sub-programs include the Penn CMU Roybal P30 Center on Behavioral Economics and Health, which focuses on the health of aging and older populations; and the FIELDS Program (Fostering Improvement in End-of-Life Decision Science), launched last year. In addition, the UPHS Center for Innovation in Health Care Financing spawned a sister center, the Penn Medicine

**Humans may be irrational, but they are at least “predictably irrational,” which means our actions can be categorized, described, and analyzed. Volpp explains that much of the science of behavioral economics involves mapping out the ways in which people make systematic decision errors.**

Center for Health Care Innovation. The newer center is a collaboration with the University of Pennsylvania Health System to improve both patients’ health and the quality and efficiency of the health care they receive.

Volpp and his CHIBE colleagues are working with employers, insurers, and health systems in testing financial and other incentives in many areas: obesity, smoking, adherence to medication for chronic disease management, glucose monitoring among people with poorly controlled diabetes, heart failure, weight management, and continuous positive airway pressure (CPAP) use for sleep apnea. For this wide range of clinical conditions, they are essentially trying to help high-risk patients become low-risk patients, which benefits not only the individual but the whole system, because high-risk typically means high-cost. The studies are funded by a long list of public and private heavy

hitters such as the NIH, Horizon Blue Cross Blue Shield, CVS Caremark, Humana, the Robert Wood Johnson Foundation, McKinsey & Company, General Electric, Aetna, the New York State Health Department, the Centers for Disease Control and Prevention, the American Heart Association, and the Center for Medicare and Medicaid Innovation.

Volpp appears to have a hand in nearly all of this. One begins to wonder how he manages his day. Scott Halpern, CHIBE’s deputy director, comments, “Let’s just say that my perception of what a normal workload looked like was warped to begin with. But it’s become exponentially more warped since Kevin and I started working together.

It’s amazing how many projects and initiatives he can juggle simultaneously. He’s one of those few truly tireless people.”

Halpern has plenty on his plate too. He holds M.D. and Ph.D. degrees, as well as master’s degrees in clinical epidemiology and bioethics, all from Penn. He is a member of the Penn Medicine Center for Health Care Innovation and director of the FIELDS program at CHIBE. Last year, Halpern received the Marjorie A. Bowman New Investigator Award, one of the annual Penn Medicine Awards of Excellence, the highest honors the School gives to faculty members. He was also one of ten recipients of the Robert Wood Johnson Foundation’s first-ever Young Leader Awards, which recognize leaders under the age of 40 for exceptional contributions to improving the nation’s health care. Of his beginnings with the CHIBE Center, Halpern notes, “After a brief time working together, Kevin asked me to take on a

leadership role in his organization. I was skeptical at first, but he can be fairly persuasive in a surprisingly calm way.”

Volpp has been highly lauded for his work: he has been published in top-tier journals such as *The New England Journal of Medicine* and *The Journal of the American Medical Association* and has been covered by media outlets like *The New York Times*, *The Wall Street Journal*, *Good Morning America*, National Public Radio, and *Time*, as well as major media outside the United States. His honors have included the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor given by the U.S. government to scientists early in their early careers, and the Alice S. Hersh New Investigator Award from Academy Health. Last year, he was elected to the Institute of Medicine of the National Academy of Sciences.

Given the many threats to our good health, what are roadblocks keeping us from doing what’s best for ourselves? According to Volpp, humans are by nature irrational. “It’s just how we’re wired,” he says with a shrug. “For example, people tend to sell stocks when the market goes down, because they can’t stanch the pain of further losses, and they tend to buy more when the market goes up. You could argue that it’s exactly the opposite of what people should do – but we often are our own worst



enemies because we really don't behave that rationally in a lot of contexts. Even though we may think we do."

Continuing the financial comparisons, Volpp points out that there are some companies that have already made an in-depth study of human irrationality – although they may not recognize it as such – and use it to manipulate people in well-known ways. "Casinos, payday lenders, sub-prime mortgage lenders . . . credit-card lenders who give you zero percent interest for six months and then jump it to some astronomical percentage. They all know that people focus very much on the present

and ignore the distant consequences of their actions. What we do in behavioral economic interventions is take a thoughtful approach to using similar decision errors, but use them to help people improve their behavior."

Humans may be irrational, but they are at least "predictably irrational," which means our actions can be categorized, described, and analyzed. Volpp explains that much of the science of behavioral economics involves mapping out the ways in which people make systematic decision errors. And there are many examples: often we ignore the future and

opt for immediate gratification (we want that powdered jelly donut or a second cigarette – right now). "We tend to be overly optimistic, very loss-averse, and make decisions based on how we feel, as opposed to any deliberate, cognitive calculation." Most of us don't understand numbers very well – we don't realize the huge difference between a probability of .00001 and a probability of .01 (which may account for the continued popularity of playing the lottery). Inertia and procrastination are frequent companions.

And we're incredibly susceptible to "framing effects": choosing an option that appears to avert losses as opposed to one promising potential gain, even if they're in fact one and the same option. In a often-cited psychology experiment, 93% of Ph.D. students registered early when a penalty fee for late registration was emphasized, but only 67% did so when this was presented as a discount for earlier registration.

Applying behavioral economics means capitalizing on these natural tendencies, trying to make it easier for people to do what's right. One method that Volpp and colleagues frequently test is offering financial incentives for people to change their behavior – which gives them a foreseeable reward for their actions instead of expecting them to focus on a far-off goal. Some case studies examine smoking, a habit notoriously difficult to kick. (A statistic Volpp cites: about 70% of smokers say they want to quit, but the actual average quit rate in the population per year is only about 3%.) Volpp and colleagues ran a program funded by the CDC that was the largest study ever done on financial incentives for smoking cessation in an employer population.

In the study, General Electric employees from around the nation were divided into two groups. One group was told they'd receive \$750 if they quit and did not smoke for a year. The other group received an

## Automated Hovering: What Is It and How Can It Help?

Last year, Kevin Volpp, M.D., Ph.D., was an author of a "Perspective" in *The New England Journal of Medicine* (June 5, 2012). The topic was "automated hovering," a promising new model for the delivery and financing of health care. Volpp's co-authors were David A. Asch, M.D., M.B.A., and Ralph W. Muller, M.A. Asch is a member of the Center for Health Incentives and Behavioral Economics (CHIBE) and directs the Penn Medicine Center for Health Care Innovation. Muller is chief executive officer of Penn's Health System and a member of the Penn Medicine Center for Health Care Innovation.

The old care model, they write, "falls short not just because it is expensive and often fails to proactively improve health, but also because so much of health is explained by individual behaviors, most of which occur outside health care encounters." Previous attempts to improve patient engagement have involved visiting nurses and staffed telemedicine services – with corresponding higher costs. Another issue has been figuring out how to incorporate hovering "into people's lives in ways that are not just acceptable and conve-

nient, but ideally even welcomed." Automated hovering aims to encourage people to change unhealthy behaviors in an interactive way, through social media, wireless devices, and other technologies, using what they describe as "carefully deployed nudges and financial incentives." The biggest savings, the authors suggest, are likely to come from reducing preventable hospitalizations and preventing the exacerbation of diseases.

Volpp, Asch, and Muller do note potential concerns that some people might have about this model: would it erode patients' sense of personal responsibility or be too intrusive? But in the CHIBE newsletter (October 2012), they remain optimistic, particularly given the development of pilot studies and randomized clinical trials using CHIBE's "Way to Health" web platform. Muller calls automated hovering "a very intriguing hypothesis." Asch asserts that "it can also help us to better understand how to engage with people in their everyday lives as well as to let us reach out to people from all over the country."

– John Shea

invitation – of the usual corporate-wellness-type – to begin a smoking cessation program. After a year, the financial incentive group’s quit rate was 14.7%; the invitation group’s, only 5.0%. There were some relapses over the months that followed, but at roughly similar rates: the financial incentive group’s quit rate after 18 months was 9.4%, and the invitation group’s was 3.6%.

“The study led to GE developing and adopting that program for all of its 152,000 employees in the U.S.,” Volpp says with evident satisfaction. “We felt we had done something that really had the potential to improve people’s health.” The study appeared in *The New England Journal of Medicine* (“A Randomized, Controlled Trial of Financial Incentives for Smoking Cessation,” by Kevin G. Volpp, M.D., et al., February 12, 2009). It also received recognition by the *British Medical Journal* Group’s “Improving Health” Awards, which granted its 2010 “Getting Research into Practice” award to Volpp and colleagues David Asch, Mark Pauly, Janet Audrain, and their team – out of about 250 nominees.

Financial incentives, such as a cash payment or a chance in a lottery, are a major weapon in the arsenal of behavioral economics. Another is monitoring, or “automated hovering” – basically, an approach



Kevin Volpp confers with two colleagues: David Asch, executive director of the Penn Medicine Center for Innovation, and Jingsan Zhu, assistant director of CHIBE.

that allows for ongoing rapid feedback and support for patients or employees, using a combination of wireless devices and behavioral economic engagement. Volpp and his colleagues have been mounting these types of studies to address the medication non-adherence problem, which he characterizes as “a huge, huge problem.” “Shockingly, study after study shows this is the case. For example, let’s say someone is admitted to

to medications in the year following hospital admission for a heart attack is only about 39%. There’s lots of clinical trial evidence that these medications can be lifesaving – can lower the rate of having another heart attack by 30, 40, 50%. But if you don’t take them, the benefits are never realized.”

CHIBE is working on several initiatives to improve medication adherence, including one that will be in the field shortly,

**One method that Volpp and colleagues frequently test is offering financial incentives for people to change their behavior – which gives them a foreseeable reward for their actions instead of expecting them to focus on a far-off goal.**

the hospital with a heart attack. Typically they are prescribed a cholesterol-lowering medicine called a statin; a beta blocker, aspirin, an ACE inhibitor; if they have a stent, they are typically prescribed something called Plavix which helps keep their arteries open. But the average adherence

funded by the Center for Medicare and Medicaid Innovation, and involving partnerships with a number of insurers in the New Jersey-Pennsylvania area. Such studies employ a technological toolbox called “The Way to Health.” It was built by Volpp and David A. Asch, M.D., M.B.A. (now execu-

tive director of the Penn Medicine Center for Health Care Innovation), and CHIBE colleagues. (The title, Volpp notes, is a play on Ben Franklin's essay "The Way to Wealth," which describes the pitfalls of trying to save for the future. It's an apt name for a Penn-based initiative that relates to behavioral economics.)

The Way to Health toolbox enables the integration of remote devices that can be either home-based or employer-based: pedometers, glucometers, blood pressure monitors, medication adherence devices, scales, CPAP monitors, all of which transmit inputs to researchers on what patients are doing or not doing. "We can give them a wireless pill cap for each of their medicines, for example," Volpp explains. "Each day our server will know if they opened

their pill bottle or not. We can give various kinds of feedback, all automated. And we can tie in incentives."

He explains the value of remote monitoring: "In the traditional way of doing things, someone with poorly controlled diabetes, for example, only comes in and sees me every three months. In the meantime, there's not much contact. I don't really know how they're doing. I'm not giving them any feedback on how their blood sugar control is. They come in, forget their log book, and say 'Oh, my sugars are fine,' and you don't really know if they were or they weren't. But you can imagine a world in which this patient has remote monitoring devices. Every day a nurse receives inputs on their blood sugar and really fine-tunes it, so between now

and their next office visit, their control could improve dramatically."

But what about those wisecracs who might just flip the wireless pill cap when they think of it and walk away? "In most studies, we test this in the context of clinical conditions where serologic measures are the primary outcome." According to Volpp, you can't game the system – you know you will be checked. And if an incentive is involved, it's based on the results of that checkup. CHIBE researchers are also testing what happens when a patient's friend or family member also receives an automated alert. In that case, the long-term, vague goal of "take your medicine to stay healthy" becomes the short-term, more motivating goal of "take your medicine to keep your daughter from calling you up in the next twenty minutes and nagging you about it."

## Smokers: To Hire or Not to Hire?

The same three authors of last year's "Perspective" piece in *The New England Journal of Medicine* on "automated hovering" joined forces earlier this year for another "Perspective." The topic this time is much more controversial: "Conflicts and Compromises in Not Hiring Smokers" (originally published on March 27, 2013 at NEJM.org). The context includes the announcement by the University of Pennsylvania Health System that, on July 1, it would "cease hiring tobacco users in our efforts to improve the overall health of our workforce while reducing health care benefit costs." David Asch, Ralph Muller, and Kevin Volpp begin by noting some grim statistics: "Tobacco use is responsible for approximately 440,000 deaths in the United States each year – about one death out of every five." (The UPHS site also notes \$193 billion in health care costs and lost productivity every year.)

The writers concede that a policy of not hiring smokers risks "creating or perpetu-

ating injustices" – but "these policies may also save lives, directly and through their potential effects on social norms." They raise questions: are such policies "aimed at tobacco, which is harmful and destructive, or at people who are addicted to tobacco, who may be seen as victims?"

But they also report on their randomized trial that compared the use of employer-provided financial incentives for smoking cessation, aided by counseling, with an approach offering similar counseling – but no incentives. The group with incentives fared notably better. "But in absolute terms, even the incentive group had an 18-month quit rate of only about 9% – meaning that even with an aggressive system of rewards, 91% of employees who wanted to quit could not." Such poor outcomes, they suggest, justify stronger kinds of interventions. In addition, they argue that policies of not hiring smokers "also make the benefits of smoking cessation more immediate and so help to counterbalance

the immediate costs of quitting."

In a "Perspective" in the same issue, three writers disagreed. Two are from Penn Medicine's Department of Medical Ethics and Health Policy – Harald Schmidt, Ph.D., and Ezekiel J. Emanuel, M.D., Ph.D. – along with Kristin Voigt, Ph.D., from McGill University. They argue that not hiring smokers is unethical. One general argument for not hiring smokers is that they "should be responsible for the consequences of their smoking. . . ." But, they go on to point out, smoking is "addictive and therefore not completely voluntary" and health-care institutions care for patients "regardless of the causes of their illness. . . ." "So what should employers do? We believe that offering support for healthful behaviors is the best approach." As the authors of the matching essay could point out, that approach is the one taken by Penn's Center for Health Incentives and Behavioral Economics.

– John Shea





It seems that applying behavioral economics to health care is all good: for the patient, the doctor, insurers, industry, the economy. Is there a down side? “I think, increasingly, people are not disagreeing with the general principle,” replies Volpp. “That said, there are obviously people who do.” He cites a study from *Science* a few years back involving Western European countries and organ donation that illustrates the potential unease created by changing a default choice. Countries in which organ donation was an opt-in choice had participation rates of 10% or less. Countries where it was an opt-out choice, however, had participation rates of 98% or 99%. “So you might look at that and say, well, that’s a little bit troubling because how can a preference be so easily altered – from 10% to 99% – just by flipping a switch, and that people couldn’t have understood exactly what this meant.”

A study Volpp’s team recently completed with CVS Caremark demonstrates a variation of this type of scenario. It involved automatic refills of chronic medications. “If you’re on, say, 6 to 8 medicines, it’s very tedious to keep track of when all the refills are due,” says Volpp. “You could see why some patients might prefer not to have to do that manually.” The idea was to change the existing opt-in program to an opt-out to increase participation. But CVS Caremark had concerns around refilling prescriptions without patients’ explicit authorization. The CHIBE team came up with an approach called “enhanced active choice.”

“We embedded an approach in the refill process that highlighted the salient advantage of being in the program. Something like, ‘Press 1 if you would prefer the convenience of having us refill your medicine for you each time, press 2 if you’d prefer to do it yourself.’” Participation in the program more than doubled after this feature was implemented. “It was pretty exciting because the number of people who might benefit from this initiative was extremely large. It was about making it easier for them to make a decision consistent with improving their health.”

Another potential concern that some observers have about behavioral economic interventions in health, according to Volpp, is that they should not be seen as a substitute for discussions about tougher policies. “For example, does it make sense for us to be subsidizing corn production in Iowa, which leads to artificially low prices for high-fructose corn syrup, which leads people to buy more goods containing high-fructose corn syrup than fruits and vegetables? So we can try with behavioral economics to overcome some foibles in how people make decisions, but, for example, if the prices aren’t right because of *other* types of interventions out there, we may not be able to overcome the problem.”

In March 2011, the Penn CMU Roybal P30 Center on Behavioral Economics and Health held its first annual Behavioral Economics and Health Symposium. The event drew experts from a variety of disciplines. The outlook seemed largely positive, but the attendees acknowledged the need for more research. One of the working groups looked specifically at the ethics of behavioral economics, raising the question “are we nannying or nurturing?” Volpp’s comment about the level of the intervention was indeed raised – should the issues be tackled at the individual level or the societal level? Another matter the experts considered was whether incen-

tives are equally effective across targeted individuals: “The potential for discrimination is greater as the targeted behavior is less modifiable.”

As applied to health care, behavioral economics is a work in progress, but its potential to deal with some problems that have not been solved in other ways makes it a very worthwhile pursuit.

And speaking of those fruits and vegetables Volpp cited, CHIBE researchers led by George Loewenstein, Ph.D., have come up with some simple but elegant ways to encourage people to make healthier food choices. Their studies have showed that merely changing where a salad bar is located from the back to the center of a company cafeteria can lead employees to eat significantly more salad. The CHIBE team performed studies of takeout restaurant menus that indicated that moving the healthier, low-calorie sandwiches onto the front page of the menu led people to



order them much more often. As Volpp puts it, “Substantial opportunities exist to use the predictable irrationality that has been mapped out by behavioral economists to improve people’s health in cost-effective, scalable ways.”

So be forewarned: the next time you’re tempted to order that double bacon cheeseburger with fries . . . to light your fifth cigarette of the day . . . to skip the gym or skip your medicine . . . be strong, because Kevin Volpp and his CHIBE colleagues may be watching you. ■

# In Mice, **Gene** Therapy Offers Broad **Protection** Against the **Flu**

The therapy protected against influenza strains that have caused pandemics.

By Karen Kreeger



**R**esearchers at the Perelman School of Medicine have developed a new gene therapy to thwart a potential influenza pandemic. Specifically, investigators in the Gene Therapy Program in the Department of Pathology and Laboratory Medicine, directed by James M. Wilson, M.D., Ph.D., demonstrated that delivering a single dose of an adeno-associated virus (AAV) that expresses a broadly neutralizing flu antibody into the nasal passages of mice and ferrets gives them complete protection and substantial reductions in flu replication when exposed to lethal strains of H5N1 and H1N1 flu virus. These strains were isolated from samples associated with historic human pandemics – one from the infamous 1918 flu pandemic and another from 2009.

Wilson, Anna Tretiakova, Ph.D., senior research scientist, and Maria P. Limberis, Ph.D., research assistant professor, both with the Gene Therapy Program, published their findings online in May in *Science Translational Medicine* ahead of print. In addition to the Penn scientists, the international effort included colleagues from the Public Health Agency of Canada, Winnipeg; the University of Manitoba, Winnipeg; and the University of Pittsburgh.

“The experiments described in our paper provide critical proof-of-concept in animals about a technology platform that can be deployed in the setting of virtually any pandemic or biological attack for which a

neutralizing antibody exists or can be easily isolated,” says Wilson. “Further development of this approach for pandemic flu has taken on more urgency in light of the spreading infection in China of the lethal bird strain of H7N9 virus in humans.”

The study was widely reported. Anthony Fauci, M.D., director of the National Institute of Allergy and Infectious Diseases, told *The Wall Street Journal* that, with an antibody “that neutralizes a whole range of influenza, including potentially pandemic influenza, you would already have in your hand something you can administer to people, rather than having

Flu virus rapidly replicated in the untreated mice, all of which needed to be euthanized. However, pretreatment with the AAV9 vector virtually shut down virus replication and provided complete protection against all strains of flu in the treated animals.

to isolate the virus and start making a vaccine” (May 30, 2013).

## AT THE READY

Influenza infections are the seventh-leading cause of death in the United States and result in almost 500,000 deaths worldwide per year, according to the Centers for Disease Control. The emergence of a new influenza pandemic remains a

threat that could result in much loss of life and worldwide economic disruption.

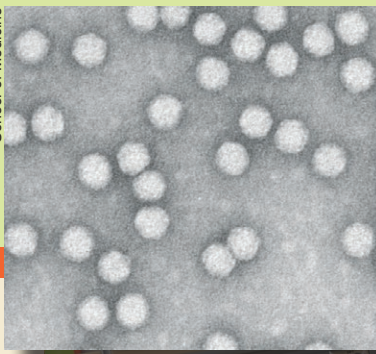
There is also interest by the military in developing an off-the-shelf prophylactic vaccine should soldiers be exposed to weaponized strains of infectious agents in biologic warfare.

Human antibodies with broad neutralizing activity against various influenza strains exist but their direct use as a prophylactic treatment is impractical. Now, yearly flu vaccines are made by growing the flu virus in eggs. The viral envelope proteins on the exterior, namely hemagglutinin, are cleaved off and used as the vaccine,

but vary from year to year, depending on what flu strains are prevalent. However, high mutation rates in the proteins result in the emergence of new viral types each year; these elude neutralization by pre-existing anti-bodies in the body (specifically, particular receptor binding sites on the virus that are the targets of neutralizing anti-bodies).

This approach has led to annual vaccinations against seasonal strains of flu viruses that are predicted to emerge during the upcoming season. Strains that arise outside of the human population, for example in domestic livestock, are distinct from those that normally circulate in humans and can lead to deadly pandemics.

These strains are also not effectively controlled by vaccines developed to human strains, as with the 2009 H1N1



Electron micrograph of adeno-associated virus particles.

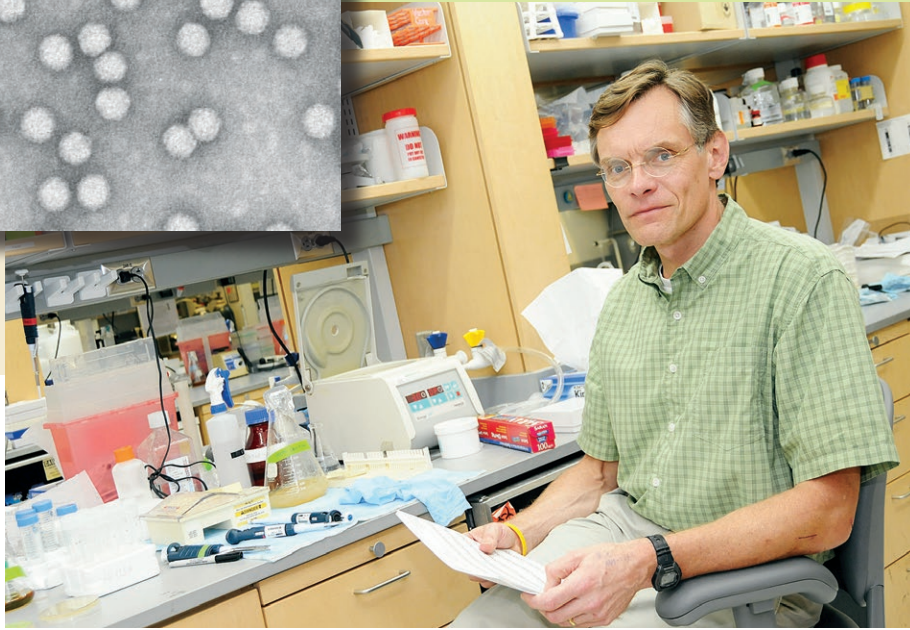


Photo by Sabrina Louise Pearce

James Wilson says the experiments “provide critical proof-of-concept in animals.”

pandemic. The time for developing a vaccine for that strain, and in general, was not fast enough to support vaccination in response to an emerging pandemic.

Knowing this, the Penn team proposed a novel approach that does not require eliciting of an immune response, because that does not provide sufficient breadth to be useful against any strain of flu except the one for which it was designed.

The Penn approach is to clone into a vector a gene that encodes an antibody that is effective against many strains of flu. They also engineer cells that line the nasal passages to express this broadly neutralizing antibody – which they normally do not – thus effectively establishing broad-based efficacy against a wide range of flu strains.

## A BROAD APPROACH

The rationale for targeting nasal epithelial cells for the expression of antibodies was to focus this expression to the site of the body where the virus usually enters the body and replicates – the nasal and oral mucosa. Antibodies are normally expressed from B lymphocytes, so one challenge was to design vectors that could

deliver antibody genes to the non-lymphoid respiratory cells of the nasal and lung passages and could express functional antibody protein.

Targeting the respiratory cells was achieved by using a vector based on a primate virus – AAV9 – which was discovered in the Wilson laboratory and evaluated previously by Limberis for possibly treating patients with cystic fibrosis. The team constructed a genetic payload for AAV9 that expressed an antibody that was shown by other investigators to have broad activity against flu.

The treatment’s efficacy was tested in mice that were exposed to lethal quantities of three strains of H5N1 and two strains of H1N1, all of which have been associated with historic human pandemics.

Flu virus rapidly replicated in untreated animals, all of which needed to be euthanized. However, pretreatment with the AAV9 vector virtually shut down virus replication and provided complete protection against all strains of flu in the treated animals. The efficacy of this approach was also demonstrated in ferrets, which provide a more authentic model of human pandemic flu infection.

According to Limberis, who is director of the animal models core for the Gene Therapy Program, “The novelty of this approach is that we’re using AAV and we’re delivering the prophylactic vaccine to the nose in a non-invasive manner, not a shot like conventional vaccines that passively transfer antibodies to the general circulation.”

“There’s a long history of using antibodies for cancer and autoimmune disease, but only two have been approved for infectious diseases,” notes Tretiakova, the program’s director of translational research. “This novel technique has allowed for the development of a prophylactic passive vaccine that is cost effective, easily administered, and quickly manufactured.”

Wilson told *U.S. News & World Report* that the “nasal spray” vaccine provides about nine months of protection in animals. In humans, he expects it to last for about six months. At present, according to Wilson, the process is too expensive for widespread use, but he hopes to find funding for a human clinical trial (May 29, 2013).

The team is working with various stakeholders to accelerate the development of this product for pandemic flu and to explore the potential of AAV vectors as generic delivery vehicles for countermeasures of biological and chemical weapons. ■

The research was supported in part by ReGenX, the Public Health Agency of Canada (#531252), the Canadian Institutes of Health Research (#246355), and the National Institutes of Health (GM083602).

Editor’s note: Wilson is a consultant to ReGenX Holdings, and is a founder of, holds equity in, and receives a grant from affiliates of ReGenX Holdings. In addition, relevant to this work, he is an inventor on patents licensed to various biopharmaceutical companies, including affiliates of ReGenX Holdings. The other authors declare no competing interests. Wilson holds a patent on adeno-associated virus (AAV) clades (US No. 7,906,111B2) with pending continuation (No. 13/023,918). Wilson and Limberis have a pending application on AAV-mediated passive immunization of airborne pathogens (PCT/US2012/034355).

# Health Care That's Not Taught in Classes or Books

By Lisa Tom

A new program, based at Puentes de Salud, seeks to teach medical and other students about the social determinants of health and to provide experience in caring for underserved populations.

When Susana Pimentel is tired in the morning, she sometimes practices deep breathing in the shower, a technique she learned in a free yoga and meditation class run through the new Puentes Health Scholars Program. “The breathing and relaxation helps me,” she said. Pimentel works as a nanny and Saturday is her only day to sleep in, but she would wake up eager to attend the class with other women from the Latino community in South Philadelphia. “We were all really excited and happy, especially because it was new to a lot of us,” she said.

The yoga and meditation class was one of two projects created by the first cohort of Health Scholars at Puentes de Salud (Bridges of Health), a non-profit clinic serving Hispanic immigrants in South Philadelphia. Puentes relies on volunteer physicians and staff from throughout Philadelphia, many of whom are Penn faculty and students. The oppor-

tunity to work at Puentes also draws dynamic, service-minded faculty and students to Penn, said Joe Metmowlee Garland, M.D., G.M.E. '11, the clinic's director of medical education. Puentes is close to Penn in every sense – the clinic operates in Penn Medicine's Tuttleman Center at 18th and South streets after hours twice a week. But as Garland explains, Puentes is an independent non-profit institution, which has allowed it a greater degree of freedom and more opportunities for collaboration across Philadelphia schools.

Sara Shuman, the student chair at Puentes, established the Health Scholars Program with Garland last fall as a way for student volunteers to learn about and address some of the social determinants of health. The World Health Organization defines “social determinants of health” as the “circumstances in which people are born, grow up, live, work and age, and the systems put in

place to deal with illness.”

Puentes has long operated on the belief that health is affected by where and how patients live – the organization also runs after-school tutoring, a women's group, and talks on nutrition in the waiting room, among other efforts to try to improve health through channels other than medical treatments.

“The Health Scholars Program really was sort of the next step in the process of thinking about how we educate volunteers at Puentes de Salud,” said Garland, who is also a clinical assistant professor in infectious diseases and director of the Global Health Residency Track at the Hospital of the University of Pennsylvania. Garland, who served as course director of the program, de-





Photographs by Tommy Leonardi

scribed fielding many questions from student volunteers about the larger social context of patients' lives. Over a nine-month period, the 12 students selected as Health Scholars did readings, attended monthly lectures and bi-monthly discussions, reflected about the program in writing, developed relationships with mentors, and designed projects with community partners.

Two Health Scholars – Beatriz Sanchez (front) and Gealina Dun (left, in pink top) – lead a yoga and meditation class.

The program brought together volunteers with varied backgrounds, including a University of Pennsylvania undergraduate senior with a double major in psychology and Hispanic studies, a research fellow at the Drexel School of Public Health, and a medical student at the Philadelphia College of Osteopathic Medicine. “We both knew a diverse group of students would add to the discussion and enhance the experience,” said Shuman, course coordinator of the Health Scholars Program and a Ph.D. candidate at the Temple University School of Public Health.

“It was a really good supplement to what we’re learning in school,” said Jonathan Sevilla, who finished his first year at the Perelman School of Medicine. “The lecturers were not all health professionals, so it gave me a sense that we’re not alone in confronting these problems. There are people in a



Good spirits: Sanchez and Dun lead another part of the yoga class.

lot of different fields working toward the same goal.”

The monthly lectures, which began in October, included physicians, lawyers, educators, and representatives of other non-profit institutions devoted to improving quality of life for the city’s Hispanic immigrants. The ways in which an individual’s community, behavior, or livelihood influence health was a constant theme.

For example, the Health Scholars heard from Meredith Rapkin, executive director of Friends of Farmworkers, a non-profit organization that provides free legal services to low-wage workers in Pennsylvania’s agricultural business. “Lots of workers call us who have been injured,” said Rapkin. “Lots of our clients live in South Philadelphia and are bused out to work in agriculture or first-line [meat] re-processing, and that’s who we’re trying to reach with Puentes.”

Rapkin described Puentes de Salud as a kind of referral center for services in the Latino community, where patients can find out about Friends of Farmworkers and Community Legal Services, which provides similar aid to low-wage employees

in other industries. “Medical providers are one place that people go to for help.”

In her experience, Rapkin has seen many workers who were initially afraid to disclose that they were injured at work. A supervisor might bring a worker to the Emergency Room and tell him not to say that the injury occurred on the job in an effort to avoid legal responsibility. Afraid to lose their jobs, wishing to avoid investigations into their immigration status, or simply intimidated by their bosses, patients will attribute the injury to some other kind of accident.

“It’s in no way every employer, but we’ve seen it repeatedly,” said Rapkin. Her hope was that maybe the Health Scholars “would think twice and ask questions in a different way in providing good medical care and documenting what actually happened. . . . We also brought some attorneys, and they spoke specifically about how to document a worker’s compensation claim so that the person can be properly compensated.”

For the Health Scholars, this was an entirely new dimension of medical care

that they had never learned about before. Certainly, whether a patient has an income after an injury or a safe working environment has a profound impact on his or her physical and mental well-being.

“It’s definitely helping me to think about how to be a better physician and incorporate some of the social determinants of health that we don’t cover in medical school,” said Tanya Keenan, who graduated from the Perelman School of Medicine in May. (Keenan, who served as chair of the board of Power Up Gambia, which provides electricity and water to health-care facilities in The Gambia through solar energy, will be serving her residency in internal medicine at Massachusetts General.

According to Rapkin, the Puentes Health Scholars “are exactly who you want to be talking to because they’re people who are going to go out into the world as leaders, teaching others.”

In that vein, Sevilla said that Penn’s Latino Medical Student Association is now looking to invite a few of the speakers from the program to speak to the entire medical school as part of the association’s lunch-talk series.

“It’s crucial to teach [students] how to build collaborative relationships with educators and community leaders,” said Steven Larson, M.D. ’88, executive director of Puentes, associate professor of emergency medicine, and assistant dean for Global Health Programs at Penn Medicine. “We’re only one part of this process of health and wellness.”

Indeed, collaboration across fields is an essential part of Puentes de Salud’s operations behind the scenes. “We don’t have a lot of money,” said Larson. “The way we have space, supplies, legal counsel is from relationships. It comes from finding like-minded people who are lawyers or business people and getting them on board.”

The hope is that the Health Scholars will take a similar sense of collaboration

with them as they practice medicine, particularly in settings with few resources.

As much as the Health Scholars learned from the lecturers, they have also learned from each other in the course discussions.

“I was looking to meet new people who have similar interests in areas of public health and medicine,” said Beatriz Sanchez, fellow in community-based research at the Center for Hunger-Free Communities at the Drexel School of Public Health. “They’ve done a great job selecting people with different interests. We have really rich conversations, and we’ve created a safe space where we’re not afraid to challenge each other.”

One evening, for example, the Health Scholars debated the potential harms and benefits of going abroad to practice medicine. Some of the scholars were motivated to pursue medicine in the developing world, but they were also struggling with the effects of such trips. One student described poignantly how such trips can undermine respect for local physicians. She remembered patients who wanted to see her, a foreign student, instead of an experienced local doctor. She wondered: did she really help or hinder care? And why go abroad when there is so much need in rural and urban America?

Many other questions were raised – with no easy answers. “You challenge yourself and you challenge others,” said Sanchez.

Without the Health Scholars Program, these students would not have had the chance to examine these issues together. Said Sevilla, “Knowing people in all these other schools has been great. There really isn’t anywhere else where you can have a prolonged academic discussion with people from other schools in Philadelphia.”

Through their potluck discussions over the course of the academic year, the Health Scholars gradually formed a community in which they could give each other advice.

Emma Hyde, a Penn undergraduate senior who plans to apply to medical school, said, “It was a good experience to be surrounded by people who are already there.”

While the students advised each other, they also found mentors in the course organizers and speakers. For instance, Hyde reached out to Anje Van Berckelaer, M.D., M.S., clinical director of performance improvement and program development at Delaware Valley Community Health, after Van Berckelaer gave a lecture on Philadelphia’s “safety net.”

“Emma’s been helping us work out a process to track referrals to make sure that people get their follow-up,” said Van Berckelaer, who was a Robert Wood

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“It was a really good supplement to what we’re learning in school. The lecturers were not all health professionals, so it gave me a sense that we’re not alone in confronting these problems. There are people in a lot of different fields working toward the same goal.”

Johnson Clinical Scholar at Penn. “She’s also helping us to do some surveys of patients who are receiving their care from us. I’m hopeful that her experience with us will be helpful to her as she looks for opportunities.”

The fact that all of the students and lecturers share a passion for working with the underserved in some way gave participants a solid common ground. “Programs like this,” said Sevilla, “help put people with similar interests in touch who otherwise would just keep working in parallel.”

The culmination of the Health Scholars Program was a team longitudinal project. Six of the Health Scholars started a yoga

and meditation class, held Saturdays, 10:30-11:30 a.m., at the Houston Community Center at 8th and Snyder, while the other six facilitated pediatric physicals for children to participate in the Tuzos Academy soccer league.

“It’s interesting because those were not actually their original plans,” Garland points out. “They really did sort of a mini-community needs assessment, talked to the patients in the waiting room, met with our Community Health Workers, and talked to the clinicians about things they saw.”

According to Sevilla, his group initially considered starting a men’s winter soccer league for the community. Shuman and Garland did not arrange the projects for the students, but they provided guidance and community contacts. “It was up to us to come up with what to do,” said Sevilla. The group eventually decided that helping boys become eligible to play in the Tuzos Academy soccer league by setting up pediatric physicals would be the most feasible and useful project in the community.

“I would like to see these projects continue,” said Garland. “The pediatric physical exams almost certainly will, because the pediatrics staff at Puentes are very behind it. Most of them are based in pediatrics at CHOP or family medicine at Jefferson, so we have some attendings moving this forward. There will already be some sort of built-in stability.”

The yoga and meditation class, conceived primarily for immigrant women, arose out of conversations with Puentes Community Health Workers and the particular skills of several Health Scholars.

“The yoga class has really been a team effort,” said Sanchez, who happens to be a certified yoga teacher. One of the other Health Scholars, Abigail Kress, brought her knowledge of massage techniques from the Philadelphia College of Osteopathic Medicine.

Keenan, who also helped organize the class, emphasized that high levels of stress

can contribute to overeating and weight gain, depression, cardiovascular disease, alcohol abuse, chronic pain, and many other medical issues. “The women are always taking care of their kids or working. . . . The idea is to have time for them to have self-care,” said Keenan. “They can really learn about relaxation techniques that they can take home with them, such as breathing, self-massage or massage with a partner, and yoga – a little physical activity.”

One or two of the Health Scholars would provide free child-care during the class.

“It was so great that they had someone to take care of our kids in the little classroom downstairs,” said Pimentel. There was even one little girl who took the class with her mother. “She can start taking care of herself [after] seeing her mom doing it.”

“It’s very hard for women to go to the gym,” continued Pimentel. “If you want to take a class, it’s expensive.”

Establishing the class was not without its obstacles. “Our biggest challenge was finding and deciding on a space,” said Sanchez. They ended up choosing the community center, which was at least a half hour away for most of the volunteers, but closer for community members. Said Sanchez, “Once you’re there, the energy is amazing.”

Pimentel, who also volunteers as a Puentes Community Health Worker, helped to recruit women to the class. Many women were a little hesitant about coming, saying that they had never taken a yoga class. “Me neither,” she would answer. “But just come and we’ll have fun.” The women were told to just bring a towel.

“The first day I thought nobody was going to show up,” said Pimentel. “And there were 10 women, and everyone was so excited. Something about just being in a group of people learning and relaxing, when you leave you feel so happy – calm.”

The Health Scholars organized six classes over a period of twelve weeks,

and began to set up a transition for the class in May, as some of the Health Scholars prepared to leave for residency, medical school, and other positions. Uncertainty about how the class could continue weighed on the scholars who had organized it.

“The entire reason we did this,” said Garland, “was for the hiccups and challenges, so that the Health Scholars see how you go through the process of identifying a community need and thinking about how to assess it – how to identify community partners – and then thinking

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Some of the Health Scholars started a yoga and meditation class for immigrant women as a way to alleviate the women’s stress. High levels of stress can contribute to overeating, depression, cardiovascular disease, alcohol abuse, chronic pain, and many other medical issues.

about implementation, and now they’re sort of in the process of thinking about sustainability.”

While many opportunities to volunteer exist across Philadelphia, the Health Scholars Program is distinct in its combination of didactic lectures and hands-on experience over a full school year with students from different backgrounds. What distinguishes the program a little bit, said Shuman, “is that this is a partnership between a community-based organization and faculty. It is a real community-university partnership.”

“You’re not going to find this in mainstream medical education,” added Larson. “It probably will be in the future.”

“Puentes is built on the three pillars of academia: service, education, and re-

search,” he continued. In the earliest stages of the clinic, health-care delivery was the priority because of constraints on time and resources. “The formal education piece, we just couldn’t do it – but now that we have a pretty solid organization, it’s the time for education to move forward.”

Shuman and Garland’s launch came six years after clinical care began at Puentes de Salud. “I was worried it would be a struggle to find students who would want to do this,” said Shuman, noting that the Health Scholars do not receive course credit from their universities. But more students applied than Shuman and Garland expected, which allowed them to choose a group with unique experiences from schools across Philadelphia.

“It’s a great program, and I think it adds a lot of value both educationally and to the community,” said Van Berckelaer.

Shuman and Garland plan to refine the curriculum this summer in preparation for next year’s class of Health Scholars.

As for this year’s first group of Health Scholars, they will carry with them new friendships and knowledge, as well as a strengthened commitment to service.

“It’s a philosophy about how to live your life and about how to practice medicine,” said Keenan. “And if you don’t have readings or a group to discuss it with, it’s hard to make time in the busyness of medical school to think about it.”

Like many of the Health Scholars, Keenan intends to care for immigrant patients during her residency and beyond. “Because of the Scholars and Puentes, I’ll understand a little bit better some of their stressors and the social determinants of health.” ♥

To volunteer with the Puentes yoga class or clinic, e-mail [puentesdesalud@gmail.com](mailto:puentesdesalud@gmail.com). To learn more, visit [www.puentesdesalud.org](http://www.puentesdesalud.org).

*Lily Tom has finished her first year at the Perelman School of Medicine.*



# A Matter of Detail

By Jon Caroulis

Life-changing experiences usually don't begin in settings like this: a debate entitled "Therapeutic Plasma Exchange: Who Should Do It and For What?" at the 42nd Annual Conference of the American Society for Artificial Internal Organs, in Washington, D.C.

On May 3, 1996, Robert E. Gerhardt, M.D. '70, M.A. '08, took one side in the exchange.

A kidney specialist by training and experience, Gerhardt, the former chief of the Section on Renal Diseases and Hypertension at The Pennsylvania Hospital, was hoping to enliven the debate with slides of paintings by old masters that depicted the work of physicians who were the nephrologists of their time: images of doctors examining flasks of urine.

Fascinated by the detail in these slides, Gerhardt came upon a 17th-century Dutch painting that, he learned, was initially attributed to the wrong artist. Later, it was found to have been painted by Michiel van Musscher (1645-1705).

"I liked it, but I knew nothing about Van Musscher or whether it truly was by him," says Gerhardt. "I tried to find information concerning him, but other than a few standard lines in numerous books, I really could not find any significant information." Given the quality of Van Musscher's paintings and their detail, Gerhardt was convinced that there had to be more information available, "if someone took the time to look."

Gerhardt started to write a novel about the painting, which led him to do more research. "I decided I needed to go back

Inspired by a painter's meticulous technique, a retired nephrologist has become a leading expert on Michiel van Musscher, an overlooked Dutch artist of the 17th century.



Robert Gerhardt at the exhibition he organized.



to school to learn the methods of art historical research and art history in general, since my entire undergraduate and medical education involved scientific research and study." So, after he retired from medicine in 2004, he enrolled in the graduate program in the history of art at Penn's School of Arts and Sciences.

A year before completing his degree in 2008, Gerhardt published a paper, "The Van Musscher Family of Artists," in a Dutch

art journal. His M.A. paper also was on Van Musscher, and he is now finishing a comprehensive monograph about the artist's life and work.

For a scientist and physician, art history presented a different world of discovery.

"Medicine has two parts: science and art," says Gerhardt. "Science concerns everything based on statistics, experimental data, and hard fact. The art of medicine concerns the application of the science:



*The Consultation.* The doctor is examining a flask of urine.

the interaction with the patient, empathy with the patient, and gentleness. However, statements for publication are only accepted if they are factual and can be backed up by objective, not subjective, data – the best example being the double-blind study. Art is art and, in a gross simplification, art history is subjective, not pure science, in that detailed data is difficult, if not impossible to find.” Objective data on economic conditions and political and social conditions exist, and new discoveries that likely influence art can be examined and studied, but, Gerhardt asserts, “there is no double-blind study to select the ‘best’ style of art in an era. It is in the eye and

perception of the beholder, set in the time period that the work is viewed.”

Data can be found on the value people place on art works at different times, but depicting one subject or another is a highly subjective choice, says Gerhardt. In the same way, he argues, “much of the writing in the history of art is also subjective and cannot be supported by statistics. Unfortunately, this often leads to subjective conclusions which are then taken as fact by subsequent authors.”

An art historian, like a scientist, looks for clues and patterns when examining the works of an artist. For example, a rare, early Van Musscher double portrait – known

only through a print of one of the sitters produced by another artist – was in a private British collection since at least the 1700s. Donated to a small museum a few years ago, the print was recently displayed on the museum’s website. When an art historian viewed the image, the relationship to the original portrait was recognized, the sitters were identified, and a long-lost, early Van Musscher portrait was rediscovered.

Through photographs or personal examination, Gerhardt has identified 119 portraits, 19 genre paintings (which represent scenes or events from everyday life), 6 self-portraits, 9 drawings, and 7 prints that he believes are definitely by Van Musscher. “I am sure that there are more,” he said, adding that some paintings may be in private collections. “I would estimate his output at somewhat over 500 works. Even of the works I have identified, some are from turn-of-the-century photographs and have not been seen since. They may not have survived the destruction of two world wars.”

Combining his previous scientific training and his new training in art, Gerhardt began to research the works of Van Musscher and the times he lived in, seeking to be able to answer this question: “Why isn’t Van Musscher better known?”

“I think there are several basic reasons. First, he was at the end of the Golden Age of Dutch art. By 1680, all of the most famous artists of the period – Hals, Rembrandt, Steen, Vermeer, and others – were dead, which to many signaled the end of this great period, and subsequent artists were ignored or considered inferior. The apex of Van Musscher’s career occurred in the 1680s and 1690s, shortly after the deaths of those great artists. In courses on Dutch art history, the end of the 17th century, after the deaths of the so-called Golden Age artists, is generally ignored.”

The second reason, according to Gerhardt, is that most of Van Musscher’s

Detail from *Self Portrait*, 1679.

oeuvre was in portraiture. “In general, a portrait of an unfamiliar or even unknown person has less value and interest than a

“Detail in Dutch paintings of the 17th century was fairly common and popular. The ability to accurately reproduce the visual perception of color and texture – for example, silk versus wool or fur – was considered the hallmark of a fine artist.”

painting of a genre subject or landscape. Many of Van Musscher’s portraits were of wealthy Amsterdammers, but these often are of less interest to the collector. However, his technical virtuosity is becoming more appreciated, and the appreciation of his paintings is now on the increase.”

A third reason Gerhardt proposes is Van Musscher’s meticulous technique. His paintings have precise detail, “painted so finely that brushstrokes were not visible.” That technique, Gerhardt explains, was popular in his time, but fell out of favor in the 1800s. It was then that Impressionist painting – which often featured that visible brushstrokes showing the hand of the artist – became the standard. The rise of photography also decreased the value placed on accurate, minutely detailed portraits. That kind of realism, says Gerhardt, “could be obtained to an even higher degree with a photograph.”

If Gerhardt liked the detail he saw in his first Van Musscher, he became enthralled with more exposure to it. “Detail in Dutch paintings of that time was fairly common and popular. The ability to accurately reproduce the visual perception

of color and texture – for example, silk versus wool or fur – was considered the hallmark of a fine artist.” He notes that Van Musscher’s *Family of the Artist*, a larger, baroque painting, is often considered his masterpiece. “It is full of amazing detail. However, I am more amazed by the amount of detail in his smaller self-portraits and especially his *Portrait of General François Lefort*, a Swiss mercenary in the service of Czar Peter the Great. The texture of silk fabric, sable fur, rug knots, and decorations is just phenomenal.

“I believe Van Musscher, for whatever reason, had the ability, eyesight, and infinite patience to paint the unbelievably fine detail in the carpets, books, and other objects. Clearly, he used magnifying glasses, as did other artists, and other artists also painted fine detail, but Van Musscher was just better at it.”

Last year, Gerhardt organized the first-ever exhibition of Van Musscher’s work, which was held at the Museum Van Loon in Amsterdam. The crowds that came to see the thirty works on display were larger than expected.

“I was told it was 25,000 visitors. Frankly, it was ex-

citing,” says Gerhardt. “At the opening and the following days, many people came up to me and asked the same question, ‘How come we have never heard of this artist?’

“It was a great feeling to realize that, through the exhibition, we were reintroducing an exceptional artist to the people of his city and country,” continues Gerhardt. “I kept waiting for someone to say, ‘Oh he’s not so good, we have so many that are better, we just don’t bother with him,’ or something to that effect. It never happened! Many people did not realize the detail until we encouraged them to look closely. We also had detail enlargements that were projected on a TV screen, and visitors would just stand and stare at them.”

Particularly gratifying to Gerhardt was a comment from the museum’s director: “Thanks to your effort and research, Michiel van Musscher is no longer a hidden master!”

*Self Portrait*, 1679.



# Development Matters

## CONSTRUCTION BEGINS ON THE MEDICAL EDUCATION CENTER

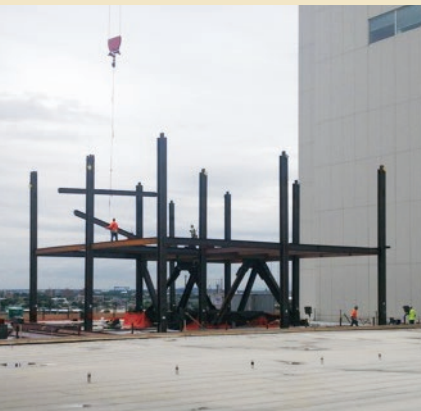
### A NEW ERA OF MEDICAL EDUCATION TAKING SHAPE

Construction is under way on the Henry A. Jordan, M.D. '62, Medical Education Center, and with it, Penn is creating an optimized learning environment for students at the Perelman School of Medicine. With its exciting location atop the Perelman Center for Advanced Medicine and connected to the Smilow Center for Translational Research and the Roberts Pro-

ton Therapy Center, the Henry Jordan Center is one of the few medical educational facilities in the nation to be fully integrated with research and clinical practice facilities. This collaboration and integration will provide students with an experience that combines the dynamic energy of medicine in the classroom, the exam room, and the lab, preparing them to be tomorrow's national health-care leaders.

*“More than a collection of classrooms and study areas, the new Henry Jordan Center will play a prominent role in advancing innovation in every aspect of medicine. As we have been re-imagining our medical campus, a remarkable opportunity has emerged: to truly redefine 21st-century medical education by physically integrating learning spaces with our research and patient care facilities.”*

– J. Larry Jameson, M.D., Ph.D.  
Executive Vice President of the University of Pennsylvania for the Health System  
Dean, Perelman School of Medicine



### TELEMEDICINE AND DIGITAL TECHNOLOGY HIGHLIGHT THE NEW HENRY JORDAN CENTER

The new Henry Jordan Center will offer a flexible, adaptable, and state-of-the-art environment to maximize the power of the Perelman School of Medicine's pioneering small-group learning model. The Center will also strengthen the collaborative and team-based relationships that define medicine today. High-tech recording and simulcast technology will allow faculty members to more easily create online courses and lectures available to millions across the globe. Students will be able to quickly call up EKG results, tissue samples, 3D videos of organs, and the latest journal articles while they discuss classroom work or clinical rotations. Telemedicine meetings or consultations will facilitate constant collaboration among Penn Medicine laboratories and other schools, centers, foundations, and institutes.



# HENRY A. JORDAN, M '62,



## NAMED IN HONOR OF A BELOVED ALUMNUS

The Center was named to honor the late Henry A. Jordan, M.D. '62, G.M.E. '67, one of the Perelman School of Medicine's most devoted alumni and friends. Henry was a steadfast champion of Penn Medicine and its students. Together with his wife, Barrie, Henry strove to advance all of Penn Medicine's missions in education, patient care, and research. Barrie's gift to the Center in memory of her late husband continues the Jordans' long history of being one of Penn Medicine's most respected and dedicated partners.

"Henry loved this institution, the vision it embraced, and, in particular, its extraordinary medical students," said Barrie. "Our family is honored to have his name associated with this stunning new educational facility."



Henry's Penn lineage extends back to his parents, who graduated from the School in 1929. As an alumnus, Henry quickly distinguished himself, becoming a noted specialist in behavior modification and an authority on weight-loss programs. He remained dedicated to his medical alma mater, serving as an inaugural member of the Penn Medicine Board of Trustees, Class Agent for the Class of 1962, and Chair of the Campaign for Penn Medicine. He was recognized with the School's first Alumni Service Award.

*"I believe the talented graduates of our medical school will become stars of the health care system in America – and that bodes well for the health of this nation."*

– Henry A. Jordan, M.D. '62, G.M.E. '67

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Reunion Co-Chairs  
The Class of 1980 Study Area

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– Edward Anderson, C '65, M.D. '69, Louis Kozloff, C '65, M.D. '69, and William Moreau Thompson, M.D. '69  
The Anderson Kozloff Thompson Classroom



## CALENDAR OF EVENTS

Visit [alumni.med.upenn.edu/calendar](http://alumni.med.upenn.edu/calendar) for more information.

### Penn Medicine in Bar Harbor

Monday, August 12, 9:00 a.m.  
The Bar Harbor Club  
Bar Harbor, ME

### Blutt Lecture in Entrepreneurism and Medicine

Thursday, October 31, 2:00 p.m.  
Smilow Center for Translational Research, Auditorium  
Penn Medicine, Philadelphia

### AAMC Penn Medicine Friends Reception

Monday, November 4  
Smilow Center for Translational Research, Commons  
Penn Medicine, Philadelphia

### Sparkman Lecture

Tuesday, November 12  
Biomedical Research Building, Auditorium and Lobby  
Penn Medicine, Philadelphia



## Progress Notes

Send your progress notes to:  
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### '60s

**R. Barrett Noone**, M.D. '65, G.M.E. '71, G.M.E. '73, Bryn Mawr, Pa., a clinical professor of surgery at the Perelman School of Medicine, was recently honored by two national organizations. He received the Honorary Award from the American Association of Plastic Surgeons, the organization's highest honor, and the Special Achievement Award from the American Society of Plastic Surgeons. Noone continues as executive director of the American Board of Plastic Surgery. A former chief of plastic surgery at Pennsylvania Hospital, Bryn Mawr Hospital, and Lankenau Hospital, Noone served as chair of the Department of Surgery at Bryn Mawr Hospital for 10 years.

**Patricia A. Gabow**, M.D. '69, G.M.E. '73, a national leader in hospital reform and public health care delivery, has joined the board of trustees of the Robert Wood Johnson Foundation. The board leads the nation's largest philanthropy devoted exclusively to improving the health and health care of all Americans. A nephrologist by training, Gabow retired in 2012 after 20 years as chief executive officer of Denver Health and Hospital Authority, an integrated health-care system serving one of the poorest populations in Colorado.

### '70s

**Diane Jorkasky**, M.D. '77, G.M.E. '83, chief scientific officer for Complexa, Inc., a biopharmaceutical company, was appointed an independent member of the board of Q Therapeutics, Inc. She is a 25-year veteran of the pharmaceutical industry with experience in clinical trials (phases 1-4), including protocol development, conduct, and reporting; site placement strategy; and regulatory in-

teraction. Formerly vice president for global clinical research operations at Pfizer, Jorkasky is board certified in internal medicine, nephrology, and clinical pharmacology and has published more than 100 peer-reviewed articles. She was a Woodrow Wilson Visiting Fellow in 2011 and this year received the Distinguished Graduate Award from The College of Wooster, where she obtained her undergraduate degree in chemistry.

### '80s

**Andrew A. Ziskind**, M.D. '84, is a managing director and leader of the Clinical Solutions group at Huron Healthcare, part of the Chicago-based Huron Consulting Group. He was recognized this year as one of the top 25 consultants by *Consulting* magazine, a leading publication for the profession. As noted by the magazine: "Dr. Ziskind has over 25 years of experience spanning clinical care; academic health-system leadership for both the physician and hospital/health system side; development of innovative primary and specialty-care delivery systems; leadership in accountable care and payment reform; and national and international consulting."

**Samuel M. Silver**, M.D., Ph.D., G.M.E. '85, was elected chairman of the board of the National Comprehensive Cancer Network, a not-for-profit alliance of 23 of the world's leading cancer centers. The network is based in Fort Washington, Pa. Silver is assistant dean for research and professor of internal medicine at the University of Michigan.

**John C. Reed**, Ph.D., M.D. '86, G.M.E. '89, has been appointed head of Roche Pharma Research and Early Development and a member of its corporate executive committee. He is based in Basel, Switzerland. Before joining Roche, Reed was chief executive officer at Sanford-Burnham Medical Research Institute in La Jolla, Calif. He holds more than 100 patents, is a member of multiple scientific journal editorial boards, and was the founder or co-founder of a number of biotechnology companies. Reed was elected to the American Association for the Advancement of Science in 2011.

## Two Alumni Hailed as Teachers

Two alumni of the Perelman School of Medicine – **William H. Lipshutz**, M.D. '67, G.M.E. '72, and **Bennett Lorber**, M.D. '68 – received teaching awards from the American College of Physicians (ACP) at the College's Internal Medicine 2013 meeting.

Lipshutz, who did his medical training at Pennsylvania Hospital and was chief resident in internal medicine, received the Outstanding Volunteer Clinical Teacher Award. The honor is in recognition of the time he dedicates to teaching medical students and residents, as well as his demonstration of "outstanding teaching prowess," a deep concern for patients, and his position as a role model and mentor. In 1978, he founded the Pennsylvania Hospital Gastrointestinal Associates, a private physician practice that currently houses six gastroenterologists at the Washington Square Endoscopy Center. A Fellow of ACP, Lipshutz is also a Fellow of the American College of Gastroenterology. Lipshutz was section chief of gas-

troenterology at Pennsylvania Hospital for more than 30 years and now teaches as a clinical professor of medicine at Penn Medicine.

Lorber is the Thomas M. Durant Professor of Medicine at Temple University, as well as a professor of microbiology and immunology. A specialist in infectious diseases, he received the Jane F. Desforges Distinguished Teacher Award for his "ennobling qualities" that have greatly inspired his former students, many of whom are now leaders in medical education. Lorber is known for his work with anaerobic infections and human listeriosis, a food-borne disease. In addition to being a master with the ACP, Lorber has been president of The College of Physicians of Philadelphia and of the Anaerobe Society of the Americas. He is also a member of the board of managers of Swarthmore College.

Lipshutz and Lorber both graduated from Swarthmore, but they have been friends since working together as camp counselors even before college.

### '90s

**Quan Dong Nguyen**, M.D. '93, has been named the McGaw Professor and Chairman of the Department of Ophthalmology and Visual Sciences and director of the new Stanley M. Truhlsen Eye Institute at the University of Nebraska Medical Center. He serves as principal investigator and chair of several multicenter clinical trials funded by the National Eye Institute, among other organizations, for diabetic macular edema, neovascular age-related macular degeneration, and ocular inflammatory and uveitic diseases.

**Jennifer Moriatis Wolf**, M.D. '95, a hand surgeon at the New England Musculoskeletal Institute of the University of Connecticut Health Center, is one of seven orthopaedic surgeons in North America selected to the American Orthopaedic Association's 2013 American-British-Canadian Traveling Fellowship. Her other honors

include the Association's John J. Fahey North American Traveling Fellowship and the Sterling Bunnell Fellowship, presented by the American Society for Surgery of the Hand.

### '00s

**Mously A. Le Blanc**, M.D. '08, has joined the Department of Physical Medicine and Rehabilitation at Penn Medicine as assistant professor of cancer rehabilitation. She completed her internship at Abington Memorial Hospital and her residency in physical medicine and rehabilitation at New York-Presbyterian Columbia and Cornell University Hospitals. She also trained in cancer rehabilitation at Memorial-Sloan Kettering Cancer Center. Her research interests include risk stratification and management of neuro-musculoskeletal complications associated with breast, lymphoma, and head and neck cancers.

## OBITUARIES

### '30s

**Dino E. McCurdy, M.D.** '39, G.M. '42, Newport News, Va.; February 1, 2013. Appointed as captain and army physician in Normandy, he followed General Patton and his troops across Europe. He returned to Methodist Hospital, where he became chief of cardiology and director of medicine. He was an emeritus professor at Jefferson Medical College.

**William J. Zintl, M.D.** '39, G.M.E. '46, Haverford, Pa.; January 27, 2013. He worked as a ship's surgeon in World War II and then as chief of surgery at three Delaware County hospitals. He later joined Misericordia and Mercy Hospitals. In 1966 he was appointed chief surgeon and board member at Riddle Hospital.

### '40s

**John H. E. Woltz, M.D.** '42, G.M.E. '46, Greensboro, N.C., a retired physician; January 23, 2013. He served as president of the Mecklenburg County Medical Society and chief of the Department of Obstetrics and Gynecology, and he was a member of the hospital advisory board at Charlotte Memorial Hospital. He was president of the Charlotte Chapter of the American Cancer Society for three terms.

**John H. Doane Jr., M.D.** '44, Winston-Salem, N.C., a retired physician; January 10, 2013. He practiced at Temple University Hospital and at Winston-Salem Health Care. His brother is Wilton A. Doane, M.D. '44, G.M. '51.

**Gilbert D. Jay III, M.D.** '44, Fayetteville, Ark., a retired general surgeon and diplomate of the American Board of Surgery; October 15, 2012. During World War II, he served two years as a flight surgeon and then finished his medical training in surgery at Henry Ford Hospital in Detroit. He opened a medical practice in West Memphis, Ark., becoming the first surgeon to serve the Crittenden County area.

**John I. F. Knud-Hansen, M.D.** '44, Oxford, Md.; October 24,

2012. He enlisted in the expedited medical-school program of the U.S. Navy/Marines and was assigned to the Pacific Island of Saipan, where the U.S. had established a Japanese POW camp. After the war, he began a 21-year career with the U.S. Navy Medical Corps. He established a private practice as a general surgeon at the Memorial Hospital of Easton. There, he served as chief of staff and chief of surgery and was president of the American Cancer Society of the Eastern Shore. In the course of his career, he helped establish a public medical practice that provided nearly all the medical care for all three islands owned by Denmark.

**Ted Wah Sing Chong, M.D.** '46, G.M. '50, Moorestown, N.J.; January 20, 2013. He attended medical school under the United States Naval Reserve program and was on active duty as a lieutenant, junior grade. He served in Operation Sandstone in the Enewetak Atoll in the Pacific and was posted at Tripler Medical Hospital in Aiea, Hawaii. After his discharge from the U.S. Navy, he began a private obstetrics and gynecology practice in Honolulu. During his tenure at the Zurbrugg Hospital in Riverside, N.J., he was a founder of a breast cancer clinic for women.

**John E. Hampton, M.D.** '46, Washington, N.J.; December 8, 2012. He received a college scholarship awarded by the U.S. Navy, serving with the rank of lieutenant, junior grade. He was first assigned to the Philadelphia Naval Hospital and later served at Portsmouth Naval Base Hospital in Kittery, Me. A former president of the medical staff at Warren Hospital in Phillipsburg, N.J., he helped establish the hospital's first coronary care unit. He was on the advisory board of Mt. Kipp TB Sanitarium and was plant physician for the American Can Corporation in Washington. He helped develop Warren County's Public Health Nursing Agency, where he later served on its board and worked at its Well Baby Clinics.

**Irvin Gerson, M.D., G.M.E.** '47, Bala Cynwyd, Pa., a family practitioner and neurological researcher; October 18, 2012. A longtime faculty member at Jefferson Medical College, he was one of the first

using EEG machines and founded a number of sleep laboratories in the Philadelphia area. He was the founder of University Services (Sleep Diagnostic and Toxicology Services).

**Robert G. Greene, M.D.** '47, Montclair, N.J.; November 2, 2012. He was former president of the New Jersey Orthopaedic Society and former president of Associated Physicians of Montclair and Vicinity. He had been president of the medical staff at Mountainside Hospital and director of its Department of Orthopaedics. He received the Lifetime Service Award from the New Jersey Orthopaedic Society for contributions to orthopaedic surgery, medicine, and the community. During World War II, he served in the U.S. Navy and also spent two years as a battle surgeon in Korea. He was honorably discharged as a lieutenant. A longtime faculty member at the University of Medicine and Dentistry of New Jersey, he had also been a teaching fellow at Harvard University.

**Sterling B. Suddarth, M.D.** '47, Portland, Ore., a retired pediatrician; December 29, 2012. He

**Robert A. Fishman, M.D.** '47, Tiburon, Calif., a neurologist; December 4, 2012. Because of World War II, he entered the U.S. Navy V12 program at Penn's School of Medicine and finished his accelerated coursework in three years. During the Korean War, he served in the Army Service Graduate School at Walter Reed Hospital. After his tour of duty, Fishman returned to Columbia, where he was appointed chief resident and subsequently joined the faculty. He began a productive research program that studied the blood-brain barrier and the physiology and biochemistry of cerebrospinal fluid. In 1966, he became chair of the Department of Neurology at the University of California at San Francisco, a position he held for 26 years. There he continued his research under the aegis of the National Institutes of Health, studying experimental metabolic encephalopathies. His work eventually led to the establishment of the Brain Edema Research Center. He became emeritus in 1994.

In addition to writing more than 100 original papers, abstracts, let-

ters, and book reviews, Fishman served as chief editor of *Annals of Neurology*. He was an honorary member of the American Neurological Association and the Medical Advisory Board of the National Multiple Sclerosis Society and was a senior member of the Institute of Medicine of the National Academy of Sciences. He served as president of the American Academy of Neurology, the American Neurological Association, and the American Board of Psychiatry and Neurology. His legacy includes the Neurology Library and Study Center at UCSF and a Distinguished Professorship in his name. In 1996, he was honored with the Distinguished Graduate Award, the highest honor of Penn's School of Medicine, in recognition of "his successful career-long efforts to enhance the study and practice of neurology while serving as a dedicated educator and mentor to his students and residents."

**John J. Mikuta, M.D.** '48, G.M.E. '54, Medford, N.J., emeritus professor of obstetrics and gynecology at the Perelman School of Medicine and a pioneer in the diagnosis and treatment of gynecologic cancers; January 25, 2013. He served a stint as a U.S. Army doctor between his internship and residency at Penn. He went on to head Penn's division of gynecologic oncology. According to Stephen C. Rubin, M.D., who succeeded him as chief of the division, Mikuta "is considered one of the founding fathers of the specialties of gynecologic oncology." Mikuta continued to treat patients for a decade after stepping down as chief in 1993. His devotion to Penn continued into his retirement, said his widow, the former Margaret Beauchamp, a British nurse who became Dr. Mikuta's second wife 40 years ago. A leader in alumni activities, he was the inaugural recipient of the Penn Medicine Alumni Lifetime Achievement

One of Fishman's daughters is Mary B. Fishman, M.D. '84, who is married to Howard A. Fine, M.D., G.M.E. '87.



Award in 2008. Mikuta was one of the doctors who cofounded the Society of Gynecologic Oncologists in 1969, and he served as its president in 1973. In addition to holding the title of Franklin Payne Emeritus Professor of Gynecologic Oncology, he received many honors, including the Humanitarian Award from the American Cancer Society, which also made him an Honorary Life Member. In 2010, Penn's Department of Obstetrics and Gynecology established the John J. Mikuta, M.D., Endowed Professorship in Gynecologic Oncology.

**Orville F. Nielsen, M.D., G.M.** '48, Endicott, N.Y., a retired gastroenterologist; April 9, 2012. He served in the U.S. Navy during World War II. He earned his M.D. degree at the University of Utah Medical School, which has named a fellowship in gastroenterology in his honor. He also served at the naval hospitals in Boston; Corona, Calif.; and Camp Pendleton, Calif. After more training at Penn's Graduate School of Medicine, Nielsen became the first board-certified gastroenterologist in the Navy. He started the Navy's first training program in the specialty. Later, he was executive officer and chief of medicine at the Naval Hospital in Newport, R.I.

**Robert E. Smith, M.D.** '48, Mt. Vernon, Ohio, a retired family practitioner; December 17, 2010.

**Gretchen Bieber Wagner, M.D.** '48, G.M.E. '52, Cleveland; September 28, 2011. She did a surgical residency under C. Everett Koop at Children's Hospital of Philadelphia. She left medical practice to rear her children, but returned 15 years later to surgery. At the age of 54, she did a residency in physical health and rehabilitation, then became a physiatrist on staff at the V.A. Hospital in Cleveland.

**Charles F. Grabiak, M.D., G.M.** '49, Yardley, Pa.; August 30, 2011. He practiced family medicine.

**Art B. Martin, M.D., G.M.** '49, Fort Smith, Ark., a retired surgeon and medical director for the Methodist Nursing Home; January 27, 2013. During World War II, he served as a battalion surgeon in the 76th Infantry Division with General Patton's Third Army

in Europe. Later, he was chief of staff at Sparks Regional Medical Center and served on the board of Baptist Hospital in Little Rock. He was a member of the Alpha Omega Alpha Honor Medical Society and was former president of the Sebastian County Medical Society.

## '50s

**Kent F. Balls, M.D., G.M.** '50, Philadelphia, a retired endocrinologist; June 5, 2011.

**Marjorie Williams Jensen, M.D.** '50, Ballston Spa, N.Y.; January 5, 2013. During World War II, she contributed to the war effort by working in a ball bearing factory. She also worked as a pathologist in the laboratory at Ellis Hospital, Schenectady, until her retirement.

**Ernest W. Crow, M.D., G.M.E.** '52, Wichita, Kan., emeritus professor of cardiology at the University of Kansas; December 26, 2011. He served in the Army Medical Corps from 1946 through 1948, attaining the rank of captain. He was cofounder of the University of Kansas School of Medicine-Wichita and served as its first chairman of the Department of Medicine.

**Herman J. Flax, M.D., G.M.** '52, North Bethesda, Md., emeritus professor and chief of physical medicine and rehabilitation at Virginia Commonwealth University; April 26, 2012. He served as president of both the American Congress of Rehabilitation Medicine and the International Rehab Medicine Association.

**Elliott L. Mancall, M.D.** '52, Lafayette Hill, Pa., who was instrumental in the discovery of two major brain diseases; January 2, 2013. An emeritus professor of neurology at Jefferson Medical College, he was founding chairman of the neurology department at the former Hahnemann Medical College. With his colleagues K. E. Åstrom and E. P. Richardson, he described progressive multifocal leukoencephalopathy (PML) as a complication of chronic lymphatic leukemia and also Hodgkin's disease. PML is a viral infection of certain cells in the brain that can follow treatments for autoimmune

diseases. It was later found to be present in other diseases, such as AIDS and immunodeficiency disorders. With R. D. Adams and M. Victor, Mancall described central pontine myelinolysis, a disease that affects the insulating cover of nerve cells in the pons region of the brain. The condition is induced by alcoholism, malnutrition, and electrolyte imbalance. In 1995, Mancall moved back to Jefferson as professor of neurology and served as interim chair of the department.

**Howard M. Rawnsley, M.D.** '52, G.M.E. '57, Hanover, N.H.; April 21, 2012. At Penn, he was professor of pathology and director of the William Pepper Clinical Laboratory. He moved to Dartmouth-Hitchcock Medical Center in 1975, serving as chairman of the Department of Pathology. He finished his career there as senior vice president for medical affairs. Rawnsley held leadership roles in several organizations, including the College of American Pathologists (CAP), the American Society of Clinical Pathology (ASCP), the American Board of Pathology, the Academy of Clinical Laboratory Physicians and Scientists, and the American Board of Medical Specialities. Among his honors was the ASCP/CAP Joint Distinguished Service Award in 1995. According to the citation at that time: "Dr. Rawnsley's career as a physician, author, academician, and volunteer continues to be enormously enriching to the field of pathology for those who practice today and those who will become the pathologists of the future." He served as chairman of the New England Regional Blood Services Program for the American Red Cross.

**Erwin H. Rock, M.D., G.M.** '52, Dobbs Ferry, N.Y., retired head of otolaryngology at Albert Einstein College of Medicine; September 4, 2011. During the Korean War, he served in the U.S. Army. He had also been chief of otolaryngology at St. John's Riverside Hospital.

**Harold L. Colburn Jr., M.D., G.M.** '53, Mt. Laurel, N.J.; May 1, 2012. After serving in the Navy from 1950 to 1952 in Newport, R.I., and Sasebo, Japan, Colburn did his residency in dermatology at the University of Pennsylvania. He developed the Burlington County Health Department, and

from 1971 until 1984, he was a Burlington County freeholder. After being elected to the state assembly, he helped institute the New Jersey Urban Hospital Reform Act and was chair of the assembly's Health and Human Services Committee. In 1995, he became director of the state board of medical examiners.

**John G. Pontius, M.D.** '53, Lancaster, Pa.; December 31, 2012. After serving in the U.S. Army 1946-47, he held leadership roles over the years at Lancaster General Hospital, including chief of the division of surgery, vice chairman of the Department of Surgery, and chairman of the medical education committee. A fellow of the American College of Surgeons and a diplomate of the American Board of Surgeons, he had been president of the Eastern Pennsylvania Chapter of the American College of Surgeons.

**David G. Skagerberg, M.D.** '53, Waveland, Miss., a retired orthopaedic surgeon; November 12, 2011. His house was destroyed by Hurricane Katrina in 2005.

**Howard W. Hansell, M.D., G.M.** '54, Berkeley, Calif., a retired psychiatrist; June 4, 2011.

**John Mauger Kearney, M.D.** '54, Reading, Pa., a retired surgeon; January 16, 2013. He entered the U.S. Army at the age of 18. A veteran of World War II, he fought in the Battle of the Bulge. He served as a medic and received the Purple Heart. After earning his medical degree, he took his internship at Wilmington General Hospital, Delaware, and his surgical residency at Marion General Hospital, Ohio. He then returned to the Reading area to open his practice. He was a general surgeon at Saint Joseph Hospital and the former General Community Hospital before retiring in 1995. A former president of the Berks County Medical Society, he was also a Fellow of the American College of Surgeons.

**Albert J. Campbell Jr., M.D.** '56, Sedalia, Mo., a retired family practitioner; October 9, 2012. Having received his Bachelor of Science degree in medicine at the University of Missouri School of Medicine, he served on the school's alumni board of governors for 30 years and was its president from



1985 to 1987. He had also been a counselor with the Southern Medical Association and was a former president of the Missouri State Medical Association.

**Rodolfo A. Garcia-Rodriguez**, M.D., G.M.E. '56, Avalon, N.J., who had maintained a family medicine practice there from 1962 to 1996; December 8, 2011. He served as a staff physician at Mercy Hospital, Ancora State Hospital, and Burdette Tomlin Memorial Hospital. He had been president of the staff at Mercy Hospital and Burdette Tomlin Memorial Hospital, where he was also vice chief of the Department of Medicine. He was a former president of the Cape May County Medical Society and of the Cape May County Heart Association.

**Chinnaswamy P. Ramaswamy**, M.D., G.M. '56, West Frankfort, Ill.; January 14, 2011. He was an orthopaedic surgeon.

**W. Robert Anderson**, M.D. '58, Excelsior, Minn.; July 26, 2011. He was a former consulting pathologist for Hennepin County Medical Center.

**Donald J. Kasper**, M.D., G.M. '58, West Chester, Pa., former chief of radiology at Taylor Hospital; March 16, 2012. He had served as president of the medical staff and had been a member of the hospital's board.

**Jerry L. Doggett**, M.D., G.M.E. '59, Houston; May 3, 2012. He served in the U.S. Army 1961-1963. He had been assistant chief of surgery at St. Luke's Hospital and served for many years as chairman of surgery at Kelsey Seybold Clinic.

**Jack Carlton White**, M.D., G.M. '59, West Chester, Pa., former vice president of medical affairs at Paoli Hospital; July 1, 2011. He served in the U.S. Navy as the ship doctor aboard the *U.S.S. Yellowstone* 1954-1956. He began his general surgical practice at the Memorial Hospital in West Chester, then moved in 1969 to Paoli Hospital, where he served as chief of surgery for more than 15 years. He was a fellow of the American College of Surgeons. White then became active in practice management and medical affairs with Main

Line Health. He founded the Wound Healing Clinic at Paoli Hospital.

## '60s

**Edmund N. Pressman**, M.D. '60, Haverford, Pa.; December 22, 2012. A diplomat of the American Board of Anesthesiology and a fellow of the American College of Anesthesiologists, he had been assistant professor of anesthesiology at Thomas Jefferson University and clinical associate professor of anesthesiology at the Medical College of Pennsylvania. He was chief of anesthesiology at Phoenixville Hospital, where he had served as president of the medical staff.

**John G. Shively**, M.D., G.M. '60, Rosslyn Farms, Pa.; December 7, 2012. In 1964, he accompanied the Pittsburgh Symphony Orchestra on its world tour as its physician. Upon his return, he established the Department of Pulmonary Medicine at Allegheny General Hospital.

**Carl Silver**, M.D., G.M. '60, Grantham, N.H., a retired otolaryngologist; September 24, 2012. In addition to his private practice, he had been director of otolaryngology at Peninsula General Hospital, Brookdale Hospital, and St. Catherine-Siena Medical Center.

**John Sanford Terrell**, M.D. '60, G.M. '64, Kansas City, Mo., retired director of the Brown Lupton Health Center at Texas Christian University; July 14, 2012. An expert in adolescent medicine, he had also held positions with Tarrant County Medical Education and Research Foundation.

**A. Vivian Yanovski**, M.D., G.M. '60, Philadelphia, a retired internist; April 19, 2011. She had attended medical school in Geneva, Switzerland. Her son is Jack A. Yanovski, M.D. '86, Ph.D. '89, whose wife is Susan Zelitch Yanovski, M.D. '85.

**Raymond D. Olson**, M.D. '61, Cortland, N.Y.; December 20, 2012. He served two years in the U.S. Air Force. An obstetrician-gynecologist, he had been president of the local board of the American Cancer Society.

**Brooks J. Poley**, M.D., G.M.E. '63, McAllen, Texas, a retired ophthal-

mologist who had served as chief of staff at Eitel Hospital; April 21, 2012. A former president of the Minneapolis Society of Medicine, he had also been an assistant clinical professor at the University of Minnesota Medical School. He was a founding member of the American Society of Cataract and Refractive Surgery. Poley also volunteered for the Hope Ship and the Orbis Flying Eye Hospital and helped establish the Minneapolis Children's Hospital.

**Richard M. Klaus**, M.D. '64, Atlanta; December 20, 2012. He served as a captain in the Army Medical Corps during the Vietnam War. He later established an orthopaedic medical practice in Atlanta that served high-profile athletes and sports teams.

**Kevin Dodds Harrington**, M.D., G.M.E. '65, Mill Valley, Calif.; January 7, 2013. He served three years in the U.S. Army. He earned his medical degree at the University of California at San Francisco and was a member of the Alpha Omega Alpha Honor Medical Society. Later, he served on the school's medical admissions board. Harrington had numerous visiting professorships throughout the United States, Europe, and South America. He was the author of *Orthopaedic Management of Metastatic Bone Disease* (1988). A consultant to the NFL Players Association, he was awarded the "Community Champion" award by the Marin Community Clinics in 2012.

**James K. Roche**, M.D. '69, Ph.D., Charlottesville, Va., a gastroenterologist; February 9, 2013. He had been a professor of medicine at Duke University before joining the University of Virginia. He helped to create the Community Partnership for Improved Long Term Care, a committee under the Legal Aid Justice Center that serves as an advocacy group to improve quality of nursing home care, working with both staff and families. Roche also volunteered with Habitat for Humanity.

## '70s

**Robert L. Yarrish**, M.D. '74, Hartsdale, N.Y., a retired physician; November 18, 2012. An infectious-

disease specialist, he was an attending physician and director of infection control at Sound Shore Medical Center in New Rochelle. In 1998 he became a military doctor, joining the Navy Reserve as a lieutenant commander. He was deployed to Kuwait in 2004 and last year to Kandahar airfield in Afghanistan as a captain. Earlier, he had set up the infection-control department at Changhua Christian Hospital in Taiwan.

**John H. Wertheimer**, M.D. '76, G.M.E. '81, Rydal, Pa., a cardiologist at Pennsylvania Heart & Vascular Group; December 12, 2012. He had doctor's privileges at several hospitals, as well as the Fox Chase Cancer Center, and had been director of cardiac clinical services at the Albert Einstein Heart Institute. Between 1981 and 2006, he was coauthor of 27 peer-reviewed articles in medical journals of internal medicine, cardiology, and emergency medicine. He lectured widely and carried out dozens of research projects on the treatment of heart ailments. Wertheimer was a fellow of the College of Physicians of Philadelphia and the American College of Physicians.

**Clarke E. Williamson**, M.D. '79, G.M.E. '86, Penn Valley, Pa., a retired vascular surgeon; October 8, 2012. In 1996, he was among African-American entrepreneurs honored by Meridian Bank for their business leadership and community involvement.

## '90s

**Joel Rosenbaum**, M.D., G.M.E. '92, Newton, Pa.; October 14, 2010. He earned his medical degree from New York University and specialized in physical medicine and rehabilitation.

**Donald C. Liu**, M.D., Ph.D., G.M.E. '95, Chicago; August 5, 2012. He died while rescuing two children who were drowning in Lake Michigan. An expert in minimally invasive surgery, Liu was the Mary Campau Ryerson Professor in Surgery and Pediatrics at the University of Chicago and surgeon-in-chief at its Comer Children's Hospital.



FACULTY DEATHS

**H. Fred Clark**, Ph.D., Philadelphia, a retired research professor of pediatrics at the Perelman School of Medicine and The Children’s Hospital of Philadelphia; April 28, 2012. CHOP recognized Clark in 2006 with its highest honor, the Gold Medal, awarded to those who have had a profound impact on children’s health in the United States and worldwide. The medal saluted Clark’s achievements as a co-inventor of the rotavirus vaccine, RotaTeq. Today, the vaccine saves the lives of hundreds of thousands of children worldwide. Clark received a degree in veterinary medicine from Cornell University and a Ph.D. degree in microbiology and immunology from the University of Buffalo. He also was an adjunct professor of the Wistar Institute. He retired in 2010.

**John J. Mikuta**, M.D. See Class of 1948.

**Paul H. Mueller**, M.D., former research professor of biochemistry and biophysics; December 16, 2012. Born in Heinsberg, Germany, he earned his medical degree from the University of Bonn in 1951. He came to the United States in 1953 on a Fulbright Fellowship to work at The Rockefeller Institute. In 1974, he joined a group of researchers at the Eastern Pennsylvania Psychiatric Institute in Philadelphia. In 1974, he also joined Penn’s Department of Biochemistry and Biophysics as an adjunct professor. He became a research professor in 1981 and left Penn in 1992.

Mueller was one of the pioneers of the field of lipid bilayers, as well as neuromorphic engineering, bioinspired smart electronics, and biomimetic systems. In the 1970s, he developed one of the first electronic models of a neuron, realized by using state-of-the-art integrated electronics components. In the 1980s, the convergence of his interest with the development of integrated circuits technology, called Very Large Scale Integration (VLSI), led to a collaboration with Dr. Jan van der Spiegel, professor of electrical and systems engineering in the School of Engineering & Applied Science, which resulted in the creation of the first fully reconfigurable large-scale neural computer in VLSI. This neural computer consisted of hundreds of chips,

similar to microprocessor chips but mimicking the analog computational properties of their biological counterparts that modeled neurons, synapses, and axons. This work, funded by the Office of Naval Research, led to the formation of Corticon, Inc., which developed other neuromorphic systems for vision, audition, and neural information processing in the 1990s and into the 2000s.

**Howard M. Rawnsley**, M.D. See Class of 1952.

**Annemarie Weber**, D.Med, M.D., emeritus professor of biochemistry and biophysics; July 5, 2012. After completing her M.D. and D. Med. degrees at the University of Tubingen in Germany in 1950, she received a Rockefeller postdoctoral fellowship to continue her training in biophysics at University College, London, and in physical chemistry at Harvard Medical School. She was recruited to Penn’s School of Medicine in 1972 as professor of biochemistry.

“Annemarie’s scientific accomplishments were outstanding,” said Mark Lemmon, Ph.D., chair of the Department of Biochemistry and Biophysics. “In 1959 she established the first direct and complete evidence that calcium ions act as intracellular messengers. . . . Annemarie played a pivotal role in establishing the overall principles of calcium action.”

Weber was elected to the Deutsche Akademie der Naturforscher Leopoldina; the American Academy of Arts and Sciences; and the American Association for the Advancement of Science. She was also named a fellow by the Biophysical Society. In 1985 she received Penn’s Leonard Berwick Memorial Teaching Award. After becoming emeritus in 1998, she continued to teach medical students – and received the Provost’s Award for Distinguished Teaching in 2001. According to one of her students, she was “extraordinarily successful at clarifying difficult concepts, integrating clinical correlations, and providing a big picture of biochemistry that facilitates active learning.”

LEGACY GIVING

Living in the Moment, Giving for the Future



Margaret Leonard and Michael Baime



Every morning Margaret Leonard wakes up and welcomes the new day. She breathes slowly and focuses on being in the moment. She is practicing mindfulness, and she reports that this way of thinking has changed her life. Now, through generous planned giving, she wants to raise awareness about this special relaxation technique.

Mrs. Leonard has made two charitable IRA rollover gifts to the Penn Program for Mindfulness. At Penn Medicine since 2002, under the direction of Michael Baime, M.D. ‘81, the program is now fully integrated with the Abramson Cancer Center. Dr. Baime’s goal is to teach patients and families how to concentrate on the here and now, and cope with thoughts of an uncertain future.

Mrs. Leonard describes her road to mindfulness as a bumpy one. In the early 1980s, her husband, Charles, had open heart surgery. His recovery depended on avoiding stress. Mrs. Leonard, a retired nurse, found a solution: listening to relaxation tapes together.

Years later, in 2005, one of their sons passed away. Sadly, she experienced more loss when her beloved husband was treated for colon cancer at Penn and died in 2007. Dr. Baime’s program greatly helped her navigate feelings of loss and sadness:

“Mindfulness has taught me to get at the heart of the issues I was facing in my life. It is a straight pathway to learning about love. I am in awe at what they do at the Abramson Cancer Center, and I wanted to give back.”

She chose to make gifts utilizing the charitable IRA rollover. The IRA rollover directs funds from your IRA to charity; you don’t recognize any income, and the gift counts toward your IRA’s annual required minimum distribution.

Mrs. Leonard was recently delighted to learn that her gifts will be matched by the charitable arm of Mr. Leonard’s employer, the General Electric Foundation.

Says Mrs. Leonard: “Dr. Baime is a great leader and has reached so many people with his teaching. He embodies truth to me and has taught me to appreciate love in my life.”

Mrs. Leonard chose one of a multitude of creative gift opportunities that benefit both the Perelman 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., Executive Director of Planned Giving, at 215-898-9486 or cewan@upenn.edu. For more information, please visit the web site at [www.plannedgiving.med.upenn.edu](http://www.plannedgiving.med.upenn.edu).

## What's the Use of Narrative?

In certain circles, narrative has always been its own reward. But there are other surroundings in which narrative is seen as a poor substitute for something else. Earlier this spring, the University of Pennsylvania Biomedical Library hosted an event to explore some of the implications and possibilities of narrative in medicine. “Penn Projects in Narrative Medicine: A Visual and Storytelling Journey in Modern Medicine” brought together a novelist, a columnist, a photographer, an illustrator, and a plastic surgeon. Only the illustrator was not an M.D. – but she has worked in an interesting fashion with the plastic surgeon.

The “narrative medicine” under discussion at the event may not have fit precisely with the term as popularized by physicians like Columbia University's Rita Charon, M.D., Ph.D. Narrative competence, as she defines it, “enables the physician to practice medicine with empathy, reflection, and trustworthiness” (*The New England Journal of Medicine*, 17 October 2001). Penn's event took a broader view of narrative.

In fact, the first speaker, Jason Karlawish, M.D., is a novelist as well as specialist in geriatrics and medical ethics. In *The Open Wound: The Tragic Obsession of Dr. William Beaumont* (2011, reissued this year in paperback), Karlawish reimagined a most unusual medical case. In 1822, Beaumont saved the life of a young fur trapper who had accidentally been shot in the stomach. As Karlawish explains on his web site: “The young trapper's injury never completely heals, leaving a hole into his stomach that the curious doctor uses as a window to understand the mysteries of digestion. . . . Beaumont seizes the opportunity to experiment upon his patient's stomach in order to write a book that he hopes will establish his legitimacy and secure his prosperity.” The doctor-patient relationship rarely comes more charged!

Karlawish noted how Beaumont became a “character” for him, not just a mad scientist. And after reading part of his book, he noted that the scene was created – “and yet it had to have occurred,” because of the truth it put forward. Alluding to the writer Robert Coles, Karlawish suggested that the chief value of narrative resides not in high drama but in the everyday events of our lives.

## Facts and Figures Are Not Sufficient

Zachary Meisel, M.D., M.P.H., assistant professor of emergency medicine, spoke next. A frequent columnist for *Slate* and for *Time.com.*, Meisel has tackled such topics as patient-directed “Google medicine” and whether better access to health care would actually lower costs. Alluding to an essay in *The Journal of the American Medical Association* that he wrote with Karlawish, Meisel noted that they've found that patients often are not happy with evidence-based care. To patients, it seems primarily to be about cost. In the *JAMA* piece, Meisel and Karlawish write that “Facts and figures are essential, but insufficient, to translate the data and promote the acceptance of evidence-based practices and policies. . . . Moreover, evidence from social psychology research suggests that narratives, when compared with reporting statistical evidence alone, can have uniquely persuasive effects in overcoming preconceived beliefs and cognitive biases” (*JAMA*, 9 November 2011). At the Biomedical Library, Meisel urged doctors to “get into this game” – to use narrative and life stories of patients not just to undermine false claims and dubious evidence but to support the sound evidence. Fact supported by narrative, directed to patients, doctors, and policy makers.



From word to image: the next speaker, John Hansen-Flaschen, M.D., professor of medicine and chief of pulmonary, allergy, and critical-care medicine, spoke about some of his recent photographs. As he put it, his intense two weeks in the ICU used to feel like a “tour of duty” in a submarine but now he's calling it “my temple or my cathedral. . . . I learn so much about human experience in this tiny, confined space.” What absorbed him were the “shrines of hope” that families members of patients would construct, arranging photos, objects, letters, words of encouragement, and the like on bulletin boards and walls. These collages appeared to him to be “visual poems of hope and redemption,” even though the patients did not always survive. Hansen-Flaschen began to photograph these shrines. As Barbara Cavanaugh, director of the Biomedical Library, noted, four of Hansen-Flaschen's photos of the collages hang in the library.

The last two speakers were Caryn Babaian, a science/medical illustrator and biology instructor at Bucks County Community College, and Ara Chalian, M.D., professor of otorhinolaryngology and director of facial and plastic & reconstructive surgery. Babaian noted the similarities between surgery and drawing – a comparable “eye-hand synergy.” She also argued that drawing is a way to intensify an experience and to help retain its memory; it develops the “noticing skills” of the practitioner. The joint project with Chalian began when he asked for illustrations of the trachea to use in teaching – but Babaian saw the opportunity to make it more personal. “What if it was *your* thyroid?” she asked him. Would the medical residents care more about it? So Chalian indeed became part of the illustrations. One of the more eye-catching ones depicts Chalian dissecting his own neck. Acknowledging some initial discomfort, Chalian became more enthusiastic. And, he noted, “My teaching scores went up.” ■

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enn's Center for Health Incentives and Behavioral Economics draws on principles from economics and psychology to look at how people make choices in complex contexts – such as personal finances and health. As Kevin Volpp, M.D., Ph.D., the center's director, points out, in those situations, “we often are our own worst enemies.”