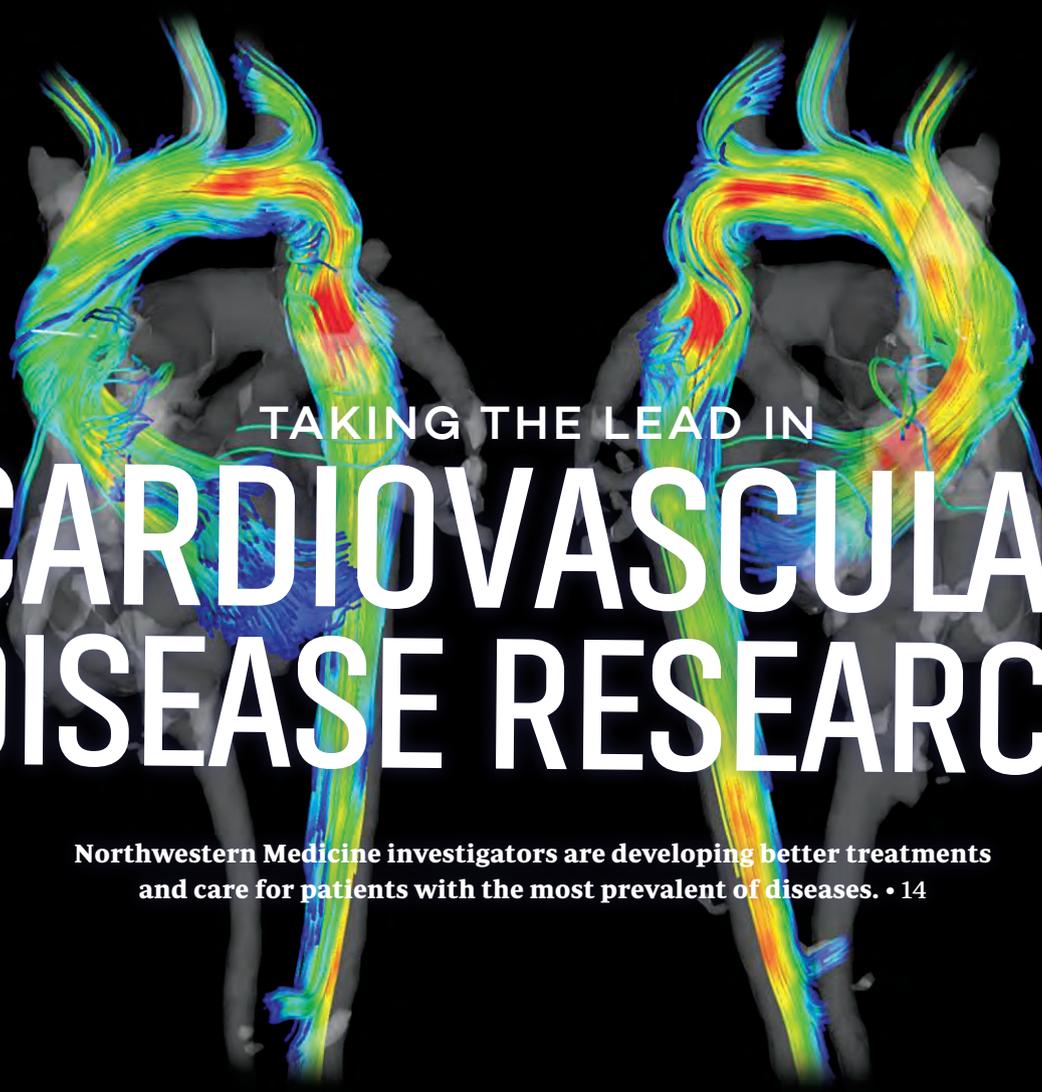


# Northwestern Medicine

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**SPRING 2018**



TAKING THE LEAD IN  
**CARDIOVASCULAR  
DISEASE RESEARCH**

Northwestern Medicine investigators are developing better treatments  
and care for patients with the most prevalent of diseases. • 14

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## Showcasing Science

### RESEARCH DAY 2018

On April 5, more than 430 scientists, trainees, students and faculty presented abstracts at Feinberg's 14th Annual Lewis Landsberg Research Day, a celebration of the medical school's innovative research and the dedicated investigators who make it happen.

Northwestern Medicine magazine is published quarterly for alumni and friends of Northwestern University Feinberg School of Medicine, Northwestern Memorial HealthCare and the McGaw Medical Center of Northwestern University.

**Editor:** Nora Dunne

**Editorial Assistant:** Yesenia Navarro

**Contributing Writers:** Andrea Arntsen-Harris, Will Doss, Bob Kronemyer,

Bridget Kuehn, Marla Paul, Cheryl SooHoo, Anna Williams

**Editorial Advisors:** Eric G. Neilson, MD, vice president for Medical Affairs and Lewis Landsberg Dean; Alan Krensky, MD, vice dean for Development and Alumni Relations; Nicole Mladic, executive director of Communications; Babette Nyka, director of Alumni Relations

**Alumni Association:** James P. Kelly, '73 MD, president; Rishi Reddy, '00 MD, president-elect

**Design:** Taylor Design

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Address all correspondence to: Northwestern University, Feinberg School of Medicine, Office of Communications 420 E. Superior Street, Rubloff 12th Floor Chicago, IL 60611

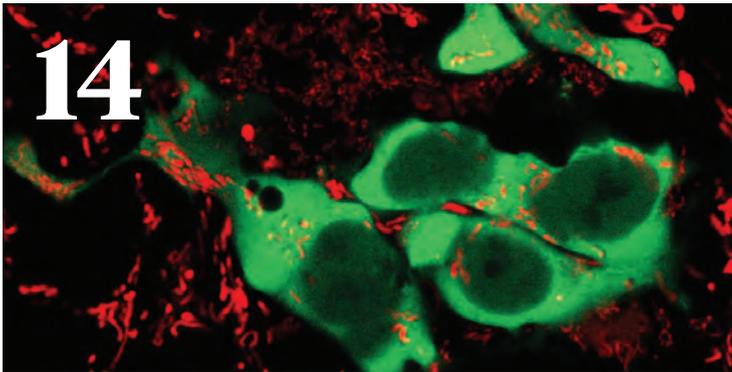
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Northwestern Medicine investigators are developing better treatments and care for patients with the most prevalent of diseases.



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A 4-D flow MRI visualizes complex 3-D blood flow in a patient with bicuspid aortic valve and aortic coarctation. The anterior (left) and posterior (right) views show a high velocity flow jet in the ascending aorta and exaggerated right handed helical flow. Image from research led by Michael Markl, PhD.

# Northwestern Discoveries Overturn Old Thinking



## **A**LL SCIENTISTS DREAM OF PRODUCING NEW KNOWLEDGE.

Every study in its own way contributes to this aim, but some research also leads to breakthroughs that fundamentally shift the entire direction of a field. At Feinberg, we've cultivated a unique research enterprise that allows scientists to make just those kinds of paradigm-changing insights.

We have built an environment that gives investigators the freedom and the infrastructure to explore novel ideas, pursue interdisciplinary collaborations and follow unexpected conclusions, because we know that exceptional discoveries happen when scientists take creative approaches to tackle old problems in new ways. Our efforts have led to a remarkable record of noteworthy findings; our scientists are truly forging new paths in their disciplines. Let me share just a few examples.

In one recent study, our investigators debunked a paradox that long flummoxed clinicians: People diagnosed with cardiovascular disease (CVD) live longer if they are overweight or obese compared with people who are normal weight when diagnosed. Sadiya Khan, MD, assistant professor of Medicine in Cardiology, and her team looked at this association in a new way — from a lifespan perspective — and demonstrated that people who are obese do not live longer; they're simply diagnosed at a younger age. The findings clear up confusions pertinent to millions of people who are overweight or obese.

Our chair of Medicine, Doug Vaughan, MD, has spent 30 years studying a protein overexpressed in CVD called PAI-1. When his team noticed that PAI-1 is created as cells age, they decided to pursue it. The work led to astonishing conclusions: Overexpression of the protein in mouse models accelerates aging, while an Amish population in Indiana with low levels of the protein is protected against multiple aspects of biological aging. Vaughan and colleagues are now developing a promising new drug to inhibit the protein and prolong the healthy lifespan of people.

Melissa Brown, PhD, professor of Microbiology-Immunology, uncovered insights that may guide greatly needed new treatments for multiple sclerosis (MS) by studying the disease in a way nobody had before. Her team isolated sex differences in the disease and explained why women are much more likely to get MS than men: A guardian molecule triggered by testosterone appears to protect male mice from the disease.



**At Feinberg, we've cultivated a unique research enterprise that allows scientists to make just those kinds of paradigm-changing insights.**

Sue Quaggin, MD, chief of Nephrology and Hypertension, exposed genetic defects that lead to glaucoma in children by focusing on a drainage vessel in the eye called the canal of Schlemm, and she's well on the way to developing new small molecule drugs to fix this vessel and attenuate the disease.

Sanjiv Shah, MD, professor of Medicine in Cardiology, mined big data while studying patients suffering from heart failure with preserved ejection fraction. He uncovered three distinct types of patients, each requiring different treatment protocols rather than the

standard one-size-fits-all approach. Today, these patients receive better, tailored therapies thanks to Shah's work.

Our scientists are also making other discoveries that defy common conceptions. The laboratory of Dimitri Krainc, MD, PhD, chair of Neurology, recently reported that mitochondria and lysosomes talk to each other directly, a rare fundamental finding about normal cell function that will likely have implications for many diseases.

Kathleen Green, PhD, professor of Pathology and Dermatology, has been a trailblazer in research elucidating the function of molecules called desmosomes traditionally known for physically holding cells together. Green has shown that these proteins may also be involved in signaling that regulate the immune system, melanoma and heart disease.

And Ali Shilatifard, PhD, chair of Biochemistry and Molecular Genetics, has spent decades pursuing ideas on how chromosomal translocation and the epigenetic misregulation of gene expression cause childhood leukemia. His unconventional thinking was controversial at first; now he is leading one of the field's most promising routes for future cancer therapeutics.

Innovative thinking drives us to keep learning and to refuse to accept incomplete answers. Such efforts yield better explanations that improve therapies clinicians need for their patients. Our investigators are challenging some of the existing understandings of disease and their diagnosis and treatment to create better paradigms for clinicians and scientists around the world to follow. Our track record to date has been impressive, but I am confident that even bigger successes lay in the future.

With warm regards,

**Eric G. Neilson, MD**  
Vice President for Medical Affairs  
Lewis Landsberg Dean

# ON CAMPUS

## Feinberg Again Ranks Among Best Medical Schools in the Nation

Feinberg is one of the best research-oriented medical schools, 20th in the nation, according to the latest *U.S. News & World Report* rankings.

This year marks a significant revision to methodology used to compile the *U.S. News* rankings for medical schools. In particular, the weighting for the reputation score was reduced by 25 percent to allow the inclusion of other new categories of research funding, and many top medical schools saw unexpected shifts in their placements.

This is the 11th year in a row Feinberg has placed in the top 20 of research-oriented medical schools, and several departments ranked highly among the specialty-specific rankings.

Four of Feinberg's specialty programs were recognized among the best in the nation, with obstetrics and gynecology ranking 8th, internal medicine rising three spots to 12th, pediatrics rising two spots to 12th and surgery ranking 12th.

### OVERALL RANKING



### SPECIALTY PROGRAMS



## SENATOR DICK DURBIN ANNOUNCES INVESTMENTS FOR BIOMEDICAL RESEARCH INSTITUTIONS



Durbin (left) with Teresa Woodruff, PhD (right), professor and vice chair for research in Obstetrics and Gynecology, dean of The Graduate School and director of the Women's Health Research Institute, who spoke at the event.

At a press conference at the Shirley Ryan AbilityLab in March, U.S. Sen. Dick Durbin (D-Ill.) announced new federal investments included in the omnibus spending bill that will help Chicago's biomedical research institutions continue creating new technologies and finding ways to treat and cure disease.

The Fiscal Year 2018 omnibus includes a \$3 billion (or nearly 9 percent) increase for the National Institutes of Health, a \$1 billion (or 14 percent) increase for the Centers for Disease Control and Prevention and a \$1.49 billion (or 5 percent) increase for Department of Defense medical research.

Durbin called it an important victory for medical research nationwide and in Chicago.



## STUDENTS LAUNCH NORTHWESTERN MEDICAL ORCHESTRA

The Northwestern Medical Orchestra began its inaugural season this February. The organization is composed of students, faculty, alumni and staff joined together by a shared love of music.

The orchestra is performing a number of concerts this spring for patients and community members. The season repertoire includes a variety of classical and pop numbers, from Dvorak's New World Symphony to a John Williams score.

"Music has always been a big part of my life, and it's really rewarding to make time for something so important not only to me but also to our other 60-odd members," said Bettina Cheung, a first-year MD-PhD student in the Medical Scientist Training Program and one of the orchestra's founders.

# Celebrating Match Day 2018

**F**ourth-year medical student Taylor Sutcliffe waited eagerly, white envelope in hand, surrounded by her peers in the class of 2018.

Then, at precisely the same moment, Sutcliffe and 160 of her Feinberg classmates tore open their envelopes and erupted into cheers as they discovered where they will be spending the next phase of their medical careers.

“There’s nothing like being surrounded by your closest friends and seeing the look on their faces as their dreams of becoming a doctor come true,” said Sutcliffe, who learned she matched into general surgery at Vanderbilt University Medical Center. “This has been a life-changing experience. I’ve wanted to become a surgeon ever since I was a little girl, and I can’t believe that now, I actually will be.”

On Match Day, held this year on March 16, medical students across the country learn at exactly the same time where they will train as residents for the next three to seven years. Feinberg’s celebration, held at Gino’s East in Chicago, is a beloved annual tradition.

For some, it was eight years in the making. “I’ve been waiting for this day for so long,” said Sara Fossum, who is also earning her PhD through the Medical Scientist Training Program (MSTP). Fossum, who studies genetics of the lung epithelium, matched into dermatology at the University of Michigan Medical Center, where she plans to continue to conduct research as a resident.

This year’s match, the largest in the history of the National Resident Matching Program, included more than 44,000 registered applicants and more than 33,000 residency positions offered.

“I’m very proud to be a member of the class of 2018. We’ve all done so well in the match this year, and I’m so excited to see what my classmates accomplish,” said Beverly Aiyanyor, who matched into pediatrics at Boston Children’s Hospital. “When I was young and I told my parents I wanted to go into medicine, they put all their financial resources, thoughts and prayers into ensuring that I reach this goal. Now they are finally seeing their

daughter become the person she’s always wanted to be.”

For students, Match Day was not only the moment that marked the beginning of their first few years as physicians, but also a celebration of their time at Feinberg.

“I am ecstatic right now,” said Joshua Stein, who matched into emergency medicine at Stanford University Medical Center. “I’m really excited to be able to put into practice what I learned at Feinberg, and I truly couldn’t be happier about where I’m going and the field that I chose.”

Stein continued, “Without the community here at Feinberg — both the students and the faculty — I feel I wouldn’t have been so prepared to do well in the residency match process. I’m just really grateful that they got me to where I am today.”



**160** students matched to medical facilities across the country



**64%** of Feinberg students matched at top 25 U.S. News-ranked residency programs in 2018



**MOST POPULAR SPECIALITIES CHOSEN BY FEINBERG STUDENTS**



# New Northwestern Medicine Lake Forest Hospital Open for Patient Care



The new, state-of-the-art Northwestern Medicine Lake Forest Hospital officially opened on March 3.

**A**fter eight years of planning, designing and building — and several months preparing to relocate patients — the new, state-of-the-art Northwestern Medicine Lake Forest Hospital officially opened on March 3. The hospital is a level II trauma center for the northern Illinois suburbs.

The hospital's five interconnected pavilions provide an integrated foundation for inpatient and ambulatory care. The new structure also offers collaborative spaces for caregivers and staff, a reduction in ambient noise and improved control over indoor lighting in patient, visitor and staff areas.

The hospital was designed for physicians and staff to take advantage of the resources

of an integrated academic health system. For example, video conferencing for staff and real-time video sharing in the operating rooms are available to enhance collaboration and care for patients.

“The design and technology of this new hospital will directly benefit our patients, and will allow us to provide a new level of care that we were not always able to do in our previous facility,” said Jeffrey Kopin, '84 MD, '88 GME, chief medical officer at Northwestern Medicine Lake Forest Hospital. “Our patients always come first and were the cornerstone of each decision that was made in the development of this hospital.”

## BY THE NUMBERS

114

PRIVATE  
INPATIENT  
ROOMS

72

OUTPATIENT  
CARE  
SPACES

8

OPERATING  
ROOMS

106

CLINIC  
EXAMINATION  
ROOMS

## How to Move a Hospital

Even though the new hospital building is right next door to the old hospital, every detail had to be planned in order to move patients, open an emergency department and be prepared for all potential scenarios, like delivering a baby during move day.

The hospital's Activation Leadership Team analyzed every piece of equipment in the old hospital and made a decision about what would be moved (and when), what would be added and what would be replaced.



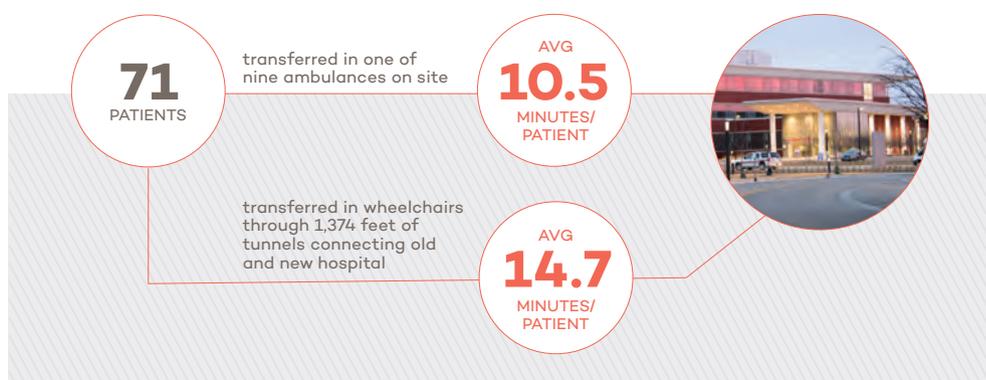
### “IT [WAS] SIX MONTHS OF PLANNING FOR A SIX-HOUR MOVE.”

“It [was] six months of planning for a six-hour move,” said Xuemei Cai, a procurement manager on the team. While arranging to move patient beds, for example, she timed how long it would take to strip a bed, move it down elevators, load it into a truck, navigate it to a staging area in the new hospital for a thorough cleaning and then deliver it to an assigned room.

Meanwhile, everyone who would work in the new hospital was required to participate in trainings. All nurses and patient care technicians practiced taking care of patients in the new facility during simulations using real patient actors. There was also a mock move six weeks before the real move day, allowing staff to practice relocating patients and identify areas for improvement.

All the preparation worked: Physicians, clinical care providers and non-clinical staff came together to safely move 71 patients by ambulances and wheelchairs through tunnels and elevators to their new rooms in 1000 North Westmoreland. Care stations were set up along the move routes to provide medical care as needed during transport.

The historic day was a coordinated effort that involved 659 staff members from Lake Forest Hospital and 114 volunteers representing 21 locations within the Northwestern Medicine healthcare system.



The historic day was a coordinated effort that involved 659 staff members and 114 volunteers.

# Focus on PhD and Master's Students

*The medical school is training more than 1,000 students through its PhD, master's degree and professional programs this academic year. Learn about the research questions and patient populations that inspire four of these students.*



## Health Sciences Student Investigates Anti-Smoking Campaigns in Sub-Saharan Africa

illnesses catches up, triggering public health campaigns and an eventual decline in smoking.

A ban on public smoking is one way to reduce smoking, but many governments are apprehensive about such a severe restriction. A more popular method is to raise tobacco taxes, according to Akanbi.

But he's particularly interested in mobile phone-based smoking cessation interventions, in the form of daily or weekly text messages to recipients who've indicated an interest in quitting smoking. Akanbi is a co-founder of the non-profit All Things Health Africa, which plans to introduce these text-based interventions in Kenya and Nigeria.

"These mobile interventions are the easiest way to reach people. Everybody has a phone and it's cheap. It's a good way to start," said Akanbi, who is also a fellow of the National Postgraduate Medical College of Nigeria. He previously earned a master's degree in Clinical Investigation from Northwestern.

## PhD Student Explores Role of Exosomes in Cancer Metastasis

**T**iny vesicles released from

non-metastatic melanoma cells trigger an immune response that prevents the cancer from spreading

throughout the body, according to research conducted by Michael Plebanek, a doctoral student in the Driskill Graduate Program in Life Sciences. **He is the first author of a recent paper in Nature Communications reporting the findings.**

The vesicles, called exosomes, are nano-sized delivery vehicles that are released by cells into the bloodstream. In recent years, significant research has focused on the role of exosomes released by cancer cells in promoting the spread of cancer. This study, however, is the first to demonstrate that exosomes can also suppress metastasis, depending on the state of the cancer cell.



**M**obile phone-based interventions and raising tobacco taxes may be cheap and effective ways to reduce smoking rates in sub-Saharan Africa, according to research by Maxwell Akanbi, MBBS, '11 MSCI, third-year doctoral candidate in the Health Sciences Integrated PhD Program.

**"By 2030, an estimated 70 percent of smoking-related deaths could be happening in middle-income countries like Nigeria,"** said Akanbi during a seminar he led in March sponsored by the Institute for Public Health and Medicine. "It's a challenge we need to get ready to face."

Countries in sub-Saharan Africa appear to be following the same model of smoking prevalence that gripped the West in the early 20th century: As a country becomes wealthier, smoking prevalence rises until mortality from lung cancer and other smoking-related

## Prosthetics and Orthotics Student Motivated By Veterans



**C**harity Smith, a first-year student in the Master's in Prosthetics and Orthotics degree program, became aware of the field after a Department of Veterans Affairs Health Care Center referred her to a local clinic to manage her plantar fasciitis with orthotic sole inserts.

"Noticing the high number of veteran patients, I wanted to know more," she said. "Both my experience as a patient and observations while sitting in the waiting room sparked my interest in this field."

Now she would like to pursue work to decrease the number of amputations due

to diabetes, increase educational initiatives through community outreach to underprivileged youth and improve continuity of care for veteran and minority patients.

**"As a veteran, I want to continue to serve my country by caring for wounded service members in the VA.** I have also considered teaching, additional specialized training or opening a private practice clinic in rural North Carolina," said Smith, who this year received the International African American Prosthetic and Orthotic Coalition's prestigious Sam D. Benson Scholarship.



## MD/PhD Student-Athlete Makes a Mark in the Lab and on the Course

Specifically, Plebanek showed that pre-metastatic exosomes carry a protein called PEDF, which ramps up the production of patrolling monocytes — immune cells that crawl along blood vessels, clearing metastasizing melanoma cells along the way.

"We could now identify other biomolecules in these exosomes that increase immune surveillance and prevent metastasis — such as PEDF — and possibly develop them into cancer therapies in the future," explained Plebanek, whose mentor is C. Shad Thaxton, '04 MD, '07 PhD, associate professor of Urology. "There's also a nanotechnology avenue. One of the biggest opportunities with exosomes is that they are nano-sized delivery vehicles, and we could utilize the knowledge we've gained about the targeting properties of these exosomes."

The study was supported by National Cancer Institute (NCI) R01CA172669, gift funds from Gibco—Life Technologies, NEI R24EY022883, Air Force Office of Scientific Research A9550-13-1-0192, NCI R01CA167041, H. Foundation Stimulus Award, NCI R15 CA161634, the Robert H. Lurie Comprehensive Cancer Center, NIDDK ST32DK062716 Cancer Center Support Grant NCI CA060553 for Flow Cytometry Core and the Northwestern Center for Advanced Microscopy/Nikon Imaging Facility.

**W**hen Jacqueline Godbe, a student in the Medical Scientist Training Program, isn't in the lab helping to develop novel delivery materials for stem cell therapies, or caring for patients during bi-weekly rotations in the Education-Centered Medical Home, you can likely find her training at the gym, pool or Lakefront Trail — **because Godbe also happens to be a champion triathlete.**

At the 2017 USA Triathlon National Championships, Godbe placed first in her age group, completing the Olympic distance in a winning 2:10:17. She also took the title of world champion at the 2017 ITU Age Group World Championships in Rotterdam, finishing in a time of 2:08:27.

For Godbe, devoting up to 15 hours a week to training for such races isn't an obstacle to succeeding in her MD/PhD program. In fact, she finds it instrumental to staying on track.

"Not only is it fun and social, but exercising is also very much how I cope with

stress," said Godbe, who plans to finish her PhD this autumn and then complete the last two years of medical school. This summer, she'll compete professionally in the 2XU New York City Triathlon.

Godbe works in the lab of Samuel Stupp, '77 PhD, director of the Louis A. Simpson and Kimberly K. Querrey Institute for BioNanotechnology, where she is interested in dopaminergic neuron transplants as a treatment for Parkinson's disease.

"[One of my projects] is about developing a hydrogel to help these neurons survive once we make them and prevent them from transdifferentiating or dedifferentiating," she said. "The other half of my research is about developing growth factors — how do we provide the fertilizer and nutrients, essentially, that are needed to keep these neurons alive and healthy as they start to integrate in the brain?"

## RESEARCH BRIEFS

### CLINICAL BREAKTHROUGHS

## CHEMOTHERAPY DRUG SHOWS PROMISE IN TREATING EVERYDAY ALLERGIES



A drug originally designed for chemotherapy successfully suppressed allergic responses to food allergens, according to a Northwestern Medicine study published in the *Journal of Allergy and Clinical Immunology*.

The drug, ibrutinib, interrupted the process that causes the body's cells to react to food allergens such as peanuts or shellfish, showing potential for reducing the severity and risk of allergic reactions, according to lead author Melanie Dispenza, MD, PhD, third-year fellow in the Allergy and Immunology Fellowship Program.

"This drug is reasonably safe, and it effectively blocks allergic responses in cells," said Bruce Bochner, MD, the Samuel M. Feinberg Professor of Medicine in the Division of Allergy and Immunology and senior author of the study.

Ibrutinib works by blocking Bruton's tyrosine kinase (BTK), an enzyme important to the growth of B-cells, which makes it a prime therapeutic target in treating B-cell lymphomas. BTK also

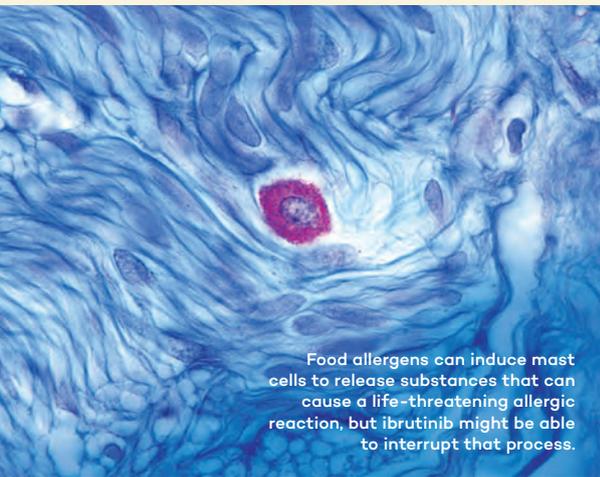
plays a key part in the body's allergic response.

A previous study also led by Bochner showed ibrutinib reduced allergic responses to an airborne allergen skin prick test, but the study had limitations: The study population included two people with allergies taking the drug to treat cancer, so testing their allergic reaction was only a secondary focus.

"This set the stage for what we really wanted to do: give ibrutinib to allergic adults who had normal immune systems," Bochner said.

In the new study, investigators recruited patients with peanut and tree nut allergies, measured their baseline reaction to a food skin prick test and then gave them a seven-day course of ibrutinib. After two days, participants had an average 77 percent reduction in the size of their skin test reaction, indicating a successful suppression of their allergic response.

This study was funded in part by a 2016 Dixon Translational Innovation Award through the Northwestern University Clinical and Translational Sciences Institute and Northwestern Memorial Foundation, the Northwestern University Allergy Immunology Research Program, and National Institute of Allergy and Infectious Diseases T32 grant AI083216 and K23 grant AI100995.



Food allergens can induce mast cells to release substances that can cause a life-threatening allergic reaction, but ibrutinib might be able to interrupt that process.

### CLINICAL BREAKTHROUGHS

## Rheumatoid Arthritis Meets Precision Medicine



Scientists are bringing precision medicine to rheumatoid arthritis for the first time by using genetic profiling of joint tissue to see which drugs will work for which patients, reports a recent Northwestern Medicine study published in *Arthritis & Rheumatology*.

Treatment for rheumatoid arthritis is currently trial and error.

"We have so many different biologic drugs, and there's no rhyme or reason to give one drug versus the other," said co-senior author Harris Perlman, PhD, chief of Rheumatology and the Mabel Greene Myers Professor of Medicine. "We waste \$2.5 billion a year in ineffective therapy. And patients go through 12 weeks of therapy, don't respond and get upset."

In the past, blood samples were used to try to determine the effectiveness of a therapy for rheumatoid arthritis and disease progression. This multi-site study used ultrasound-guided therapy to take a tissue biopsy in the affected joint.

"It's just like oncology, where you go to the tumor," Perlman said. "Why go anywhere else? In rheumatoid arthritis, we've never gone to the target organ."

Scientists analyzed tissue in 41 rheumatoid arthritis patients, separating out different immune cell populations. They focused on macrophages, the garbage collectors of the immune system that are overactive in rheumatoid arthritis.

The team segregated patients based on the genes being produced by their macrophages

and identified two patient groups who shared aspects of the genetic profiles. Then they identified which of these populations had joints getting better and what biologic therapies they were taking. They also found a gene sequence associated with patients with early disease. The earlier the patient is treated, the more effective the therapy.

Richard Pope, MD, the Solovy/Arthritis Research Society Professor of Medicine in the Division of Rheumatology, and Deborah Winter, PhD, assistant professor of Medicine in the Division of Rheumatology, were also lead Northwestern authors.

The study was supported by grants AR064313, AR064546, HL134375, AG049665, and UH2AR067687 from the National Institute of Arthritis and Musculoskeletal Disease, the National Heart, Lung and Blood Institute, the National Institute of Aging and the National Cancer Institute, all of the National Institutes of Health and the Rheumatology Research Foundation.

## SCIENTIFIC ADVANCES

# Adult-Onset Neurodegeneration Has Roots in Early Development



The disease mechanism for adult-onset progressive degenerative diseases may begin much earlier than previously thought, according to a Northwestern Medicine study published in the *Journal of Clinical Investigation*.

**“THIS MAY WELL BE GENERALIZABLE TO A WHOLE HOST OF OTHER DISEASES, INCLUDING ALZHEIMER’S DISEASE, HUNTINGTON’S DISEASE, PARKINSON’S DISEASE AND AMYOTROPHIC LATERAL SCLEROSIS.”**

Using a mouse model of spinocerebellar ataxia type 1 (SCA1) genetically engineered to precisely mirror the human disease, investigators uncovered an altered neural circuitry in the cerebellum that sets the stage for later disease vulnerability.

“This is the first discovery of alterations in an adult-onset spinocerebellar disorder that stem from such early

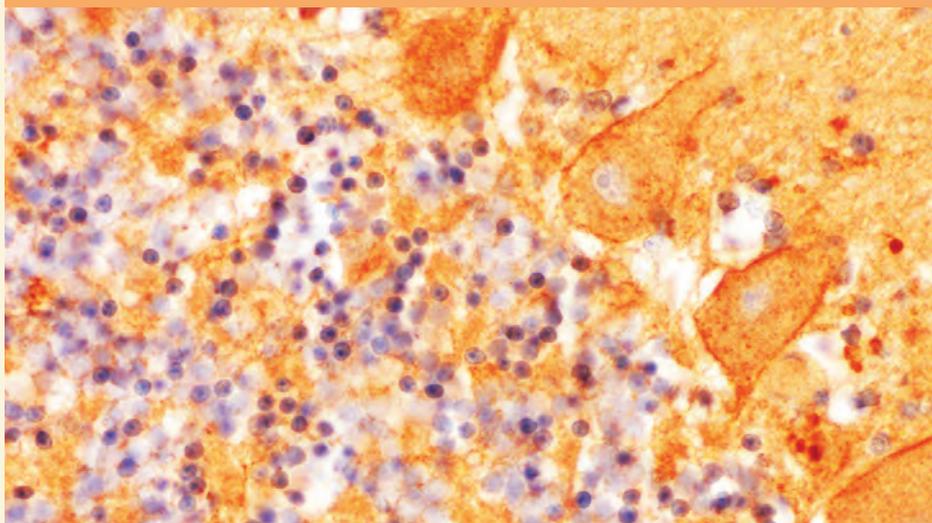
developmental processes,” said Puneet Opal, MD, PhD, professor of Neurology in the Division of Movement Disorders and senior author on the study. “This may well be generalizable to a whole host of other diseases, including Alzheimer’s disease, Huntington’s disease, Parkinson’s disease and amyotrophic lateral sclerosis.”

SCA1 is caused by a genetic defect in a protein involved in regulating gene expression called ATXN1. While ATXN1 is expressed throughout the brain, when mutated it predominantly affects the cerebellum, leading to a loss of coordination and an abnormal gait in patients.

The scientists in this study found that mutant ATXN1 leads to a very different cerebellar network than usual.

“We knew that cerebellar stem cells generate inhibitory neurons, but in this case the number of inhibitory neurons was so much more than normal that they generated an enhanced inhibitory effect on Purkinje neurons, the chief output neurons of the cerebellum,” Opal said.

This study was supported by National Institutes of Health grants 1R01 NS062051, 1R01 NS082351 and 1R21NS090346.



Neurofascin staining reveals inhibitory neurons called basket cells surrounding Purkinje neurons in the cerebellum, the chief output neurons of the cerebellum.

## CLINICAL BREAKTHROUGHS

## GENE THERAPY FOR THALASSEMIA SHOWS PROMISE



Gene therapy for a serious blood disorder called beta-thalassemia showed significantly improved outcomes among patients, without serious side effects, according to the results of two clinical trials published in the *New England Journal of Medicine*.

“The results exceeded our expectations and represent a major step forward for beta-thalassemia and related diseases,” said Alexis A. Thompson, MD, MPH, professor of Pediatrics in the Division of Hematology, Oncology and Stem Cell Transplantation, who led the international, multi-center trials.

Beta-thalassemia is an inherited blood disorder caused by mutations in the beta globin gene that impair production of a fundamental component of hemoglobin, the substance in red blood cells that carries oxygen. Patients with the most severe form of beta-thalassemia are profoundly anemic and generally require regular, lifelong blood transfusions for survival.

Gene therapy — in which a patient’s own stem cells are collected, treated in the laboratory to introduce healthy copies of the beta globin gene and then returned to the patient — is a novel treatment option for the disease.

“These clinical gene therapy trials represent the results of decades of research that have now refined the process by which the function of a single, disease-causing gene can be restored,” Thompson said. “One key aspect is that a patient is their own donor, which overcomes some of the fundamental limitations of conventional transplantation for many patients.”

This research was supported by bluebird bio, which manufactures the gene therapy, as well as the National Center for Advancing Translational Sciences, National Institutes of Health grants UL1TR000003 and UL1TR001878, Assistance Publique Hopitaux de Paris, INSERM, France’s Commissariat à l’Energie Atomique et aux Energies Alternatives and France’s Agence Nationale de la Recherche.



## MEDIA SPOTLIGHT

THE WALL STREET JOURNAL.

CNN npr THE NEW YORKER

### Gene Therapy Shows Promise in Patients with a Blood Disorder

Investigators have used an experimental gene therapy to reduce the number of blood transfusions needed in 22 people with beta-thalassemia, an inherited blood disorder. The results, published in the *New England Journal of Medicine*, are another sign of the promise of gene therapy, which aims to deliver beneficial genes to patients' cells to replace defective ones. Read more about this study on page 11.

TODAY

### Food Allergies in Kids May Be Result of 'Perfect Storm' of Factors



Scientists studying genetically vulnerable baby mice and the allergens that might trigger sensitivity were surprised to find

many of them did not develop food allergies even after their skin was exposed to peanuts. So the investigators started adding other possible exposures to the mix. They found mice with the genes for an eczema-like condition would only develop food allergies if they were also exposed to dust mites or mold, had skin contact with the problem foods and were cleaned with soap. "This is a recipe for developing food allergy," said Joan Cook-Mills, PhD, professor of Medicine in the Division of Allergy and Immunology and lead author of the study in the *Journal of Allergy and Clinical Immunology*.



AP Associated Press The New York Times

### Midlife 'Wealth Shock' May Lead to Death, Study Suggests

Middle-aged Americans who experienced a sudden, large economic blow were more likely to die during the following years than those who didn't in a new study published in *JAMA*. The heightened danger of death after a "wealth shock" crossed socio-economic lines, affecting people no matter how much money they had to start. "This is really a story about

everybody," said lead study author Lindsay Pool, PhD, research assistant professor of Preventive Medicine. Stress, delays in health care, substance abuse and suicides may contribute, she said. "Policymakers should pay attention." Overall, wealth shock was tied with a 50 percent greater risk of dying, although the study couldn't prove a cause-and-effect connection.

The Washington Post

### How Romance Can Protect Gay and Lesbian Youths From Emotional Distress



Being in a romantic relationship can help gay and lesbian youth feel less mental distress — even more so if they are black or Latino. This contrasts with the fact that, in heterosexual teens' lives, romance is generally found to cause distress rather than alleviate it. "The person they were dating ... helped navigate issues with coming

out or challenges they were having in the family about those relationships," said Brian Mustanski, PhD, director of Northwestern's Institute for Sexual and Gender Minority Health and Wellbeing and lead author of the study in the *Journal of Abnormal Psychology*. He said that although parents and friends can help sexual minorities feel better, that support doesn't tend to offset the effects of bullying as much as being in a relationship.

# FACULTY AWARDS & HONORS



Four faculty were honored during the 14th annual Lewis Landsberg Research Day on April 5:

• **Michael Abecassis, MD, MBA**, the James Roscoe Miller Distinguished Professor of Medicine, founder and director of the Comprehensive Transplant Center, chief of Organ Transplantation in the Department of Surgery and professor of Microbiology-Immunology, received the Tripartite Legacy Faculty Prize in Translational Science and Education. [📍 1](#)

• **Mercedes Carnethon, PhD**, vice chair of Preventive Medicine, chief of Epidemiology in the Department of Preventive Medicine, received the 2018 Mentor of the Year Award from the Medical Faculty Council. [📍 2](#)

• **Erin Hsu, PhD**, research associate professor of Orthopaedic Surgery, and **Wellington Hsu, MD**, the Clifford C. Raisbeck, MD, Professor of Orthopaedic Surgery



and associate professor of Orthopaedic Surgery and Neurological Surgery were selected as co-recipients of the 2018 Mentor of the Year Award. [📍 3, 4](#)

**Neil Stone, MD**, the Robert Bonow, MD, Professor, received the 2018 Joseph Stokes, III, MD Award from the American Society for Preventive Cardiology for his achievements in preventive cardiology. Since 1988, Stone has served on two National Heart, Lung and Blood Institute panels responsible for cholesterol guidelines that affect treatment for millions of Americans. In 2013, Stone chaired the American College of Cardiology and the American Heart Association panel during the release of the most recent guidelines. [📍 5](#)

**Karl Bilimoria, MD, '08 MS, '10 GME**, the John B. Murphy Professor of Surgery and director of the Northwestern Surgical Outcomes



and Quality Improvement Center (SOQIC), was elected president of the Association for Academic Surgery, the world's largest organization of academic surgeons. His new role will be effective February 1, 2019.

**Robert Murphy, MD, '81, '84 GME**, director of the Center for Global Health and the John Philip Phair Professor of Infectious Diseases; **Patrick Kiser, PhD**, professor of Obstetrics and Gynecology; and **Wendy Murray, PhD**, professor of Physical Medicine and Rehabilitation and Physical Therapy and Human Movement Sciences, were elected to the American Institute for Medical and Biological Engineering's College of Fellows. These fellows comprise the top 2 percent of medical and biological engineers in the country.



**William J. Gradishar, MD**, the Betsy Bramsen Professor of Breast Oncology and director of the clinical network of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University, was appointed chief of Hematology and Oncology in the Department of Medicine. [📍 6](#)

**Janardan Reddy, MD**, professor emeritus of Pathology, received the Gold-Headed Cane Award from the American Society for Investigative Pathology, for his leadership and long-term research in liver biology and pancreatic/hepatic differentiation.

**Michael Markl, PhD**, the Lester B. and Frances T. Knight Professor of Cardiac Imaging in the Department of Radiology, was named a fellow in the Society for Cardiovascular Magnetic Resonance.



**Katherine Barsness, MD, '11 MS**, associate professor of Surgery in the Division of Pediatric Surgery and of Medical Education, was named a fellow in The Mayday Pain & Society Fellowship Program. [📍 7](#)

**Hank Seifert, PhD**, the John E. Porter Professor of Biomedical Science in the Department of Microbiology-Immunology, received the 2018 Penn State Graduate School Alumni Society Lifetime Achievement Award.

**Richard Burt, MD**, chief of Immunotherapy and Autoimmune Diseases in the Department of Medicine, received the Van Bekkum Award during the Annual Meeting of the European Society for Blood and Marrow Transplantation.



The following faculty have been invested into endowed professorships in 2018 to date:

• **Jennifer Wu, PhD**, professor of Urology and Microbiology-Immunology, as the Mary and Patrick Scanlan Professor

• **Daniel Brat, MD, PhD**, chair of Pathology, as the Magerstadt Professor of Pathology

• **Ankit Bharat, MBBS**, associate professor of Surgery in Thoracic Surgery and of Medicine in Pulmonary and Critical Care, as the Harold L. and Margaret N. Method Research Professor of Surgery

• **Leena Sharma, MD, '89 GME**, professor of Medicine in Rheumatology, as the Chang-Lee Professor of Preventive Rheumatology

• **Jason Albert Wertheim, MD, PhD**, associate professor of Surgery in Organ Transplantation, as the Edward G. Elcock Professor of Surgical Research



# TAKING THE LEAD IN CARDIOVASCULAR DISEASE RESEARCH

**T**his January, the American Heart Association (AHA) released updated heart disease statistics. The report contained many all-too-familiar facts and figures: Cardiovascular diseases remain the No. 1 cause of death in the world and in the United States. But it also shared new findings: An estimated 103 million people — nearly half of all U.S. adults — have high blood pressure and are at risk for heart attacks and strokes, following AHA guidelines published last fall that redefine the metric.

The numbers highlight the critical importance of cardiovascular disease (CVD) research: basic science studies to understand its underpinnings; translational work to turn findings in the lab into viable treatments for patients; clinical trials to test new behavioral interventions, medications and care models; and population studies to understand how we can minimize risk factors so the disease doesn't manifest in the first place.

Across Northwestern departments and within the **Feinberg Cardiovascular and Renal Research Institute**, an illustrious cohort of investigators in doing just that. The fruit of the school's growing cardiovascular research portfolio is evident in high-impact scientific publications, 50-plus ongoing clinical trials and patient care at Northwestern Memorial Hospital's **Bluhm Cardiovascular Institute** ranked No. 7 for cardiology and heart surgery in the nation by *U.S. News & World Report*.

Northwestern's leadership in this domain is apparent: The medical school is part of four AHA-funded research networks — more than any other institution in the country — one concentrating on vascular disease, a second on preventing risk factors for CVD, a third on disparities in CVD rates and a fourth on cardiovascular health in children.

**Northwestern Medicine investigators are developing better treatments and care for patients with the most prevalent of diseases.**

“With our depth of research expertise in clinical, translational, basic and outcomes sciences, there is no area of contemporary cardiovascular medicine that we can't explore,” says Clyde Yancy, MD, Msc, chief of Cardiology in the Department of Medicine,

Magerstadt Professor and vice dean for Diversity and Inclusion. “A wealth of talent, determined vision and array of resources allow us to build unparalleled research networks and proceed with pivotal research capable of changing life and living for those with known, or for those at risk for, cardiovascular disease.”

The medical school's faculty are many of the leaders behind the clinical practice guidelines and performance measures that inform clinicians nationwide. Yancy, for example, chairs the AHA's Get With The Guidelines heart failure registry, a quality improvement

initiative that holds more than 1 million patient records and captures data from over 35 percent of all U.S. hospitals.

“Part of our growth and success reflects the momentum generated by recruitment of world-class senior faculty in an environment that already housed world-class population scientists and stellar clinical investigators,” says Douglas Vaughan, MD, and the Irving S. Cutter Professor of Medicine. In his own research, Vaughan studies a protein overexpressed in CVD called plasminogen activator inhibitor-1 and has developed a new drug to inhibit its action.

Discover more of the wide-reaching CVD research led by Northwestern faculty, including studies exploring home-based interventions for a common form of atherosclerosis, the molecular roots of heart failure and improvements for cardiovascular care in low- and middle-income settings around the world.

**On left-hand page:** Cardiac muscle cells (cardiomyocytes) with their nuclei stained blue, from the lab of Hossein Ardehali, MD, PhD.

# MOBILIZING PATIENTS

## PERIPHERAL ARTERY DISEASE

Many patients with peripheral artery disease (PAD) are sidelined from activities they love because of difficulty walking. They can't travel, go out with friends, keep up with grandkids or walk to the store, explains Mary McDermott, MD, '92 GME (photographed below right), the Jeremiah Stamler Professor of Medicine in the Division of General Internal Medicine and Geriatrics.

One in five people age 75 and older develop PAD, which occurs when the arteries that supply the legs narrow or are blocked by a buildup of cholesterol and other substances. Despite how life-altering and common PAD is, many physicians incorrectly attribute their patients' mobility problems to old age or arthritis, and miss opportunities to minimize patients' risk of heart attack or stroke and to improve their mobility, McDermott says.

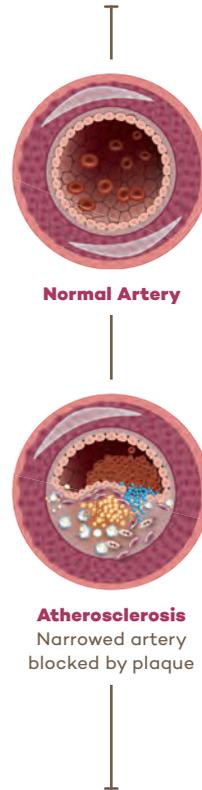
While tried-and-true medications like statins and antiplatelet therapies can help reduce cardiovascular events in patients with PAD, options to improve mobility are limited. Physicians may use a stent to improve blood flow, but the benefit typically only lasts a few

years and not all patients with PAD are good candidates for these procedures. Supervised exercise three times a week at a medical center can help, but that intervention is not always feasible.

McDermott's team has been testing home-based exercise strategies. In one trial, published in *JAMA*, patients who came in to a medical center just once per week and completed the rest of their exercise at home improved their six-minute walk by more than 50 meters, compared to a 30-meter improvement for patients doing supervised exercise. During their weekly visits, they met with other patients and a coach who helped them set walking exercise goals and monitor progress.

"Based on what we know in 2018, patients need to come in to the medical center occasionally and meet with a coach and really feel accountable to that coach," says McDermott, also a professor of Preventive Medicine and director of Northwestern's AHA center focused on calf muscle pathology and disability in PAD.

McDermott's group is also testing experimental medications.



Currently, there are only two drugs for PAD approved by the Food and Drug Administration. One offers only a modest benefit and recent trials suggest the other doesn't work at all, she says.

"We need new drugs that can be combined with exercise or help get patients to the point where they're able to exercise," McDermott says. She has a clinical trial underway testing whether the diabetes drug metformin may benefit patients with PAD who don't have diabetes.

"Scientists have successfully reduced rates of heart attack in older people, so people are living longer," McDermott explains. "Now we're really trying to focus on the ability of patients with PAD to engage in life fully and have a better quality of life." ▶▶

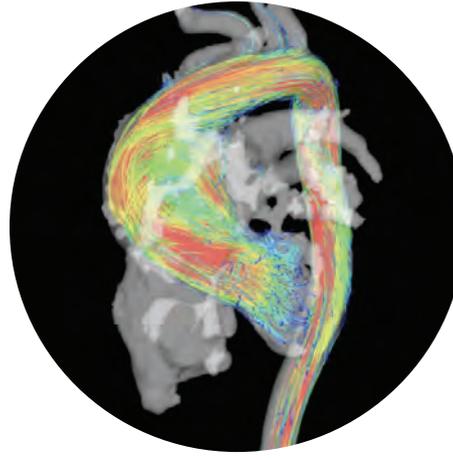


**"Scientists have successfully reduced rates of heart attack in older people, so people are living longer. Now we're really trying to focus on the ability of patients with PAD to engage in life fully and have a better quality of life."**

### RECENT CVD NEWS AT NORTHWESTERN

**1 ▶** Heart muscle cells called cardiomyocytes are a principal source of the molecular signals that drive scarring in the heart, a common manifestation of aging and nearly every form of heart disease.

**2 ▶** Obese people live shorter lives and have a greater proportion of life with cardiovascular disease, a finding that debunks the "obesity paradox" previously suggesting that people diagnosed with cardiovascular disease live longer if they are overweight or obese compared with people who are normal weight at the time of diagnosis.



**Left:** Adam De Jesus, a fifth-year MD-PhD student in Northwestern's Medical Scientist Training Program, principal investigator Hossein Ardehali, PhD, and postdoctoral fellow Paulina Stanczyk, PhD, working in Ardehali's lab.

**Right:** 4-D flow MRI from Michael Markl, PhD, the Lester B. and Frances T. Knight Professor of Cardiac Imaging in Radiology, visualizes complex 3-D blood flow in a patient with bicuspid aortic valve. With Cynthia Rigsby, MD, professor of Radiology and Pediatrics, Markl's research group has developed this kind of imaging test to identify hemodynamic biomarkers that better characterize congenital heart disease. The ongoing work has already been translated to clinics.

## MOLECULAR METABOLISM

### MITOCHONDRIA AND CARDIAC METABOLISM

Scientists in the Feinberg Cardiovascular and Renal Research Institute (FCVRI), are also opening up new avenues for treating CVD, but they're taking a different approach, looking at what goes wrong in the heart from a basic science perspective.

Hossein Ardehali, MD, PhD (photographed below right), director of the FCVRI's Center for Molecular Cardiology, focuses on understanding the role of mitochondria in heart failure. These cellular powerhouses produce energy in the form of a chemical called adenosine triphosphate (ATP). The heart is a huge consumer of this energy, using more than six kilograms of ATP a day as it pushes blood throughout the body.

"Understanding cardiac metabolism is really important," says Ardehali, also a professor of Medicine in the Division of Cardiology and of Pharmacology. "We think that if we target metabolism, we can reverse some CVD processes."

Historically, studying cellular metabolic processes has been the focus of endocrinologists studying diseases like

diabetes; Ardehali applies methods he learned training with an endocrinologist to CVD.

"We are going into an area that has not been studied in the past to understand the pathways involved in energy production," he says. For example, his lab published a paper in *Nature Communications* showing that a novel protein that regulates both sugar and fat metabolism is critical for normal heart function, and that its deletion leads to heart failure in mice. Now, the group is turning its focus to how changes in cardiac metabolic processes regulate epigenetics in the heart.

"There is crosstalk between all of these pathways," Ardehali says. "It makes perfect sense because there are no isolated systems in our bodies."

His lab has also shown that elevated levels of iron in the mitochondria contribute to heart

**"We think that if we target metabolism, we can reverse some CVD processes."**

muscle weakening caused by inadequate blood flow or the cancer drug doxorubicin, findings published in the *Journal of the American Heart Association* and the *Journal of Clinical Investigation*. The team is now working with Northwestern's Department of Chemistry to develop iron-chelators, drugs that help strip excess iron from the body.

"We are trying to target mitochondrial iron in the heart as a way of protecting the heart from getting damaged," Ardehali says. The research is very timely because some patients with heart failure who are iron deficient are currently given infusions of iron, which he worries could be harmful.

As a physician-scientist, Ardehali is also collaborating with colleagues in the clinic to apply his findings to patients. "We are at the stage where we can translate our findings to clinical practice," he says.



**3 ▶** Among patients with HIV, higher levels of HIV-related immunosuppression are associated with substantially higher odds of atrial arrhythmias.

**4 ▶** After performing whole genome sequencing on a family with a strong preponderance of genetic heart disease, scientists discovered that a mutation in a newly discovered gene, MYBPHL, increases the risk of arrhythmia and cardiomyopathy. The gene could eventually be included on gene panels, while better understanding its function could lead to new targets for therapy.

**5 ▶** Reprogrammed stem cells can be used to identify patients with cancer who are likely to experience cardiotoxicity — heart muscle damage so severe that it can lead to heart failure — after taking a common chemotherapy drug.

# WORLDWIDE QUALITY IMPROVEMENT

## CVD CARE IN INDIA

Mark Huffman, MD, MPH, '11 GME (photographed right below), joined Northwestern to pursue his interest in cardiovascular research with an international impact. His work has focused on the south Indian state of Kerala.

Asian Indians bear a disproportionate burden of CVD without a clear cause to their underlying predilection for vascular disease, Huffman says. Plus, India is a middle-income country that's seen rapid economic and technological growth in the past 25 years, so there are many opportunities for improvement.

"Places like India seem poised for innovation and new ideas that can help all of us," says Huffman, an associate professor of Preventive Medicine and of Medicine in the Division of Cardiology.

Managers in Indian hospitals often lack the training they need to be effective, according to research by Northwestern medical student Kyle Yoo. There is also a shortage of clinicians, so physicians may see more than 100 patients in an afternoon, Huffman says.

In addition, electronic medical systems are just now becoming available in Kerala. Huffman and his colleagues in India have worked hard over the past decade to provide safe and effective cardiovascular care despite these hurdles.

Earlier this year, the team published in *JAMA* the results of a randomized trial testing a quality improvement toolkit in 63 Indian hospitals. More than 21,000 patients with acute myocardial infarction participated. The investigators demonstrated improvements in the quality and safety of care delivered, but not in the rate of major cardiovascular events over 30 days, despite similar programs being used in the United States.

"We think it's useful to identify not only what works, but also what doesn't, and why not," Huffman says. One of the reasons for the neutral trial results might be major improvements in cardiovascular care in Kerala over the past decade. Survival rates after



**Kerala, India**  
Huffman has focused his research in this south Indian state.

heart attacks in Kerala now mirror rates in the U.S., but other states have much lower survival rates after heart attacks.

"It's exciting to think about what Kerala is doing that can serve as a model for other states in India," Huffman says. "It also demonstrates how high-quality, safe care is possible in a low- or middle-income country setting."

In fact, Huffman says there is much the U.S. healthcare system, which faces ballooning costs, can learn from these countries about delivering effective care inexpensively. For example, he noted the success of using community health workers in sub-Saharan Africa to deliver pre-exposure prophylaxis and antiretroviral therapy, a strategy that can serve as a model for longitudinal, chronic disease care in the United States.

"If we're going to solve big problems, we need to be working with a diverse and inclusive set of partners,"

Huffman says. +



**"Places like India seem poised for innovation and new ideas that can help all of us."**



6 ▶ Northwestern is leading one of the first international randomized trials designed to treat heart failure with preserved ejection fraction using a dime-sized shunt device designed to lower pressure in the left upper heart chamber.

7 ▶ Northwestern investigators are validating the accuracy of wearable devices that record heart rhythm over time for patients with arrhythmias.

### CREDITS

- 1 Flevaris/Vaughan: *Circulation*
- 2 Khan/Lloyd-Jones: *JAMA Cardiology*
- 3 Sanders/Feinstein: *PLOS One*
- 4 Barefield/McNally: *Circulation*
- 5 Burrige/Wu: *Nature Medicine*
- 6 Shah/Ricciardi: ongoing clinical trial
- 7 Passman: ongoing clinical trial

WRITTEN BY CHERYL SOOHOO

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# Refining Standards of Maternal-Fetal Care

Novel research is changing the way we approach healthcare for mothers and their babies.

Even though human life begins small, the importance of providing the best of care for an expectant mother and her unborn child is monumental.

Nowhere is this more evident than within Northwestern Medicine, where Prentice Women's Hospital can accommodate some 13,600 births annually. Prentice and next-door neighbor Ann & Robert H. Lurie Children's Hospital of Chicago together treat more than 2,000 of the most fragile of infants in neonatal intensive care each year.

Taking advantage of this fertile environment, Northwestern investigators are advancing novel research in maternal-fetal medicine in directions never before seen. Collaborations involving obstetricians, neonatologists and psychiatrists plus biomedical engineers, pharmacologists and developmental psychologists have sparked initiatives that touch upon all aspects of pregnancy to birth and beyond.

## A Labor of Discovery

Choosing to induce labor in healthy women for no medical reason has long been thought risky. Obstetricians have feared prompting a cesarean delivery and/or causing harm to the newborn through an unnecessary intervention. Turns out, this conventional wisdom has some wiggle room. In fact, inducing labor at 39 weeks — just one week earlier than the standard 40 weeks of pregnancy — actually reduces the rate of C-sections and decreases maternal and fetal complications, according to new research.

At the annual meeting of the Society for Maternal-Fetal Medicine in February, William Grobman, MD, MBA, '97, '00 GME, the Arthur Hale Curtis, MD, Professor of Obstetrics and Gynecology, presented the startling findings

“Something that had been thought to be true for many years is in reality not the case. That’s why medical research is so interesting. You don’t just guess.”



from his National Institutes of Health (NIH)-funded project, the largest randomized study of its kind to show that elective inductions in low-risk women may not be the driving force behind unnecessary C-sections — a serious public health issue. In the United States, approximately a third of women give birth via cesarean delivery, and a quarter have their labor induced before their due date.

“Incredible controversy swirls around the best use of this intervention. People were absolutely convinced they knew the truth when in effect we had no idea what the truth was,” says Grobman, who also leads a study center for the NIH’s Maternal-Fetal Medicine Units (MFMU) Network at Northwestern. Providing a multi-institutional research infrastructure, MFMU promotes initiatives to improve obstetric outcomes, including preterm birth and maternal morbidity.

“Based on a few small observational studies, it was widely believed that elective inductions double the risk of C-section,” Grobman explains. So he was stunned and excited when his study of more than 6,100 pregnant women from 41 hospitals across the country revealed the contrary. “The reaction has been ‘Oh, my gosh.’ Something that had been thought to be true for many years is in reality not the case. That’s why medical research is so interesting. You don’t just guess.”

Investigators randomly assigned the women to two groups: those waiting for nature to take its course (or “expectant management”) and those undergoing an elective induction at 39 weeks gestation, a sweet spot of time when babies have reached full term and can be safely delivered. Study results showed that 19 percent of the women whose labor was induced required a C-section compared to 22 percent of those who waited for labor to begin on its own.



Additionally, the induction group developed fewer complications such as preeclampsia and gestational hypertension. As for the newborns, 3 percent in the induction group needed help breathing compared to 4 percent in the expectant management group. Grobman and his colleagues hope to publish results from the study by the end of the year.

On the heels of smaller studies that pointed toward the same conclusions, Grobman’s study could reverse current thinking and policies about inductions. If nothing else, clinicians and patients now have more to go on when making decisions about labor and delivery. Says Grobman, “This new knowledge gives women the autonomy and ability to make more informed choices regarding their pregnancy that better fit with their wishes and beliefs.” ▶▶

STUDY RESULTS

After week

39

elective induction

only

19%

of women had C-sections

leading to



pre-natal complications

## Precision Dosing

One in seven expectant mothers suffers from depression. An all-too-common complication of pregnancy, major depressive disorder can lead to life-threatening consequences, with suicide accounting for 20 percent of deaths in postpartum women. While antidepressants help pregnant women stay safe and well, prescribing effective drug therapy can be hit or miss.

“Pregnancy accelerates liver enzyme activity, which influences the way the body processes drugs,” says Katherine L. Wisner, MD, MS, the Norman and Helen Asher Professor of Psychiatry and Behavioral Sciences and of Obstetrics and Gynecology. “A dose that works well early in pregnancy may lose its potency weeks later. For example, Zoloft, the most commonly used antidepressant, undergoes increased clearance from the body in the first half of pregnancy so that by 20 weeks gestation we begin to see women experiencing relapses of depression.”

From obstetricians to nurse practitioners, myriad healthcare practitioners routinely prescribe antidepressant medications for pregnant patients. Antidepressants such as Prozac, Celexa and Lexapro — known as serotonin selective reuptake inhibitors (SSRI) — each have their own metabolizing nuances. Unlike Zoloft, for instance, Prozac breaks down slowly in the body, so the concentrations do not change as rapidly during pregnancy compared to other SSRIs. Better understanding the pharmacokinetics of these various medications during pregnancy would greatly assist in creating dosing guidelines, especially important for prescribers who are not mental health professionals.

“The vast majority of prescribers don’t realize that plasma concentrations of antidepressants drop across pregnancy, and they may need to readjust the dosage,” Wisner says.

Hoping to enhance the care of this “orphan” patient population, Wisner and fellow principal investigators Catherine Stika, MD, clinical professor of clinical Obstetrics and Gynecology and Alfred George Jr., MD, chair and Magerstadt



KATHERINE L. WISNER, MD, MS

**“If we decide that using a medication to control depression justifies fetal exposure, we should be certain that we are giving the appropriate dosage across pregnancy and after birth.”**



Professor of Pharmacology, launched a study to optimize medical management for mothers with depression. The NIH-funded research comprises three parts: a clinical project to assess the safety and toxicity of drugs throughout pregnancy and into postpartum; a translational study to identify genes responsible for liver enzymes involved in the metabolism of antidepressants during pregnancy; and a pilot study focused on infant outcomes after exposure to SSRIs while in the womb.

To date, the team has enrolled about 35 expectant mothers in the study, with an ultimate goal of recruiting 200 participants. The pregnant women undergo monthly blood draws to measure drug levels and assessments of their mood to determine if the antidepressants are doing their job. They also consent to cord blood collection from their newborns during labor and delivery that will be analyzed to see how much of the drug has crossed the placenta to the fetus. This spring, the team begins pharmacogenetic analyses of the biologic samples — an exciting first step toward applying a precision medicine approach to effectively manage SSRI therapy in women during pregnancy depending on their unique DNA.

“If we decide that using a medication to control depression justifies fetal exposure, we should be certain that we are giving the appropriate dosage across pregnancy and after birth,” Wisner says. “What we don’t want is two exposures: to the disease and to a drug that is not working.”

### RESEARCH PLAN

**3**  
parts

CLINICAL:  
**assess**  
safety & toxicity  
of drugs

TRANSLATIONAL:  
**identify**  
genes involved  
in metabolism

PILOT:  
**focus**  
on infant  
outcomes



## WHEN TO WORRY

Wakschlag is also leading a series of NIH-funded studies focused on what she calls the “science of when to worry” about young children’s behavior and development. From that work, she and colleagues have developed new tools that distinguish normal from atypical behavior during a child’s first five years.

One of the studies, funded by the National Institute of Mental Health,

focuses on young children’s irritability. Another, recently funded by the National Institute on Deafness and Other Communication Disorders, will identify when to worry about young children’s language delays.



## Healthier, Earlier

Chronic stress doesn’t do any body — or mind — good, but for the developing fetus, high levels of stress passed from mom to baby before birth may adversely affect the health and well-being of that child for a lifetime. Stress has been implicated in almost every human disease, from the common cold to heart disease and mental disorders such as schizophrenia. Creating a zen prenatal experience could enhance outcomes well before a newborn enters the world.

“We know that susceptibility to health or disease begins before birth,” says Lauren Wakschlag, PhD, director of Northwestern’s Institute for Innovations in Developmental Sciences. “If we can improve gestational biology and, in turn, fetal neurodevelopment, we might be able to improve health trajectories beginning in early childhood and well into adulthood.”

Taking early intervention to new heights, Wakschlag has assembled a diverse team of bio-medical and social scientists across the Evanston and Chicago campuses to explore the impact of prenatal stress reduction on maternal well-being and early life neurodevelopment. Part of the Perinatal Origins of Disease strategic research initiative at the Stanley Manne Children’s Research Institute at Lurie Children’s,

the project will use leading-edge bio-sensor technology to tailor stress reduction interventions in real time to pregnant women. The intervention is led by Darius Tandon, PhD, associate professor, and Judy Moskowitz, PhD, professor, both in the Department of Medical Social Sciences.

A wearable Band-Aid-type device developed by John Rogers, PhD, the Louis Simpson and Kimberly Querrey Professor of Materials Science and Engineering, will unobtrusively capture and record physiological signs of stress such as maternal heart rate variability. An algorithm being developed by Nabil Alshurafa, PhD, assistant professor of Preventive Medicine, combines the sensor data with self-reported stress levels collected via smartphone. Expectant moms under stress will then receive real-time customized mindfulness techniques via text messages that refocus them on pleasant thoughts or positive activities. The intervention will be tested in a randomized controlled trial of 200 mothers and their babies to be launched at Prentice this September.

“This initiative brings together and integrates the disciplines of obstetrics, pediatrics, prevention science, medical social sciences, bioengineering and adult medicine. After all, all adults began life in utero,” says Wakschlag, also a professor of Medical Social Sciences and vice chair for scientific and faculty development in the department. +

### LAUREN WAKSCHLAG, PHD

**“If we can improve gestational biology and, in turn, fetal neurodevelopment, we might be able to improve health trajectories beginning in early childhood and well into adulthood.”**



# Transitioning to Health

Through innovative transitional care programs, Northwestern Medicine clinicians help vulnerable patients achieve healthier lives after leaving the hospital.

**FOR** some patients, the most impactful medicine comes not from a prescription or a procedure, but from a care plan for after they walk out the hospital doors.

Across the Northwestern Medicine health system, multidisciplinary teams are helping some of the most complex and vulnerable patients transition from acute care settings to healthier lives outside the hospital. The result: improved continuity of care, reduced readmissions, lowered healthcare costs and better outcomes for patients overall.

“These programs are enormously valuable to individual patients and, frankly, to the system as a whole,” says James Adams, MD, chair of Emergency Medicine and chief medical officer at Northwestern Medicine. “Without them, the emergency department cannot address the root causes of these patients’ problems. Only in addressing the root causes can we improve their quality of life, feel satisfied in the care that we provide and, incidentally, optimize healthcare expenditures. Everyone benefits.”

## COMPREHENSIVE CARE FOR OLDER ADULTS

The Geriatric Emergency Department Innovations (GEDI) program launched at Northwestern Memorial Hospital in 2013. Originally funded through a Health Care Innovation Award from the Center for Medicare and Medicaid Services, the program set out to reduce hospitalization of older patients after a visit to the emergency department (ED), and prevent revisits and readmissions.

The team faced a formidable challenge: Studies estimate that up to 25 percent of patients seen in the ED are 65 years or older — a number that’s expected to continue

to rise — and roughly one-third of older patients who visit the ED are admitted to the hospital. But hospitalization is often not the best place for patients, especially for older adults.

“Hospitalization comes with risks for delirium, falls and infections — and we really want to minimize those risks,” explains Scott Dresden, MD, director of GEDI and an assistant professor of Emergency Medicine. “We also find that many times our older patients just want to be home. If that’s the right place for them, we want to make that happen.”

As such, the GEDI intervention includes a key new role in the ED: a geriatric nurse liaison. These GEDI nurses (pronounced like the knights in “Star Wars”), meet one-on-one with older patients to evaluate their overall well-being, determine what level of care might best serve them and coordinate their transition to life outside the ED.

“As we see more older adults in the ED, we’re trying to change how we care for them,” Dresden explains. “Emergency departments weren’t designed for older patients, nor were they necessarily designed to treat all of the underlying issues behind why a patient was there.”

But within GEDI, nurses look at the patient as a whole. During a visit, they cover everything from screening for delirium, elder abuse and fall risks, to understanding how the patient obtains groceries and what kind of overall social support system they have.

After the initial assessment, GEDI nurses ensure patients are safe to go home and set up for health going forward — whatever that might entail. A day in the life of a GEDI nurse might include helping a patient obtain a walker, collaborating with physician referral services to ▶▶

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*Emergency departments weren't designed for older patients, nor were they necessarily designed to treat all of the underlying issues behind why a patient was there.*

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set up an appointment with a specialist, procuring forms for handicapped parking or calling a family member to check in on a patient when they return home.

The nurses work closely with dedicated pharmacists — to reconcile patients’ medications, for example — and social workers who help patients understand resources available through their insurance, connect them with home health services or the Department of Aging, and evaluate financial and caregiver strain. Every GEDI patient discharged from the ED or hospital also receives a follow-up call from a nurse.

In some cases, GEDI nurses refer patients to Northwestern’s Home Care program, where clinicians provide vital primary care services directly in an older adult’s home.

**GERIATRIC PATIENTS:**

↓33%

**DROP IN UNNECESSARY HOSPITAL VISITS WITH GEDI PROGRAM**

“A lot of older patients who come to the emergency room with vague complaints like fatigue are deep down looking for the support our program provides,” explains

Rebecca Zakem, RN, a GEDI nurse. “They often don’t have families or any other way to get help, and that’s really why they keep coming back to the emergency room.”

The program seems to be working: A study published in the *Journal of the American Geriatrics Society* in January found that GEDI cut unnecessary hospital admissions by as much as 33 percent. Data has also shown that patients seen by GEDI nurses have a reduced risk for 30-day readmissions. Even though the original grant initiated in 2013 has ended, the GEDI program remains a key facet of the emergency department today.

Statistics aside, clinicians note that the program simply serves patients better. As such, while the original grant initiated in 2013 has ended, the GEDI program remains a key facet of the emergency department today.

“This program makes a difference, not only in patients not having to return to the ER, but also in giving them such a better quality of life at home,” says Catherine Wilk, RN, another GEDI nurse. “In this work, it’s not about getting patients to the cath lab in time or saving lives from a heart attack. It’s the little things we do that really make people’s lives so much better.”

**TRANSITIONING PATIENTS TO PRIMARY CARE**

Older adults aren’t the only vulnerable population requiring a different kind of care than what the traditional ED or hospital is set up to provide.

In fact, research suggests that about one-third of emergency room visits are for care that could be better delivered in other settings. Not only does this contribute to hospital overcrowding and increased healthcare costs, but many patients with complex issues most likely need more comprehensive, continual care.



▲ GEDI nurses Lisa Lui Popelka, RN (left), and Emily Ruben, RN (right), talk with patient Carol Wittwer at her bedside in the Emergency Department at Northwestern Memorial Hospital. Popelka and Ruben are specially trained to treat older patients and arrange help for them at home.

“

*How do we help patients who are currently using the hospital for all of their care feel empowered to use primary care clinics, and receive preventive care so they don’t get sick going forward?*

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“Patients who receive primary care in the community have better outcomes and use the hospital less,” says Christine Schaeffer, MD, medical director of the Northwestern Medical Group Transitional Care (TC) clinic and clinical assistant professor of Medicine in the Division of General Internal Medicine and Geriatrics. “So how do we help patients who are currently using the hospital for all of their care feel empowered to use primary care clinics, and receive preventive care so they don’t get sick going forward?”

In 2011, Schaeffer launched the TC clinic to meet the needs of patients recently discharged from the ED or hospital who lack a regular source of primary care, are uninsured, or are overwhelmed by medical conditions or mental health challenges. The clinic does whatever it takes to stabilize these patients, help them transition to partner community clinics and, ultimately, reach healthier lives.

**NO PRIMARY CARE PATIENTS:**

↓40%

**LESS LIKELY PATIENTS RETURN TO HOSPITAL AFTER VISITING TC CLINIC IN 2015/2016 COMPARED TO 2011/2012**

What began as just Schaeffer and a single social worker has grown into a large, bilingual, multidisciplinary team. Staffed with clinicians, nurses, psychiatrists, social workers and health advocates, the clinic is now housed in a new, sunny space across the street from the hospital.

The care plan at the TC clinic is driven by the individual needs of the patient. In many cases, health education is fundamental to a successful transition. “We’re helping people understand and





▲ In some cases, GEDI nurses refer patients to Northwestern's Home Care program, where clinicians like Dwayne Dobschuetz, APN, provide primary care services directly in an older adult's home. **Pictured above:** Dobschuetz (left) visits patient Marvin Shimp (right), who has lost much of his vision to macular degeneration. Dobschuetz helps him stay out of the hospital with regular visits to check vitals and answer questions. **Below:** Dobschuetz sees several patients in their homes each day, riding a bicycle between stops.

navigate the confusing health system, and teaching them how to advocate for themselves,” Schaeffer says.

There’s an art and a science to caring for these patients. Addressing acute and chronic health issues and connecting patients with a federally-qualified health center in their community is a large component of the process, but a significant portion isn’t strictly medical: It’s helping people find housing, obtain bus passes to get to an appointment, locate a food pantry near their home, and fill out paperwork to enroll in insurance. It’s the combination of these interventions that ultimately sets a patient up for success.

“This clinic sees the most complex patients with great physical and mental health challenges, and low resources,” says Joseph Feinglass, PhD, research professor of Medicine in General Internal Medicine and Geriatrics, who has partnered with the TC clinic to conduct research. “With the clinic’s very refined approach, clinicians can really get to the social determinants of health and bring patients to a point where they’re ready to start taking caring of themselves. These clinicians are my heroes.”

Feedback collected from the clinic’s patients also speaks to the significance of TC. “You worked with me until I was on the proper medication, and kept testing me until I understood my medications,” one woman remarks. “This clinic has kept me alive, [thanks to] the personal treatment and dedication of my doctor,” one man says. “You brought me back,” another simply states.

Research is also demonstrating the large-scale impact of the clinic as it expands over time. In August, Feinglass and Schaeffer published a study in the journal *Healthcare* that showed, through electronic health



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*We’re all clinicians looking for solutions to problems for specific subtypes of patients who the traditional care model didn’t work for.*  
 ”

records, that patients who visited the TC clinic in 2015 and 2016 had an almost 40 percent decreased likelihood of hospital use within 90 days, compared to patients seen in 2011 and 2012. A randomized controlled trial, recently completed and not yet published, also had promising results: Among patients who are uninsured or with Medicaid, those seen in the TC clinic were associated with a significant reduction in hospital utilization, compared to those who received standard care.

Another specialized clinic, the Complex High Admission Management Program (CHAMP), founded in 2015, focuses on patients who are frequently hospitalized.

FREQUENTLY HOSPITALIZED PATIENTS:  
 ↓ 20-30%  
 READMISSIONS WITH CHAMP CLINIC

“Our patients’ frequent admissions are a sign that the current system of care doesn’t meet their complex medical and psychosocial needs,” says Bruce Henschen, ’12 MD, ’12 MPH, ’15 GME, assistant professor of Medicine in General Internal Medicine and Geriatrics. “We try to design a system of care to address the underlying factors leading to hospitalization.”

Co-led by Henschen and Margaret Chapman, MD, assistant professor of Medicine in the Division of Hospital Medicine, with social workers also on staff, the program is based on a longitudinal, relationship-based care model emphasizing provider continuity, intensive care management and personalized care plans.

Preliminary research shows that the clinic is associated with a 20 to 30 percent reduction in hospital readmissions. The team is currently conducting a randomized, controlled trial to further assess its impact.

#### A NATIONAL MODEL

Though each program serves a unique patient population — and tackles a specific healthcare challenge — CHAMP, the TC clinic and GEDI are united in a core mission: improving the model of care for vulnerable patients.

“We’re all looking for solutions to problems for specific subtypes of patients who the traditional care model didn’t work for,” Schaeffer says. “All of these are novel, cutting-edge programs — and they’ve led to real improvements and advances in care.”

The Northwestern programs serve as models for other medical centers across the country.

“One of our goals is to begin teaching this process to other institutions,” Schaeffer says. “These programs are all part of a national conversation. They’re meshing real science with healthcare to change outcomes — not just for the individual but for the larger system. We’re a great example of how when a university and a health system are paired, really cool things happen.” +

# H

Her accomplishments reach far and wide:

In the last 25 years, Lori Post, PhD, has developed methods to identify victims of violence and ways to hold their perpetrators accountable for their crimes. She has also influenced policy passed into law increasing penalties for female genital mutilation; established a screening and prognostic tool to recognize victims of elder abuse visiting the emergency department; developed background check systems for healthcare providers that is now in the Affordable Care Act; and worked with organizations around the world to eradicate violence against women.

“There’s a link between all of my work, and it’s addressing risk factors of vulnerable populations,” says Post, the inaugural director of Feinberg’s new Buehler Center for Health Policy and Economics. “All of my career, I’ve been driven by the conviction that we cannot remain complicit while women, children and the elderly continue to be abused, neglected and exploited. Academics can play a strong role in informing policy.”



# Policy Expert

WRITTEN BY NORA DUNNE  
PHOTO BY BRUCE POWELL

Lori Post takes a high-level approach to protect worldwide victims of abuse, neglect and exploitation.

### From Small-Scale Interventions to Policy

Post was taking an undergraduate forensic science class at the University of London when she was first exposed to the physiological aftermath of domestic violence. She recalls an autopsy of an elderly woman who had died of a heart attack according to the initial examination. Further testing, however, revealed signs of decades of physical abuse, including broken bones in various stages of remodeling, detached retinas and subdural hematomas. A few years later, Post remembered that woman when she was pursuing a master's degree in demography.

"I was working with a team of professors who wanted to estimate the prevalence of women older than 65 years who are abused by their husbands," she explains. "I thought, why not look at women who have died?"

Post cross-referenced police, prosecutor and domestic violence shelter records of older deceased women who had died from injuries and was able to complete the task. The work eventually inspired her

"Change happens when we hold people accountable — the doctors who perform these procedures and the families who subject their daughters to them," she says. Last year, she delivered expert testimony to the Michigan Senate Judiciary Committee before members passed a set of bills making female genital mutilation a felony punishable by up to 15 years in prison (the federal penalty is up to five years).

"There's also an education component, helping people understand the harm that happens. These women and girls have high rates of infertility and very bad outcomes during birth," Post adds. "This is not a 'cultural practice' like food, language or art. These are 'harmful traditional practices' based on income inequality."

### A Leader at Northwestern

Since arriving at Northwestern early last year, Post has been building the new Buehler Center into an anchor for investigators who want to explore how their own work can inform policy decisions. Her group



PhD dissertation. After completing a postdoctoral fellowship in epidemiology in 1999, she received her first major grant: From the Centers for Disease Control and Prevention, it assessed community efforts to protect women and children from domestic violence in Michigan's Upper Peninsula.

"I learned that more than half the cases of domestic violence there involved Native American women, even though the reservation only accounted for 3 percent of the population," Post says. She published the results of the project in the *Journal of Interpersonal Violence*. "I noticed a pattern of vulnerability due to ethnicity and poverty."

In 2008, Post joined Yale University, where she continued assessing individual and community interventions but also started to drift toward policy.

"For every one person you help, 20 get in line," she says. "I began looking at the underpinnings of these problems and how policy can be used to solve them from a higher level."

For example, she says extreme poverty and food insecurity are often the underlying causes of violent practices such as female genital mutilation, child marriages, widow cleansing and witch hunting.

"Female genital mutilation helps secure a marriage in resource-poor environments," explains Post, who is looking at outcomes for Feed the Future, an Obama Administration initiative to reduce poverty in the world's poorest countries, most of them in Africa.

Post is quick to point out that violence typically associated with developing countries spreads to developed countries, too, as populations migrate. The Centers for Disease Control and Prevention estimates that more than half a million women and girls in the United States were at risk of female genital mutilation or its consequences in 2012.

**"All of my career, I've been driven by the conviction that we cannot remain complicit while women, children and the elderly continue to be abused, neglected and exploited. Academics can play a strong role in informing policy."**

will ultimately provide resources on everything from designing studies to engaging stakeholders who make policy decisions to calculating return on investment for interventions.

"We can help faculty interested in the policy and economic ramifications of many medical and public health issues," she says, citing opioids and successful aging as two areas where this kind of work will have a major role. "We're a great place to catalyze research and build interdisciplinary teams."

"Lori has been working tirelessly to strengthen the Buehler Center's presence and to engage diverse members of Northwestern's faculty and staff to contribute to this vibrant new hub for health policy and economic studies and scholarship," adds Ronald Ackermann, MD, MPH, director of Feinberg's Institute for Public Health and Medicine, which houses the center.

Post is also the Buehler Professor of Geriatric Medicine in the Departments of Emergency Medicine and Medical Social Sciences at Feinberg. ▶▶



## Positive Change

Though she believes in the power of policy, Post is also a realist: “Just because you have a law doesn’t mean people follow it. It’s illegal to beat your wife, but if you live in a culture where people don’t believe victims, victims will stop reporting what is happening to them.

With this in mind, Post has developed an approach to align public will with political will to secure positive social change. Her work in the area has gained the attention of the World Health Organization, World Bank, Rockefeller Foundation, United Nations and USAID.

She also believes that better policy is key to ensuring perpetrators don’t have opportunities to commit their crimes again.

“Our laws on domestic abuse and sexual violence are so outdated and ineffective,” she says. “The best laws, like one just passed in Scotland, look at patterns of behavior. Here, each event is treated as a singular event, and we ignore emotional and psychological coercion, which is more devastating than a beating. So how do we stop long-term, repeat predators?”

Post has an answer to this question in the area of elder abuse. In Michigan, she developed a comprehensive background check system for workers in long-term care and hospice facilities, to make sure people who have done things like steal Social Security checks or physically abuse or neglect patients don’t slip through the cracks.

I found that people who are applying for jobs in long-term care have three times the criminal history rate as the general population,” she says, citing a review she published in the *Journal of Advanced Review*. “Previously, many types of crimes were not discoverable by doing background searches, so perpetrators would just move to a different type of facility or a different state and begin offending again at a new job.”

Post’s background check system has become the gold standard: It’s spread to other states and was funded by the Affordable Care Act as the national model. And Post has become an expert on public health violence surveillance, delivering presentations to the Centers for Medicare & Medicaid Services and trainings to the FBI. She’s currently working to apply her work to gun control policy, as well.



▲ In March, Post helped organize a workshop for health policy investigators, civil rights lawyers and policymakers focused on combating female genital mutilation, held at the University of Oxford.

◀ James Adams, MD, chair of Emergency Medicine, bestows Post with a medal marking her investiture as the Buehler Professor of Geriatric Medicine during a ceremony last summer.

“While background check systems developed to screen long-term care providers inform firearm background checks, preventing mass shooters requires identifying escalating predatory behavior and personality disorders such as psychopathy,” Post says.

Though her work covers weighty topics spanning from female genital mutilation to elder abuse and other types of violence, Post manages to stay positive.

**“We can help faculty interested in the policy and economic ramifications of many medical and public health issues. ... We’re a great place to catalyze research and build interdisciplinary teams.”**

“You can think of it as sad work,” she admits. “But it’s also been wonderful to make a difference. I get to travel the world collaborating with academics and civil rights lawyers; it’s gratifying to see the application of my work on developing effective policy and to make positive social changes.”

In her free time, Post focuses on her family: husband, Tim, a health economist who she met over a cadaver in that forensics class in London, and

their four children, who live across the United States pursuing careers and education in art, filmmaking, sports and math theory.

“I’m a big believer in following your passions at all costs, so I’m always pushing my kids to be risk takers,” she says. “I think it would be horrible to come to the end of your life and say ‘I wish I had done that.’” +

# De-risking the Future

*A letter from Jim Kelly, '73 MD*

**T**hat great visionary Yogi Berra once said, "It's hard to make predictions, especially about the future." But we can rely on select individuals who have been there to help us de-risk the future and give us both direction and some insight on how we make our way in the future world of medicine.

Our Medical Alumni Association Board (MAAB) has been involved in new initiatives hoping to engage Northwestern medical students, residents, fellows and alumni. With the help of many MAAB members, we have undertaken an "MDs in Business" seminar series; we planned and inaugurated an innovative, six-part curriculum for our students in collaboration with a nonprofit healthcare technology incubator in Chicago called MATTER and the American Medical Association (AMA); and we continued a very successful Women in Medicine panel during Alumni Weekend (we'll have full coverage of Alumni Weekend in the upcoming summer issue of *Northwestern Medicine* magazine).

Our inaugural "MDs in Business" seminar last fall featured Eugene Bauer, '67 MD, chief medical officer at

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*Through each of these forums, we have provided insights into the future decisions that our students, residents and fellows will encounter as they progress through the educational system and begin their careers. We hope that the information we provide to our future alumni will help de-risk their future.*

them a better return on investment while academia gets essential money to build and expand academic infrastructure.

Dermira, and Bruce Scharschmidt, '70 MD, currently an independent biotech consultant and previously the senior vice president and chief medical officer at Hyperion Therapeutics and MAAB president. Bauer explained that the relationship between academia and industry has changed dramatically. This partnership means industry has access to more discoveries, giving



Below: Bruce Scharschmidt, '70 MD, spoke to medical students about life as a pharmaceutical entrepreneur during the inaugural "MDs in Business" seminar.

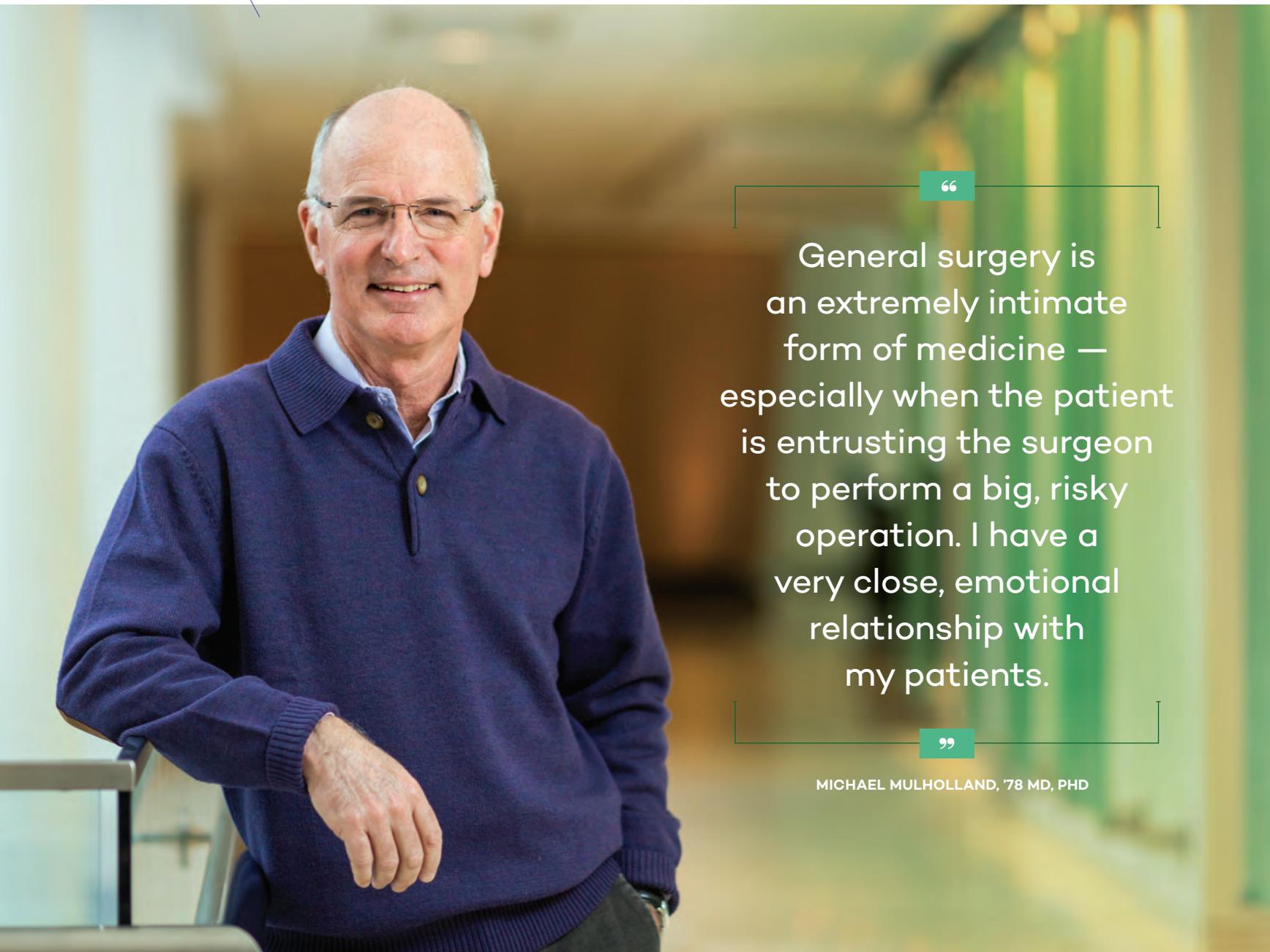
Scharschmidt echoed Bauer's thoughts, and he focused on the distinct difference between life as an academic physician and life as a pharmaceutical entrepreneur. The acceptance of failure as a key tenet of entrepreneurship is in stark contrast to ongoing tenets in medical residency training. In March, Jordan Dubow, '03 MD, '07 GME, followed up their talk with a presentation focusing on his own career, which has ranged from academic medicine to Big Pharma to biotech to his own clinical trial consulting business.

The MAAB's leadership has also supported the innovation curriculum at MATTER with AMA sponsorship for our medical students. The program exposes the next generation of physicians to opportunities in healthcare innovation and entrepreneurship. It was designed to equip, empower and embolden our students to be active leaders, as well as harness their potential as budding entrepreneurs. This year-long program is targeted to first- through third-year

medical students to educate them on the business of healthcare and to introduce them to design thinking. The initial presentations involved uncovering the innovation process, as well as meeting entrepreneurs, investors and industry leaders, and facilitating the opportunity to ideate and harness entrepreneurial ambitions.

The inaugural session was held at MATTER on February 28th and was entitled "A Medical Student's Journey into Healthcare Entrepreneurship." Two Northwestern students, Alexei Mlodinow, CEO of Surgical Innovation Associates, and Tyler Wanke, CEO of Innoblative, led the session, focusing on key decision-making points in their medical school careers and, retrospectively, what they would have done differently.

Through each of these forums, we have provided insights into the future decisions that our students, residents and fellows will encounter as they progress through the educational system and begin their careers. We hope that the information we provide to our future alumni will help de-risk their future.



“

General surgery is an extremely intimate form of medicine — especially when the patient is entrusting the surgeon to perform a big, risky operation. I have a very close, emotional relationship with my patients.

”

MICHAEL MULHOLLAND, '78 MD, PHD

# Commemorating 40 Years

When Michael Mulholland, '78 MD, PhD, married during the last month of medical school, he was sharing a small room in Abbott Hall, a dormitory at the time. “Our room had two beds, two dressers and two desks, with a community bathroom down the hall,” he recalls.

Upon vacating his quarters, all of Mulholland's earthly possessions, mostly books, fit in the back seat of a Volkswagen Beetle. “But I left Northwestern with a great education, someone to share my life with and a future,” he says.

Mulholland, now chair of the Department of Surgery at the University of Michigan in Ann Arbor,

met his one-day spouse, Patricia Heyboer, '76 CERT, on the Northwestern campus early in his medical school years. She was also a student, in Northwestern's physical therapy program. The two of them married on the Evanston campus in the Shiel Chapel, before living together in a Chicago apartment.

So there's no question that 2018 is shaping up to be a banner year for Mulholland. In addition to celebrating 40 years of marriage and graduation from medical school, he is marking his 30th year at the University of Michigan and, in April, was bestowed Feinberg's 2018 Distinguished Medical Alumnus Award.

Places like Northwestern University and the University of Michigan "are true jewels of American public life," Mulholland states. "They are both dedicated to a really high set of ideals, including care of the sickest individuals, the advancement of knowledge and teaching the next generation of caregivers. Those are noble attributes that benefit the larger American society and are worth honoring and supporting."

Mulholland, who graduated in 1971 from high school in Decatur, Illinois, chose Northwestern to pursue his undergraduate degree because the state of Illinois offered a college scholarship to residents who remained in state. "My experience as an undergraduate was so wonderful that I applied to the medical school as well," says Mulholland, who earned his bachelor's degree in chemistry in 1974.

Mulholland was drawn to general surgery because he enjoys taking care of sick patients and was attracted by the immediacy of results following the intervention. Plus, "there is a certain performance pressure when performing an operation that I relish," he says. "General surgery is an extremely intimate form of medicine — especially when the patient is entrusting the surgeon to perform a big, risky operation. I have a very close, emotional relationship with my patients."

Before landing at the University of Michigan in 1988, Mulholland spent seven years at the University of Minnesota in Minneapolis, where he was first an intern and then a resident in surgery. He also earned his PhD in surgery there in 1985.

At Michigan, where Mulholland has been the chair of Surgery since 2002 and surgeon-in-chief at University Hospital since 2003, he performs mostly operations of the upper gastrointestinal track — technically demanding but intriguing work.

Apart from having a major clinical practice, Mulholland has been the principal investigator of an NIH-funded research laboratory since 1988. "Over the last decade, our research has been dedicated to the mechanisms that control appetite, food ingestion and metabolic rate," he explains. "All these things are of central importance to American life in terms of ingestive behavior or obesity or dysregulated eating behavior and metabolism."

Mulholland is interested in understanding how abnormalities occur and hopes that the new knowledge can be used to treat obesity, prevent diabetes or modify behavior.

But he's most proud of his work building the University of Michigan's faculty and general surgery residency program, "both of which I have poured my heart and soul into for the last 30 years."

Mulholland, who in 2004 was elected to the Institute of Medicine, says that laparoscopic surgery has revolutionized the field of surgery since he graduated from Northwestern. "There have also been major advances in biology and medical research that have made surgery a multidisciplinary endeavor to a much greater degree than it was when I was beginning my career."

He believes that the formula for a happy life is very simple: rewarding work and a loving family. "My work has been stimulating and challenging," he says. "I cannot imagine professionally doing anything else in my life, and I currently do not have any plans to retire."

He and Patricia have four grown children: an elementary school teacher, a college professor, a biomedical engineer and an attorney.

In the winter, Mulholland likes to ski, and in the summer, sail. He is also an enthusiastic gardener. Perhaps more impressive, though, is that the general surgeon, now 64, fulfilled his promise of commuting to work by running nearly 10 miles roundtrip until he turned 60.

## CAREER TRAJECTORY

- '74 *Graduated from Northwestern with a BA in chemistry*
- '78 *Graduated from Northwestern with MD*
- '85 *Finished residency and received PhD in surgery from the University of Minnesota*
- '88 *Joined faculty at the University of Michigan*
- '02 *Became chair of Surgery*
- '03 *Became surgeon-in-chief at University Hospital*
- '04 *Elected to the Institute of Medicine*

## MICHAEL &amp; PATRICIA



THEN - 1978



NOW - 2018

## BY THE NUMBERS

- 40<sup>th</sup> *Wedding anniversary this year*
- 40<sup>yrs</sup> *Since medical school graduation*
- 30<sup>th</sup> *Work anniversary at the University of Michigan*
- 20<sup>th</sup> *Recipient of Feinberg's Distinguished Medical Alumnus Award*
- 10<sup>mi</sup> *Distance per day Mulholland ran to and from work until age 60*

# Making a World of Difference

*Introducing the Institute for Global Health at Northwestern*



Above: Marketplace in Tanzania near the Rural Aid Organization hospital, one of Feinberg's clinical outreach sites. Photo courtesy of medical student Brianna Knoll.

**E**very aspect of health is global. Good health positively impacts economies, communities and entire societies, while poor health can have profoundly detrimental effects within these realms. Feinberg is leading the way to ensure that good health prevails worldwide through the endowment of the Institute for Global Health. This new institute will integrate medical research, education, clinical care and service with university-wide graduate and undergraduate programs.

Last September, Eric G. Neilson, MD, vice president for Medical Affairs and Lewis Landsberg Dean, announced the launch of the Campaign for the Institute for Global Health.

*Driven by the medical school, the institute will focus on nine distinct, faculty-driven centers in global health: education, infectious disease, primary care, global surgery, cancer, cardiovascular risk, brain and neurological disease, rehabilitation and eHealth distance learning.*

“This truly will be an institute like no other in the world, and we hope to raise an endowment to be sure that it is built to last,” said Neilson. “Global health is one of the highest priorities for our medical school and university as we train the next generation of global leaders and physicians.”

The institute will be regarded nationally and internationally as a premier academic leader in global health innovation and impact. Likewise, it will continue to create and inspire compassionate physicians capable of addressing the most pressing global health issues and disparities.

“Disease knows no geographic boundaries, and global means everywhere. The work we do benefits us all,” said Robert J. Havey, ’80 MD, ’83, ’84 GME, clinical associate professor of Medicine and founder of the medical school’s highly successful Global Health Initiative (GHI), which provides resources for both research and education in global health. Founded in 2008 and supported by the faculty physicians at Northwestern Medicine Primary and Specialty Care, the GHI Fund has supported the global health-related activities of nearly 1,000 Feinberg students and residents.

For more information on the Institute for Global Health, please contact Cynthia Garbutt at 312-503-0761 or [cynthia.garbutt@northwestern.edu](mailto:cynthia.garbutt@northwestern.edu).



Feinberg medical student Kyle Yoo with his research team in Delhi, India. Photo courtesy of Kyle Yoo.

#### CASE STUDY IN GLOBAL HEALTH

## Cardiology in Kerala, India

“The Keralan cardiologists are leaders in creating a culture that values quality and safety in Indian healthcare. We are interested in exploring the effects of this type of intervention in other states and conditions. We need global partners like these to help us solve the most urgent, most challenging global problems. We have an opportunity to make fundamental discoveries about underlying diseases — we are well-positioned to lead the global efforts to do so, but we cannot do it alone.”

**MARK HUFFMAN, MD, MPH**  
associate professor of Preventive Medicine and Medicine

India’s population suffers more heart attacks than any other country, yet heart attack care is variable and often sub-optimal. For nearly a decade, Mark Huffman, MD, MPH, associate professor of Preventive Medicine and Medicine, has been working to address this problem in partnership with the Cardiological Society of India, Kerala Chapter, and the Centre for Chronic Disease Control in Delhi.

Huffman has created a global team of emerging leaders from 42 countries who are working to contextualize, implement and scale a cardiovascular prevention playbook and toolkit that can be utilized in settings and populations in greatest need, like India. Between 2014 and 2016, Huffman and his team conducted the largest cardiovascular randomized trial in India, evaluating the effect of the cardiovascular prevention playbook and toolkit (read more about his work on page 17).

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#### CASE STUDY IN GLOBAL HEALTH

## Rehabilitation in Recife, Brazil

Recife is located in the state of Pernambuco, a region of Brazil hard hit by the country’s failing economy. It currently lacks adequate healthcare for its population of over 1.5 million people. The number of trained physicians and access to medical supplies are declining, while demand for health

“I am certain that our collaborative work in critical education, timely research and support for clinical care will improve lives for our low-income citizens in Recife, Brazil. Our goal is to revitalize this port city, through better health, education and economic opportunities. By addressing pressing healthcare needs in rehabilitation, surgery, cancer and general medicine, we can save lives and increase hope. This is the work of the institute. Together with Northwestern, we want to improve health not only in Brazil but around the world.”

**MARCOS ROBERTO DUBEUX**  
president of Cone and Northwestern University ambassador in Brazil for the Campaign for the Institute for Global Health

services for the poor has doubled. There are currently no rehabilitation services for the poor in Recife.

Northwestern University is partnering with Cone Condominio de Negocios S.A. (Cone) to envision a new Recife Rehabilitation Center. Once built, the center will collaborate with the Institute for Global Health at Northwestern, along with strategic nonprofits, to bring donated equipment, supplies, treatment and education to the region.



Feinberg medical students funded by the Global Health Initiative in Nicaragua. Photo courtesy of the Northwestern University Alliance for International Development.

#### ADDITIONAL INSTITUTE FOR GLOBAL HEALTH INITIATIVES

- Saving lives at birth
- Providing access to surgical care to reduce disability and death
- Employing cutting-edge technology to track, study and reduce mortality
- Providing sustainable education and training to local healthcare workers
- Effectively treating chronic conditions like diabetes, hypertension, heart disease and arthritis
- Curtailing the spread of infectious disease
- Establishing primary care models of education, mentorship, training and scholarship

# PROGRESS NOTES

*We'd love to hear from you!  
Please share your recent  
news, accomplishments and  
important milestones with us.*



Send your updates and  
high-resolution photos to  
[medcommunications@northwestern.edu](mailto:medcommunications@northwestern.edu).

We will publish them in an upcoming  
issue of the magazine.

## 1950s

**Gerson Bernhard, '53 MD, '59 GME**, writes, "I am still an attending, precepting rheumatology fellows in clinic. I do some utilization reviews and volunteer for a tele-medicine project and at the San Francisco Free Clinic. It has been great fun and free of administrative burden, and it keeps me mentally active. If osteoarthritis of back and knees was less, I would still be playing tennis and skiing. As an alternative, I bike about 25-35 miles/week and am a regular at the gym. Both daughters and seven grandchildren are flourishing.

I have recently been in touch with **Simon Myint, '53 MD**, now 92, and still playing competitive tennis. I tried to match him. I hope to see **Bill Johnson, '53 MD**, when we go to Ashland, Oregon, for theater. He is in a retirement facility in Medford.

So, despite global warming, societal disintegration, guns and global chaos, life is good."

## 1960s

**Ferdinand A. Ofodile, '68 MD**, gave a lecture at Columbia University, as a part of the Emeritus Professors in Columbia Tuesday Lecture Series, on "Rethinking Rural Healthcare Delivery: A Nigerian Diaspora-Town Union Partnership." Ofodile shared his experience and insights from the Nnobi USA Diaspora Health Group. A clinical professor emeritus of Surgery at Columbia, Ofodile also received the 2017 Lifetime Achievement Award from the New York Regional Society of Plastic Surgeons.

## PAUL PALMBERG, '69 PHD, '70 MD, RECEIVED THE OUTSTANDING EDUCATOR AWARD FOR 2018 FROM THE AMERICAN GLAUCOMA SOCIETY.

**Paul Palmberg, '69 PhD, '70 MD**, professor of Ophthalmology at the Bascom Palmer Eye Institute, University of Miami Miller School of Medicine, received the Outstanding Educator Award for 2018 from the American Glaucoma Society (AGS) at its annual meeting. He was previously the AGS's Surgery Day lecturer in 2014 and received the World Glaucoma Association Prize in 2000 for work demonstrating that glaucoma damage could be halted in most cases. He was in the initial class of the Honors Program in Medical Education at Northwestern in 1961 and the initial group of the Medical Scientist

Training Program in 1965. He is still actively teaching residents and fellows, vice-chair of the University of Miami's IRB and medical monitor for an FDA trial of a new glaucoma operation.

## 1970s

**Richard F. Gillum, '70 MD**, published an article in the medical humanities quarterly journal, *The Pharos*. He wrote about the long career of surgeon, community health pioneer and family advocate Harold L. May, MD, MPH, which provides insight into the two-century-long process by which African-Americans struggled to gain improved access to quality education.

Gillum is a professor of Medicine at Howard University College of Medicine in Washington, DC. He was the first African-American internal medicine intern at Peter Bent Brigham Hospital in Boston and the only African-American in his medical school class at Northwestern.

**Leo Gordon, '73 MD**, senior consultant in clinical surgery at the Surgery Group of Los Angeles, achieved the rank of professor of Surgery at the Cedars-Sinai Medical Center last July.

**Howard Woodward, '73 MD**, orthopedic spine surgeon, retired in December 2017 after 38 years of practice in Omaha, Nebraska. Woodward is a fellow of the American Academy of Orthopedic Surgeons, North American Spine Society and Scoliosis Research Society. He was a founder and president of Nebraska Spine + Pain Center, as well as founder and chairman of the board of the Nebraska Spine Hospital. Sons Kiel

Woodward, MD, and **Chase Woodward, '12 MD**, also attended Northwestern University. Chase will join Nebraska Spine + Pain Center as an orthopedic spine surgeon in August 2018. 📷 1

**Louis Claybon, '76 MD, MS**, retired from practice in clinical anesthesia after 35 years in the Greater Cincinnati and Northern Kentucky area. He is so grateful for being groomed for anesthesia at Northwestern. He is now a part-time physician advisor for St. Elizabeth Healthcare, where he practiced for the past 12 years. The scope of his new “fun job” is “fascinating and beyond eye opening” after all those years in the operating room. The part-time schedule is perfect for visiting grandchildren in Brooklyn and Nashville with Kathy, his spouse of 45 years.

**Barbara Pettitt, '76 MD**, received the Evangeline T. Papageorge Award for Distinguished Teaching at the 2017 commencement of Emory University School of Medicine. Since 2001, she has been the director of medical student education for Emory’s Department of Surgery, where she oversees the M3 clerkship, the M4 surgery sub-internship and M4 surgery electives program — a month-long intensive review of anatomy and surgical and clinical skills every March for students entering surgery residencies — and the M4 Applicant Prep program. She is also a faculty advisor for the annual medical student surgery trip to Haiti.

Pettitt is on many committees at Emory, the Association for Surgical Education and the National Board of Medical Examiners. She serves on the American College of Surgeons (ACS) Board of Governors, is incoming chair

of that group’s surgical training workgroup and serves on several ACS education task forces and committees. She was awarded the Association for Surgical Education’s Philip J. Wolfson Outstanding Teacher Award in 2009 and the Association for Women Surgeons’ Olga Johansson Distinguished Member Award in 2014.

**RICHARD F. GILLUM, '70 MD, WAS THE FIRST AFRICAN-AMERICAN INTERNAL MEDICINE INTERN AT PETER BENT BRIGHAM HOSPITAL IN BOSTON AND THE ONLY AFRICAN-AMERICAN IN HIS MEDICAL SCHOOL CLASS AT NORTHWESTERN.**

**Stanford L. Gertler, '78 MD**, celebrated 34 years as a partner in the Southern California Permanente Medical Group in December, having served as chief of the Division of Gastroenterology there for 32 years. Gertler’s early retirement will include part-time work, teaching at the University of California, Irvine, and traveling with his wife, especially to visit their two granddaughters.

**Ernest E. Ertmoed, '79 MD**, received the A. Raymond Eveloff Award for Clinical Excellence, for his work in patient care and dedicated leadership at the Springfield Clinic in Springfield,

Illinois. Ertmoed has served on the board of directors and numerous committees for the Springfield Clinic since joining the organization in 1987. 📷 2

**1980s**

**Ernie Nitka, '81 MD, '82, '85 GME**, writes, “I will be in semi-retirement starting June. I will be doing rural neurology in southwest Kansas. That being said, I am not totally crazy so I will maintain my residence in Denver, Colorado. This will allow me to expand my photography portfolio and spend time with my wife, Vicki, doing motorsport-related activities.”

**Marylalice Stetler-Stevenson, 81 PhD, '84 MD, '87 GME**, received the 2017 NIH Director’s award for her role developing highly effective immunotherapy for children and young adults with refractory acute lymphoblastic leukemia. Stetler-Stevenson is acknowledged as an expert in leukemia detection and lymphoma post antigen directed therapy, namely antibody-based and chimeric antigen receptor T-cell therapy and molecularly-targeted therapy, with associated phenotypic changes. She is on the forefront of minimal residual disease detection. Stetler-Stevenson is director of the Clinical Flow Cytometry Laboratory in the National Cancer Institutes (NCI) at the National Institutes of Health.

She resides in Kensington, Maryland, with her husband, **William Stetler-Stevenson, '83 PhD, '84 MD, '87 GME**, chief of Extracellular Matrix Pathology at the Radiation Oncology Branch of the NCI. 📷 3



Marylalice Stetler-Stevenson, 81 PhD, '84 MD, '87 GME, and team receiving an NIH Director’s award last year.



**Ukeme Umana, '85 MD**, was part of a medical and surgical mission to Liberia from March 8 to 19. The mission was the sixth for Umana through the Hands of Hope Foundation since 2011. They were also joined by a team from Nigeria, ProHealth International. Together, they performed more than 200 general and eye surgeries over the week. Liberia is a West African country that was ravaged by a 15-year war and recently Ebola.

## 1990s

**Erik O. Gilbertson, '92 MD, '93 GME**, received the Health Professional Volunteer of the Year Award from the National Psoriasis Foundation. Gilbertson is chief of Dermatology at Scripps Clinic Rancho San Diego in La Mesa, California.

**Paul T. Giboney, '96 MD**, has been appointed associate chief medical officer for the Los Angeles County Department of Health Services. Giboney previously served as director of specialty care at the Los Angeles County Department of Health Services and as medical director of Clínica Monseñor Oscar A. Romero, a non-profit community health center in Los Angeles.

**Arthur Ollendorff, '93 MD, '97 GME**, was elected to a three-year term as secretary-treasurer of the Association of Professors of Gynecology and Obstetrics.

**“MY FOUR YEARS [AT NORTHWESTERN] WERE SOME OF THE BEST OF MY LIFE. ... I WAS SURROUNDED BY BRILLIANCE AND PERSONALLY AIMED TO EMBODY THE IMPERATIVE CLEARLY COMMUNICATED BY THE SCHOOL ... I AM SO PROUD TO TALK ABOUT MY ALMA MATER.”**

—STEPHANIE HARTSELLE, '07 MD

**Shirley Jean-Baptiste, '99 MD, '03 GME**, joined Pinnacle Dermatology following Pinnacle's acquisition of Southwest Dermatology. Jean-Baptiste is board certified by the American Board of Dermatology, and her practice interests include advanced therapy for psoriasis, eczema and skin cancer surgery, including Mohs. 📍 4

**Daphne E. Schneider, '99 MD**, was accepted into the International Association of Healthcare Professionals with her upcoming publication in *The Leading Physicians of the World*. She is a physician in geriatrics serving patients in Cambridge, Massachusetts. 📍 5

## 2000s

**Michael Ujiki, '00 MD, '07 GME**, was named the Louis W. Biegler Chair of Surgery at NorthShore University Health System in Evanston. Ujiki is vice chair of Surgery for Innovation and Program Development, chief of Gastrointestinal and General Surgery, director of Minimally Invasive Surgery and director of Surgical Simulation. 📍 6

**Stephanie Hartselle, '07 MD**, writes, “My four years [at Northwestern] were some of the best of my life. From Dr. Cochard in anatomy to my college mentor, Dr. Brisson, I was surrounded by brilliance and personally aimed to embody the imperative clearly communicated by the school — that my role in each interaction is to use your incredible training to its fullest and to never lose sight of the human you are honored to be treating. Every learning experience underscored this aspect of Northwestern's culture. I am so proud to talk about my alma mater when asked.

Since graduation, I trained at NYU and Bellevue in adult psychiatry, finished a child fellowship at Brown University and now remain in Providence on Brown's faculty. This year, I won the Dean's Award for teaching from Brown, for lecturing on neuropsychiatry, and I am active at the state and national levels of my professional academies in changing the legislature on mental health. I lecture nationally, giving keynotes on psychiatry, and I am writing



**Lynn M. Koehler, MD, '89 GME**, will practice in Homer Glen and Plainfield with DuPage Medical Group. She previously practiced with the group in Lockport. 📷 8

**Lyle L. Berkowitz, MD, '95 GME**, has been appointed chief medical officer and executive vice president of product strategy for MDLIVE, as well as president of the MDLIVE medical group. Berkowitz is founder and director of the nonprofit Szollosi Healthcare Innovation Program, which partners with the Northwestern Medicine health system. Berkowitz most recently served as director of innovation for Northwestern Memorial HealthCare.

**Daniel McCormick, MD, '97 GME**, has been named president and chief executive officer of Franciscan Health Crown Point in Crown Point, Indiana. McCormick was formerly vice president of medical affairs for the hospital.

**Andrew M. Evens, MD, '03 GME, '04 MS**, has been named associate director for Clinical Services at Rutgers Cancer Institute. Evens also will work as director of the institute's Lymphoma Program in the Division of Blood Disorders. Most recently, he served as director of the Cancer Center at Tufts Medical Center and was on faculty at Tufts University School of Medicine. Evens is a member of the Scientific Advisory Board for the Lymphoma Research Foundation. 📷 9

a book in addition to running my full-time private practice. Northwestern gave me the foundation and confidence to be the doctor I am today." 📷 7

Salinger previously served as co-director of the Endovascular Center and director of the Comprehensive Cardiac Care Center at Evanston Northwestern Healthcare/NorthShore University HealthSystem.

**Randall M. Toig, MD, '82 GME**, was appointed to the board of directors of CTD Holdings, Inc., a clinical stage biotechnology company. Toig is currently a physician with Gold Coast Gynecology of Chicago and on faculty at Feinberg.

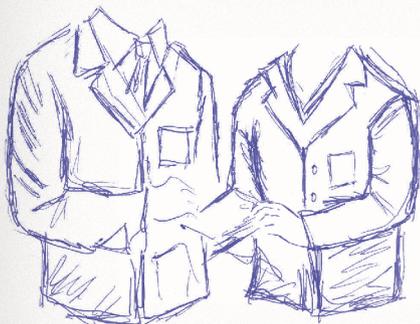
**Robert A. Behar, MD, '88 GME**, was named a 2018 Top Doctor in Cypress, Texas. He is a radiation oncologist, founder and chair of the board, and chief executive officer of North Cypress Medical Center. Behar is also an international lecturer and published author.

## GME

**Richard D. Zorowitz, MD, '81, '89 GME**, was named a 2017 Top Doctor in Washington, DC. He is a physical medicine and rehabilitation physician with the MedStar National Rehabilitation Network.

**Michael H. Salinger, MD, '82, '84 GME**, joined Froedtert & the Medical College of Wisconsin Health Network in the Division of Cardiology.

## SUPPORT A STUDENT DURING THE WHITE COAT CEREMONY



Held on Founders' Day, the White Coat Ceremony welcomes incoming medical students to Feinberg and honors those who have come before. Your involvement in this momentous occasion can change a student's world. Last year, 144 MD alumni supported the purchase of white coats for the incoming class.

**Make your gift to support a white coat this year at [wewill.northwestern.edu/whitecoatfy18](http://wewill.northwestern.edu/whitecoatfy18).**



ALUMNI RESPOND 

After reading a perspective piece by **William Weber, '17 MD, '17 MPH**, in the winter 2018 issue of *Northwestern*

*Medicine* magazine ("Check One or More Boxes: A young alumnus debates the utility of clustering patients into demographic categories"), **Dennis A. Greene, MD, '73 GME**, wrote:

"The essay by Dr. Weber, describing an octogenarian with an STD, at the end of an issue that highlights advances in precision medicine, laboratory testing and machine-driven diagnoses, offers important lessons for clinicians, especially younger ones.

First, the continuing importance of taking a good history. In this case, one's prejudices about "old people" was likely the cause of not asking a simple question about sexual health. It may be an uncomfortable moment between a young doctor and someone old enough to be a grandparent, but a moment not to be neglected.

Second, even in the age of advanced technology, it is still important to know something about a patient's living conditions. Is there a stable home? Is the patient all alone? Are conditions such that no amount of advice and good wishes on the part of the physician can actually be followed, due to income, lack of shelter, or physical or mental abuse? When we see patients only in our examining rooms or hospitals or, with telemedicine, from far away, are we losing something that a simple house-call used to inform?

Third, who really gets to know our patients these days, when we are separated from them by technicians, mid-level practitioners and other intermediaries and spend so little time face-to-face?"

 Read the original perspective piece at [magazine.nm.org/2018/02/13/mark-one-or-more-boxes](http://magazine.nm.org/2018/02/13/mark-one-or-more-boxes)



**Melina Kibbe, MD, '03 GME**, was inducted into the American Institute for Medical and Biological Engineering on April 9.

**Timothy Richard Smith, MD, '08, '14 GME, PhD, MPH**, joined Milford Regional Medical Center. In partnership with two fellow neurosurgeons, Smith has also recently opened a new practice, Brigham and Women's Neurosurgery of Milford, in the Hill Health Center at Milford Regional in Milford, Massachusetts. He is also an assistant professor of Neurological Surgery at Harvard Medical School.  10

## TIMOTHY RICHARD SMITH, MD, '08, '14 GME, PHD, MPH, JOINED MILFORD REGIONAL MEDICAL CENTER. IN PARTNERSHIP WITH TWO FELLOW NEUROSURGEONS, SMITH HAS ALSO RECENTLY OPENED A NEW PRACTICE, BRIGHAM AND WOMEN'S NEUROSURGERY OF MILFORD.

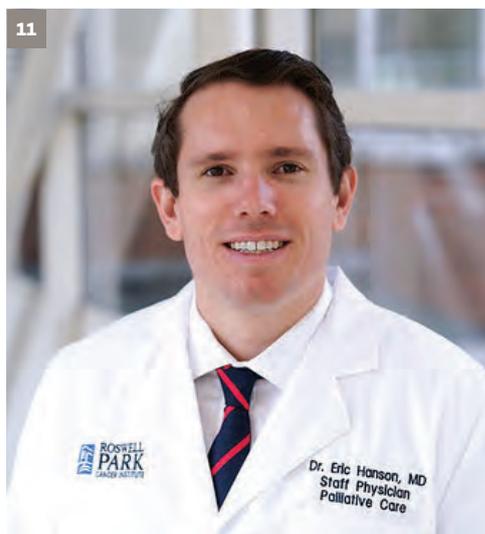


**Eric David Hansen, MD, '16 GME**, joined the Jacobs School of Medicine and Biomedical Sciences at the University of Buffalo as an assistant professor in the Department of Medicine. Hansen is a palliative care physician at Roswell Park Comprehensive Cancer Center, where he cares for patients with advanced cancer. Hansen completed an internal medicine residency at Northwestern with a research focus on advanced care planning in underserved populations and a palliative care fellowship at Johns Hopkins Hospital with research focuses in immunotherapy toxicity and advanced care planning in patients living with HIV.  11

## PT

**Barbara Cone Knebelkamp, '69 PT**, reports slowly sliding towards retirement as she approaches 50 years as a physical therapist. Beginning at Cook County Hospital in the days of no air-conditioning and progressing through multiple inpatient, outpatient, rehab, nursing home and homecare settings, she provided direct care, managerial, unit design and marketing services in Illinois, Kentucky and with several national corporations.

She writes, "During this time, I have been a vocal advocate for exercise in all forms for fun, health and mental acuity. My own personal passion is dance — recent studies are proving its effectiveness in maintaining function and longevity. This past year, at the age of 82, I competed successfully in the Naples,



## In Memoriam

*Northwestern Medicine expresses its condolences to the families and friends of the following alumni (listed in order of their graduation year) and faculty who have recently passed away. All dates are in 2018 unless noted.*

### ALUMNI

**Phyllis Schlotterbeck, '50 MD**  
Minocqua, Wisconsin  
DECEMBER 29, 2017

**Howard N. Jacobson, '51 MD**  
Plant City, Florida  
FEBRUARY 5

**Kenneth K. Meyer, '51 MD**  
Cranberry Township,  
Pennsylvania  
JANUARY 8

**Blanca Smith, '51 CERT**  
Bethlehem, Pennsylvania  
FEBRUARY 20

**G. D. Smith, '53 MD**  
Burr Ridge, Illinois  
MARCH 4

**Judith Smith, '53 MD**  
Burr Ridge, Illinois  
MARCH 18

**Ed Levy, '54 MD**  
Topeka, Kansas  
JANUARY 17

**George O. Lewis, '54 MD**  
Austin, Texas  
JANUARY 10

**Mary A. Tomasiewicz, '56 CERT**  
Anchorage, Alaska  
JANUARY 4

**James H. Lindsey, '59 MD, '64 GME**  
Pauls Valley, Oklahoma  
MARCH 12

**Terry L. Hansen, '61 MD**  
Pocatello, Idaho  
JANUARY 9

**Donald W. Lyddon, Jr., '62 MD, '64, '69 GME**  
Rockford, Illinois  
FEBRUARY 1

**Glen Hait, '65 MD**  
Phoenix, Arizona  
MARCH 29

**A. Kent Teaford, '66 MD, '67 GME**  
Walnut Creek, California  
JANUARY 28

**Thomas J. Fuller, '69 MD**  
Ocala, Florida  
JANUARY 26

**Gary L. Winter, '69 CERT**  
Beatrice, Nebraska  
MARCH 22

**Robert J. Sawchyn, MD, '75 GME**  
Chicago, Illinois  
JANUARY 13

**Patricia L. Gardner, '76 CERT**  
Bishop, California  
MARCH 24

**Alice Perry, '78 CERT, '88 MS**  
Chicago, Illinois  
APRIL 7

**John H. Serocki, '85 MD**  
San Diego, California  
FEBRUARY 21

**Susan M. Haack, MD, '88 GME**  
Phoenix, Arizona  
DECEMBER 30, 2017

**Matthew Fields, '90 PT**  
Montclair, New Jersey  
NOVEMBER 25, 2017

### FACULTY

**Karen Breen, MD**  
*assistant professor of  
Psychiatry and Behavioral  
Sciences*  
Chicago, Illinois  
MARCH 7

**Donald L. Chatman, MD**  
*clinical associate professor  
of Obstetrics and Gynecology*  
Chicago, Illinois  
FEBRUARY 22

**Kathryn N. Farrow, MD, PhD, '05 GME**  
*professor of Pediatrics*  
Chicago, Illinois  
FEBRUARY 7

**Harold G. Wedell, '46 MD**  
*associate professor emeritus  
of Medicine*  
Peoria, Arizona  
FEBRUARY 7



Barbara Cone Knebelkamp, '69 PT, with her granddaughter, Lily Gardiner, at the Louisville Ballet School's Spring Showcase

Florida, Swing Into Summer National Ballroom Competition and, most recently, danced in the Louisville Ballet School's Spring Showcase with my 10-year-old granddaughter. Although we obviously danced in different segments, it was a very special shared activity.

"I am currently heading the Physical Therapy Department at the Kentucky Correctional Institution for Women three days a week. It is really interesting, and I feel I am providing healing services over and beyond the traditional rehab. My advice for happy aging is to keep working with challenges as long as possible and to dance every chance you get!" 📺 12

**MY ADVICE FOR HAPPY AGING IS TO KEEP WORKING WITH CHALLENGES AS LONG AS POSSIBLE AND TO DANCE EVERY CHANCE YOU GET!**

-BARBARA CONE KNEBELKAMP, '69 PT

# JOURNEY TO FAMILY MEDICINE

*In a small town in Russia and a crowded apartment in the US, she witnessed her family's compassion for others.*

How does a little girl living in a small town south of Moscow come to be a chief resident in family medicine at Northwestern? Growing up in that small town, I frequently witnessed my grandmother, a pediatrician, step out into late-night blizzards because a patient needed help. Like a magical, year-round Mrs. Santa Claus, she would even bundle herself in a sleigh to reach her patients. The entire town spoke highly of how she truly got to know patients

**THAT IMAGE OF A CARING PHYSICIAN HAS remained in my mind: one who believes that a patient is more than his or her illness, and maybe brings a little magic to them, too.**

and their families. Throughout my journey to medicine, and now as I embark on my career, that image of a caring physician has remained in my mind: one who believes that a patient

is more than his or her illness, and maybe brings a little magic to them, too.

When my parents and I moved to the United States from Russia, we could only afford to rent one room in a two-bedroom apartment, with a second family living in the other. Even as an enthusiastic little girl getting underfoot in a small space, I noticed how my parents immersed themselves in helping others. I watched my mother teach piano ten hours a day and volunteer for every musical event in the community. I saw my father walk to graduate school because we couldn't afford a car, but put in extra hours at work when a coworker needed help. Like my grandmother, my parents made me realize that the values of compassion, dedication and service are what create magical moments.

In high school, I spent over 900 hours volunteering at my local hospital, annoying every medical professional who was willing to answer my many questions and discovering my passion for medicine. The summer after my freshman year in the seven-year Honors Program in Medical Education at Northwestern, I encountered an obstacle I never thought I would face: during a routine appointment, my family medicine physician confirmed some breast masses I had felt. After numerous biopsies, I was diagnosed with a phyllodes tumor, as well as multiple fibroadenomas.

That year, I learned what it is like to experience the medical system from the patient perspective. My encounters with multiple medical professionals taught me about the kind of physician I do and do not want to be. Later that year, after surgery, I was finally given a clean bill of health. With it came a deep sense of empathy for my future patients and a desire to choose family medicine, a field that focuses on the patient-physician connection and lets me be there for my patients like my family doctor was there for me.

In every rotation throughout medical school, I found myself enjoying and gravitating

toward opportunities to hear patients' stories and be a source of support. One of my favorite experiences in medical school was participating in the Education-Centered Medical Home (ECMH), in which students from all years of medical school attend the same clinic biweekly for their four years of medical school. At my ECMH, I first learned about continuity of care and found that family medicine allows me to put into practice the principles I learned from my family and my own experiences as a patient. My ECMH is where I knew I wanted to build relationships with my patients in my future practice and see all members of the family.

The field of family medicine is all about community, so it makes sense to me that as I look back it was not one moment or person that led me to it, but collections of moments among communities of people. And

maybe a little bit of my grandmother's magic, which I now have the privilege of passing on to my own patients.



*Balabanova is currently chief resident at the Northwestern McGaw Family Medicine Residency at Lake Forest.*



## 1890s-present

### Community Clinic

#### MEDICAL STUDENTS LEARN WHILE GIVING BACK

**N**orthwestern University's medical school has a long history of community outreach. This photo, likely taken in the 1890s or 1900s, shows a scene from an ear and eye dispensary. "The medical school had quite a few dispensaries that provided medical care at no charge to those who couldn't afford it; in turn, medical students received clinical training," says Katie Lattal, special collections librarian at Northwestern's Galter Health Sciences Library and Learning Center.

Today, Northwestern students volunteer at many community clinics, gaining experience providing care to the underserved and working with people who have diverse needs. In one student-run program, called Keep Your Heart Healthy, volunteers provide cardiovascular disease risk assessment and counseling to low-income, predominantly black and Hispanic residents of Chicago at community centers, churches and public schools.

MORE ONLINE AT [MAGAZINE.NM.ORG](http://MAGAZINE.NM.ORG).

