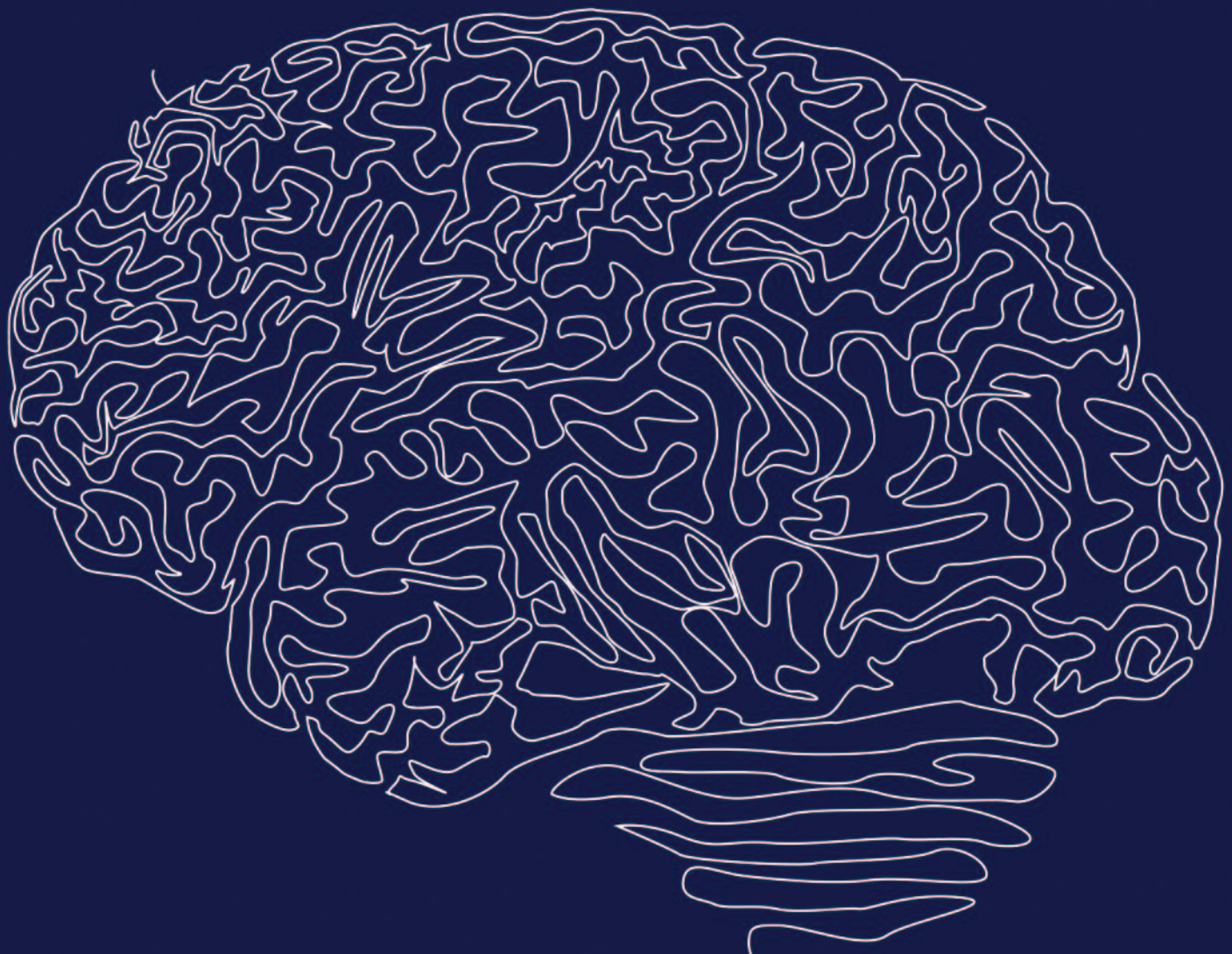
VANDERBILT

MEDICINE

SUMMER 2015



Undone in the ICU

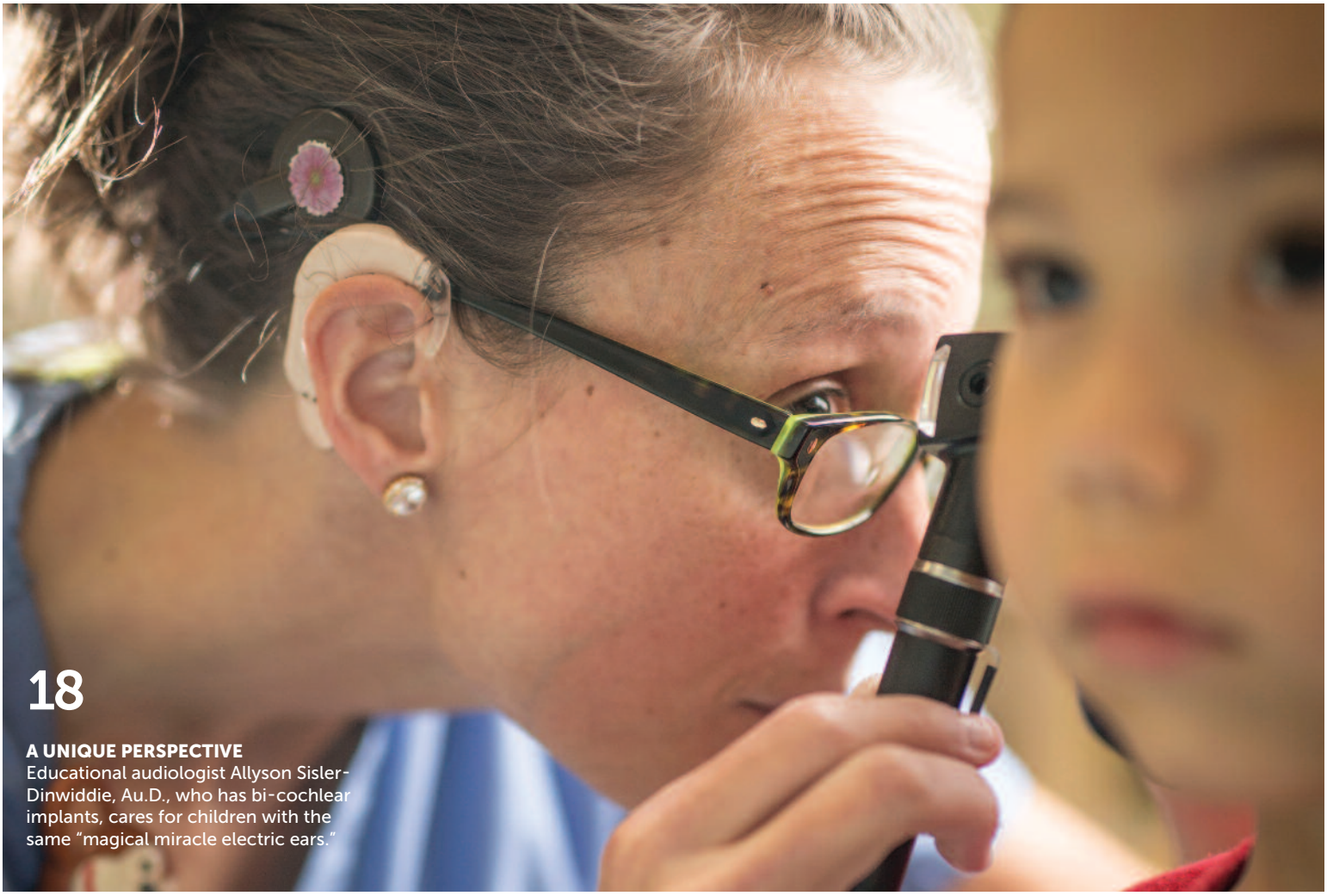
Mending the damage caused by delirium

SCENE ON CAMPUS

David Amsalem gets a lift from fellow School of Medicine graduate Benjamin McCormick as they arrive in style for Commencement on May 8.

JOHN RUSSELL

CONTENTS



18

A UNIQUE PERSPECTIVE
Educational audiologist Allyson Sisler-Dinwiddie, Au.D., who has bi-cochlear implants, cares for children with the same "magical miracle electric ears."

ON THE COVER

Between 60 to 80 percent of patients in the intensive care unit (ICU) experience delirium, a predictor of longer, more expensive hospital stays, higher mortality rates and dementia-like impairment. Vanderbilt initiatives help preserve their brains—and their dignity.

ONLINE EXTRAS

Angelman Syndrome
Learn more about one mom's race for a cure for son's rare disorder.

Patients and Aging Brain Problems
Wes Ely, M.D., speaks about what drives the work of the ICU Delirium and Cognitive Impairment Study Group.

DEPARTMENTS

FEATURES

VANDERBILT MEDICINE

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EDITOR
Kathy Whitney

DESIGN AND ART DIRECTION
Diana Duren

CONTRIBUTING WRITERS
Matt Batcheldor
Jerome Boettcher
Ashley Culver
Christina Echegaray
Heidi Hall
Leslie Hill
Nancy Humphrey
Jessica Pasley
Bill Snyder
Kathy Whitney

PHOTOGRAPHY/ILLUSTRATION
Daniel Dubois
Joe Howell
Barbara Proud
Anne Rayner
John Russell
Susan Urmy

DIRECTOR OF PUBLICATIONS
Nancy Humphrey

EXECUTIVE DIRECTOR OF NEW MEDIA AND ELECTRONIC PUBLICATIONS
Wayne Wood

COVER ILLUSTRATION
Yuri Lobo

EDITORIAL OFFICE
Office of News and Communications
T-5200 Medical Center North
Vanderbilt University
Nashville, Tenn., 37232-2390

VANDERBILT MEDICAL ALUMNI ASSOCIATION
D-8200 Medical Center North
Nashville, Tenn., 37232-2106
(615) 322-6146
(800) 288-0266
Fax: (615) 936-8475
E-mail: medalum@vanderbilt.edu

Visit us at:
medschool.vanderbilt.edu/alumni

Our Strength in Personalized Medicine is Leading the Way

Earlier this summer, Vanderbilt University Medical Center was honored to host the first National Institutes of Health (NIH) workshop for the federal Precision Medicine Initiative announced in January by President Obama.

The two-day gathering, led by NIH director Dr. Francis Collins, was held so the nation's leaders in the field could begin to develop and execute on the Initiative's aggressive plan to, among other things, establish a cohort of at least 1 million research volunteers who will share their biological, environmental, lifestyle and behavioral information with qualified researchers in a de-identified way that will maintain their privacy. This is a massive undertaking, but the rewards will be tremendous, creating a trove of data that can be used to unlock countless medical mysteries and improve the lives of people everywhere.

Affirmation of our longstanding commitment to precision medicine (we prefer the term "personalized medicine") came when the NIH chose VUMC to host this important gathering, and again when Dr. Collins said in his opening comments, "Vanderbilt is the natural place to come for this part of it, because of the strengths here." He was referring to our national leadership in DNA biobanking, biomedical informatics and related disciplines, along with our early commitment to and significant investment in precision/personalized medicine.

Indeed, our DNA databank, BioVU, now one of the world's largest, has more than 200,000 de-identified genetic samples that are leading to discoveries across a range of diseases such as cancer, diabetes, heart disease, immune system diseases, lung disease and in pharmacogenomics through numerous studies of drug and gene interactions.

Through our strengths in the basic sciences and clinical research, and the ability to leverage our expertise in bioinformatics, we have long since achieved a critical mass in personalized medicine, providing genetic screening for our cancer, heart and transplant patients to optimize the therapeutic benefit of their medicines, offering them the best chance to thrive.

In July, VUMC was the recipient of a $12.8 million, five-year National Institute of General Medical Sciences grant to find better ways to predict how patients will respond to the drugs they're given. The goal of this research is to understand the genetic variables that put patients at risk for severe adverse drug reactions, and to more broadly predict how individuals will respond to drug therapies.

As a founding member and the coordinating center for the Electronic Medical Records and Genomics Network (eMERGE) our bioinformatics researchers, collaborating with other network members, have developed tools to extract and analyze relevant information from electronic medical records and combine this data with genetic information from blood samples into a single database. The phenome-wide association studies we are now able to conduct from this data are allowing us to rapidly discover new links to a continuum of diseases. Such studies can also help link seemingly unrelated symptoms and potentially harmful side effects of drugs.

In the past 10 years the number of advancements we have been able to achieve through personalized medicine are fundamentally changing the way health care is delivered on our campus and elsewhere. As Vanderbilt continues to lead health care into an exciting new era, the next decade looks even more promising. ■

Jeff Balser, M.D., Ph.D.
Vice Chancellor for Health Affairs
Dean of Vanderbilt University School of Medicine

CONVERSATIONS AROUND THE MEDICAL CENTER

We want to hear from you! Connect with us on Facebook, Twitter, YouTube, Flickr and Instagram.

Comments on the Winter 2015 issue of *Vanderbilt Medicine:*

IAN CROZIER – EBOLA

What a good man. He chose to go into 'the hot zone,' to help his fellow man, knowing the high risk of infection he faced, and contracted. The world needs a lot more men like him. God bless you, Dr. Crozier, and be well.
– ***Buddy Ray Williams***

There are many heroes out there that we will never hear about during the Ebola crisis. Dr. Crozier is one of many who deserve our appreciation!
– ***Ann Murphy***

How wonderful for you to share your very own story with the world. So grateful you are advancing in your recovery.
– ***Diana Etherton***

Great read. Thank you, Dr. Crozier, for your unselfish sacrifice. You are a true doctor of kindness and compassion.
– ***Dixie South***

INFLAMMATION

Great research. Thanks! I recently changed my diet, which greatly eliminated the constant inflammation and chronic pain I was having. I feel 20 years younger.
– ***Lorraine Grula***

Thanks to Vanderbilt and to federal support for science.
– ***Sara Olson***

BURN CENTER

Vanderbilt burn unit staff is awesome. I was a burn patient with 3rd and 4th degree burns, and they saved my life in many ways.
– ***Theresa Tucker***

So thankful for this very special group of people! My husband, Robert, was burned on 9/20/2013, and flown to Vandy Burn Center. Had great care from everyone, and he had a quick, full recovery. Thank you all! Big shout out to the whole team, but a special shout out to Maria!
– ***Denise Powell Miller***

My husband was burned over 70-75% of his body 4 years ago. The burn unit became our 2nd home for 3 months. These special doctors and nurses saved his life! They will always hold a special place in our hearts. They have become part of our family!
– ***Amber Massengill Durbin***

Great group of people when my 18-month-old was burned! Quick recovery because of great care.
– ***Lindsay Creasy***

These people are the most caring group I have ever met. My son was there for 5 days in 2003. He passed away; he had third degree burns over 90% of his body. I couldn't have gotten through this without the wonderful caregivers and the wonderful people of Nashville.
–***Phyllis Strickland Hamilton***

JOIN THE CONVERSATION
Post comments to our website: mc.vanderbilt.edu/vanderbiltmedicine or email kathy.f.whitney@vanderbilt.edu or on Facebook: facebook.com/VanderbiltUniversitySchoolofMedicine

Find us on instagram at social.vanderbilt.edu

grizzle_bearr via instagram.com

I'll never NOT post a beautiful #vandygram like this.

#vandygram

akfenoglio via instagram.com

Operating w/ Zellner!

#vandygram

hastingsak via instagram.com

I wish this was a smell-o-gram, because these are incredibly fragrant!

#vandygram

A CLOSER LOOK

Second- and third-year medical students perform at the annual Cadaver Ball, hosted by the fourth-year class. This year's theme was "Phantom of the Operating Room."

ANNE RAYNER

Paralyzed by accident, grad student engineers his future with exoskeleton

Andrew Ekelem sits in a wheelchair at the bottom of the fifth-floor stairwell at Olin Hall, laptop balanced on his thighs, quick keystrokes making tiny adjustments for the exoskeleton that promises to change his life.

If Ekelem is impatient with this process, it's impossible to tell. But he readily admits it's his impatience that brought him to Vanderbilt University for his Ph.D. in mechanical engineering.

The exoskeleton he's programming could one day help him walk and potentially impact the lives of an estimated 250,000-400,000 Americans living with spinal cord injuries or dysfunction.

Growing up in Walnut, California, 20 minutes east of Los Angeles, Ekelem was a smart, active kid, the son of an urgent care physician and an anesthesiologist. He earned spots on school tennis and wrestling teams and skateboarded for fun.

He littered his room with pieces of remote-controlled cars, winning a Los Angeles County science fair in seventh grade with one powered by a solar panel taken from a garden lamp. By eighth grade, he knew he'd be an engineer.

A horrific accident shaped which kind.

It was Sunday, March 7, 2010, in Squaw Valley near Lake Tahoe, the end of a long weekend of snowboarding. Ekelem insisted on one more jump – one of the highest. His friends agreed to wait.

"I thought the worst thing that could happen was that I'd break an arm," he said. "When I got to the top of the jump, and I was in the air, I thought, 'I may not walk after this.' I was facing the sky. When I landed on my back, I felt fine. Then I tried to get up and couldn't move my legs.

"I was surprised how tranquil I was. I didn't freak out, which was probably the wrong reaction."

A helicopter delivered Ekelem to a Reno, Nevada, hospital for emergency surgery. He was hopeful and clung to stories about people who learned to walk again after accidents like his.

After two surgeries, he began to notice that his physical therapists didn't talk about what it would take to walk again. Instead,

JOHN RUSSELL

Ph.D. student Andrew Ekelem, seated, and physical therapist Christina Durrough work with exoskeleton test subject Dustin Fleeman.

"My injury has given me experience I can learn from and can use to make life better for other people. And myself."

they discussed maneuvering his wheelchair and stretching to be sure his muscles didn't contract.

Ekelem, 25, earned his undergraduate degree in bioengineering in 2012 from University of California-Berkeley, choosing the field so he could specialize in stem cell research for spinal cord regeneration.

He spent his last year at Berkeley in that school's exoskeleton lab. So when he decided to go for a Ph.D., there was really only one lab he wanted—that of Michael Goldfarb, Ph.D., Vanderbilt's internationally recognized H. Fort Flowers Professor of Mechanical Engineering, whose light, portable exoskeleton is in clinical trials at five spinal cord rehabilitation centers across the country.

Background, perspective earns place

Ekelem's engineering background was ideal for the exoskeleton team, Goldfarb said. But his accident gave him a perspective few graduate students acquire.

"He's more highly motivated and has more insight about what we want to do," Goldfarb said. "We can do the engineering, but it's impossible to get the insight that Andrew brings. If I were in his position, I would want to be in a lab with this technology."

Licensed as Indego, the exoskeleton weighs 26 pounds and breaks into five pieces that users easily transport and put on by themselves. Ekelem and the rest of Goldfarb's team are working on an addition—sending electrical impulses to users' leg muscles, which encourages healthy movement and conserves the battery because motors would do less work.

The Indego technology is licensed to Parker Hannifin Corp. and is expected to have FDA approval and go on the market late this year.

That day in the stairwell, it was Dustin Fleeman of Lawrenceburg, Tennessee, wearing the exoskeleton, rising to his feet in one swift motion with the push of its blue power button. When he leaned forward to indicate he wanted to walk, the exoskeleton instantly complied. Fleeman, whose spinal cord injury is mid-waist, moved easily down the hall outside Goldfarb's lab, first with a walker, then with crutches clasped to his forearms for balance, the quiet whir of Indego's motors accompanying his every step.

Ekelem rolled his wheelchair behind, his laptop tethered to the Indego by 25 feet of wire, clicking boxes marked ascent, descent, walking and standby—information that will one day be stored within the exoskeleton itself.

"My injury has given me experience I can learn from and can use to make life better for other people," he said. "And myself." ■ *Heidi Hall*

Quicknotes

Antibiotics with anticancer potential

The type II topoisomerases—enzymes that manage tangles and supercoils in DNA—exist in all organisms and are important drug targets. Widely prescribed anticancer agents including etoposide and doxorubicin target human type II topoisomerases, and quinolone antibiotics such as ciprofloxacin target bacterial topoisomerases.

Clinically relevant quinolones have no activity against human type II topoisomerases, but a series of experimental quinolones have high activity against both bacterial and human topoisomerases. To understand the basis for this quinolone cross-reactivity, Neil Osheroff, Ph.D., and colleagues analyzed the activity of one of the experimental compounds (CP-115,955) and a series of related quinolones and quinazolinediones against type II topoisomerases from *Bacillus anthracis* and humans.

They found that CP-115,955 uses different structural features, which they defined, to recognize both bacterial and human enzymes. The findings, reported in the Feb. 10 issue of *Biochemistry*, suggest that the CP-115,955 series quinolones may be a good starting point for developing novel topoisomerase II-targeted drugs with anticancer potential.

RNA defects in multiple sclerosis

Profound defects exist in the integrity of structural RNA molecules in patients with relapsing remitting multiple sclerosis (RRMS), a new study reports. RRMS is one type of multiple sclerosis, an inflammatory disease characterized by damage to the insulating myelin on nerve cells. The disease mechanisms that produce multiple sclerosis are not fully understood.

Thomas Aune, Ph.D., and colleagues used quantitative PCR and whole genome RNA sequencing to examine defects in structural RNA surveillance in blood immune cells from subjects with RRMS and in cell lines. Structural RNAs participate in a wide range of cellular processes, including protein production. The investigators found elevated levels of mis-processed structural RNAs, genome-wide defects in mRNA splicing and deficiencies in proteins that participate in quality control of structural RNAs. Betaseron, a common therapy for RRMS but not other autoimmune diseases, restored balance to structural RNAs.

The findings, reported March 25 in *Genome Biology*, establish that defects in structural RNAs exist in RRMS.

Boosting cell-based heart repair

Mesenchymal stem cells (MSCs)—adult stem cells traditionally found in bone marrow—have been used therapeutically to repair injured heart, soft tissue and bone. However, more than 100 clinical trials of MSCs in cardiovascular diseases have demonstrated only modest improvements in cardiac function.

To explore factors that may limit the potency of MSC-based regenerative therapy, Sarika Saraswati, Ph.D., Pampee Young, M.D., Ph.D., and colleagues evaluated the responses of MSCs to the low oxygen conditions (hypoxia) found in injured tissue. They reported in the April issue of *Stem Cells* that MSCs switch to anaerobic metabolism, and have dramatically increased expression of a monocarboxylate transporter (MCT4), a lactate exporter. Using a mouse model of cardiac injury, the investigators showed that MSCs expressing high levels of MCT4 worsened cardiac function, whereas MSCs with silenced MCT4 significantly improved cardiac function.

The findings reveal a metabolic alteration in MSCs that adversely affects cardiac repair, suggesting that strategies to prevent this response may boost MSC therapeutic efficacy.

+BY THE NUMBERS

427 Organ transplants performed at VUMC In 2014

1,194 Patients on organ donation waiting list at VUMC

LASER TECHNOLOGY OFFERS NEW OPTION TO TREAT EPILEPSY

Vanderbilt recently debuted a new minimally invasive surgical treatment for epilepsy, and for 25-year-old Cory Moquist, the procedure, which he underwent in February, is "opening a lot of doors."

The cutting-edge technique employs MRI-guided laser ablation to destroy the brain tissue causing seizures in place of surgical resection.

"I'm excited that this could fix my epilepsy for good," Moquist said. "I take so much medication, and I think I'm more tired than I should be. I feel like I've put off starting my career, and this will open everything up."

A native of Spokane, Washington, Moquist began having seizures at age 2, but was able to control them with medication until a severe seizure at age 18, just before he went to college.

"At the beginning of college I was still pretty much in denial and continued to have seizures every two to three weeks. Most people who have witnessed them say they last 20-30 minutes."

With the supervision of family and friends, Moquist has always been able to do the outdoor activities he loves. Now he hopes to live an even fuller life seizure-free. ■ *Leslie Hill*

Study shows poor heart function could be major Alzheimer's disease risk

A Vanderbilt study, published in *Circulation*, associates heart function with the development of dementia and Alzheimer's disease. Participants with decreased heart function, measured by cardiac index, were two to three times more likely to develop significant memory loss over the follow-up period.

"Heart function could prove to be a major risk factor for dementia and Alzheimer's disease," said Angela Jefferson, Ph.D., director of the Vanderbilt Memory and Alzheimer's Center, and principal investigator of the study.

JAMES STEINBERG

"A very encouraging aspect of our findings is that heart health is a modifiable risk. You may not be able to change your genetics or family history, but you can engage in a heart-healthy lifestyle through diet and exercise at any point in your lifetime."

The research used data from the Framingham Heart Study, an effort that began in 1948 to identify risk factors for heart disease. In the study 1,039 participants from Framingham's Offspring Cohort were followed for up to 11 years to compare cardiac index to the development of dementia.

Over the study period, 32 participants developed dementia, including 26 cases of Alzheimer's disease. Compared to normal cardiac index, individuals with clinically low cardiac index had a higher relative risk of dementia.

Jefferson said the research community has long associated heart health with brain health, but cardiac index has not been previously recognized as a risk factor for significant memory loss or dementia.

Jefferson emphasizes that this research points only to a risk factor.

The National Institute on Aging, the National Heart, Lung, and Blood Institute, and the Alzheimer's Association funded the research. ■ *Leslie Hill*

+ BY THE NUMBERS

28 Retiring faculty members recognized during Vanderbilt's Commencement ceremony on May 8

156 Endowed chair holders honored since 2010 initiative was announced

Q+A

Michelle Izmaylov is a third-year medical student from Atlanta, and a successful writer of fantasy-fiction books for young adults. Izmaylov, 24, has already published three novels and one novella and received several literary awards including the 2010 Blumenthal Award for Best Undergraduate Essay, among others. She holds the Hollis E. and Frances Settle Johnson Scholarship.

Q. How did you get into writing?

A. I was 11 when I wrote my first book and 13 when it was published. When I saw the words I'd written bound together, it left a big impression. I realized something I write can really matter to people. I can give this to someone, and someone can read this.

Q. Why did you choose to attend medical school?

A. Choosing medical school does not have to be at the exclusion of my writing. When I was shadowing doctors back in college I realized it's a lot about listening to a patient's story and how that story evolves over time. I often bring my writing into medicine. Writing has really helped me to analyze a character which has translated well to evaluating patients and their medical story.

Q. What are you working on now?

A. Another student and I are working on a project called Sick, MD. We are collecting nonfiction short stories from medical students, residents, fellows and attending physicians at Vanderbilt in which they describe their experience with their own illness and how that has affected how they care for patients. Also, when I'm not studying for class, I'm working on my latest novel.

Q. How do you do it all?

A. The question is what are you willing to give up? What's important to you and what's not important? School and studying take up most of my time, but I usually have about an hour a day to get some writing done. I'll write 100, 150 words, which does not seem like much, but over a year it comes to 150,000 words.

Q. What do you say to people who think you can either be a right brain or left brain person?

A. There is a false division in society which wants to separate logic and reason from emotion and feeling. There are times in medicine and writing where it's really important to be logical and not just write a scene because you love a character. And on the flip side, the best medical decision for a patient has to be weighed against other things going on in his life: personally, culturally, religiously, that come into play. The best approach to either medicine or writing is to remember that the other side will always bring some benefit if you bring it in. ■ *Ashley Culver*

"Once I'm a practicing physician, regardless of my chosen field, I plan to continue to make time for writing alongside patient care and dedicate my life to both."

From Jocks to Docs

On July 15, four Vanderbilt student-athletes arrived for orientation for the Vanderbilt University School of Medicine—former football players Patton Robinette, Alex Hysong and Steve Monk and men's cross country standout John Ewing.

Just 91 applicants were accepted for the VUSM Class of 2019, which was ranked as the 15th best by *U.S. News and World Report,* and nearly five percent of that class spent their undergrad years as a Commodore student-athlete.

The entering Commodore quartet won't be alone either. Former student-athletes John Stokes (football) and Aaron Noll (men's basketball) are beginning their fourth and final year at VUSM. For some, becoming a doctor was a childhood dream. For others, that path was made clearer after arriving at Vanderbilt.

Either way, Athletic Director David Williams tries to get interested student-athletes in front of Ann Price, M.D., as soon as possible.

Price is the associate dean for Alumni Affairs for the Vanderbilt School of Medicine. A 1978 graduate from the medical school, Price, who was a three-time Tennessee State Collegiate Singles champion and reached the Sweet 16 of the National Women's Tennis Tournament twice, understands what awaits prospective med students.

"You really have to start getting ready when you're a freshman," Price said. "That is what it takes. It takes thinking ahead and really thinking through why I want to be a physician and making the plan and sticking with that course."

By his sophomore year at Vanderbilt, Ewing knew he wanted to be a physician. A chemical engineering major, the Atlanta native liked the science and biology involved. Being an athlete, anatomy intrigued him and being a physician interested him more than a career in research or public health. But the real kicker for Ewing, similar to his peers, was patient care.

"You could really have the opportunity to have a direct impact on a patient's life," said Ewing, who was a H. Boyd McWhorter Award given to the SEC's top scholar athletes. "It also provides the opportunity for you to wear a lot of different hats. You really could be a leader. It requires you to be a great communicator, a great analytical thinker… something that is challenging in a lot of different ways. But the core of that is being able to work with the patient and make an impact."

Hysong, of Bethesda, Maryland, knew in high school he wanted to be a doctor. With both parents as dentists, he was exposed to health care at a young age. Among the criteria for medical school applications is research experience. With a busy afterschool life it is often hard for student-athletes to find the time. Price says a research block can be built into the curriculum for Vanderbilt undergrads or aspiring med school students must capitalize on their summers.

All four have done just that, by conducting research or job shadowing. Hysong interned at the National Institutes of Health, at VUMC and at clinics in Nashville and Maryland, but doing research under Mark Kelley, M.D., a surgical oncologist, was extremely influential.

"Observing that surgical oncologist and seeing him interact with his patient, the impact a physician could have on a patient's life was pretty eye-opening for me," said Hysong.

Monk came to Vanderbilt unsure of his career path but "being a doctor was one of the things on my short list." The biology and economics double major also enjoyed fixing things. From a young age, he liked tinkering with broken items or mastering jigsaw puzzles. Monk, who was the valedictorian of his high school class and earned a perfect score on the SAT while at University Laboratory School in his hometown of Baton Rouge, Louisiana, is leaning toward orthopedics or neurosurgery.

"I know it sounds weird but I like putting things together," he said. "I like doing things with my hands. I figure if I get to do that and get to help people while I'm doing it… there is really nothing else that combines that humanitarian aspect and hands-on approach. That is ultimately why I decided to go into medicine."

Both Monk and Robinette cut their football careers short due to concussions.

"The best decision for my future and my interests moving forward in life would be to move forward in my medical career," Robinette said. "Hopefully, one day I can come back and have the same effect on athletes the doctors here have had on me."

These Commodores agree the student-athlete experience didn't hinder their chances, but instead prepared them for the challenges ahead.

"That's something I've really enjoyed about the student-athlete community—that we're motivated to excel in both. I have a lot of respect for my fellow student-athletes and am amazed by the people I met through athletics. Steve, Alex and Patton are great guys and I'm excited to start med school with them," Ewing said. ■ *Jerome Boettcher*

(from left to right) Patton Robinette, John Ewing, Steve Monk and Alex Hysong

JOE HOWELL

+ BY THE NUMBERS

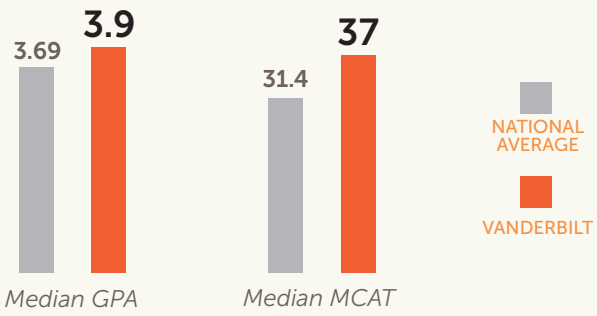
$51,000 Amount raised by this year's Shade Tree Trot and benefit dinner

600 Participants for the Shade Tree Trot, which raises money for the student-run Shade Tree Clinic

VUSM CLASS OF 2019

(MD + MSTP as of July 15, 2015)

6,831 APPLICATIONS *for* **91** SPOTS

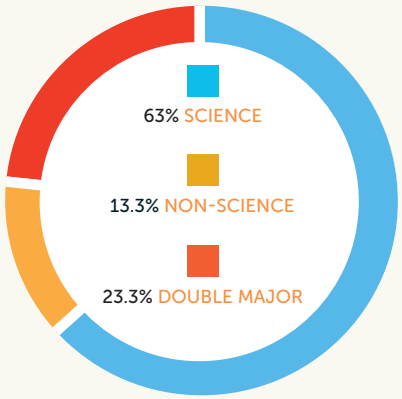


FIVE MOST COMMON MAJORS:

1. *Biology*
2. *Biochemistry*
3. *Neuroscience*
4. *Chemistry*
5. *Biomedical Engineering*

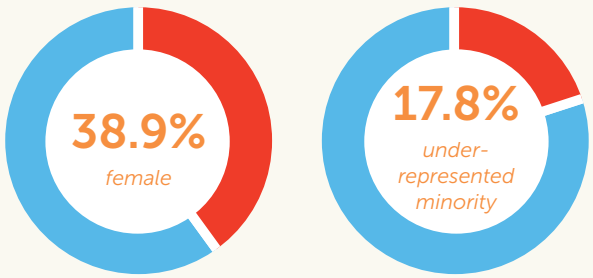
UNIQUE MAJORS:

1. *Jazz Studies*
2. *Honors in Classical Language and Literature*
3. *Anthropology*
4. *English*
5. *History*

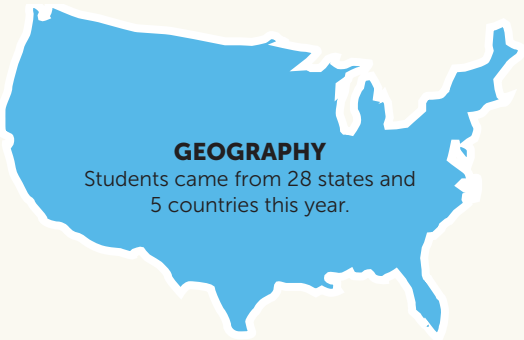


SCIENCE VS. NON-SCIENCE MAJORS

GENDER, ETHNICITY AND AGE



21-31
Age Range



GEOGRAPHY
Students came from 28 states and 5 countries this year.

Western States, **17%**
Midwest, **21%**
Mid-Atlantic, **13%**
New England, **8%**
South, **30%**
Southwest, **4%**
Guam, **1%**

6% are international.

The Class of 2019 represents a wide range of talent and accomplishments.

Many of our incoming students did research and have been published.

Some have done intense service work and EMT service and have earned PhDs.

There are 10 college varsity athletes in the class.

Others have climbed mountains, and performed stand up comedy.

In My Life

SIR NORMAN (TYLER) MELANCON

Second-year medical student; former linebacker for Dartmouth College

Recipient of the Bess & Townsend McVeigh Scholarship

Hometown: Parker, Texas

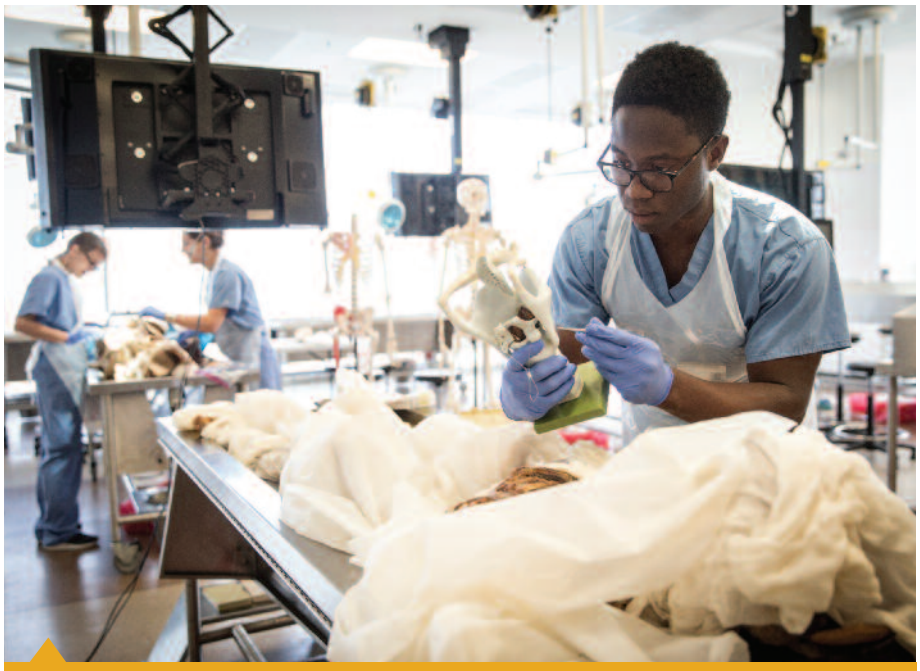
"The individual focus and early introduction to clinical experience attracted me to Vanderbilt. The emphasis on wellness and support for pursuing interests outside of science also made me think there was a place for my humanities approach to clinical practice. The strong black heritage and history of Nashville made me feel connected to the community."

+

Photography by John Russell and Daniel Dubois

VUSM's curriculum integrates basic science and clinical experiences from the start.

Saturday flag football: "The smell of the turf reminds me of how I spent so many days of my life."



Experiential training using human cadavers is an important part of the first-year Gross Anatomy course.

A vegetarian for 3.5 years, Sir Norman takes advantage of the weekly Nashville Farmers' Market on campus.

Canoeing the Harpeth River with girlfriend Crishuauna Williams is a welcome respite from studying for first-year finals. "My first year has been a true privileged experience."

Undone in the ICU

Mending the damage caused by delirium

BY KATHY WHITNEY + PHOTOGRAPH BY DANIEL DUBOIS

"I was under the impression that I was being held prisoner. There were people I was aware of who would come into the room, in the outer areas, and they wouldn't talk to me or look at me. I remember being aware that I couldn't move my arms. I was being held somehow. I started picking at what I thought was a line of threads, thinking, if I could just get these threads loose, I can be free. I felt that I was a prisoner and I was trying to escape."

Six years after being admitted to Vanderbilt's medical intensive care unit (ICU) for acute respiratory distress syndrome, Melissa Akers, 55, still recalls with clarity the delusions she experienced while she was sedated and on life support. The images that haunted her as she slipped into a state of delirium over the course of six weeks in the ICU play on a continuous loop in what she refers to as 'snapshot memories.'

"I remember to the left of my hospital bed there was a window that I thought was a dead end street with a Volkswagen parked in it, and I thought if my husband could just get me to it, I could get away," Akers recalled.

Even more frightening than the hallucinations she experienced in the ICU is the cognitive impairment she has struggled with since she left.

"My brain changed incredibly. My short-term memory doesn't stick. I am not back to where I was before I got sick," said Akers, who could not walk, talk or feed herself after her lengthy hospital stay. "Learning to accept that I am disabled is something I struggled with and fought against. The words 'new normal' is the place I had to get to."

Between 60 to 80 percent of ICU patients experience delirium, characterized by inattention and confusion and the inability to think clearly and make sense of what is happening. Delirium is typically caused by diseases like sepsis combined with the sedatives patients are given.

When critically ill patients experience delirium, which can occur over a short period of time, it is a predictor of longer stays in the hospital, higher cost of care, threefold higher likelihood of death by six months, and long-term cognitive impairment that looks a lot like dementia.

Akers prided herself on being a multitasker when she worked in the Medical Center's development office. Her executive function—a group of thinking skills that help people plan, problem solve and set goals—spiraled to the ninth percentile following her ICU stay, and she was unable to return to her job.

Understanding the Scope of the Problem

Much of what is known about delirium in the ICU and its long-term impact can be attributed to the work of Vanderbilt's ICU Delirium and Cognitive Impairment Study Group, led by Wes Ely, M.D., MPH, professor of Medicine and Critical Care, alongside an interprofessional team of other physicians, surgeons, nurses, psychologists, pharmacists, biostatisticians and health policy experts.

In the late 1990s, Ely, a critical care pulmonologist who specializes in geriatric problems, started noticing a trend among his patients who were lucky enough to leave the ICU alive.

"I started seeing patients, both young and old, come back to the clinic who couldn't balance a checkbook, plan a party, remember where they parked their car, or walk without support. Sometimes they couldn't return to work or school," Ely said. "Patients and families ask 'What happened, and what is this private nightmare I'm living now?'"

In an attempt to measure delirium, he and his colleagues developed and validated the Confusion and Assessment Method (CAM) for the ICU (CAM-ICU), a 2-minute nursing bedside assessment based on one developed for elderly patients, and began training intensivists and nurses at Vanderbilt and around the country.

"So now people could measure something. It was valid, it was reliable. It meant something," Ely said. "It quickly became an 'if you build it, they will come' sort of phenomenon. People all over the world started using the CAM-ICU and translated it into more than 25 languages."

Vanderbilt's ICU Delirium and Cognitive Impairment Study Group has spent the past decade connecting ICUs around the country, sharing information and collaborating to restore patients not only to good health physically, but emotionally and cognitively. The scope of the group's work is voluminous with more than 150 peer-reviewed publications on delirium alone. (See sidebar on the next page)

"Delirium in critically ill, hospitalized adults is a serious yet understudied issue," said Molly Wagster, Ph.D., chief of the Behavioral & Systems Neuroscience Branch in the National Institute on Aging, part of the National Institutes of Health. "These findings provide important evidence of the extent of the problem, the imperative for greater recognition and the pressing need for solutions."

A 2013 *New England Journal of Medicine* study found that 74 percent of the 821 patients studied, all adults with respiratory failure, cardiogenic shock or septic shock, developed delirium while in the hospital, which the authors found is the strongest and most modifiable independent predictor of a dementia-like brain disease that can persist years after discharge from the ICU.

"As medical care is improving, patients are surviving their critical illness more often, but if they are surviving their critical illness with disabling forms of cognitive impairment then that is something that we will have to be aware of, because just surviving is no longer good enough," said lead author Pratik Pandharipande, M.D., MSCI, professor of Anesthesiology and Critical Care.

Akers' husband, Doug, said the hospital staff tried to prepare them for what lay ahead, including several months in rehab.

"It wasn't the ARDS she was recovering from; it was the immobilization. Six months after rehab, Melissa still was barely able to go up steps. You might expect that with someone who has had a stroke, not just from lying in bed," he said.

Escape Fire

Ely describes the standard of care that had to be overcome in order to effect better outcomes for critically ill patients.

"If a patient comes into the ICU and is dramatically sick, he is put on a ventilator. The old way of thinking was 'You are so sick, we don't want you to remember any of this. We are going to sedate you with drugs, tie you down, protect you from yourself; and when we think you're better, we'll wake you up, in six or seven days.'

"In the meantime the patient has now acquired brain disease and body disease; his muscles, brain and nerves are all screwed up, and it's not just because of the disease he came in with. We created more of a disease for him by immobilizing him with both chemical and physical restraints. We actually poured kerosene on the fire and made things worse."

The ICU Delirium and Cognitive Impairment Study Group,

JOE HOWELL

Wes Ely, M.D., MPH, and Pratik Pandharipande, M.D., MSCI, of the ICU Delirium and Cognitive Impairment Study Group

in collaboration with the University of Chicago and others and building on evidence published in major journals like the *Journal of the American Medical Association, New England Journal of Medicine* and *Lancet*, developed the 'ABCDEF' protocol to help patients "escape the fire of pain of suffering," Ely said.

ABCDEF is a standard bundle of ICU measures that includes: **A**ssess for and manage pain; **B**oth Spontaneous Awakening Trials (SATs) & Spontaneous Breathing Trials (SBTs)—i.e., turning off sedatives and the ventilator every day; attention to the **C**hoice of sedation and analgesia; **D**elirium monitoring and management; **E**arly mobility; and **F**amily engagement.

"Now, instead of coming into the ICU and being thrown in the fire with the ventilator, sedatives and restraints, we're going to assess every single day for pain," Ely said. "We ask the families to keep us honest when we tell them we're going to check their loved one every day for delirium, we're going to stop sedatives and try to get them off the ventilator every day."

ICU Liberation

Ely was recently tapped to co-chair the ICU Liberation Campaign, created and funded by the Society of Critical Care Medicine (SCCM) with a grant from the Gordon and Betty Moore Foundation. The campaign is designed to educate providers on the clinical practice guidelines for the Management of Pain, Agitation, and Delirium (PAD) in Adult Patients in the Intensive Care Unit. Timothy D. Girard, M.D., MSCI, assistant professor of Medicine, serves on the task force.

Vanderbilt will host a two-day conference in September with ICU simulation demonstrations that will teach implementation strategies and discuss application of the PAD guidelines. Additionally, there will be a collaborative process with 80 ICUs across the country (both adult and pediatric) to put the ABCDEF bundle into play.

"Hospitals across the globe are implementing this," Ely said.

"I started seeing patients, both young and old, come back to the clinic who couldn't balance a checkbook, plan a party, remember where they parked their car, or walk without support."

Gordon Moore, co-founder of Intel, prompted the addition of the "F" to the bundle for 'family engagement' based on his own experience of ICU delirium.

Having dedicated his career to improving the lives of patients not only while they are in the ICU but after they leave, Ely sums it up with what he calls his mantra:

"It's about preservation of self-worth and human dignity," he said.

"It is undignified to be lying in a hospital, suffering in pain. We have to show our patients that we know they have dignity. Historically, the ICU has not been geared to do that. In the past, providers did not care to look at how patients did after the ICU as long as they survived the life support," he said. "The patients were telling us their lives are awful afterwards. This is unacceptable."

To hasten recovery, Vanderbilt now follows ICU patients after discharge through the Vanderbilt ICU Recovery Center led by Carla Sevin, M.D., neuropsychologist James Jackson, Psy.D., alongside pharmacists and nurse practitioners.

Melissa Akers, who battled leukemia for two years before she developed ARDS that landed her in the ICU, can attest to the need for follow up.

"I never dreamed after leukemia and chemo that anything else could be worse. And this was so much worse—spiritually, emotionally, physically and intellectually—than cancer. Presented with ARDS or cancer, I'd choose leukemia," she said. ■

Preserving the brains—and dignity—of ICU Patients: A Decade of Published Work

In 2004 the ICU Delirium and Cognitive Impairment Student Group published a paper in the *Journal of the American Medical Association* (JAMA) that provided the first documented cohort study to include daily measurements of delirium in the ICU. The study found the development of delirium presents the patients with a 300 percent increased likelihood of dying by six months (independent of other predictors) as compared to similar patients who didn't develop delirium.

"The dilemma in critical care is that people often develop brain dysfunction or delirium in the ICU setting which is erroneously thought to be of no real importance to survival or long-term quality of life," Wes Ely, M.D., MPH, said at the time. "Frankly, it's been overlooked by medical teams for years and in the past was simply called 'ICU psychosis.'"

In 2006, Pratik Pandharipande, M.D., MSCI, professor of Anesthesiology and Critical Care, worked with Ely to publish data in the journal *Anesthesiology* that for the first time showed that benzodiazepine sedatives were a striking predictor of delirium in ICU patients. At that time, these sedative medications were almost universally prescribed to reduce anxiety and to keep patients sedated while on mechanical ventilation.

In 2007, Pandharipande and Ely published a study in JAMA that found that sedation with dexmedetomidine resulted in more days alive without delirium or coma and a lower prevalence of coma than sedation with lorazepam (a benzodiazepine). Taken together, these highly cited studies contributed to a large shift in thinking, spawned other studies, and have led to guideline recommendations against widespread use of benzodiazepines.

In 2012, the group received a $2.8 million grant from the National Heart, Lung, and Blood Institute (NHLBI) to compare the effects of sedation with propofol versus dexmedetomidine. This ongoing randomized, controlled trial is an example of the type of difficult-to-orchestrate multicenter trials that the ICU Delirium and Cognitive impairment Study Group undertakes via its coordinating center and team of experts. They have an even larger ongoing study that is a placebo-controlled, NIA-sponsored trial called MIND-USA, to determine the role of antipsychotics in managing delirium.

The most startling findings, however, came in 2013, when the group published a study in the *New England Journal of Medicine* that indicated patients treated in intensive care units often leave with deficits similar to those seen in patients with traumatic brain injury (TBI) or mild Alzheimer's disease that persist for at least a year.

For more information, visit www.icudelirium.org and www.iculiberation.org

JOURNEY OUT OF SILENCE

Born with hearing loss, an audiologist brings unique perspective—and passion—to her job

Allyson Sisler-Dinwiddie, Au.D., will never forget the day her hearing went away. She was just waking up, home alone on a Saturday morning, when her dog, Maddie, leapt off the bed and darted to the bedroom door.

"I could tell she was barking, but I couldn't hear her. I picked up the phone to see if there was a dial tone, turned it all the way up. Nothing.

"I've never felt so scared, so lost, so alone in my entire life."

BY MATT BATCHELDOR + PHOTOGRAPHY BY DANIEL DUBOIS

Sisler-Dinwiddie had every reason to worry.

At the time, in 2005, she was midway through graduate studies at Vanderbilt University to become an audiologist. How could a deaf audiologist, who struggled through a difficult childhood with hearing loss, help people to hear?

The answer is that she could. She now works with a committed group of audiologists, surgeons, researchers and others whose groundbreaking research could dramatically change how cochlear implant devices are implanted and programmed, improving hearing for potentially more than 400,000 people worldwide who depend on them.

Getting to that point took a wellspring of willpower, cutting-edge medical devices and exclusive research underway at Vanderbilt University.

"I've been so lucky to be here because I've been able to take part in some of that research, and, to be honest, it's truly changed the way my ears work and my confidence in general—just being able to understand," she said.

Her childhood struggles, coupled with her work at Vanderbilt, have helped her pave an easier path for today's children with hearing loss and the adults they become.

Giving in Action: Vickie and Tom Flood

Donors such as Vickie and Thomas Flood are supporting the Vanderbilt Bill Wilkerson Center's world-class teaching, research and clinical care. The Center specializes in communication disorders such as hearing, speech, language, and voice problems.

For many years, the Floods have supported faculty needs, research, graduate students and other expenses related to childhood hearing loss. Their generous contributions led to the creation of the Vickie and Thomas Flood Chair in Hearing and Speech Sciences.

The endowed chair was awarded this year to Fred H. Bess, Ph.D., director of the National Center for Childhood Deafness and Family Communication and professor of Audiology in the Department of Hearing and Speech Sciences. Bess previously served as chair of the Vanderbilt Bill Wilkerson Center from 1978 until 2009.

"Tom and I have supported the center to help children, their families and the wonderful researchers, teachers and support staff to find new and more sophisticated devices to aid in hearing," Vickie Flood said. "Children are our future and as Tom and I have seen in previous years with the students who have moved on from the Vanderbilt Bill Wilkerson Center, nothing is impossible, and we are honored to be part of this wonderful organization."

BORN WITH HEARING LOSS

Allyson Sisler was born in Columbus, Ohio, on Feb. 13, 1981, three months premature, weighing just 1 pound and 13 ounces. She spent her first 6 months in the neonatal intensive care unit at The Ohio State University Medical Center. Amid the challenges of caring for a premature child, Jon and Gayle Sisler had no idea their early arrival came with hearing loss. There were simply no newborn hearing screenings then to tell them otherwise.

"I really did not start to develop any speech at all for a while and then once it started coming it was more of a stutter," she said. "I didn't have any high-frequency sounds."

She couldn't hear the letters "s" or "f" and the sounds "th" and "sh." She couldn't distinguish between singular and plural words. She couldn't fully understand the sounds in her maiden name, Sisler.

As a result, she didn't start speaking at the usual age. Once she did, she stuttered as she tried to express what she wanted to say. She struggled in school early on.

The origin of her speech problems remained a mystery until she was 8 years old. Her mother, the school nurse for Marion County (Ohio) Schools at the time, was administering a hearing screening for students at Waldo Elementary School. Her mom realized that her daughter wasn't recognizing the sounds she was presenting. A few others at school tested her and came up with the same result.

"At that point, we literally left school," Sisler-Dinwiddie said. Mother and daughter drove 40 minutes south to The Ohio State University. There, she had her first clinical hearing test, which confirmed her condition, and her mother drove her home with several hearing aids in tow.

Once home, her mom and dad sat her down at the dinner table, with three models of hearing aids spread before her. She recalls that her dad, a man of few words, looked at her solemnly and said, "We can tell you that these are going to help, but this is going to be up to you, and so all we can ask is that you try. Try. Pick one."

"I picked one," Sisler-Dinwiddie said.

Her father continued, "Ally, no matter what happens, I want you to promise me right now, you will never ever let your hearing or lack thereof get in the way of any dreams that you have or anything that you want to do."

Sisler-Dinwiddie said, "That conversation stuck with me for the rest of my life, to this very day. Any time there's a challenge, which there has been along the way, you just have to trust that there's a way."

Indeed, the challenges had only begun.

ADAPTING TO HEARING AIDS

The teasing began in middle school, a tough time for many children, but especially hard for her. For nearly a semester, she would take her hearing aids off once she got to school. Once her grades began dropping, her teachers discovered something was wrong.

Sisler-Dinwiddie poured her frustration into sports—particularly basketball, track and field and swimming. Her dedication paid off—she went to college at Miami University in Oxford, Ohio, on a basketball and track scholarship. It's where she found her calling.

One day, when she took her hearing aids to an audiologist and professor at the school, the professor asked her if she would speak to her class, Introduction to Communication Disorders, about her experience growing up with hearing loss.

"That was the very first time anyone had ever, I guess, asked me to share a story about my life," she said.

She accepted the invitation and addressed a "huge group of people

STUDY FINE-TUNES HEARING

When Vanderbilt audiologist Allyson Sisler-Dinwiddie, Au.D., received her own cochlear implant, she experienced what many such patients do – her hearing was restored, but understanding speech could be difficult, especially in noisy situations.

"There's a wide range on how people do," said David Haynes, M.D., professor of Otolaryngology, Neurosurgery and Hearing and Speech Sciences and director of the cochlear implant program.

Some do very well, while others return to audiologists dozens of times to have the device's electrodes reprogrammed – between 12 and 22 of them – to improve hearing. Recognizing the need for improvement, an interdisciplinary research team at Vanderbilt came up with an innovative way to reprogram the implants. A Vanderbilt study showed that 72 percent of people participating preferred the new programming method over their previous program.

According to current clinical practice, all the electrodes in a cochlear implant are turned on and programmed, which sometimes causes interference when adjacent electrodes stimulate the same nerves, resulting in distortion or noise. The Vanderbilt team discovered that by turning certain electrodes off entirely, patients' hearing often improved.

The study began in 2012, when the team developed a method of overlaying computer models of the auditory nerves onto patients' CT scans to determine the location of the nerves. Once they could estimate where individual nerves were, they hypothesized that by turning off certain electrodes that stimulate the same groups of nerves, patients' hearing might be improved.

Jack H. Noble, Ph.D., a research assistant professor in Electrical Engineering and Computer Science, created computer models of the cochlea that enable inferring the positions of the nerves in patient CT images. He did so using high-resolution imaging of 10 cadavers in his prior doctoral work.

"It's a really exciting, new piece of information, and we're excited to be able to explore how to use that information to help the programming process and improve outcomes," he said.

JOHN RUSSELL

+
Allyson, seated, and her audiologist, Rene Gifford, Ph.D., in the anechoic chamber, an echo-free room used for hearing research

Before Sisler-Dinwiddie participated in the study in 2012, the hearing in her right ear was more muffled than her left. "Anytime someone talked, it sounded like they had a mouth full of marshmallows," she said.

The improvement in her right ear since reprogramming has been "unbelievable," she said.

Rene Gifford, Ph.D., who is Sisler-Dinwiddie's audiologist, recalls her calling on the phone, overjoyed about how she was hearing after her cochlear implants were reprogrammed.

"She said, 'I don't know what you did, but I can talk on the phone with this ear now,'" Gifford said. "I was blown away. I didn't believe her."

Though the method is only available at Vanderbilt now, the team hopes to make it more widely accessible. The study is the result of having an engineering school and a medical school right next to each other and the spirit of cooperation across campus, said Benoit Dawant, Ph.D., Cornelius Vanderbilt Professor of Engineering.

"The only place right now where this sort of method is being implemented is in the research lab here... across all of our labs," Dawant said. "This type of research is probably possible at very few institutions and Vanderbilt is one of them."

For more information about the study, contact Wendy Lipscomb at 615-936-2491 or wendy.lipscomb@vanderbilt.edu. ■

Matt Batcheldor

who were completely excited that I was there and wanted me to join them in studying speech and audiology."

At the time, she wasn't studying to be an audiologist. She was majoring in sports medicine and kinesiology, which she loved, but didn't know what she would do after graduation.

She had thought before about becoming an audiologist, but figured that her hearing impairment would prevent her from administering hearing tests. Her peers persuaded her that she could use an FM system, an Assistive Listening System that utilizes radio broadcast technology to enhance the ability to hear someone speaking.

Sisler-Dinwiddie, soon switched her major to audiology. She graduated from Miami University in 2003, and began looking for potential graduate schools. She quickly arrived at Vanderbilt. "It just took one visit, to come to Nashville, and I fell in love with the people," she said.

In 2003, she joined 10 students from across the country in the first incoming doctorate of audiology class at Vanderbilt University School of Medicine. Another hurdle down, she would soon face the biggest one of her life.

AN ACCIDENT

Sisler-Dinwiddie had just left her first class of summer 2004, and was heading down West End Avenue in her Mitsubishi Eclipse with the sunroof open and windows down. Suddenly, a car pulled out right in front of her, totaling her car.

"I don't remember much else aside from the many people that surrounded me at the time after I was pulled from the car," she said. "I do have some recollection of a lot of smoke, shattered glass, debris all over me."

Allyson Sisler-Dinwiddie tends to a student at the Mama Lere Hearing School.

She was left with a head injury.

"My right eye didn't work in sync with my left," she said. She spent months at the Pi Beta Phi Rehabilitation Institute at Vanderbilt while dealing with short-term memory issues.

Her hearing was also beginning to fade. At first, she blamed it on her hearing aids, sending them back to the manufacturer for repair several times. She tried progressively stronger hearing aids, with no luck.

And then came the Saturday morning when she couldn't hear her dog bark. The audiogram she received later told the tale: she met the criteria for a cochlear implant.

FROM HEARING AIDS TO COCHLEAR IMPLANTS

A cochlear implant consists of an internal device that is surgically implanted in the ear and an external device called a sound processor that is worn behind the ear, connected to the internal implant by a magnet. This allows the internal and external devices to talk to each other. The electrodes in the internal implant deliver electrical stimulation to the auditory nerve, taking the place of thousands of tiny hair cells within the inner ear that perform the function for people who hear normally.

Seven surgeons perform cochlear implant surgery at VUMC, and once installed, staff audiologists fine-tune them with a computer.

Vanderbilt, and the program it merged with in 2004, the Otology Group, have performed 2,500 cochlear implant surgeries in Nashville over 35 years, said David Haynes, M.D., professor of Otolaryngology, Neurosurgery and Hearing and Speech Sciences and director of the cochlear implant program. More than 200 surgical procedures are completed each year.

"We're a huge force in the field," Haynes said. "Our multidisciplinary team approach has created one of the top cochlear implant programs in the world here at Vanderbilt."

While cochlear implants are considered standard treatment for severe-to-profound hearing loss, the quality of hearing they provide is not the same as normal fidelity and some recipients may experience only marginal hearing restoration. For Sisler-Dinwiddie, the choice was get an implant or adjust to being deaf in a hearing world.

"You would think that being in audiology that the decision to get a cochlear implant was easy, but it really was not," Sisler-Dinwiddie said. "It really gave me a perspective on the other side of the table."

She was scared. Online simulations of cochlear implant hearing sounded like Donald Duck, she recalled – high pitched and unusual.

"This was somebody who had been very high functioning," said Robert Labadie, M.D., Ph.D., professor of Otolaryngology and Biomedical Engineering. "Her career aspirations included the ability to hear so that she could really excel in her field. So to all of a sudden find out … everything had been reversed, now she was going to be the patient that an audiologist was going to have to help. That was a very trying thing."

She chose the implants, undergoing surgery on her right ear in October 2005. Labadie was her surgeon.

"I went into surgery with realistic expectations, and was blown away by how amazing my world was after it (the implant) was turned on," she said.

She heard birds and the sound a flip flop makes—for the first time.

The longer she had the implants, the better she heard. Nine months after her first cochlear implant, she received another in her left ear, resulting in further improvement.

In May 2007, she stood on the stage at the Ryman Auditorium and received her doctorate degree from VUSM. "I remember I had to kind of choke back the tears because all I could think was I am so, so thankful for everybody here helping me be able to walk across the stage and the fact that I was able to hear my name being called was enough to make me cry with tears of joy," she said.

HOW COCHLEAR IMPLANTS WORK

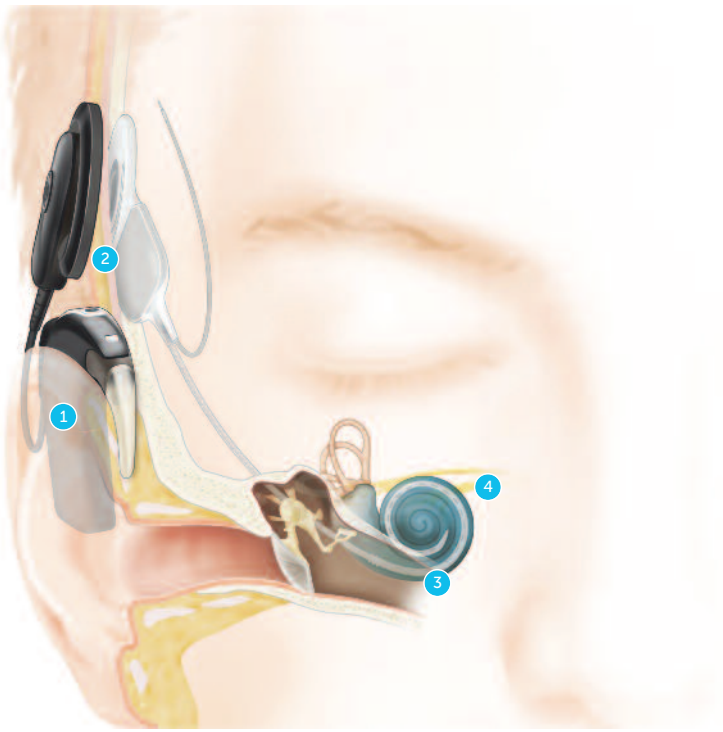


*IMAGE COURTESY OF COCHLEAR AMERICAS. ©<CURRENT YEAR

1. External speech processor captures sound and converts it to digital signals.
2. Processor sends digital signals to internal implant.
3. Internal implant turns signals into electrical energy, sending it to an array inside the cochlea.
4. Electrodes stimulate hearing nerve, bypassing damaged hair cells, and the brain perceives signals; you hear sound.

LIFE TODAY

Sisler-Dinwiddie now spends her career ensuring a new generation develops great hearing and speech with the same "magical miracle electric ears," as she refers to her cochlear implants. In her day job, she is the educational audiologist for the Mama Lere Hearing School at the Vanderbilt Bill Wilkerson Center. The school teaches about 35 children ages 18 months to 5 years how to listen, read, sing and talk. The goal is to bring them to the level of their regular-hearing peers by first grade.

When she's not in the school, she is testing cochlear implants during surgery. And two days a week, she is working with school systems in nearby Sumner and Bedford counties to support children with hearing loss.

In short, life is great.

"While there have been several hurdles to clear along the way, I've come to realize there's a much larger purpose behind the many challenges faced thus far, especially when it comes to my ears," she said. "If nothing else, I hope the many kids and families that I cross paths with each day feel less alone in this journey, less frightened of the unknown and more prepared to move forward with a more positive outlook on the many ways in which hearing loss has impacted their life." ■

Katrina Robertson

Hope Amid a Continuing Crisis

Research transforms HIV/AIDS into a manageable, chronic disease

BY BILL SNYDER + PHOTOGRAPHY BY DANIEL DUBOIS

It's been 20 years since her doctor silently handed Katrina Robertson a lab report that showed she was infected with human immunodeficiency virus (HIV). Yet the memory is still painfully fresh.

"I remember just boo-hooing and crying because it was like I'm gonna die," said the 47-year-old native Nashvillian. "Everybody I'd heard about … it was an immediate death sentence."

HIV affects specific cells of the immune system, and over time, it can destroy so many of these cells that the body can't fight off infections and disease, resulting in acquired immune deficiency syndrome—AIDS.

With a positive HIV test, Robertson, who'd struggled with devastating drug addiction for years, relapsed. "I couldn't stay clean," she said. "I thought if I was going to die anyway I might as well kill myself. But God had another plan for me."

Fortuitously, around the same time as Robertson's diagnosis, new, more effective drugs that blocked HIV replication reached the market, and the Comprehensive Care Center (CCC), Nashville's first medical "home" for people infected with HIV, had opened the previous year.

Family nurse practitioner Beverly Byram, M.S.N., R.N., however, remembers the terribly sick and incredibly brave young men and a few young women who passed through the CCC before there was effective treatment for AIDS.

One man had been in hospice for several weeks when he made an appointment to see Byram. He handed her a paperweight his grandmother had given to him. On the bottom he'd taped the photo from his driver's license. "Don't ever forget me," he said. He died the next day.

"I think about him often," Byram said. "The paperweight is in my office on a shelf of other mementos. I look at them every day to remind me why I'm here."

Stephen Raffanti, M.D., MPH, medical director of what is now the Vanderbilt Comprehensive Care Clinic (VCCC), remembers breaking into an apartment to rescue a patient with AIDS and severe schizophrenia who'd missed several appointments.

Raffanti and two nurses found the man lying in filth, abandoned. They took him to the home of two gay men who cared for him until he died four months later. "He told me they were the happiest four months of his life," Raffanti recalled.

This was the era of AIDS after the discovery in 1983 of HIV, which hijacks and disables a critical part of the body's immune defenses, but before the mid-1990s, when anti-retroviral drugs that prevent HIV from replicating itself became available.

Almost overnight the new drugs transformed HIV infection from a virtual death sentence into a manageable, chronic disease—at least in resource-rich countries like the United States. Yet the battle against AIDS is far from over, and it still could be lost.

DOUBLING THE RISK

AIDS remains a major killer in parts of the world where access to effective treatment is limited. Even in this country, 50,000 new HIV infections occur annually, and long-term survivors face serious health challenges, notably a doubling of the risk of heart attacks and strokes.

"We really need better ways to reverse the epidemic. Without research, that's not going to happen," said David Haas, M.D., who leads the clinical research effort at Vanderbilt University Medical Center to improve HIV treatment.

"Without a vaccine, it will be very hard to ever really control it,"

VUSM student earns HIV/AIDS fellowship

Fourth-year Vanderbilt University School of Medicine student Ishan Asokan has been selected as an inaugural member of the Elton John AIDS Foundation (EJAF) Fellowship for students addressing HIV/AIDS and health disparities.

Asokan has been working at the Vanderbilt Comprehensive Care Clinic (VCCC) since his first year of medical school and will be using the clinic as the site of his 10-week internship.

The EJAF fellowship seeks to destigmatize HIV and provide care to those who otherwise would not be able to afford it.

Through the internship Asokan hopes to form a connection between VCCC and Nashville's LGBTQ facility, OutCentral.

"One of the goals is to create a safe space and treatment facility for LGBT youth to access," said Asokan. "It is really an empowerment project. We want to target at-risk adolescents between the ages of 20-24 and make sure that they have a haven to seek medical attention and receive necessary resources." ■ *Jessica Pasley*

added Barney Graham, M.D., Ph.D., who, as a Vanderbilt chief resident in 1982 diagnosed one of the first two cases of AIDS in Tennessee. "It's going to require another breakthrough."

Graham, a former professor of Medicine at Vanderbilt, is deputy director of the Vaccine Research Center at the National Institute of Allergy and Infectious Diseases, part of the National Institutes of Health (NIH). He and his colleagues are closing in on HIV.

They and others have discovered that the viral envelope protein, the outer coating that the immune system "sees" and which antibodies target, is hypervariable, constantly changing. It's also flexible, covered with sugars, and presents a decoy to antibodies to throw them off the chase.

Since 2009, however, researchers at NIH and around the country have developed hundreds of monoclonal antibodies capable of neutralizing HIV.

These are antibodies generated in the laboratory against specific targets by selecting B cells using specially designed probes and recovering the immunoglobulin genes from individual cells in order to synthetically produce the antibodies made by that cell.

The resulting "guided missiles" have helped researchers map the vulnerable sites on the HIV envelope. This is aiding efforts, at NIH, Vanderbilt and elsewhere, to develop the first effective vaccine against the virus.

It also may be possible, Graham said, to inject neutralizing antibodies (instead of vaccinating) as a way to prevent HIV infection from taking hold in people who have been exposed to the virus.

At Vanderbilt, James Crowe Jr., M.D., director of the Vanderbilt Vaccine Center, and Jens Meiler, Ph.D., associate professor of Chemistry and Pharmacology, have taken this line of research to another level.

With the help of a computer program that predicts the structure of a protein from its amino acid sequence, they and their colleagues have redesigned an antibody so that it has increased potency and can neutralize more strains of HIV than the original natural antibody.

Their findings, reported in May in the *Journal of Clinical Investigation*, suggest that computer-redesigned antibodies may speed the search for a curative therapy or vaccine for a virus that so far has eluded all attempts to eradicate it.

"If computational design … can predict how viruses evolve in the future, we could potentially design antibodies and vaccines for viruses before they occur in nature," said Crowe, the Ann Scott Carell Professor and professor of Pediatrics, and of Pathology, Microbiology and Immunology.

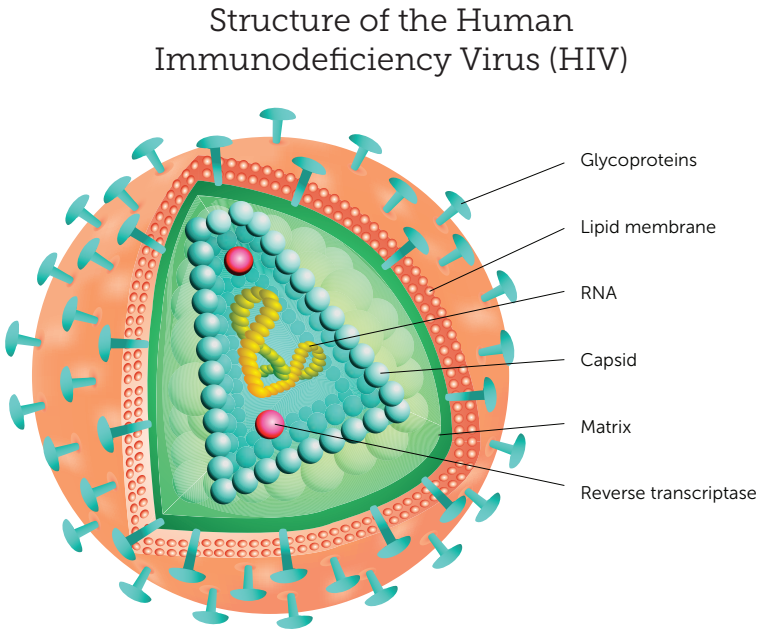


ILLUSTRATION BY ISTOCK

JOHN RUSSELL

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A single person infected with HIV carries more variations of the virus than all the influenza strains isolated worldwide, says James Crowe Jr., M.D.

KICK-AND-KILL

Haas, who has directed the Vanderbilt HIV Therapeutics Clinical Research Site since 1996, is involved in a multi-center study aimed at draining the body of latent reservoirs of HIV that hide out in quiescent white blood cells.

The strategy, called kick-and-kill, involves selective activation of virus in the dormant cells while the patient is on HIV therapy. The hope is that the cells will either die or be recognized and killed by the immune system.

Another multi-center study is testing whether giving HIV patients a statin will reduce their risk of heart attacks and strokes. Statins not only lower cholesterol, but reduce chronic inflammation, a risk factor for blood vessel disease that also is associated with HIV infection.

The Therapeutics Clinical Research Site (CRS) is one arm of Vanderbilt's AIDS Clinical Trials Unit. The other is the Vanderbilt HIV Vaccine Program, directed by Spyros Kalams, M.D., associate professor of Medicine.

Vanderbilt also is a partner in the recently established Tennessee Center for AIDS Research with Meharry Medical College and the Tennessee Department of Health. The center's aims are twofold: to improve the continuum of HIV/AIDS care in Tennessee and beyond, and to advance personalized care in the treatment of HIV.

Personalized care is "a huge strength" at Vanderbilt, Haas said. It refers not only to genetic variations that may affect patients' response to medications, but to other important medical, social and environmental factors that impact the course of disease including AIDS.

The new center will draw from the Vanderbilt Institute of Global Health, which has helped to pioneer the continuum of HIV care in countries like Mozambique, as well as from the VCCC.

"We have the opportunity to take what's been learned there and bring it to the United States," Haas said.

The Tennessee Center for AIDS Research investigators are involved in small pilot and large multicenter projects aimed at preventing long-term complications of chronic HIV infection, including heart disease and stroke, pursuing potential treatments that could one day lead to a cure for the disease, and developing an effective vaccine to prevent HIV infection.

The need is great, and much work remains to be done but, said Haas, "we're getting closer."

HIV may not yet be subdued, but 30 years of fighting has helped win other battles – against hepatitis C and RSV, respiratory syncytial virus, for example.

And yet, because of a decade of flat federal funding for biomedical research, "I think we've lost two generations of physician-researchers," Graham said. "The barriers to establishing a laboratory or doing research are so high (that) they're not going to choose research.

"What's going to happen in the future when we don't have the workforce or resources to address new problems that come up?"

Today, Katrina Robertson, whose future appeared bleak 20 years ago, is the national sales director for Thistle Farms, a Nashville-based residential program and social enterprise run for and by women who have survived lives of prostitution, trafficking, addiction and life on the streets.

Robertson, who's been in recovery for 10 years, is enjoying a full life that includes her husband, Barry, and daughter, Ebony.

AIDS remains a major killer in parts of the world where access to effective treatment is limited. Even in this country, 50,000 new HIV infections occur annually, and long-term survivors face serious health challenges, notably a doubling of the risk of heart attacks and strokes.

She continues to receive treatment at the VCCC. "I take good care of myself," she said. "I eat right. I exercise. I take my medicine. I work closely with my doctor. We can live normal healthy lives."

Yet she worries that shame, guilt and stigma still keep many people from being tested or seeking treatment. "We've got to talk about it … and help people understand it's not a death sentence anymore and see that we live long, healthy and happy lives and to understand the importance of getting treatment." ■

DANIEL DUBOIS

HIV/AIDS in the United States

In 2013, an estimated 47,352 people were diagnosed with HIV infection in the United States. In that same year, an estimated 26,688 people were diagnosed with AIDS. Overall, an estimated 1,194,039 people in the United States have been diagnosed with AIDS.

MORE THAN

1.2 million

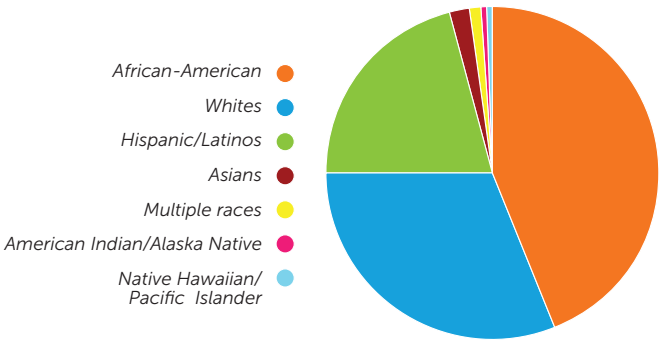
PEOPLE ARE LIVING WITH HIV INFECTION, AND ALMOST

1 in 7 (14%)

ARE UNAWARE OF THEIR INFECTION

OVER THE PAST DECADE, THE NUMBER OF PEOPLE LIVING WITH HIV HAS INCREASED, WHILE THE ANNUAL NUMBER OF NEW HIV INFECTIONS HAS REMAINED RELATIVELY STABLE.

NEW HIV INFECTIONS BY RACE/ETHNICITY: 2010



AT SOME POINT IN THEIR LIFETIMES, AN ESTIMATED

1 in 16

AFRICAN-AMERICAN MEN AND

1 in 32

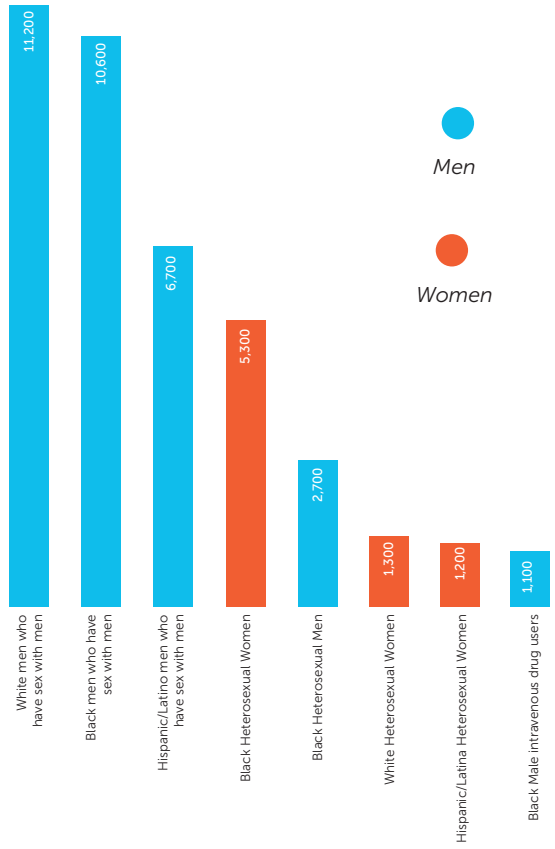
AFRICAN-AMERICAN WOMEN WILL BE DIAGNOSED WITH HIV INFECTION.

THERE ARE ABOUT

50,000

NEW HIV INFECTIONS PER YEAR.

ESTIMATED NEW HIV INFECTIONS IN 2010, FOR THE MOST AFFECTED SUBPOPULATIONS

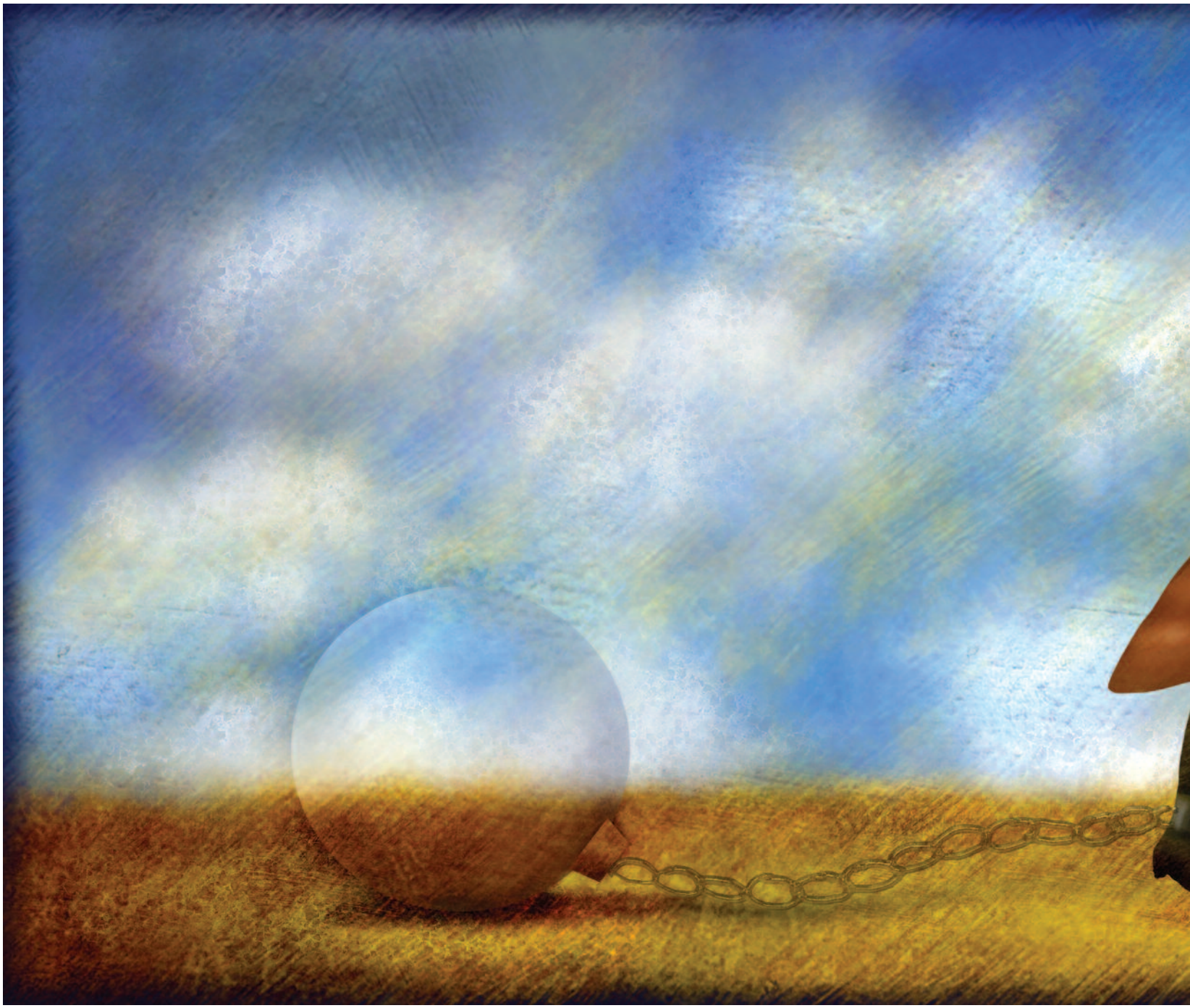


AN ESTIMATED

13,712

PEOPLE WITH AN AIDS DIAGNOSIS DIED IN 2012

Source: Centers for Disease Control and Prevention



Chronic Fatigue Syndrome

A Real Disease, Redefined

BY NANCY HUMPHREY + ILLUSTRATION BY DAVE CUTLER

Dee Rogers has a busy and stressful job at Vanderbilt University Medical Center. So it would be normal to be tired at the end of the work day. But in 2014 she began to notice that she didn't feel rejuvenated even after a good night's sleep or weekend's rest.

On Saturday, she'd get up, eat breakfast, put in a load of laundry and have to go back to bed for a three- to four-hour nap. Filling up the dishwasher was exhausting. She had no social life because she was too tired to go out with friends. She often had to miss work, and took FMLA (Family and Medical Leave Act) to secure her job.

"For months, I didn't have a life. Family members, who live seven streets down, would invite me to dinner. I couldn't even do that."

Rogers, who has rheumatoid arthritis (RA), associated her fatigue, headaches and some joint and muscle pain with RA. But her physician, Chad Boomershine, M.D., Ph.D., thought otherwise. Finally she was diagnosed with Chronic Fatigue Syndrome (CFS), a complex, debilitating, multisystem and frequently undiagnosed condition that affects between 1 million and 4 million in the United States and millions more worldwide. The disease, which is not associated with any underlying medical condition, has been called Myalgic Encephalomyelitis outside of the United States.

Its hallmark is persistent and profound fatigue where, on a bad day, simple tasks can put you back in bed.

"It's crippling," Rogers said. "You just want to go to sleep. All the time."

Patients with CFS are often dismissed by peers and even by physicians who are unfamiliar with the disease.

"Their family often doesn't understand; their co-workers don't understand, and especially their bosses don't understand," Boomershine said. "It's very frustrating for these patients. They can't do what they want. They're extremely limited in just doing their daily activities and things they enjoy doing. We're not talking about your run-of-the-mill 'I didn't get enough sleep last night' fatigue." Boomershine estimates he treats about 500 CFS patients.

New diagnostic criteria and a new name

CFS is so misunderstood and misdiagnosed that the Institute of Medicine (IOM), the health arm of the National Academy of Sciences, commissioned a report. The committee writing the 235-page report, "Beyond Myalgic Encephalomyelitis/Chronic Fatigue Syndrome; Redefining an Illness," was chaired by Vanderbilt's Ellen Wright Clayton, M.D., J.D., the Craig-Weaver Professor of Pediatrics and professor of Law at Vanderbilt University. Italo Biaggioni, M.D., professor of Medicine and Pharmacology, was a reviewer.

The committee was asked to define diagnostic criteria for CFS, to propose a new process for reevaluation of these criteria in the future, and to consider whether a new name for the disease is warranted. The committee pored over peer-reviewed literature on CFS and took into account input from hundreds of patients and their advocates and developed evidence-informed diagnostic criteria.

"This is a disease that's been the subject of contention for decades," Clayton said. "People think it's made up; it's all in the patient's head; it can't be distinguished from other things. Patients have felt like they are being dismissed by physicians. These people have a real disease, but it's often not recognized or taken care of. The amount of research funds devoted to it is trivial compared to the magnitude of the problem."

The committee's findings (see sidebar on next page) resulted in changing the name of CFS to systemic exertion intolerance disease (SEID) and identifying at least one criteria that must be present for diagnosis: cognitive impairment or orthostatic intolerance. "These more focused diagnostic criteria will make it easier for clinicians to recognize and accurately diagnose these patients in a timelier manner," the report read.

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Ellen Wright Clayton, M.D., J.D., chaired the IOM committee tasked with defining diagnostic criteria for CFS and coming up with a new name.

SUSAN URMY

"We're very eager for clinicians to recognize this disorder, to make the diagnosis and at least refer to a specialist. We developed the name we did because it describes the symptoms required for a diagnosis."

"Our contention is this constellation of symptoms is pretty unique, and if they're present, a diagnosis should be made," Clayton said. "A point that is really important is that prior definitions have said this is a diagnosis of exclusion, as if there are many other disorders that have this constellation of symptoms or that if you have another disease (depression, diabetes or even fibromyalgia), you can't have this. As a clinician, the idea that people can only have one thing is pretty dumb. You wouldn't say that someone with diabetes can't have a co-morbid condition like renal failure or hypertension or vascular disease or depression. We have to recognize that people can have co-morbidities."

The committee's work attracted some controversy because patients and investigators were worried that the patient testimonies

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Chad Boomershine, M.D., Ph.D., estimates he treats about 500 CFS patients.

SUSAN URMY

wouldn't be believed and felt the committee's recommendations could possibly halt the small amount of research that is being done.

The committee held two open meetings where they heard testimony from patients and their advocates. "They were quite powerful," Clayton said. And they allowed comments on the Internet—about 1,000—and took suggestions from the public about the new name. One patient said having CFS "feels like permanently having the flu, a hangover, and jet lag while being continually electrocuted."

"We read them all. We heard many powerful stories about the impact of this disease and how it's not getting adequate attention from physicians or the research community."

The Trial and Error Approach to Treatment

CFS is more common in females and affects all racial and ethnic groups. It usually strikes people between the ages of 20 and 40, but it also occurs in teens. A CFS-like illness also has been identified in children younger than 12. The actual number of children and teens affected by CFS is unknown.

There are no FDA-approved treatments for CFS, Boomershine said. "It's a big limitation for us as physicians. There's a lot of trial and error involved in treating these patients." He treated one patient for three years before finding a combination of medications that worked.

"Medications that work for one patient might not work for another. Some of the therapies we'd like to use, we can't, because they're off label and insurance won't cover them because there's no indication for chronic fatigue with the medicines," he said.

Physicians often use antidepressant medications that increase adrenaline to help with the fatigue, and sometimes stimulant medications (Ritalin, Adderall, etc.) are used, but that creates another issue because the stimulant medications are controlled substances so prescriptions must be on paper, there are no refills and there are other logistical issues when prescribing.

Some patients improve when treated with non-stimulant wakefulness-promoting agents, such as Provigil and Nuvigil. However, these drugs are only indicated to treat sleep apnea, work shift syndrome and narcolepsy, and cost about $600 a month.

Improving the quality of a CFS patient's sleep is important, Boomershine said.

"These patients have non restorative sleep. They can sleep for 12-15 hours and wake up just as tired as when they went to bed. It's a much different problem than insomnia where you can't fall asleep, but once you do, you sleep well."

Another challenge is separating CFS from other issues that these patients deal with—many CFS patients have fibromyalgia and vice versa. Fibromyalgia is a syndrome that affects the muscles and soft tissue and its symptoms—chronic muscle pain, fatigue and sleep problems, mimic CFS.

Boomershine prescribed bupropion (Wellbutrin) for Dee Rogers, a medication used to treat both depression and attention deficit hyperactivity disorder, and it's made all the difference.

"Within a week of starting on Wellbutrin, my fatigue was better. It gave me my life back," she said. "My family was very concerned about me. I have a boyfriend now. I didn't have the strength or the desire to have a social life of any kind before."

Clayton said she's proud of the work the committee did on the report and hopes that it helps the CFS patient population get the help they deserve.

"It's a huge service to patients with this disorder," she said. "We made a very powerful case that this is a serious, complex multi-system disorder with huge impact."

But there's much more work to be done, Clayton said.

"We're very eager for clinicians to recognize this disorder, to make the diagnosis and at least refer to a specialist. We developed the name systemic exertion intolerance disease because it describes the symptoms required for a diagnosis," she said. "Do we think that name will stand in perpetuity? Probably not. The history of medicine over the millennia is to change names as you learn more about disease. Look at cancer.

"Our sincere hope is if research is done and we understand more about the etiology, we can define subtypes. One thing we do know is that kids are different from adults—their triggers and manifestations are different. Orthostatic intolerance is much more common in kids. We don't have the data now to define subtypes, but we sure hope the knowledge will advance. It's critical."

Clayton said that the IOM's task was clear—to evaluate current criteria and define the disease, "to do what we were asked to do and no more. Do we feel what we have proposed is better than what is currently available? You betcha."

The panel recommended the criteria be revisited in five years. "It's my fervent hope that in five years we're going to know so much more about this disease and that the next panel can refine this." ■

The IOM committee's findings regarding CFS:

- There is indeed a disease;
- Three features are present in virtually every patient with CFS:
  1. Profound fatigue (devastating and ongoing) not alleviated by rest. "We're not talking 'it's 3 a.m. and I'm feeling tired kind of fatigue.' This is devastating knocked out fatigue," said Ellen Wright Clayton, M.D., J.D.
  2. Post-exertional malaise (often described by patients as a "crash" or "collapse" after even minor physical or mental exertion). "If you and I get tired, we push through it, recover and get over it. For these folks, exertion has a profound impact, often delayed a day or two," she said.
  3. Unrefreshing sleep
- And at least one of these two criteria must be present:
  1. Cognitive impairment (brain fog, inability to think) or
  2. Orthostatic intolerance (needing to sit down before you fall down)
- The name of the disease should be changed to systemic exertion intolerance disease (SEID). "We spent a lot of time thinking about a name, because we feel the name chronic fatigue syndrome has done this community a huge disservice. It's time to get past that," Clayton said.

Son's Disease Prompts Mom's Scientific Quest

BY LESLIE HILL + PHOTOGRAPH BY DANIEL DUBOIS

At age 50, Terry Jo Bichell, a midwife and mother of five with no basic science training, set out to cure Angelman Syndrome.

It wasn't a mid-life crisis; a fit of reinvention as her four oldest daughters left the house. It was a pure desire to help her son Louie, 16, and the thousands of other children like him who are living with the disorder marked by delayed brain development, lack of speech, uncoordinated motor function, behavior difficulties, seizures and sleep disorders.

"Angelman is caused by just one gene. Why don't we have a drug that turns on that gene?" Bichell wondered.

"I just didn't want to sit around complaining about other scientists not doing it. There can't be anyone more motivated than me, so I should get off the couch and go to school and figure out how to turn on the gene. Why not?"

Sleepless nights

When Louie was born in February 1999, Bichell immediately sensed something was wrong. He wasn't breast-feeding as well as his four older sisters and wasn't meeting developmental milestones, except he smiled and laughed earlier than expected. (The syndrome is marked by frequent laughing, smiling and a generally happy demeanor.)

"As a midwife, I couldn't take no for an answer on the breast-feeding. I had told a thousand other women they could breast-feed and wasn't going to let my own baby get away with not doing it," Bichell recalled. "The pediatrician told me he was going to be fine. He was my first boy and they're different than girls. She said I'm almost 40, maybe I'm more neurotic."

She and her husband, David Bichell, M.D., now chief of pediatric cardiac surgery at Monroe Carell Jr. Children's Hospital at Vanderbilt, would often flip through his medical books looking for an answer to Louie's delays.

When Louie was finally diagnosed with AS around his first birthday, Terry Jo was working in Mexico as a midwife with her mother and

four children in tow while David stayed behind to work in San Diego. She walked 2 miles to the closest Internet café and started Googling.

"It was like the door opened. It was like somebody said, 'OK now you have work to do.'"

She found out the first international Angelman conference was in six weeks in Finland, and recruited her mother to come along to help care for Louie. Like most children with AS, Louie has difficulty sleeping, waking often in the night and still requiring a special adult-sized crib to keep him safe.

"Finland in July is 23 hours of sun, and I have a kid with a sleep disorder. It was ridiculous. In the middle of the night he would be wailing, and I would pace the lobby so my mom could get some sleep," Bichell recalled.

Also sleepless was Art Beaudet, M.D., the scientist who originally discovered the Angelman gene (or "the Yoda of the 15th chromosome," as Bichell calls him). They struck up a friendship in the wee hours, and the Bichells began supporting Beaudet's research to find a way to turn on the paternal gene.

At the conference, Bichell saw that the scientists weren't really connecting with the families and made it her mission to speed their discoveries from the lab into clinical trials. She became involved with various Angelman groups and supported researchers working in the field.

Angelman Syndrome (AS), named for British pediatrician Harry Angelman who first described the disorder in 1965, occurs in one in every 10,000-20,000 births. It is the medical school textbook example of genomic imprinting, a phenomenon that silences genes from either the mother or father. In the case of AS, the paternal copy of gene UBE3A on chromosome 15 is turned off, and the maternal copy fails to produce the necessary proteins.

"Terry Jo took it by the horns," David Bichell said. "The interest had been purely scientific—genomic imprinting, isn't that wacky? They really had blinders to turning that into a treatment. All along she has been pushing their scientific agenda into the clinic. Then carrying the ball all the way down the court, she decided to be more educated and figure it out herself."

Back to School

Bichell enrolled in the Vanderbilt Brain Institute's Neuroscience Graduate Program in 2010. She joined the lab of Kevin Haas, M.D., Ph.D., and began looking at the amount of neurotransmitters in the brains of mice with AS. Her mice showed abnormal increases and decreases in neurotransmitters but research colleagues in Memphis found the opposite pattern. There was no explanation for this difference, so Bichell drove to Memphis to make sure they were doing their dissections exactly the same.

"It's easier for me to find a babysitter at night, so I would put Louie on the bus at 9 in the morning, get to work about 11 and do all my dissections between 5 and 8 in the evening. [The researchers in Memphis] were doing theirs at 9 in the morning," she said.

Time of day was the only difference, and Bichell latched onto the idea that the biological clock, or circadian rhythm, is important in AS.

Long before her scientific training, Bichell started logging Louie's sleep patterns and noticed a five-week cycle.

"He would get more and more off over a month's time, then have a disastrous week and be back to normal. I really wondered if there was something about the gene that he's missing that functions in the biological clock."

More experiments she performed with Carl Johnson, Ph.D., and Shuqun Shi, Ph.D., showed that mice with AS had a 25.5-hour day, and the results were published in February in the journal *Current Biology*.

These findings could have huge implications for upcoming clinical trials for treatments for AS. There are two known ways to turn on the faulty gene—a brain cancer drug called topotecan and binding a DNA sequence known as an antisense oligonucleaotide—that could potentially reverse the effects of AS. A properly functioning biological clock could be an immediate signal that the treatments are working.

"We're hoping this circadian knowledge will give the pharmaceutical firms a biomarker. When the gene is turned on, the mice's clocks are normalized within a day. Anything you can change in a day is a great biomarker," Bichell said.

"I was so naïve. I thought by the time I finished grad school we'd have that gene turned on. Now that I know more about science, I realize it was crazy! But really I'm behind where I thought the research would be. I really thought we would have it in kids by now."

The Greater Good

The Angelman community was extremely reluctant to use the word "cure," but Bichell knew there had to be a drug that would turn on the gene, and eventually decided to find it herself. She's not at all disappointed other scientists beat her to it.

"There are two drug companies, Isis and Ovid, who say they are starting clinical trials in 2016. There is a cure in sight, and I want to help them get their drugs into kids," she said.

Today, Louie is an a ninth-grader at Hillsboro High School. He's a bit of a celebrity among his classmates and their families, and gives exuberant greetings to everyone he meets.

"Louie is a good kid. He's got a great sense of humor and is very affectionate and super attached to us. He does walk and does feed himself, and he's better at sleeping now that I know how sensitive he is to light," Bichell said.

She hopes to finish her Ph.D. this summer and then be involved with clinical trials or help translate scientific information for families and donors. Her husband David is proud of her perseverance.

"There are a thousand points of 'no' along this pathway and she's just pushing them aside. She doesn't let anything be an obstacle to what is her clear mission," he said.

"And it's all with sobering understanding that pretty much everything she's driving toward may be too late for Louie. But that doesn't change her resolve. She really is thinking about future kids." ■

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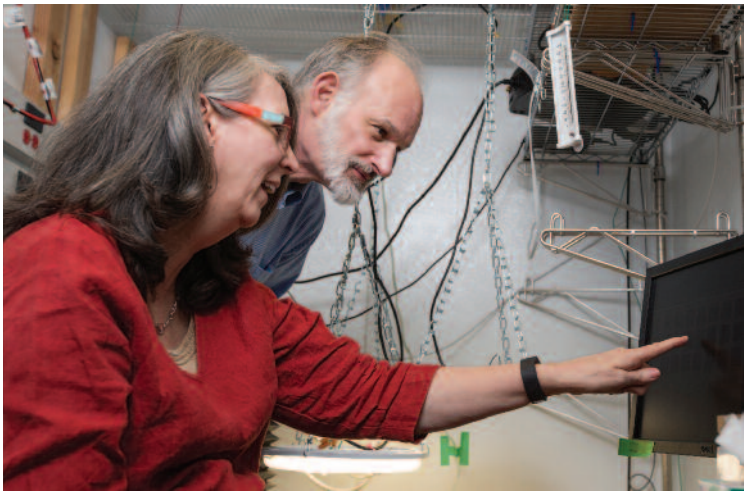
Carl Johnson, Ph.D., and Terry Jo Bichell study circadian rhythm in Angelman Syndrome.

JOE HOWELL



Alumni notes

1960s

Antonio (Tony) Gotto, M.D., '65, BA '57, received the 2015 American College of Cardiology Lifetime Achievement Award and the National Medical Fellowship's Excellence in Academic Medicine Award.

Richard Johnston Jr., M.D., '61, HS '63, BA '57, was honored by the Institute of Medicine for his outstanding service during the IOM's 44th annual meeting in Washington, D.C.

1970s

Ben Byrd, M.D., '77, HS '81, FE '83, FAC, professor of Cardiovascular Medicine, recently finished his 2013-2014 term as president of the American Society of Echocardiography, while his brother, **Thomas Byrd, M.D.**, '81, an orthopaedic surgeon, just completed his presidential year with the Arthroscopy Association of North America.

Aubrey Hough, M.D., '70, HS '75, has been named a University Professor at the University of Arkansas for Medical Sciences (UAMS). He is the first UAMS faculty member to receive the honor, which is conferred only to active faculty in recognition of an extended period of exemplary service to UAMS.

Roger Jones, M.D., '77, HS '80, has been named chief of staff for the Tennessee Valley Health Care System.

John Lea, M.D., '77, a retired cardiac and thoracic surgeon, will serve as chief medical officer for the National Scout Jamboree in 2017. He recently received the prestigious Buffalo Award for his tireless service and dedication to the Boy Scouts of America.

William Mattingly Jr., M.D., '73, HS '77, and his wife, **Sally Mattingly, M.D.**, '72, HS '77, traveled to East Africa with other Vanderbilt alumni with the Travel Program's Tanzania Migration Safari earlier this year.

Robert Schell, M.D., '74, HS '79, BA '70, has retired after practicing surgery in Owensboro, Kentucky, for 36 years. Over the years, Schell specialized in vascular surgery, specifically, abdominal aortic aneurysms.

Richard (Rick) Stahl, M.D., '76, has been appointed senior associate dean for strategic relationships at the Frank H. Netter MD School of Medicine at Quinnipiac University.

Anthony (Tony) Urbanek, M.D., '79, HS '77, FE '78, has invented the Explain My Pain (EMP) medical device, which eases jaw inflammation. He is a board-certified oral and maxillofacial surgeon.

SEND US YOUR NEWS

Email Ann Price, M.D., at medalum@vanderbilt.edu with alumni updates and photos.

1980s

Ken Berovitz, M.D., '85, has joined OSF HealthCare in Peoria, Illinois, as senior clinical vice president for the cardiovascular service line.

Joel Landzberg, M.D., HS '88, has been elected president and governor of the New Jersey Chapter of the American College of Cardiology.

Gregory LeMense, M.D., '89, HS '92, a board-certified pulmonologist, has joined Blount Memorial Hospital's medical staff and sees patients at East Tennessee Medical Group.

John Neylan, M.D., HS '82, a nephrologist, transplantation specialist and biopharmaceutical executive, has been named chief medical officer for Keryx Biopharmaceuticals, Inc.

James Segar Jr., M.D., HS '87, FE '88, has been named the inaugural professor and director of Reproductive Science and Women's Health Research, a newly established division of the Department of Gynecology and Obstetrics at Johns Hopkins University School of Medicine.

Valerie Short, M.D., '85, BA '81, is running for governor of Mississippi. She is a U.S. Air Force veteran having served for 10 years, three of those as an OB/GYN. Short recently completed her Master of Public Health degree at the University of Southern Mississippi.

Mark Werner, M.D., '84, HS '88, has joined the Chartis Group as national director of clinical consulting where he will work with clients on innovation around the design and implementation of health care delivery and clinical integration models capable of producing value for patients, members and providers.

1990s

Derek Abbott, M.D., '00, Ph.D., '98, has received the Arline H. and Curtis F. Garvin M.D. Professorship in Medicine at Case Western University School of Medicine where he is an associate professor with tenure in the Department of Pathology.

Ted Anderson, M.D., '93, Ph.D., '85, HS '94, FAC, has been elected treasurer for the American Congress of Obstetricians and Gynecologists.

Jeffrey Balser, M.D., Ph.D., '90, vice chancellor for Health Affairs and Dean of the Vanderbilt University School of Medicine, was named to the board of directors for the Center for Medical Interoperability.

Andrea Carlsen, M.D., '99, has joined the board of directors of the Vincent Smith School. She is board-certified in adult and child and adolescent psychiatry and is the medical director of North Shore TMS (Transcranial Magnetic Stimulation) in Huntington, New York.

Sarah England, Ph.D., FE '95, a professor of obstetrics and gynecology, has been named an inaugural Alan A. and Edith L. Wolff Professor of Medicine at Washington University School of Medicine in St. Louis.

Mark Fox, M.D., Ph.D., '97, has been appointed director and associate dean of Indiana University School of Medicine - South Bend. Fox is an expert in community health.

Katrina Gwinn, M.D., '91, HS '92, led a team that won the highest award given to any website for the U.S. government. The NINDS Parkinson's Disease Biomarkers Program Data Management Resource received the 2014 Best Overall Excellence.Gov award.

Dear Vanderbilt University Medical Alumni,

Congratulations, VUSM Class of 2015
The Vanderbilt Medical Alumni Association (VMAA) proudly welcomed the newest members of our medical alumni family, the VUSM Class of 2015, at a faculty appreciation/"almost alumni" luncheon on May 6. I know each of you joins me in celebrating their achievements as we begin to eagerly anticipate learning of their success in future alumni news/worthy of note editions of *Vanderbilt Medicine* magazine.

VMAA Host Program
More than 385 alumni participate in our VMAA Host Program. The interview cycle for the VUSM class of 2016 will begin soon. Please see the website to learn more about this program, which greatly decreases travel costs for our fourth-year students as they travel the country for residency interviews. Your participation as a host will be greatly appreciated.

VUSM Reunion 2016
Our next biennial VUSM Reunion is scheduled for **Oct. 20-22, 2016**, in conjunction with VU's Homecoming festivities. All VUSM classes ending in 0,1, 5, 6, the Quinq Classes '66 and '67, and the Quinq Plus classes (1965 and earlier) will gather for special anniversary class parties on Oct. 21. Visit our website for a preliminary schedule and check back frequently for updates.

VUSM Medical Education Opportunities for VU Homecoming/Reunion 2015 Participants
Are you a "dual" Vanderbilt alum celebrating a VU undergraduate reunion in 2015? While VUSM will not hold a reunion this year, the medical school will offer a strong slate of educational opportunities on Oct. 23 (many with CME) for alumni returning to campus for undergraduate Homecoming/Reunion festivities. Specialty-specific grand rounds and conferences are available for returning alumni. See our reunion website for a complete list.

VMAA Board Welcomes Four New Members
The VMAA board welcomes new representatives Ashlee Hurff Arteaga (Class of 2016), William Sullivan, M.D., (PGY-3, Medicine/Pediatrics), Rishi D. Naik, M.D., (PGY-3, Medicine) and Catherine Fuchs, M.D. (Linton Society).

Worthy of Note News
It is always great to hear from you. Please submit your alumni news for our next edition of *Vanderbilt Medicine* magazine. Send your news and photographs to medalum@vanderbilt.edu. We hope to hear from you soon.

Best Wishes,

Ann H. Price

connect with us ...

VMAA WEBSITES:
medschool.vanderbilt.edu/alumni
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ALUMNI PROFILE: JEFF SPERRING, M.D., '95

+
photo courtesy Seattle Children's Hospital
written by Christina Echegaray

VUSM prepared alum for leadership roles

Jeff Sperring M.D., '95, took on the role of chief executive officer of Seattle Children's Hospital in May, arriving armed with great memories and lessons learned from his days at Vanderbilt University School of Medicine.

"Vanderbilt was the perfect balance of high educational expectations but also the sense of being a part of a team and a community, and that students were important and supported," Sperring said in a telephone interview from his new office in Seattle. "Vanderbilt consistently ranked highly in student ratings for their medical education experiences—I've taken that through the rest of my career in a leadership role. I want people to have experiences and a level of engagement that motivates them and makes them want to do better."

Growing up in Atlanta, Sperring never had a deciding moment or influence to practice medicine. "I always thought about the opportunity to help people make a difference in life and I wanted to use science to be able to do that."

Sperring earned his Bachelor of Science in biology from Emory University in Atlanta. From there he went to Vanderbilt, where in his third year he fell in love with pediatrics. "Taking care of kids who are severely or chronically ill sort of stuck out to me," he said.

After medical school, Sperring's career took a rapid trajectory rising through the ranks of medicine. He did his residency in general pediatrics at Naval Medical Center in San Diego, where he also met his future wife, Amie, a naval nurse. Then he served three years as a pediatrician in the United States Navy Medical Corps in Twentynine Palms, California.

In 2002, Sperring went to Riley Hospital for Children at Indiana University Health where he formed the pediatric hospitalist program. Working alongside the CEO at Riley on several projects, he was named chief medical officer in 2009, and then CEO a couple of years later.

"I loved being a pediatrician because I felt like I could have an impact on kids and kids' health, but that was 20-25 patients a day," he said. "Leading a children's hospital, I get to think about how I can have an impact on children's health globally and work with thousands of team members who are dedicated to making a difference."

SNAPSHOT

VUSM GRADUATING CLASS
1995

HOBBIES
sports; golf; outdoor activities; house remodeling; woodworking

HOMETOWN
Atlanta

CURRENT RESIDENCE
Seattle

FAVORITE BOOK
"Leaders Eat Last" by Simon Sinek

FAVORITE MOVIE
"Hoosiers"

Thomas Johnston, M.D., '88, HS '92, was appointed to Nashville's TriStar Centennial Medical Center's board for a three-year term.

Sam Marzo, M.D., HS '97, has been named chair of the otolaryngology department at Loyola University Medical Center.

Gary Margolies, M.D., HS '90, certified in internal medicine and rheumatology, has joined Saint Thomas Health in Nashville.

Omer Shedd, M.D. '98, HS '01, is an electrophysiologist in North Carolina and recently was elected vice president of Promise for Haiti.

Kathryn Teng, M.D., '97, HS '99, has been named division director/chief for general internal medicine and community internal medicine at Metro Health Medical Center, the county hospital affiliate of Case Western Reserve University School of Medicine.

Benjamin (Ben) Van Voorhees, M.D., '90, HS '94, has been named interim chair of pediatrics at the University of Illinois-Chicago.

Eden Wells, M.D., HS '92, director of the University of Michigan School of Public Health's Preventative Medicine Residency in Ann Arbor, was named chief medical executive for the Michigan Department of Health and Human Services.

2000s

Sarah Bourne, M.D., '13, and Alexander Bick were married on April 30 in Boston. Bourne is a second-year neurosurgery resident at Massachusetts General Hospital.

Zach Brewer, M.D., '11, won the American Association for Thoracic Surgery (AATS) Top Gun Resident Competition, a simulated coronary anastomosis. Brewer is a fourth-year resident at Stanford.

Christopher Carey, M.D., HS '11, has joined the general surgery team at Integris Medical Group. He received the Harwell Wilson Award, given to the chief resident who epitomizes the ideals of dedication to patient care, research and teaching.

Jillian Copeland, M.D., '08, has been named chief resident of psychiatry at New York University.

Community of Support
+ Children's Hospital Board

The Monroe Carell Jr. Children's Hospital at Vanderbilt is growing to new heights on the shoulders of its board members, who are making key contributions to the campaign for a four-floor expansion, both in the giving of their time and resources.

Monroe Carell Jr. Children's Hospital Board members, including Bob Rolfe, Sarah Trahern and Joey Jacobs, are getting others excited about Vanderbilt's mission.

The Growing to New Heights Campaign is a $40 million effort to expand the size and reach of Children's Hospital to patients. As of press time, more than $29.3 million in gifts, pledges and verbal commitments has been received for the campaign to fund the new tower, which is expected to open in 2017.

Bob Rolfe, CEO of Medical Reimbursements of America, based in Franklin, Tennessee, and a board member since 2010, is leading the effort to get every Children's Hospital board member to support the expansion campaign.

His three children were born at Vanderbilt, and his role has only deepened over the years. He also received an executive MBA from the Vanderbilt Owen Graduate School of Management in 1988. His wife, Kathy, is a past president of Friends of Children's Hospital and served on a previous campaign for the hospital.

"There are points in time when the hospital will be over 100 percent occupied," he said. "This makes so much sense to expand the capacity. The level of care for the most critically ill children just cannot be duplicated or replicated ... there's really nothing like it."

Sarah Trahern's road to the Children's Hospital Board came through Music Row. Trahern, CEO for the Country Music Association (CMA), has more than 27 years of experience in network television, much of it in the business of country music.

Her affinity for Vanderbilt deepened as she graduated with an executive MBA from the Vanderbilt Owen Graduate School of Management in 2004. She joined the Children's Hospital Board in 2012 at the urging of a fellow officer at the Academy of Country Music, where she chaired the board at the time.

"The warm and welcoming atmosphere lets every patient and every family member know, as they walk through the door, that it's about them," she said. "It's such a built-in collaborative environment that patients coming have the advantage of multiple folks working on their care as opposed to a standalone hospital that may have one specialist."

Joey Jacobs is another veteran in the health care industry who is passionate about the mission of Children's Hospital. He is the chairman and chief executive officer of Acadia Healthcare, a Franklin, Tennessee-based provider of mental health services in the United States, Puerto Rico and the United Kingdom. He has served on the Children's Hospital Board since 2008.

Jacobs is leading by example. He and his wife, Deborah, helped support an earlier expansion at Children's Hospital, and they also have generously committed to supporting the coming expansion.

"We really think Vanderbilt is a special place, with nationally recognized faculty," he said. "I keep going back to that. There's only one Vanderbilt Children's Hospital, the Monroe Carell Jr. Children's Hospital at Vanderbilt, and it is world class." ■ *Matt Batcheldor*

Community support that helps the Growing to New Heights Campaign starts with the board.

Community of Support
+
Research Saving Lives

One important source of funding for young investigators is small philanthropic organizations, the grassroots groups that take up a cause and raise money, often in honor of a loved one impacted by cancer. Though their gifts may not equal the government's spending power, they can give researchers the jumpstart they need to earn future National Institutes of Health (NIH) grants or the flexibility to test an unusual idea that just might work.

H. Charles Manning, Ph.D., associate professor of Radiology and Radiological Sciences, said it is often selling foundations short to say that they only fill funding gaps. "Really, they let us tackle high-risk, high-reward ideas that may be too risky for government funding but could really pay off."

A great example of foundation support in action is Linda's Hope and its network of young professionals who support Vanderbilt-Ingram Cancer Center, including a discovery grant for Manning's research. Linda's Hope was founded in Nashville in 2009 after the loss of Meredith Crowley's mother, Linda, to pancreatic cancer.

Manning, 36, is developing a positron emission tomography (PET) imaging test that could help decide the best course of treatment for patients who are diagnosed with indeterminate cystic lesions on their pancreas. The test capitalizes on the translocator protein that Manning discovered was elevated in high-risk pre-malignant lesions and in pancreatic cancer.

On CT scan, there is no way to know if the lesions are malignant or benign. It's a difficult decision whether to wait and watch a vicious cancer grow, or to have surgery, which is routinely the extremely difficult and invasive Whipple procedure.

Pancreatic cancer has a very poor prognosis, often because it is discovered so late. Manning hopes the imaging test could help patients who need surgery get it sooner and avoid it in patients who don't. This offers not only better quality of life for patients but also reduced health care cost.

"We think young investigators can be more daring. They may have the crazy ideas that could really work," Crowley said. "Pancreatic cancer is the most underfunded and most deadly cancer. There are really terrifying statistics, and many people look at it as a death sentence. We want to provide hope. There is not much awareness because there are not survivors to talk about it. It's up to loved ones to spread the word and raise money." ■ *Leslie Hill*

Robert Chagrasulis, M.D., HS '01, has joined Franklin Health Surgery in Farmington, Maine.

Titus Daniels, M.D., FE '06, MPH '07, MMHC '11, FAC, has been named executive director of the Vanderbilt Medical Group and COO of Adult Clinical Operations. Daniels has worked at Vanderbilt for nearly 10 years, most recently as associate professor of Medicine and vice chair for Clinical Affairs.

Brett Donegan, M.D., '11, BE '06, recently matched into a fellowship position in interventional radiology at Emory University for the 2016-2017 year.

T. Mark Earl, M.D., HS '09, MSCI '07, a board-certified general surgeon who performed the first pancreas transplant in Mississippi, has been elected to the Diabetes Foundation board of directors.

David Eskind, M.D., '12, HS '15, an internal medicine resident, married Megan Dickson, RN, on Sept. 27, 2014.

Ryan Fritz, M.D., '13, MBA '13, HS, and **Cristin Quinn Fritz, M.D.**, '15, MPH '15, were married on May 16. Ryan is a second-year resident in the Department of Emergency Medicine at Vanderbilt.

Scott Hagan, M.D., '13 and **Anna Fahy, M.D.**, '13 were married in October 2014, and were selected to serve as chief residents for the University of Washington Internal Medicine Residency Program for the academic year 2016-2017.

George Hill, M.D., FE, FAC '01, was elected treasurer for the American Society for Reproductive Medicine. In his new role, Hill also fills a seat on the executive board.

Katie Jameson, Ph.D., FE '15, has joined Jansen BioTech as a medical science liaison specializing in solid tumor therapeutics.

Marlon Joseph, M.D., '11, recently finished an internal medicine-pediatrics residency at Rush University Medical Center and will be practicing primary care at Cambridge Health Alliance post-residency. **Kara Brown Joseph, M.D.**, '11, just graduated from a Psychiatry residency at Northwestern and started a Women's Mental Health Fellowship at Brigham and Women's in July.

Marwan Khalifeh, M.D., '00, joined the Navy Reserves as Lieutenant Commander, Medical Corps, and will be serving at Walter Reed National Medical Center as a plastic surgeon.

Michelle Kiger, M.D., '11, and her husband, Dave, welcomed their son, Asher David, on Feb. 27.

Jessica Lilley, M.D., '07, FE '13, is a pediatric endocrinologist at Children's of Mississippi in Tupelo. She has been elected to the Diabetes Foundation board of directors.

R. Bradley (Brad) Lindell, M.D., '12, and his wife, Karen Lindell, VU, JD, '12, welcomed daughter, Julia, on Jan. 5. Brad is starting a chief resident year at the Children's Hospital of Philadelphia.

Eric Liu, MSCI '13, FAC '15, has joined Rocky Mountain Cancer Centers in Denver, specializing in the treatment of neuroendocrine tumors.

Zurabi Lominadze, BA '08, M.D., '12, will be doing a gastrointestinal fellowship at Loyola.

Bonnie Mackenzie, M.D., '06, BS '02, and her husband, Scotty, welcomed a daughter, Sophie Campbell (Cami), on May 18, 2014.

Mary Alice Mina, M.D., '08, and her husband, George, welcomed their second child, Lucy Aida, on Feb. 24. She joins big brother, George. Mary Alice practices Mohs surgery and dermatology at Georgia Dermatologic Surgery Centers and Emory University in Atlanta.

Pharis Mohideen, M.D., MSCI '06, has joined Atterocor, Inc., as chief medical officer. The company is developing novel therapy for adrenal cancer.

Lara Phillips, M.D., '11, HS '14, will graduate from the Wilderness Medicine Program through Harvard at Massachusetts General Hospital this year. As part of that fellowship, she was working in a high altitude clinic in the Himalayas and was also in Nepal during the earthquake. **Charles Phillips, M.D.**, '11, HS '14, is finishing his chief year in pediatrics. They moved to Philadelphia in July where he will start his fellowship in pediatric hematology/oncology at Children's Hospital of

Faces & Places

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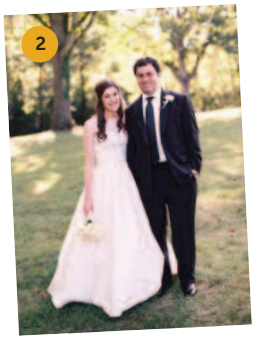

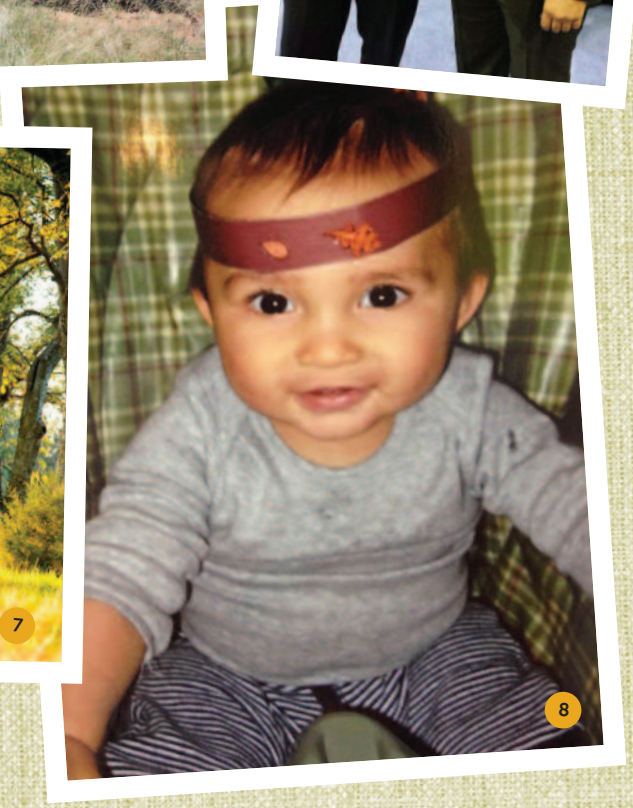

1. Sophie Campbell (Cami), daughter of Bonnie Mackenzie, M.D., '06, and her husband, Scotty; **2.** David Eskind, M.D., '12, HS '15, and his bride, Megan Dickson, RN; **3.** Natalie Ausborn Lockney, M.D., '13, and Tim Lockney, M.D.,'13, center, celebrating their April nuptials with several members of the VUSM 2009 first-year class (from left to right) Scott Hagan, Anna Fahy Hagan, Ben Deschner, Weston Langdon, Kevin Kumar, David Moore, Neil Bansal, Michael Poku, Bobak Parang, Laila Hassam-Malani Mohammad, Rishi Naik, Devin Patel, Meredith Sellers, Michael Pelster and Vishruth Reddy; **4.** Vanderbilt alumni on the Travel Program's Tanzania Migration Safari; **5.** Zach Brewer, M.D., '11, right, with James Fann, M.D., who served as his coach for the AATS Top Gun Resident competition; **6.** Lucy Aida, daughter of Mary Alice Mina, M.D., '08, and her husband, George; **7.** Katie Jameson, Ph.D., FE '15, and her husband, Neil Phillips, wed in October 2014; **8.** Bodhan (Bodhi), son of Nishant Sekaran, M.D., '06, and his wife, Jami.

+
photo by Barbara Proud
written by Christina Echegaray

AAP President Dedicates Career to Childhood Obesity

Sandra Hassink, M.D., FAAP, '78, was a trailblazer in treating childhood/teenage obesity, starting a weight management clinic in 1988 at Alfred I. duPont Children's Hospital, well before most pediatricians even realized there was an issue to address. Today, childhood obesity has reached epidemic levels plaguing the youngest generations.

"In those days, childhood obesity was not on anyone's radar screen. I was seeing children and adolescents with obesity who were not well, and they wanted to lose weight," said Hassink, who currently serves as president of the American Academy of Pediatrics (AAP), a role she assumed in January. "There had been no focus on weight issues in medical school. So, I began a journey of trying to find ways I could help engage nutrition and exercise folks. At first, it began as a couple days of clinic a week, and then eventually I built it to be a full-time, five-day-a-week clinic. I've dedicated my entire professional life to taking care of children with obesity."

Hassink recalls a snowy day when she drove to a give a Grand Rounds lecture to find only three people present for her talk. "Obesity was unusual at that time. The epidemic hadn't taken hold then, and I don't think people realized what was coming. Unfortunately, today 30 percent of children and adolescents are obese or are overweight," she said.

No single cause is to blame for the epidemic, she says, noting a host of reasons that contributed, including sugary drinks, processed foods, less physical activity, more sedentary time, reduced recess and physical education, screen time, lack of access to healthy foods, among others.

As an undergraduate majoring in chemistry at the University of Delaware, Hassink wanted to combine her love for science with a people-oriented profession, leading her to medicine. When her husband, Bill Hassink, got a job at the Old Hickory, Tennessee, plant for DuPont, she applied to Vanderbilt University School of Medicine, where she was one of 14 women in her graduating class.

Looking back on medical school, she said Harry Greene, M.D., former chief of the Division of Pediatric Gastroenterology/Nutrition, had an influence on her career. "Certainly having that exposure to having someone so committed to pediatric nutrition had an impact," Hassink said.

In the almost 30 years since she founded the Nemours/Alfred I. duPont Weight Management Clinic, she has become an internationally recognized expert in childhood obesity prevention, testifying before Congress and serving as chair of the Delaware Governor's council on Health Promotion and Disease Prevention and directing the AAP Institute for Healthy Childhood Weight. Before becoming AAP president, she served as president of the AAP Delaware Chapter; a member of the AAP Board of Directors; chaired the AAP Obesity Leadership Workgroup, the AAP Institute for Healthy Childhood Weight Advisory Committee, and the AAP Strategic Planning Committee. She authored numerous articles for parents and pediatricians and two books: "Pediatric Obesity: Prevention, Intervention, and Treatment Strategies for Primary Care" and "A Clinical Guide to Pediatric Weight Management."

SNAPSHOT

VUSM GRADUATING CLASS
1978

HOBBIES
Weaving, gardening

HOMETOWN
Springfield, Pennsylvania

CURRENT RESIDENCE
Wilmington, Delaware

FAVORITE BOOK
1776 by David McCullough

FAVORITE MOVIE
Star Trek, 2009

Philadelphia and she will be working at Jefferson University Hospital.

Stephen Schleicher, M.D., '11, is completing an internal medicine residency at Brigham and Women's Hospital and then moving to New York City for his oncology fellowship at Memorial-Sloan Kettering.

Nishant Sekaran, M.D., '06, and his wife, Jami, welcomed a baby boy, Bodhan Ballantine (Bodhi), on April 17. The family resides in Durham, North Carolina, where Nishant is doing a fellowship at Duke and Jami is a pediatric dentistry resident at the University of North Carolina.

Meredith Sellers, M.D., '13, BA '09, was selected to be a chief resident in internal medicine for the 2016-2017 academic year at Northwestern Memorial Hospital. Last year, she also received the Dr. A.A. Goldsmith award, an institution-wide award given to the first-year trainee who best exemplifies humanness and empathy toward patients and their families. Meredith hopes to pursue a fellowship in hematology/oncology after her chief year.

Evan Silverstein, M.D., '10, HS '14, has accepted a position at Virginia Commonwealth University as a pediatric ophthalmologist, effective in September.

Velmalia Matthews-Smith, M.D., BA '97, FE '10, has joined St. Lawrence Health System in New York as a hematologist/oncologist.

Worthy of Note
+
Kyla Terhune, M.D.

The General Surgery residency program at Vanderbilt School of Medicine has a new program director, but one with a familiar face.

Kyla Terhune, M.D., HS '11, associate professor of Surgery, took over the residency program, which is one of the largest on campus. She replaced John Tarpley, M.D., '70, who served in that role for nearly two decades.

Tarpley, a professor of Surgery and Anesthesiology, who is continuing his other clinical and academic duties, highlighted Terhune's experience that makes her ideal for the job—including her time as a high school basketball player.

"She is a point guard, a teacher, a coach—great attributes and skills to lead our Surgical Residency program," he said. "She coaches folks up rather than judges or puts them down."

In the role, Terhune is charged with coordinating all aspects of the General Surgery residency, including the medical student interview and selection process, mentoring the 75 residents going through the program and assuring that all accreditation requirements for the residency are met.

While the transition was official on Nov. 2014, Terhune, who is also an assistant professor of Anesthesiology, has been playing a key role in the residency program role for several years.

"She and I have been sharing this job for a while," Tarpley said. "Every year she has done more and more."

Terhune emphasized that she and Tarpley have long shared the same vision for the residency, and the change will be seamless.

"I have been certainly very lucky to be able to learn from and work closely with Dr. Tarpley over the past decade," she said. "We both value and support residents, their education and their well-being and see the idea of working for the residents as one of the most rewarding jobs in the world." ■

C.J. Stimson, M.D., '08, JD '10, HS '14, has been named the 2015 H. Logan Holtgrewe Legislative Fellow. He is the first honoree of this new program, which is designed to prepare and educate urology residents and fellows in the legislative aspect of health policy.

Billy Sullivan, M.D., '13, MEd '13, and his wife, Elizabeth, welcomed a daughter, Amelia Grace, on Dec. 16, 2014. Billy is a second-year internal medicine and pediatrics resident at Vanderbilt.

Caitlin Toomey, M.D., '10, and **Ned Ruhotina, M.D.**, '11, are engaged and planning a May 2016 wedding. After graduating from Vanderbilt, Michelle completed an internal medicine residency at Northwestern in Chicago and is a primary care physician and assistant professor of medicine at Tufts Medical Center in Boston. Ned is about to start his chief year of urology residency at Brigham and Women's.

Haritha Veeramachaneni, M.D., '07, has joined Long Island Plastic Surgical Group, specializing in nerve repair and breast reconstruction.

Adam Wegner, Ph.D., '08, M.D., '12, and **Mary Baldwin,** BS '04, Ph.D., '12, welcomed a daughter, Addison Irene, on Dec. 24, 2014. He recently finished a research year where he received two resident research grants to study post-traumatic arthritis.

Mike Wolfe, M.D., '12, is beginning a fellowship in pediatric critical care and his wife, **Rachel Wolf, M.D.**, '15, is starting a med-peds residency at the University of Pittsburgh Medical Center.

Losses

Emanuel Abraham, M.D., '49, died March 29. He was 93. Dr. Abraham was predeceased by his wife, Helen, and is survived by his children Lynn, Susan, Mark and Lee; nine grandchildren; and one great-grandchild.

Fred Allison Jr., M.D., '46, HS '47, FAC '02, professor of Medicine, emeritus, and former chief of the Division of Internal Medicine, died May 8. He was 92. Dr. Allison is survived by his wife, Clara; children Rebecca, Martha, Fred and Robert; and three grandchildren.

Walter Bonney Jr., M.D., FAC '67, died April 18. He was 85. Dr. Bonney was predeceased by two daughters and is survived by his wife, Virginia, daughter Amy, and one grandson.

Ernest Buxton III, M.D., HS '69, died March 15. He was 73. Dr. Buxton is survived by his wife, Georgia; children Georgia, Elizabeth and Courtnay; five grandchildren and one step-grandson.

George Coale III, M.D., HS '60, died Jan. 22. He was 85. Dr. Coale is survived by his brother, Robert; son John: stepchildren John and Ann; two grandchildren and four step-grandchildren.

John Currie, M.D., FAC '03, died April 22. He was 72. Dr. Currie is survived by his children John, Lauren, Caroline, KC and Wilbur; and six grandchildren.

John Dampeer Jr., M.D., HS '51, died March 8. He was 90. Dr. Dampeer is survived by his wife, Milly; children John, Mac and Johanna; four stepsons and 20 grandchildren and great-grandchildren.

Dr. G. William (Bill) Davis, M.D., HS '63, BA '54, died March 11. He was predeceased by his first wife, Jean, and is survived by his wife, Margie; children Bing and Gina; and five grandchildren.

Richard (Dick) Doyle, M.D., HS '66, died Jan. 12. Dr. Doyle was predeceased by his wife, Marilyn, and is survived by his children Thomas, Owen and Helen; nine grandchildren and two step-grandchildren.

James Elliott, M.D., FAC '02, professor of Ophthalmology and Visual Sciences, Emeritus, died April 17. He was 88. He was the first chair of the Department of Ophthalmology at Vanderbilt University School of Medicine. Dr. Elliott is survived by his wife, Roberta; children Rick, Jack, Steve and Elaine; stepchildren Tamara and Robert; and several grandchildren and great-grandchildren.

James (Jimmie) Finney Jr., M.D., '64, BA '60, died April 15. He was 77. Dr. Finney is survived by his wife, Pattie Perry; children Margaret, Perry, James and Mabel; and four grandchildren.

Robert Fulenwider, M.D., HS '55, died Nov. 13, 2014. He was 89. Dr. Fulenwider was predeceased by his wife, Susan. He is survived by his children Robert, Ann and Mark; stepson Matthew Little, and nine grandchildren.

William (Bill) Fuqua, M.D., '49, died March 14. He was 90. Dr. Fuqua is survived by his wife, Mary; children Lucy and William; four grandchildren and three great-grandchildren.

Stanley Glasser, M.D., FAC '73, died May 1. He was 88. Dr. Glasser is survived by his wife, Dorothy; two children, two grandchildren and one great-grandchild.

Robert F. Heimburger, M.D., '43, died June 9. He was 97 years old. Dr. Heimburger is survived by sons Corbett (Carol), Doug (Beth), daughter-in-law Barbara Fletcher, 12 grandchildren and 15 great grandchildren.

Timothy (Tim) Hulsey, M.D., '74, HS '83, died Nov. 18, 2014. He was 65. Dr. Hulsey is survived by his wife, Cynthia; children Brian, Kevin and Seth; and two grandchildren.

Sally Ann Jaggard Killian, M.D., FAC '91, died April 13. She was 59. Dr. Killian is survived by her husband, Thomas; children Ann, Mary, Patrick and Bridget.

Abrose Langa, M.D., HS '54, died April 7. He was 94. Dr. Langa is survived by his children Carol, Erin and Paul; eight grandchildren and 11 great-grandchildren.

Neville Lefcoe, M.D., '50, HS '51, died Jan. 11. He was 90. Dr. Lefcoe is survived by his wife, Marilyn; children Daniel, Robert, Jane and Andrew; and eight grandchildren.

John McGill, M.D., '46, died Nov. 11, 2014. He was 92. Dr. McGill is survived by his wife, Mabel; children John, Charles, Frances, Meredith and Elizabeth; and six grandchildren.

Clay Miller, M.D., '43, died Nov. 21, 2014. He was 96. Dr. Miller is survived by his wife, Bennetta; children Lynne, June and Dawn; 11 grandchildren and 10 great-grandchildren.

David Ong, Ph.D., FAC '08, professor of Biochemistry, emeritus, whose contributions to research in the area of vitamin A biochemistry were recognized worldwide, died April 25. He was 71. He is survived by his fiancée, Lili, four brothers and one sister; and two stepchildren.

Judson Randolph, M.D., '55, HS '49, BA '50, a member of the Vanderbilt University Board of Trust for more than two decades and longtime chief surgeon at Children's Hospital in Washington, D.C., died May 17. He was 87. Dr. Randolph is survived by his children Somers, Garrett, Judson Jr., Adam and Comfort, and several grandchildren.

Scott Shappell, M.D., Ph.D., FE '97, died April 1. He was 52. Dr. Shappell is survived by his wife, Heidi; son, Travis; and many members of his extended family.

Robert (Bob) Smith, M.D., HS '63, died Dec. 15, 2014. He was 83. Dr. Smith is survived by his wife, Helen; children Joseph, Julie, James and George; eight grandchildren and three great-grandchildren.

Reza Soltani, M.D., died Dec. 3, 2014. He was 91. Dr. Soltani is survived by his wife, Nosrat; five children and nine grandchildren.

Bob Stempfel Jr., M.D., '52, died Nov. 3, 2014. He was 90. Dr. Stempfel is survived by his wife, Sarah; children Anna and Ted; and three grandchildren.

Robert (Bob) Stine, M.D., '72, died Feb. 22. He was 72. Dr. Stine is survived by his wife, Nancy; children Nancy and Robert; and five grandchildren.

Elizabeth Szalay, M.D., FAC '87, died Dec. 29, 2014. She was 61. Dr. Szalay is survived by her husband, Ken; stepchildren Juliane, Joel and Luke; and two grandchildren.

Oscar Touster, Ph.D., FAC '02, professor of molecular biology and biochemistry, emeritus, and first chair of the Department of Molecular Biology, died Feb. 27. He was 93. Dr. Touster was predeceased by his wife, Eva, poet and professor of English, emeritus, at Peabody College. He is survived by his daughter, Alison, and two grandchildren.

Thomas (Tom) Weatherall, M.D., '53, died Feb. 2. He was 85. Dr. Weatherall is survived by his wife, Jennifer; children Thomas, Wendy and Rebecca; and seven grandchildren.

Lee Worley, M.D., '54, HS '55, died April 10. He was 87. Dr. Worley is survived by his wife, Christine; children Ellen, Adrienne, Jonathan and Michael; four grandchildren and two step-grandchildren.

VUMC THROUGH TIME

Levi Watkins Jr., M.D., '70, shown here in 1990, was a renowned cardiac surgeon, champion of racial equality and diversity, and the first African-American to be admitted to and graduate from Vanderbilt University School of Medicine. Dr. Watkins died April 11, from complications after suffering a stroke.

1970

MEDICINE
The Occupational Safety and Health Act, or OSHA, was signed into law. The Institute of Medicine was established to examine policy issues that affect the health of the public.

ENTERTAINMENT
American Top 40, hosted by radio personality Casey Kasem, became the first successful nationally syndicated radio program featuring a weekly count-down. The Beatles broke up.

BREAKING NEWS
Four protestors at Kent State University in Ohio were killed by National Guard troops. An explosion on board the Apollo 13 lunar mission forced the crew to abort their mission to the moon and devise a way to bring the spaceship home.

VANDERBILT MEDICINE
Vanderbilt University
D 8200 Vanderbilt University Medical Center North
Nashville, TN 37232-2106

CHANGING LIVES

Second-year student Adil Faqih (above) and David Patterson, M.D., '85, share more than a passion for medicine—each received exceptional encouragement and support from their parents. Patterson honored his parents by creating the Alice and V.K. Patterson Scholarship. That life-changing generosity allows Adil to pursue his studies without incurring huge debt.

To learn more about supporting scholarships for medical students, contact Mary Beth Thompson at mary.beth.thompson@vanderbilt.edu or (615) 322-8846.

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