

# Medical Bulletin

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL

SPRING 2018

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## THE SMALL BUT MIGHTY CELL



50 years of blood and marrow transplant expertise at the U paves the way for new cell therapies

14 Figuring out why a brain gets out of tune

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# On the fast track

A new B.A./M.D. pipeline program welcomes a diverse group of freshmen bound for medical school

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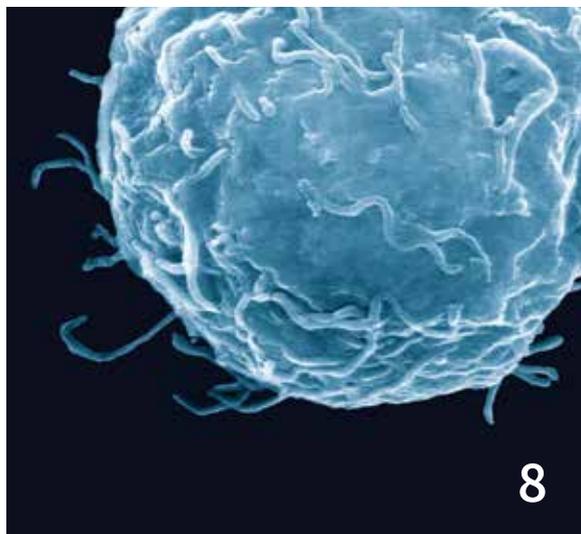
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# Medical Bulletin

SPRING 2018



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## A proud legacy



AS WE CELEBRATE the Medical School's 130th anniversary this month, we are excited to recognize both new developments as well as breakthroughs of the past. We are projecting the needs of the future and working to put people in place today who will drive the care improvements necessary for good health and quality of life tomorrow. (Visit [med.umn.edu/about/history](http://med.umn.edu/about/history) to view a timeline of the Medical School's milestones, and watch for special online anniversary features starting later this spring.)

Our vision is to create a legacy of excellence by training superb and compassionate physicians—scientists with the courage and expertise to pursue life-changing discoveries—and by improving the lives of Minnesotans through the highest-quality medicine.

To achieve that vision, we started the year with a refocused mission: to combine our scientific and clinical strengths to deliver the best in innovative, accountable, compassionate care to our patients and to impact the field of medicine for all. We are working to do this by building on our foundation, composed of five intertwined parts:

patient care, research, education, service to community, and legacy.

As alumni, you are our legacy. How well have we equipped you to make change in our world? We'd like to know. Your feedback helps us understand how to improve the experience for future students, residents, and fellows. We want to be a medical school that makes you proud.

As friends, you are our community, no matter where you are. Service to community is a critical part of our mission as a land-grant university. We do not perform research, teach, and provide care in a vacuum. Input from the community helps us to focus on unmet needs, improve our practices, and become your go-to source of compassionate and cutting-edge care.

Your voice is important to our future. Please let us know what you are thinking by contacting me at [MSDean@umn.edu](mailto:MSDean@umn.edu). 

*Jakub Tolar, M.D., Ph.D.  
Dean, Medical School  
Interim vice president, Health Sciences*

## Pacala at the helm in family medicine

James Pacala, M.D., M.S., new head of the Department of Family Medicine and Community Health, feels lucky but not complacent. "I'm in the enviable position of taking over a department that's highly accomplished and rated," he says. "We're a top 10 department, but the goal is to be No. 1."

He envisions a threefold approach to getting there: build upon the department's academic excellence in research and scholarship, continue to serve underserved communities, and continuously search for innovative care models—already the bedrock of physician training at the U, says Pacala, who assumed his new role on December 1. The board-certified family physician and geriatrician has been with the department since 1992, most recently serving as its associate head. He follows Macaran Baird, M.D., M.S., who held the top position for 15 years.

"Academic research and community outreach are inextricably linked," Pacala says. They, in turn, are tied to innovative care. "How is primary care changing and how will it be delivered with new technologies being developed? All those innovative care models we study and develop will be in underserved areas."

Pacala views his experience in geriatrics as the ideal background for his position. "The basic philosophical anchors of family medicine and geriatrics are congruent—a holistic approach to health care."

Moreover, he says, geriatrics is a model for managing complex patient care, an essential skill in 21st century family practice. "Family physicians are going to be handling more complex patients: chronic illness, more patients with potentially clashing treatment plans. Geriatrics was one of the pioneers of case management and care coordination."



Pacala's quarter century at the Medical School has prepared him well, says Medical School Dean Jakub Tolar, M.D., Ph.D. "Dr. Pacala is a strong, loyal, and innovative leader whose extensive experience will be key to continuing the nationally recognized work of this department." 

## MEMORY KEEPERS MDT GETS A NEW SPACE

A new home for the Medical School's Memory Keepers Medical Discovery Team (MDT) opened in Duluth in November. The space serves as a comfortable environment to collaborate and connect with the state's Native American and rural communities.

"I see this building and our space design as a research tool," says J. Neil Henderson, Ph.D., executive director of the Memory Keepers MDT. "The purpose of getting this together is to meet face-to-face and break out of ourselves."

The state-supported Memory Keepers MDT was created to address health disparities, particularly those that American Indian and rural populations experience. These groups are disproportionately affected by dementia and diabetes, and the MDT aims to develop interventions and research to meet the health needs of people living far from the resources of urban population centers.

## U team is first to implant new DBS device

In December, University of Minnesota Health physicians became the first in the United States to implant a newly approved medical device that could further help people living with Parkinson's disease and other movement disorders, such as essential tremor and dystonia.

The Food and Drug Administration approved the new deep brain stimulation (DBS) device from

Boston Scientific, the third such device available in the United States, earlier that month.

Boston Scientific's Vercise DBS system allows the care team more precision and flexibility over previous models, says M Health neurologist Jerrold Vitek, M.D., Ph.D., who leads the U's Udall Center of Excellence for Parkinson's Disease and the Medical School's Department of Neurology. Vitek also served as the lead national researcher for a clinical trial to evaluate the device.

In DBS, neurosurgeons implant a thin wire – called a lead – into targeted areas of a patient's brain. Electrical stimulation is delivered via the lead, which helps control the abnormal activity in the brain that leads to tremors, stiffness, and slowness of movement associated with Parkinson's disease.

*"I believe this device has unique capabilities that will help us optimize the benefits of treatment while reducing the incidence of side effects."*

– Jerrold Vitek, M.D., Ph.D.,  
Department of Neurology



PHOTO: ANDREW RANALLO

The Medical School's Duluth Campus is nationally recognized as a center of rural, American Indian, and indigenous health research. In 2017, *U.S. News and World Report* ranked the University of Minnesota Medical School third in the country for rural medicine. The Duluth campus also boasts one of the highest American Indian faculty ratios at any medical school in the country. [MIB](#)



### WEB EXTRA

Take a video tour of the new Memory Keepers MDT space at [z.umn.edu/memorykeeperspace](http://z.umn.edu/memorykeeperspace).



Each lead on the Vercise has eight individual contact points for precise delivery of electrical stimulation. Those contact points are connected to separate current sources, which means neurologists are able to individually control each contact on the lead, increasing the electrical current to some while reducing the power in others.

"I believe this device has unique capabilities that will help us optimize the benefits of treatment while reducing the incidence of side effects," Vitek says. [MIB](#)

## UNIVERSITY OF MINNESOTA MEDICAL SCHOOL

Jakub Tolar, M.D., Ph.D.  
Dean

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PHOTO: JACK MCTIGUE

## U is first to produce a 10.5 Tesla MRI of a human

SCIENTISTS AT THE University of Minnesota's Center for Magnetic Resonance Research (CMRR) are breaking barriers again. In December they produced the world's first MRI of the human body at 10.5 Tesla—a magnetic field strength seven times greater than a standard MRI.

The 110-ton magnet promises to produce finely detailed scans, bringing new capabilities to scientists studying how the body works. In turn, these discoveries may help physicians more precisely choose the best treatment options for a wide range of diseases, such as Alzheimer's, heart disease, diabetes, and cancer.

The CMRR team plans to further develop the capabilities of the 10.5-Tesla magnet and its supporting hardware.

While the magnet is capable of imaging the entire body, CMRR scientists are focusing on the brain. Much of what researchers know about brain circuitry comes from the Human Connectome Project, a collaborative national effort that included the work of CMRR and changed the landscape of how scientists understand the brain.

Given that most of the Human Connectome Project was conducted with a 3-Tesla magnet, the much stronger 10.5-Tesla instrument promises to be a tool for unlocking new discoveries and keeping the U of M at the forefront of neuroscience research, says CMRR director and Medical School professor Kamil Ugurbil, Ph.D.

"This is an instrument with which we want to push the boundaries of imaging brain function," he says. [MIB](#)

Center for Magnetic Resonance Research director Kamil Ugurbil, Ph.D., and his team are known for pushing the limits of imaging technology.

## CHAINBREAKER

### SAVE THE DATE FOR CHAINBREAKER 2018

Join us August 10–12 for a three-day weekend of cycling, entertainment, and volunteerism to support lifesaving research at the Masonic Cancer Center, University of Minnesota. Chainbreaker offers a full-service experience that ensures a safe, successful, and fun weekend for all riders.

For the inaugural Chainbreaker ride last August, 1,021 cyclists—ranging from age 14 to 81—and more than 400 volunteers joined the effort. The event raised nearly \$1.4 million for the Masonic Cancer Center—one of only 49 National Cancer Institute–designated Comprehensive Cancer Centers in the country. [MIB](#)

*Find more information about this year's events at [chainbreakerride.org](http://chainbreakerride.org).*

## Bone cancer research advances to clinical study

A Phase I clinical trial has opened to test a new treatment for recurrent and refractory osteosarcoma. The therapy stems from discoveries in the University of Minnesota lab of Branden Moriarity, Ph.D.

Moriarity, a Masonic Cancer Center member and an assistant professor in the Medical School's Department of Pediatrics, has been working with the Rochester, N.Y.–based company Vaccinex Inc. for the past few years to bring the therapy to people with this stubborn type of bone cancer.

The study will determine the optimal and safe dose of a medication that's designed to inhibit the gene SEMA4D, which Moriarity and colleagues found was associated with osteosarcoma's growth. Vaccinex produces an antibody that has been used to target SEMA4D in clinical trials for other types of solid tumors.

The osteosarcoma clinical study, supported by the National Cancer Institute, is available at University of Minnesota Masonic Children's Hospital and other sites around the country. [MIB](#)

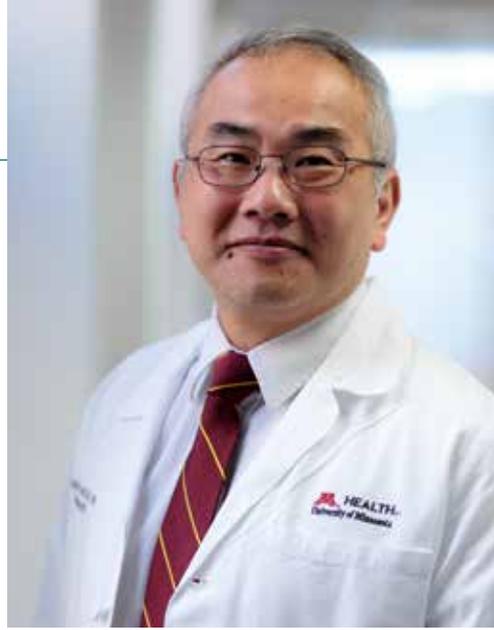
## Laser-focused treatment

Hibbing resident Peter Carvalho, 27, in January became the first person in Minnesota to have brain surgery using the ClearPoint Neuro Navigation System, a minimally invasive, MRI-directed technique.

The surgery, which employed thermal ablation to destroy a tumor in Carvalho's brain, was performed in an MRI suite, eliminating the need to move Carvalho between the operating room and MRI scanner. Direct visualization allows surgical maneuvers to be adjusted in real time, making the procedure safer.

"The ability to 'look inside' the brain through the MRI eliminates the need for a big incision or removing a significant portion of the skull," says Clark C. Chen, M.D., Ph.D., head of the Medical School's Department of Neurosurgery and holder of the Lyle French Chair in Neurosurgery, who performed the procedure. "By combining the ClearPoint and the laser technology, I was able to safely treat a large tumor through an incision smaller than a pencil eraser."

Chen also used the real-time MRI to monitor the amount of tumor destroyed and to prevent injury to the patient's brain. [MIB](#)



## MEDICAL SCHOOL NAMES NEW FACULTY AFFAIRS DEAN

The Medical School has named Amanda Termuhlen, M.D., its new associate dean for faculty affairs. When she joins the University in June, she will be responsible for all aspects of the Office of Faculty Affairs, including faculty development, promotion and tenure, diversity and inclusion, and general faculty issues.

Termuhlen comes to the U from the Keck School of Medicine of the University of Southern California. She is the medical director of clinical services and director of faculty development and medical education in the Division of Pediatric Hematology/Oncology/BMT at Children's Hospital Los Angeles.

An internationally recognized expert in rare pediatric non-Hodgkin lymphoma, Termuhlen focuses her research on clinical trials for lymphoma and studies on the late effects of cancer treatment in children and adolescents. [MIB](#)



## Ryan named HOT Division director

The University of Minnesota Medical School has named Charles J. Ryan, M.D., the new director of the Department of Medicine's Hematology, Oncology, and Transplantation Division. He will also serve as associate director for clinical research in the Masonic Cancer Center and will hold the B.J. Kennedy Chair in Clinical Medical Oncology.

Ryan comes to the U from the University of California, San Francisco, where he was a professor of clinical medicine and urology, a Thomas Perkins Distinguished Professor in Cancer Research, and the associate director for clinical science at the Helen Diller Family Comprehensive Cancer Center. He is internationally recognized for his research on the roles of androgens and the androgen receptor in prostate cancer.

Ryan received his M.D. from the University of Wisconsin. He completed an internal medicine residency at the University of Wisconsin and a fellowship in medical oncology at Memorial Sloan-Kettering Cancer Center.

He joins the Medical School in April. [MIB](#)



LOCATION: Morocco MISSION: Crossing borders to remedy rural physician shortages



## Collaborative spirit

PATIENTS AND DOCTORS alike feel reverberations of the physician shortage in rural Morocco. University of Minnesota Medical School, Duluth Campus students couldn't help but notice that the physicians they shadowed at six clinics and hospitals across the country last June raced through their clinic rounds.

"The average time spent with each patient was 3 to 5 minutes, or sometimes less," recalls second-year medical student Emily Lund, who made the trip with three classmates.

Regional campus dean Paula Termuhlen, M.D., had traveled with Ruth Westra, D.O., M.P.H., and Mustafa al'Absi, Ph.D., both with the Department of Family Medicine and BioBehavioral Health, in January 2017 to explore possible medical education opportunities.

Despite the rushed exams, the Duluth faculty members found Morocco's solutions to combating its nationwide shortage of rural doctors—also a problem in the United States and in many other countries throughout the world—to be resourceful and cooperative.

"You see a lot of rural medical professionals working together in the same space," says al'Absi. "We thought that was a great way for professionals to consult with one another. And we were impressed with the collaborative spirit held by the minister of health and our colleagues at the University of Fez."

Termuhlen, Westra, and al'Absi hope to build a collaborative relationship with the University of Fez so that the student trip can continue annually. Lund and her fellow student participants are helping to select next year's cohort, as well as looking into ways to host Moroccan medical students in Minnesota to build reciprocity.



### SUBMIT YOUR WORK

The *Medical Bulletin* is seeking compelling photos and stories featuring U of M Medical School student, alumni, or faculty experiences abroad. Selected submissions will be published in future issues of the *Medical Bulletin*.

For more information or to submit your photo or story, email managing editor Nicole Endres at [nendres@umn.edu](mailto:nendres@umn.edu).



PHOTOS: EMILY LUND

The students' five-day observational visit to Morocco, a culturally and religiously diverse crossroads between the Mediterranean and Francophone Africa, proved enlightening. The students were able to talk openly with their Moroccan peers and physicians about institutional solutions to the rural physician shortage. They also had the chance to shadow doctors in the clinic. One Moroccan doctor in particular stood out to the group.

"He got out from behind his desk and was very gentle and interactive," says Lund. "One patient turned to us and said, 'This is the best doctor I have ever had. He listens to what my body and I are saying.'"

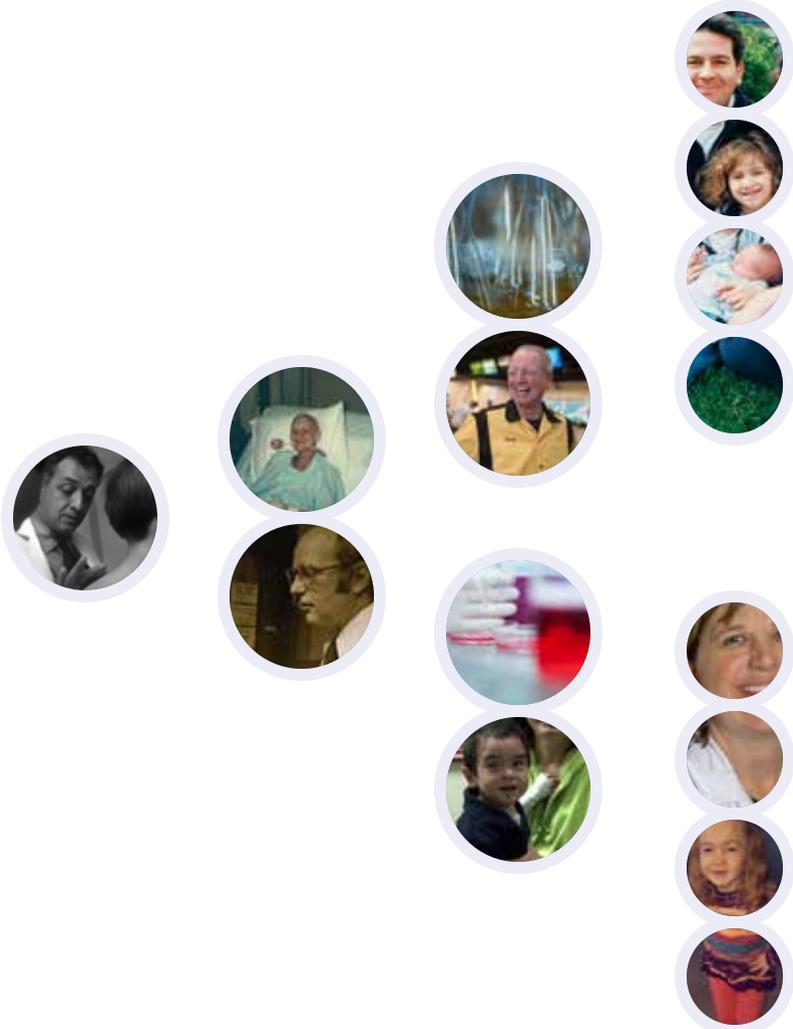
Regardless of the circumstance, one thing perpetually holds true, says Lund: "Across all these different borders and barriers between Morocco and the U.S., the patient always wants to be listened to and treated with respect."

By Carolyn Bernhardt, an editor/writer at the University of Minnesota

*Across all these different borders and barriers between Morocco and the U.S., the patient always wants to be listened to and treated with respect.*

- Emily Lund, medical student

# THE SMALL BUT MIGHTY CELL





**D**avid Camp was born with a hereditary disease that would certainly have cut his life short. A severe immune system deficiency prevented his body from forming enough antibodies to fight off the germs of everyday life.

That is, until August 24, 1968, when one of David's four older sisters, 9-year-old Doreen, donated her healthy bone marrow to save her baby brother's life in a first-of-its-kind transplant at University Hospitals.

David Camp became the recipient of the world's first successful bone marrow transplant from a matched, related donor, under the direction of famed University of Minnesota Medical School immunologist Robert A. Good, M.D. It was a monumental feat—and it pioneered an entirely new field of specialty care that would open the door to cures for dozens of other life-threatening diseases.

Since achieving this milestone nearly 50 years ago, the University has continued to lead the field. U teams have performed nearly 8,000 blood and marrow transplants (BMTs), primarily for the treatment of leukemias, lymphomas, myelomas, and other blood-related cancers.

Today, the use of BMT has expanded beyond blood cancers and immune deficiencies to also include solid tumors, Fanconi anemia (FA), bone marrow failure disorders, and inherited metabolic diseases such as adrenoleukodystrophy (ALD) and Hurler and Hunter syndromes.

U experts are also exploring the use of BMT to treat the skin blistering disease epidermolysis bullosa (EB), HIV/AIDS, and autoimmune diseases such as scleroderma, multiple sclerosis, and inflammatory bowel diseases.

"BMT has evolved into the establishment of an entire cell therapeutics domain," says Veronika Bachanova, M.D., Ph.D., an associate professor in the Medical School and member of the Masonic Cancer Center. "It is not stagnant. It brings about so many new sprouts."

### How it works

BMT, a type of cell therapy, works by replacing diseased or failing bone marrow with healthy stem cells that will eventually settle in the bone marrow and produce new blood cells. Healthy blood cells are critical to the body, as red blood cells carry oxygen to our tissues, platelets form clots after an injury, and white blood cells fight off infection.

## A PIONEERING BONE MARROW TRANSPLANT AT THE U OF M 50 YEARS AGO HAS LED TO THOUSANDS OF LIVES SAVED AND LAUNCHED A NEW GENERATION OF POTENT CELL THERAPIES

Stem cells for a transplant can come from a donor's bone marrow, a donor's blood, donated umbilical cord blood (the blood left in a placenta after a baby is born), or even a patient's own body in some cases.

Before a transplant, a patient receives high doses of chemotherapy and sometimes radiation to both destroy the cancer or other disease-causing cells and prepare the body to receive the healthy cells. Then the healthy cells are infused intravenously, where they home to the bone marrow.

Over the following days, the transplanted stem cells start to grow, making new blood and marrow, as well as a new immune system for life.



Renowned U immunologist Robert A. Good, M.D., led the world's first successful bone marrow transplant from a matched, related donor.

PHOTO: COURTESY OF UNIVERSITY ARCHIVES

### Opening doors

Some aspects of the process are quite similar to what they were 50 years ago, says Medical School professor Daniel Weisdorf, M.D., who served for five years as head of the Division of Hematology, Oncology, and Transplantation and 40 years as head of the University of Minnesota Health Adult Blood and Marrow Transplant Program.

“But many, many things have improved,” he says, naming better donor-recipient matching techniques, conditioning processes, transfusion practices, antibiotics and antivirals, drugs to support immune recovery, symptom control, and long-term follow-up.

These improvements make BMT available to more people than ever before. Older adults were once deemed ineligible for the intense treatment regimen, as were people who were already very sick. Now, the process is much safer. Whereas many of his patients 25 years ago were in their 30s and 40s, Weisdorf says that now most of his patients are in their late 50s or early 60s.

“There’s been improvement in everything,” says his colleague Claudio Brunstein, M.D., Ph.D., an associate professor in the Medical School and current director of the M Health Adult Blood and Marrow Transplant Program. “More people survive transplant, and survive it longer.”

### Making the match

David Camp’s bone marrow transplant in 1968 worked because his U of M doctors made a careful donor selection based on human leukocyte antigen (HLA) tissue typing. The body uses HLA markers to recognize which cells are one’s own and which are invaders, so a close match between the patient’s and donor’s HLA markers is critical to a successful transplant.

Following that success, the Medical School team continued to pioneer new frontiers in donor selection over the next several decades. They developed autologous marrow transplan-

tation for chronic myelogenous leukemia in the 1980s and—for the approximately two-thirds of patients without an HLA-matched sibling donor—started a volunteer unrelated donor transplant program in 1985.

The year after that, the National Marrow Donor Program, which operates the now well-known Be The Match Registry, was created in Minneapolis.

In the 1990s, umbilical cord blood—saved after birth—came onto the transplant scene and changed the BMT landscape.

“It made stem cell transplants available to nearly everyone. That was the big breakthrough,” says pediatrics professor John E. Wagner Jr., M.D., who holds the Children’s Cancer Research Fund/Hageboeck Family Endowed Chair in Pediatric Oncology and McKnight Presidential Chair in Childhood Cancer Research. “No longer were we limited by matching. We could do mismatched transplants successfully with cord blood.”

In the last 10 years, therapeutic advances have made stem cell donations from a half-matched donor such as a parent or child a viable option, too.

“So we’ve gone from having donors for about half of our patients who needed transplant to having donors for almost everyone who comes through the door,” Brunstein says. “Finding a donor is no longer a problem, despite the fact that donor selection became more strict because of our better understanding of the HLA system.”

### Getting creative

While most BMTs across the country are performed to treat people who have cancer, U of M physician-scientists have been leaders in developing BMT to treat other diseases as well.

“Here at Minnesota, we do a lot of things for these very niche diseases,” says Paul Orchard, M.D., a professor of pediatrics and medical director of the U’s inherited metabolic and storage disease BMT program. “And people come to us from all over.”



John Kersey, M.D., performed the first successful bone marrow transplant for treating lymphoma.

PHOTO: COURTESY OF UNIVERSITY ARCHIVES



In 1978, a Medical School team was the first in the United States to perform a BMT to treat the genetic bone disorder osteopetrosis.

Based on early success with an inherited enzyme deficiency condition called Hurler syndrome, researchers in the early 1980s then pioneered the use of BMT for other inherited metabolic diseases, including leukodystrophies such as ALD. “Now we transplant more patients with ALD than anywhere else in the world,” Orchard says.

The U’s expertise in Fanconi anemia (FA), a rare, inherited disease that leads to bone marrow failure, also has made it a sought-out treatment center. Today this program, under the direction of Margaret MacMillan, M.D., treats more FA patients than any other center in the nation.

More recent research has led to an experimental treatment for epidermolysis bullosa (EB), a devastating skin blistering disorder. U of M physician-scientists were the first to use cells from one organ, the bone marrow, to heal a totally different organ, the skin.

“It’s important to see this new application as a continuation of what this place is about,” says Medical School Dean Jakub Tolar, M.D., Ph.D., who leads the EB research program and holds the Edmund Wallace Tulloch and Anna Marie Tulloch Chair in Stem Cell Biology, Genetics, and Genomics, “and how deep our tradition is in BMT.”

### A delicate balance

Despite the improvements in BMT, there’s still work to do.

Key to a better BMT process today is keeping both relapse rates and graft-versus-host disease (GVHD) in check. And that requires striking a delicate balance.

A patient needs enough immune suppression to ward off GVHD, a complication affecting some 50 percent of transplant patients receiving donor-derived cells, in which the donor cells see the recipient’s organs as invaders and attack



PHOTO: SCOTT STREBLE

## FIRST SUCCESSFUL BMT FOR LYMPHOMA

DAVID STAHL’S FUTURE LOOKED GRIM. It was 1975, and the 16-year-old had just been diagnosed with Burkitt’s lymphoma.

“Back then, with the word ‘cancer,’ you thought ‘death,’” he recalls.

Stahl was given a 5 percent chance of survival. But there was one last hope—to try an experimental bone marrow transplant. “The doctors said, ‘If you don’t, you’re not going to make it,’” Stahl recalls. “So we said OK.”

Under the direction of the University of Minnesota’s John Kersey, M.D., a pioneer in his field and founding director of the Masonic Cancer Center, Stahl received the first-ever bone marrow transplant for treating lymphoma. The marrow came from his younger brother Kim. David Stahl still remembers seeing his brother wheeled by on a stretcher after the donation and giving him a thumbs-up.

The family remained optimistic.

“Dr. Kersey was very positive about it,” Stahl says. “Maybe he had to be.”

Or maybe it was because he was confident. Today Stahl is a technical illustrator, a husband, and a father to a college student—who attends the U, of course. He enjoys bowling, fishing, and spending time by the lake.

“It’s nice to know that, because of the University, kids who had cancer like I did are living [long lives] now,” he says. “I think about how lucky I am every day.”

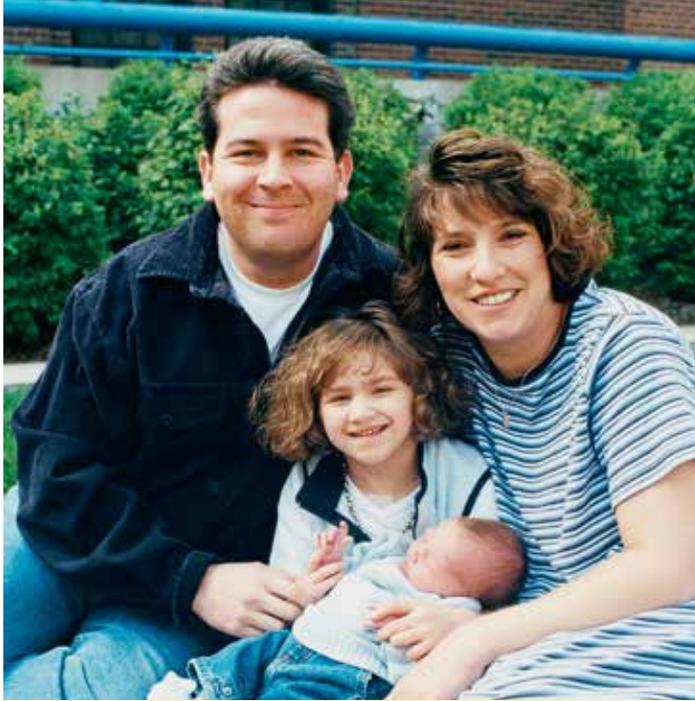


PHOTO: COURTESY OF UNIVERSITY ARCHIVES

## FIRST ‘SAVIOR SIBLING’

MOLLY NASH WAS BORN in 1994 with Fanconi anemia (FA), a severe, inherited blood disorder that would likely cause bone marrow failure by age 6 and myelodysplastic syndrome or leukemia by age 8.

The only proven treatment was a blood or marrow transplant. Molly’s parents, Lisa and Jack Nash, desperately searched for help in the 1990s, when very few children with FA survived without a matched brother or sister marrow donor. Unfortunately, Molly had no siblings.

After much ethical debate, the University of Minnesota’s John Wagner Jr., M.D., offered a new option to the Nashes called embryo selection. Newly available technologies allowed for rapid genetic testing on a single cell after in vitro fertilization, letting couples select embryos that were unaffected by FA. After birth, these children can serve as HLA-matched donors for their ailing siblings.

The Nash family jumped at the idea, knowing their choice would be highly controversial – and that it was ultimately Molly’s best chance to live.

On August 29, 2000, Adam Nash was born, and his umbilical cord blood was saved. Several weeks later, Molly received the stem cells from that cord blood via transplant.

Nearly 18 years later, both Molly and Adam are happy young adults who are helping to raise money for FA research and care.

– KRYSTLE BARBOUR

PHOTO: COURTESY OF LISA NASH



them. There can’t be too much immune suppression, though, because the recovering immune system is what keeps the cancer away. And although BMT is curative for many, 20 to 30 percent of patients still relapse.

“BMT preconditioning is still too toxic,” Weisdorf says. “I’m so proud of how it works and how many people we can make better. But I’m sure it feels to patients like, ‘You step off this bridge, and we promise we’ll catch you.’ ... It’s safer than it used to be, and it works better than it used to. But we need a bigger safety net at the bottom.”

## What’s next?

A half-century of BMT expertise at the University has paved the way for precision medicine—using cell-based therapies that target disease and leave normal cells unharmed. Safer and less toxic, these approaches stand to improve long-term outcomes for patients.

One experimental cell therapy being developed at the Medical School employs the power of the immune system’s own natural killer (NK) cells, white blood cells that kill viruses and detect and eliminate early signs of cancer. The Masonic Cancer Center’s Jeff Miller, M.D., holder of the Roger L. and Lynn C. Headrick Chair in Cancer Therapeutics, has studied and refined the use of these cells over the last 20 years. Clinical trials continue to progress.

“We have shown for the first time that this therapy can bring about remission in a patient with the most refractory [difficult-to-treat]



PHOTO: SCOTT STREBLE

acute myeloid leukemia,” Bachanova says. Although this NK cell therapy is not yet considered curative on its own, remission could make a patient eligible for a BMT.

The team is expanding the use of NK cell therapies to treat not only leukemia but also lymphoma and solid tumors such as ovarian and lung cancers.

University of Minnesota Medical Center and Masonic Children’s Hospital are among the 30 centers in the nation certified to offer another treatment, CAR T-cell therapy, to children and young adults with treatment-resistant or relapsed acute B-cell lymphoblastic leukemia (ALL). Like the NK approach, CAR T-cell therapy redirects a patient’s own immune system to fight cancer.

Because the therapy is so new, doctors don’t really know how the modified T cells will function long term — whether they’ll know when to back down after the initial cancer threat is resolved or whether they’ll keep fighting, potentially attacking healthy cells in the body when the cancer is gone.

That’s why Masonic Cancer Center scientists Bruce Blazar, M.D., and Chris Pennell, Ph.D., are exploring ways to “turn off” the superpowered T cells when they’re not needed anymore and turn them on again if needed.

Blazar’s lab is also investigating the use of regulatory T cells to reboot the immune system after a BMT — with very promising results.

“Through a series of studies, we have been able to show that these cells are very potent suppressors of the graft-versus-host disease response,” says Blazar, a Regents Professor and holder of the Andersen Chair in Transplantation Immunology.

Mark Osborn, Ph.D., an assistant professor of pediatrics in the Medical School, is taking a related research tack. He and his collaborators are using state-of-the-art gene-editing technologies to engineer T cells that are better able to



PHOTO: JIM BOVIN



PHOTO: COURTESY OF CHAMONIX WHITE

direct their potent effects toward tumor cells while leaving normal tissue unharmed.

“These are next-generation therapies that are progressing at a pace that we hope will be applicable to the current generation of patients,” Osborn says.

### Survivors, no longer patients

One of the best parts of Weisdorf’s job, he says, is when BMT survivors come back to the clinics for very long-term follow-up visits. This is one of the perks of working at an institution that has offered BMTs for 50 years.

“I always make a lot of noise in the waiting room,” Weisdorf says. “Somebody transplanted in 1981 showed up, so I brought him out and introduced him to a lot of people and said, ‘Here’s 30-plus years later, and look at how healthy he’s been.’ It is obviously motivating for people going through the scary early parts of the transplantation process to see someone well many decades later.

“Then they’re no longer patients, actually. That’s the important part.” <sup>[MIB]</sup>

Nicole Endres is managing editor of the *Medical Bulletin*.

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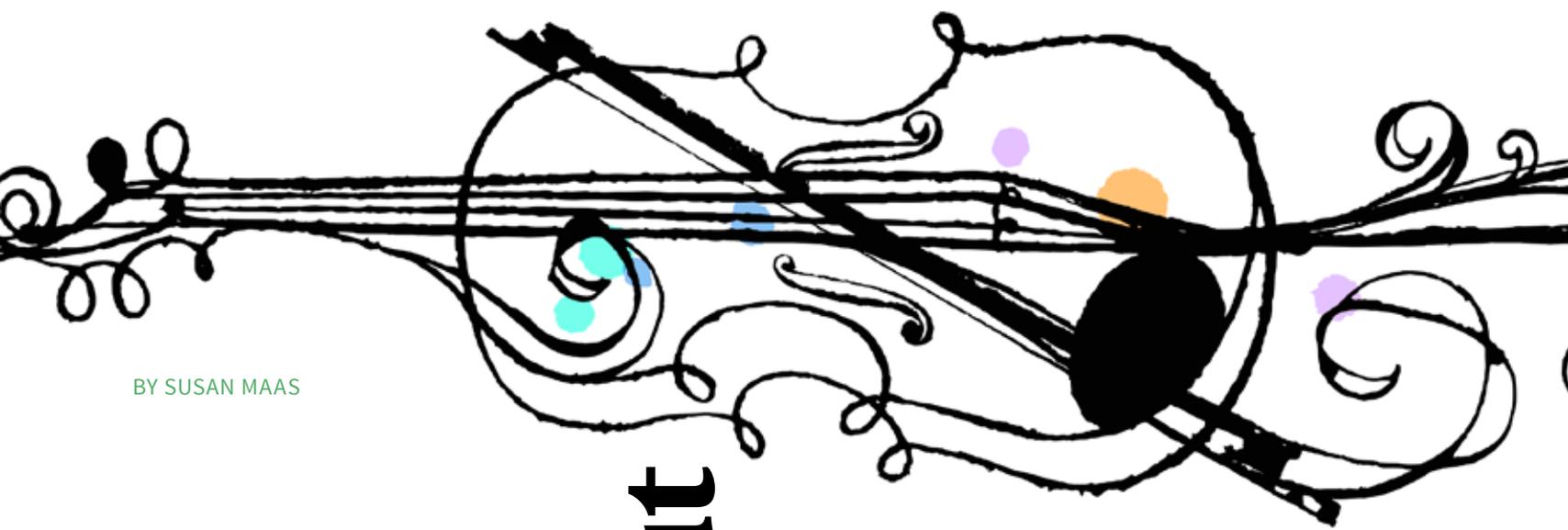
#### WEB EXTRA

Watch a video about the child who received the world’s first successful bone marrow transplant at the U and see an animation about how BMT works at [z.umn.edu/bmt50](http://z.umn.edu/bmt50).

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Four-year-old Taytem White is one of the many patients who has gone through a bone marrow transplant for a disease other than cancer. Taytem had a BMT for Hurler syndrome, a rare genetic disease, in 2014.





BY SUSAN MAAS

# A brain **out** of tune

Computational psychiatry—the use of such tools as data analysis, computer simulation, mathematical models, and brain imaging—can reveal how and why a brain becomes discordant

Sophia Vinogradov, M.D., isn't given to hyperbole; she tends to speak with a scientist's precision and restraint. But she doesn't hesitate to give an emphatic "yes!" when asked if psychiatry is undergoing a revolution.

"In the next five to 10 years, we're going to see radical changes in how we think about evaluation and diagnosis and treatment of mental illness—even in how we make prognoses," says Vinogradov, head of the University of Minnesota Medical School's Department of Psychiatry.

In the new era she envisions, psychiatrists will use data-driven mathematical modeling to understand the flow of information in an individual's brain—leading to more effective, finely tailored therapies for patients.

This emerging approach, called computational psychiatry, will lead to a golden age in the evaluation and treatment of mental illness, predicts Vinogradov, who holds the Donald W. Hastings Endowed Chair in Psychiatry.

In a commentary she wrote last year for *Nature Human Behaviour*, she likened the brain to a symphony orchestra; each person's unique and malleable brain circuits "perform their computations (play their music) across a probabilistic distribution of tuning, efficiency, coordination, and connectivity," she wrote. "The brain that has 'poor tuning,' 'inefficient connectivity,' or a 'dysfunctional

conductor' will show alterations in thoughts, feeling, and behavior."

"All you need," she explains in person, "is a little [misfire] here and a little one there, and all of a sudden, the symphony is playing out of tune."

## Deeper, richer assessments

Currently, psychiatrists can't pinpoint where or explain exactly why the misfires are occurring; they can only describe the consequences.

"What's unique to psychiatry is that we make diagnoses that are completely descriptive," says Vinogradov. "'Depression,' for example, is really just a description of the behavior; it's the manifestation. It's not based on an understanding of the underlying pathophysiology of what's actually going wrong in the body."

That's where computational psychiatry comes into play. The approach includes not only clinical observation but also longitudinal data collection and analysis, brain imaging, customized cognitive assessments, and computer simulations.

Until now, Vinogradov says, "it's been really hard to make a connection between what the neuroscientists were studying—in terms of how the neurons were



*A little misfire here and a little one  
of a sudden, the symphony is playing*

functioning—and what you see when you talk with the patient in front of you.”

Computational psychiatry helps connect those dots. “We can create almost an engineering algorithm of how an individual’s information flow is going, at least hypothetically, to a certain kind of behavior,” Vinogradov says. “The goal is to figure out what are the right indicators and how do you follow them over time?”

### Crossdisciplinary creativity

Collaboration between neuroscience and psychiatry is critical to making that happen—and it’s flourishing at the U of M, says Vinogradov.

“There’s an incredibly strong neuroscience department here,” she says. “Collaborating with [neuroscientists] has really informed how we [in psychiatry] think about our next steps.”

She meets regularly with neuroscientist and Distinguished McKnight University Professor David Redish, Ph.D., an international expert in computational psychiatry. “He’s literally written the book,” she says, referring to *Computational Psychiatry* (published in 2016), which Redish coedited with Joshua Gordon, M.D., Ph.D., director of the National Institute of Mental Health. “This may be one of the only places in the world where a basic neuroscientist is consulting and dialoguing with the head of psychiatry, who’s thinking about how we bring this into the clinic.”

Vinogradov partners with colleagues from other disciplines at the University, as well, including a “powerhouse” group of people in the Institute for Health Informatics and imaging specialists at the U’s Center for Magnetic Resonance Research.

“The whole is much greater than the sum of its parts,” says Redish of the crossdisciplinary research. “And what Sophia’s done that’s really amazing is she’s been the integrative [force] to pull in all of these different people. She has the ability to connect with people in so many different fields.”

### Exercise for the brain

Vinogradov’s own lab focuses on cognitive dysfunction in people who have schizophrenia. “We’re trying to understand, what are the brain systems that don’t process information very well, and what are the brain training approaches we might come up with to strengthen that information processing?”

It’s a line of inquiry that revolves around the brain’s remarkable plasticity, and it requires the patient to actively engage.

“It’s so analogous to going to the gym and doing reps,” Vinogradov says. “It’s hard work, but [the exercises] get these information pathways to start working correctly again.”

Currently, the University of Minnesota Health psychiatric clinic is piloting an initiative—called the Discovery Program—to bring measurement-based care to patients who have experienced their first psychotic episode.

Patients in the program come to the clinic and log on to a computer to complete self-reports on their perceived stress, social functioning, drug and alcohol use, nutrition, and coping strategies, says Vinogradov. “[We look at] processing speed, working memory, executive function, ability to process auditory and visual information, and so forth,” she explains. “It’s almost like getting your lab tests done before your doctor’s appointment.”

*There, and all  
out of tune.*

PHOTO: BRADY WILLETTE



She hopes to broaden the pilot study's scope to include people who have mood disorders, anxiety disorders, and substance abuse problems.

### Enhancing the treatment toolbox

Cognitive training approaches are one promising new tool in a rapidly growing psychiatric treatment toolbox, Vinogradov says.

"We're approaching the ability to tailor treatments to what's unique for each person — each person's unique 'flavor' of depression, or psychotic illness, or anxiety disorder. Unique in terms of what their brain is up to, and also unique in terms of their environmental exposure."

It's momentous work.

"There's no doubt that the University of Minnesota is in the vanguard," says Redish. "Everybody talks about translation; this is what it's really about. We truly are translating from fundamental science to helping people."

As the treatment toolbox expands, it will include newer therapies as well as standbys like medication, group therapy, and psychotherapy. That "subjective" side of psychiatry remains important, Vinogradov says.

"The piece that is about meaning and narrative has always been a quintessential part of psychiatry," she says. "That's the 'art' of it. And in essence, all good doctors pay attention to that." <sup>[MIB]</sup>

Susan Maas is a freelance writer and editor who lives in Minneapolis.

Sophia Vinogradov, M.D., predicts "radical changes" in how psychiatrists evaluate, diagnose, and treat mental illnesses within the next decade.

### NAMI AWARD WINNER

ONE KEY RESEARCH TARGET for Sophia Vinogradov, M.D., is early intervention: delaying or preventing the onset of deteriorating mental illness in adolescents and young adults.

For that work, she earned the 2017 National Alliance on Mental Illness Scientific Research Award in December.

"Nothing has ever meant to me what this award means to me. ... I'm moved to the marrow of my bones," Vinogradov said in her acceptance speech.

Thanks to advances in psychiatry, neuroscience, computer science, and other fields that are helping to develop cognitive brain training therapy for people with early psychosis, the day is approaching when "we can stop that train before it even leaves the station," Vinogradov says.



#### WEB EXTRA

Sophia Vinogradov, M.D., explains brain training for mental illness at [z.umn.edu/brainoutoftune](http://z.umn.edu/brainoutoftune).

# 6200

Approximate number of health sciences students educated at the U each year

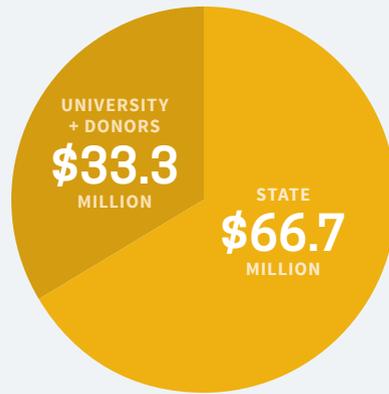
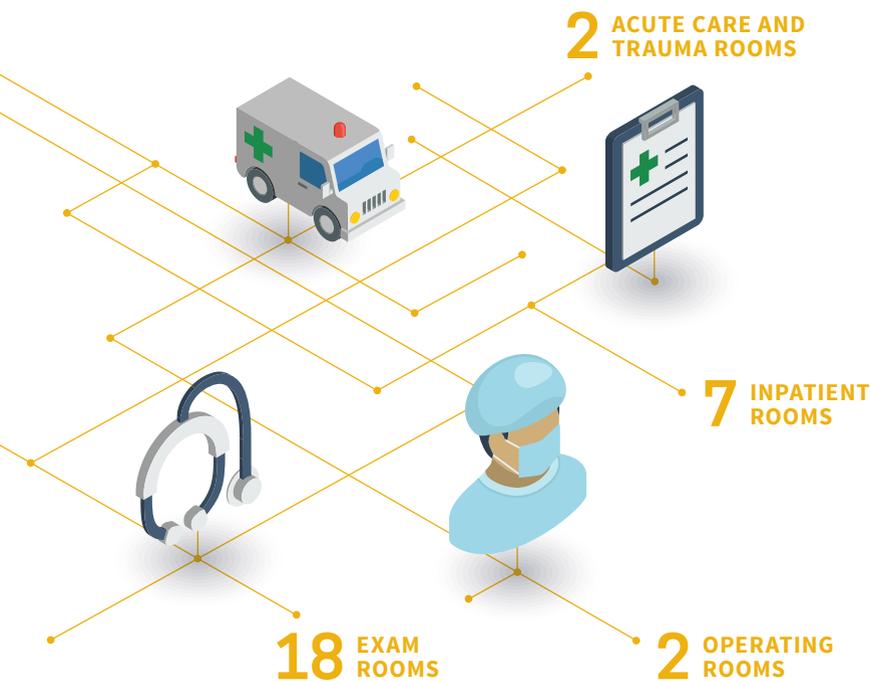
# A space to inspire

## TEAMWORK, INNOVATION, AND LEARNING

WHEN IT OPENS IN 2020, the University of Minnesota’s new Health Sciences Education Center (HSEC) will usher in a new era of teamwork, helping to train health professionals who are ready to work together to meet the needs of our communities.

This state-of-the-art facility will serve as the “front door” to the University’s health sciences schools, educating students in a space that promotes active learning and collaboration. The new space will significantly improve the student experience, as many of the schools’ current education facilities are more than 40 years old, and will help attract the best and brightest students and faculty to the U. <sup>[MIB]</sup>

### A STATE-OF-THE-ART SIMULATION CENTER WILL FEATURE



FUNDING FOR THE FACILITY

### BY THE NUMBERS

**100,000**

Square feet of outdated facilities being replaced by the HSEC

**6**

Number of “1:1 Button Video Recording Studios” – fully automated, professional HD video recording spaces in which students can conduct mock patient interviews and create multimedia presentations

**1**

Maker and Innovation Space, where students, faculty, and community partners are exposed to new technologies (such as 3-D printing), become familiar with the innovation process, develop confidence in prototyping ideas, and put those ideas into practice to solve health care problems

**4**

Number of large active-learning classrooms with 135 to 200 seats each, designed to encourage collaborative learning



# 202

**THOUSAND SQUARE FEET OF SPACE**  
in the new HSEC – which will make it one of the most comprehensive interprofessional education facilities in the country

# 70

**PERCENTAGE OF MINNESOTA'S HEALTH PROFESSIONALS WHO TRAIN AT THE U OF M**  
including doctors, nurses, dentists, pharmacists, veterinarians, and public health professionals



University of Minnesota health sciences schools that together form a powerful force for improving the health of our state and beyond

# Physician, heal thyself

A University of Minnesota surgeon steps up to challenge the culture of silence that shields shockingly high rates of physician burnout and suicide in the U.S.

BY AMANDA BROWER

*“The bedside clock reads 3:13 a.m. There are no noises, nothing unusual. Then I realize I am thinking of [medical student] Kaitlyn’s heartfelt letter to her parents written before her suicide. Why can’t I get her story out of my head?”*

– David Rothenberger, M.D., “Breaking the Culture of Silence on Physician Suicide,” 2016

“I didn’t know Kaitlyn. She was not in our medical school, but it was her tragic story that compelled me to confront our medical culture,” says University of Minnesota surgeon David Rothenberger, M.D. Kaitlyn’s was one of 53 suicide letters from medical students and physicians that Pamela Wible, M.D., had compiled in her book *Physician Suicide Letters—Answered*. Rothenberger recalls, “On that sleepless night, I asked myself, ‘How many other Kaitlyns are out there in our medical schools? Our hospitals? The medical profession?’”

He decided he could no longer stand on the sidelines. Instead, he made a commitment to educate himself and others about the high rates of physician burnout and suicide that plague the medical profession, bringing this taboo subject out from the shadows. But he knew it would be a monumental task to change a culture ingrained at every level of the health care system.

Jakub Tolar, M.D., Ph.D., dean of the University’s Medical School, is keenly aware of the toll that physician burnout can take, ranging, he says, “from something as simple as a doctor being too stressed to return a patient’s call at the end of the day, to substance abuse, to leaving the profession, to suicide.”

To help combat the problem at the University, he recently appointed Rothenberger as senior adviser for physician well-being. In his new role, Rothenberger will advise the Medical School’s leadership team on policies, programs, and practices aimed at reducing burnout and promoting wellness.

“Because medicine is both a high-intensity field and an extremely personal one, its impact extends beyond physicians to the patients they care for, the faculty and staff they interact with, and the students they teach,” Tolar says. “We want to create an environment where we allow people who are expected to be compassionate toward others to first be compassionate to themselves. Dr. Rothenberger will ensure that compassion remains at the forefront of our mission.”

## Taking stock

Rothenberger reached two milestones in March 2017: He turned 70, and he completed his term as chair of the Medical School’s Department of Surgery after four years in that role and 39 in the department. But some of his most courageous work was just beginning.

“Our profession is in the midst of a crisis, an epidemic crisis of epic proportions,” says Rothenberger about physician burnout. “But most in our profession do not yet acknowledge its existence, let alone the obligation to address it.”

The data are clear. At any given time, one in three physicians experiences burnout, a syndrome characterized by emotional exhaustion, depersonalization, and a sense of reduced personal accomplishment; it often







PHOTO: SCOTT STREBLE

Longtime U of M surgeon David Rothenberger, M.D., says physician burnout is an “epidemic crisis of epic proportions.”

results in drug and alcohol abuse, disruptive behavior, broken relationships, workplace conflicts, and, ultimately, withdrawal. Worse, an estimated 400 U.S. physicians commit suicide annually. Alarming, medical students have an equal, or even higher, risk of burnout, depression, substance abuse, and suicide.

A 2009 American College of Surgeons (ACS) study found that a stunning 40 percent of physicians surveyed met the diagnostic criteria for burnout, while 30 percent screened positive for depression, and 6.4 percent reported thoughts of suicide.

“Ignoring the problem will continue to have lasting consequences,” Rothenberger stresses, “not only for burned-out physicians but also for their patients, their colleagues, and their families.”

### **Taking action nationally**

When Rothenberger was invited to speak at the ACS Clinical Congress in 2014, he wasn’t sure how his colleagues would react to the topic of burnout. “I thought no one would show up or that those who did would throw tomatoes at me,” he says. Instead, the large hall was filled to capacity. Afterward, almost a hundred physicians spoke to him or emailed him, sharing their personal struggles with burnout. He was encouraged that change might be on the horizon.

Then, in 2016, Rothenberger coauthored the National Academy of Medicine (NAM) discussion paper “Breaking the Culture of Silence on

Physician Suicide.” He and his three coauthors wrote heartbreakingly, each from their own perspective—surgery, nursing, medical training, the clergy—about Kaitlyn’s suicide.

“We reasoned that if NAM would get involved,” says Rothenberger, “it could do the same thing for the issues of burnout and well-being as it had previously done for safety in medicine. [The 1999 landmark report “To Err Is Human” effectively increased awareness about deaths caused by preventable medical errors.] Our intent was to make an emotional appeal that no one in medicine could ignore.”

It worked.

In 2017, NAM held the first public meeting of the newly formed Action Collaborative on Clinician Well-Being and Resilience. NAM President Victor Dzau, M.D., welcomed the audience by confessing that he hadn’t really understood why well-being and resilience should be a concern to NAM—until he read “Breaking the Culture of Silence on Physician Suicide.”

Dzau followed up a year later with a perspective piece in the *New England Journal of Medicine* titled “To Care Is Human—Collectively Confronting the Clinician-Burnout Crisis.” As he and his coauthors pointed out, “‘To Err Is Human’ identified high rates of medical error ... and spurred systemwide changes that have improved safety and quality. Today, we need a similar call to action.”

Rothenberger is encouraged by NAM’s actions. “I’m sure many other factors led to its decision to address physician burnout, but it was nice to learn that our strategy had an influence on their leaders and that they’ve now committed major resources and energy to this problem.”

*Ignoring the problem will continue to have lasting consequences, not only for burned-out physicians but also for their patients, their colleagues, and their families.*

### **Creating change here**

John Andrews, M.D., the Medical School's associate dean for graduate medical education, heartily welcomes Rothenberger to his new advisory position. And he welcomes new guidelines from the Accreditation Council for Graduate Medical Education (ACGME) that explicitly acknowledge its "obligation to help physicians in training find meaning and joy in their work, while also providing them with the resources necessary to care for themselves and their patients."

Andrews also supports realigned efforts to improve physician well-being at the institutional level. The time to begin mitigating stressors that cause burnout, he believes, is in medical school.

"We are in the infancy of addressing the problem. No institution has figured it out, but we're making a good effort here," he says.

### **Going forward**

Since Rothenberger now frequently delivers lectures on physician burnout, he has become even more aware of the depth of the problem.

"After giving a talk, I often have physicians approach me to share their struggles," he says. "There have been many painful conversations with those who are experiencing real despair. I was even approached recently by someone who was thinking about taking their own life." Working with other University professionals, Rothenberger was quickly able to get that person much-needed help.

Thomas Gilliam, R.N., M.B.A., administrative director of the David A. Rothenberger Leadership Academy (formerly the Emerging Physician Leaders Program), recently teamed up with Rothenberger to teach a graduate class of physicians, other health care providers, and

administrators. During one discussion, Rothenberger outlined the signs of burnout. After class, he and Gilliam were approached by a student who had realized that every sign applied to him, without any previous inkling that his symptoms added up to bona fide burnout.

"The problem is a cultural one," says David Darrow, M.D., M.P.H., a fifth-year neurosurgery resident and member of the University's ACGME Resident Leadership Council. "There's a myth that physicians are superheroes, that we can't make mistakes. And just trying to identify the problem puts residents in a vulnerable position."

Darrow's research now focuses on innovative methods to effectively treat people struggling with mental health issues. At the policy level, he advocates for his fellow residents throughout the Medical School, because he knows that they are hesitant to open up about mental health.

As he says, nationwide, about 30 percent of residents have depression. "But what do you do about it? Who would they see for a mental health appointment, and when?"

These are just a few of the questions Rothenberger hopes to answer as he continues to push for solutions. In his moving essay in "Breaking the Culture of Silence on Physician Suicide," he laid out the challenge to his colleagues: "Do we have the courage and will to break through the culture of silence, end institutional cover-up, and commit to finding effective ways for the healing profession to care for ourselves as well as for our patients?"

He is heartened that, at the University of Minnesota, the answer is now a resounding yes.

**[MIB]**

Amanda Brower is communications director of the Medical School's Department of Surgery.

# On the B.A./M.D. fast track >

A new program  
welcomes a diverse group  
of University freshmen  
bound for medical school

BY BARBARA KNOX

WITH LAST FALL'S LAUNCH of the new B.A./M.D. Scholars Program at the University of Minnesota, the pathway to medical school just got a lot more direct for 10 of Minnesota's most promising future physicians.

"At the Medical School, we're always asking ourselves, 'What kind of programs can we create for learners in Minnesota to help get them where they want to go?'" says Dimple Patel, M.S., the Medical School's associate dean of admissions. "This new program, a partnership with CLA [College of Liberal Arts], is a way for Minnesota to retain some of its best and brightest students from widely diverse backgrounds who will ultimately serve others as physicians."

The new B.A./M.D. model is a so-called 3-4 program: Students spend three years in CLA majoring in one of the two available biological science degrees, then move directly into the four-year Medical School program.

To get in to this new program, students must be invited to apply. Here's how it works: All freshmen admitted to the U's College of Liberal Arts are considered for admission to this program. Standout candidates with a strong interest in science and medicine, and evidence of contributions to diversity and inclusion, are invited to apply to the new program. Ultimately, the U asked a select group of those students

to come in for a day of interviews, and then accepted the 10 now enrolled in the program.

These 18- and 19-year-olds already understand what medicine is about and know they want to become doctors. As Barbara Goodwin, CLA adviser to the students, explains, the B.A./M.D. program is designed to offer support, guidance, mentorship, and all the richness of University resources to ensure that they not only get to medical school, but are prepared to step into leadership roles in the future.

"These students are part of the group that's going to diversify the face of medicine in Minnesota," she says, "to help solve the health disparity challenges we face."

Taisha Mikell, M.B.A., M.S., director of pipeline programs for the Medical School, says the B.A./M.D. program shows students a pathway they might otherwise miss.

"These students don't need a special program because they're somehow lacking," Mikell stresses. "They have incredible credentials. But the difference is that students from underrepresented backgrounds don't always see the pathway. We want to make sure they can realize that dream of putting on the white coat and becoming a physician." <sup>MB</sup>

Barbara Knox is a freelance writer and editor and a frequent contributor to the *Medical Bulletin*. Managing editor Nicole Endres contributed to this story.



*“Getting to learn one-on-one from doctors here is amazing. We shadow them, they give us advice and support ... it’s everything I could have imagined.”*



**ISAIAH REIS**

HOMETOWN  
New Hope, Minn.

SCHOOL  
Fourth Baptist Christian School

MAJOR  
Physiology

MINORS  
Russian and psychology

*“My family does foster care, and we had a few really intense medical foster babies. I helped out a lot with one of them when I was 11. That’s when I decided I wanted to be a doctor.”*



**AMERA HASSAN**

HOMETOWN  
Blaine, Minn.

SCHOOL  
Blaine High School

MAJOR  
Physiology



**RANITA TARCHAND** >

HOMETOWN  
Farmington, Minn.

SCHOOL  
Farmington High School

MAJOR  
Biology, society, and environment

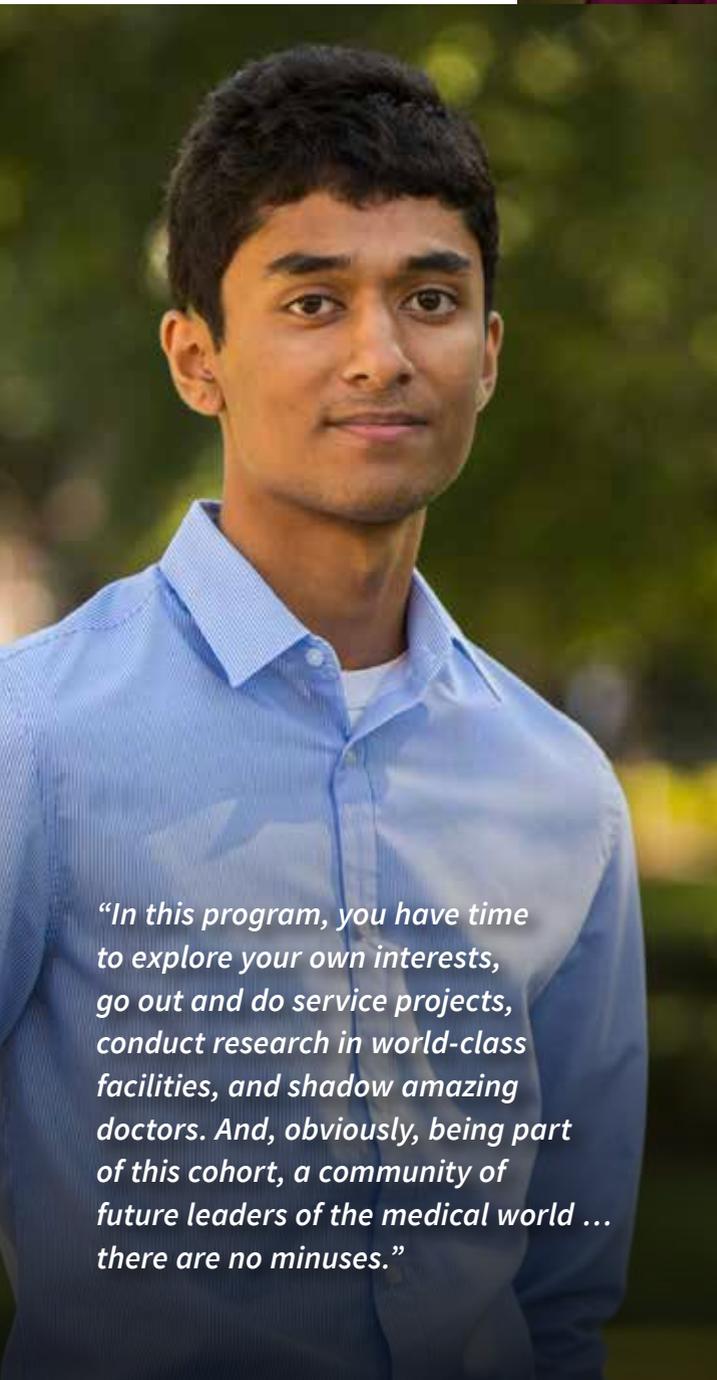
MINOR  
Public health

*“I knew that I wanted to be a doctor, but I thought, ‘Maybe this isn’t the right path. Maybe I’m aiming too high.’ And I think a lot of minority or diverse students have that same feeling because we never see ourselves – I had never met anybody of Caribbean descent who was a doctor. You can’t limit yourself just because you haven’t seen it.”*

**MADELEINE BERG** >

HOMETOWN  
Cottage Grove, Minn.  
SCHOOL  
East Ridge High School  
MAJOR  
Physiology

*“We all want to lift each other up. That’s what this program is all about. That’s the best part for me.”*



*“In this program, you have time to explore your own interests, go out and do service projects, conduct research in world-class facilities, and shadow amazing doctors. And, obviously, being part of this cohort, a community of future leaders of the medical world ... there are no minuses.”*

*“I think it’s pretty cool to brag about how you’re one of 10 people in this cohort. Everyone has their own interests. It’s not competitive at all, but at least I can look at what they’re doing, and say, ‘Dang, I need to start research now. I need to do different things.’ But I think it’s really motivating, and it’s really nice to have the support system.”*

< **MILKI GEMEDA**

HOMETOWN  
Brooklyn Park, Minn.  
SCHOOL  
Champlin Park High School  
MAJOR  
Biology, society, and environment  
MINOR  
Public health

< **RAJIV DHARNIPRAGADA**

HOMETOWN  
Maple Grove, Minn.  
SCHOOL  
Maple Grove High School  
MAJOR  
Physiology  
MINOR  
Neuroscience





*“The resources in this program are just incredible. The shadowing, clinical experiences, research opportunities, the medical seminar ... I wouldn’t have had access to this same quality of resources this early if I had taken the traditional route.”*



*“I take classes in music, so that gives me a break from all of the rigorous science classes. It’s hard, but it’s a different kind of hard. It’s not as intellectually taxing, but it’s emotionally taxing.”*



**ALAINNA CAVIN**

HOMETOWN  
Brooklyn Park, Minn.  
SCHOOL  
Maranatha Christian Academy  
MAJOR  
Biology, society, and environment  
MINORS  
Sociology and Spanish

*“It is kind of intimidating at times, being surrounded by so many smart people. But at the same time, it just drives you to be even better. And I think that’s a great preparation for medical school because that’s exactly how it’s going to be. ... It makes you evaluate yourself. A lot. Constantly. But for the better.”*

**MILLER BALLEY**

HOMETOWN  
St. Paul, Minn.  
SCHOOL  
DeLaSalle High School  
MAJOR  
Biology, society, and environment  
MINOR  
Spanish

**TATIANNA SILVERNESS**

HOMETOWN  
Duluth, Minn.  
SCHOOL  
Duluth East High School  
MAJOR  
Biology, society, and environment

*“I’ve always had an interest in health sciences, and I had a rough idea of the path I wanted to take. I didn’t really understand what this program was all about until I got into it – and it was a life-changing decision. I’m so glad I did this.”*

**VICTOR FURMAN**

HOMETOWN  
Minneapolis  
SCHOOL  
South High School  
MAJOR  
Physiology  
MINOR  
Music



## Long-distance relationship

*Traveling to Uganda and back three times a year, this collaborative doc makes strides in understanding and treating meningitis in people who have HIV*

JOSHUA RHEIN, M.D., is someone who always goes the distance. Tens of thousands of miles, in fact.

As director of training and research at the Uganda Hub, a program of the University of Minnesota's Center for Global Health and Social Responsibility (CGHSR), Rhein divides his time between Minnesota and Kampala, Uganda's capital city, making the approximately 16,000-mile round-trip to the Twin Cities three times a year.

But the impact Rhein is having can't be measured in miles. In the five years he has lived and worked in Uganda, he and his team have made enormous strides in understanding and treating meningitis in people who have HIV disease—his primary research focus—and in helping build collaborative, productive relationships among students, researchers, and practitioners in both Uganda and Minnesota.

"I feel we are making a large impact in Uganda, whether it be the research we are working on or through our involvement in training the next generation of Ugandan researchers," says the 2007 Medical School graduate.

Relatively common in Africa, cryptococcal meningitis is a deadly fungal form of the disease. When Rhein began his work in Uganda, few clinical trials had ever been conducted on drugs used to manage cryptococcal meningitis in people with HIV disease. Minimal guidelines were written into standards of care based mostly on expert opinion.

Since he arrived in Uganda, Rhein has enrolled roughly 1,000 cryptococcal meningitis patients in clinical trials directed by his primary mentors, the U's David Boulware, M.D., M.P.H., and Makerere University's David Meya, MBChB, Ph.D. "Through the trials, we've gotten better at learning how to take care of these patients," Rhein says.

Even medical student and resident sub-studies coming out of clinical trials have borne fruit, such as one that helped Rhein and his team determine the best way to supplement electrolytes and give IV fluids to mitigate the side effects of drugs.

Two years after the protocol became established, it was added to the World Health Organization's guidelines.

### WORK THAT MATTERS

The chance to do work that matters is what drew Rhein, 42, to global health. He first went to Uganda in 2006, during a flex year in medical school, to help Paul Bohjanen, M.D., Ph.D., now director of the Division of Infectious

Rhein supervises visiting U of M internal medicine resident Alex Zanotto, M.D., while he performs a lumbar puncture on a patient with meningitis.

Diseases and International Medicine in the Medical School's Department of Microbiology and Immunology, establish the first collaborative research projects between the U and Makerere University.

The opportunity to work in Uganda alongside Bohjanen was attractive to Rhein in part because he longed to return to Africa after a previous two-year stint in the Peace Corps. It turned out to be a momentous decision.

"That year changed my outlook," says Rhein. "It introduced me to academic medicine and research. I started seeing that global health could be a career, and I saw the power of research to change how clinical medicine is practiced."

When Rhein left Bohjanen's lab to begin his residency at Indiana University, he didn't think Uganda would be in his future. But after he finished his infectious diseases fellowship at the U in 2012, the promise of the then-nascent Uganda Hub beckoned him. He has been there ever since.

### THE 'WRANGLER'

The U of M's Academic Health Center (AHC) established the Uganda Hub in 2015 to strengthen the infrastructure needed to support robust research, education, and training the Medical School and its AHC and Uganda partners were conducting. The Hub's central operations are at Makerere University's Infectious Diseases Institute in Kampala, where Rhein works, but it also supports research projects in other areas of the country.

PHOTO: ANTENEH ZEWDE





PHOTO: CUONG PHAM

“I call Uganda our legacy hub,” says CGHSR executive director Shailey Prasad, M.D., M.P.H. “The Hub was a natural extension of the activities the U has had in Uganda for some time.”

One of Rhein’s key roles is to lead the Ugandan Research Training Collaborative, a unique program that teams up students from Minnesota and Makerere under the mentorship of faculty members from both institutions. The interdisciplinary, international teams propose and carry out their own independent projects on the ground in Uganda.

Prasad considers the program the embodiment of reciprocal engagement in that it benefits learners on both sides and lays the groundwork for equitable long-term relationships. And Rhein, he says, is exactly the right person to nurture its development.

“Besides being a wonderful human being, Josh is very humble in his approach,” Prasad says. “He has a lot of working experience in Uganda. He understands the local conditions very well and our learning culture here. His cultural outlook is perfectly blended.”

Prasad calls Rhein a “wrangler” because he is deft at bringing together the right people at the right time and place. Rhein himself knows he is in the right place at the right time.

“There is never a dull day while living and working in Uganda,” he says. “Ugandans are just about the nicest people you will meet. It is the ideal place to start a career in academic research.” <sup>[MIB]</sup>

By Cynthia Scott, a Minneapolis freelance writer and editor



## Featuring uniquely regional research

The University of Minnesota Medical School, Duluth Campus has launched the new online, open-access *Journal of Regional Medical Campuses* (JRMC), published every other month in collaboration with the University of Minnesota Libraries.

The first-of-its-kind journal offers the medical school community a place to publish educational findings and research specific to the 115 regional medical campuses located in the United States and Canada.

“The JRMC was born out of a need to tell our stories and share our unique perspectives and challenges,” says Paula Termuhlen, M.D., regional campus dean and JRMC’s editor-in-chief. “The JRMC is our opportunity to enhance the academic environments of our campuses by creating a home for the scholarship produced on our campuses.”

Faculty members and deans from regional campuses across North America make up the journal’s editorial board and serve as reviewers.

JRMC’s inaugural issue explored such topics as physician-attorney collaboration, confidence building in first-year residents, and the primary care pipeline – all from the regional campus perspective. <sup>[MIB]</sup>

Find the latest issue at [z.umn.edu/JRMC](http://z.umn.edu/JRMC).

## ALUMNI HOSTS NEEDED

Residency interviews – which can be both exciting and stressful – often involve travel. The Medical School is seeking alumni volunteers who live outside Minnesota to host medical students as they travel for residency interviews. Besides sharing their homes, hosts can offer students advice about the local community, residency training, and the medical center the student is visiting. <sup>[MIB]</sup>

Interested alumni should contact Lyndsay Stevens, alumni relations manager, at [lstevens@umn.edu](mailto:lstevens@umn.edu) or 612-625-2841.

## Honor outstanding alumni

The Office of Alumni Relations is seeking nominations for the 2018 Medical School Alumni Awards. Honor a fellow alumna or alumnus with the Harold S. Diehl Award, Distinguished Alumni Award, or Early Distinguished Career Alumni Award. Recipients will be honored at the Medical School Alumni Awards Banquet on Wednesday, October 3, 2018, at the Weisman Art Museum. [MIB](#)

**NOMINATIONS  
MUST BE  
RECEIVED BY  
AUGUST 10.**

Visit [med.umn.edu/alumni/alumni-awards](http://med.umn.edu/alumni/alumni-awards) for award criteria, nomination requirements, and a list of past recipients.

## Mark your calendar



Please save the date for these fall 2018 Medical School events:

### **FAMILY WEEKEND (NEW!): SEPTEMBER 14-15**

Parents and other family members of first-year medical school students, this is your chance to tour the Medical School, hear from faculty, and spend time with your student.

Learn more at [med.umn.edu/alumni](http://med.umn.edu/alumni).

### **ALUMNI CELEBRATION AND HOMECOMING: OCTOBER 4-6**

This year's Alumni Celebration will coincide with the U of M Homecoming. Medical School alumni are invited back to campus to share in the festivities with faculty, fellow alumni, and current students. Reunion dinners will be held for the classes of 1963, 1968, 1978, 1983, 1988, 1993, and 2008. Watch for more details in the coming months.

To update your contact information, visit [med.umn.edu/alumni](http://med.umn.edu/alumni).

### **GET INVOLVED**

The Medical School is seeking alumni to serve on the reunion planning committee or as reunion gift volunteers. To learn more about the Alumni Celebration and opportunities to get involved, please contact Maureen Long at [mlong@umn.edu](mailto:mlong@umn.edu) or 612-626-8045. [MIB](#)

## A new direction, one kidney lighter

MEDICAL STUDENTS KNOW they will be called upon to make many sacrifices during their rigorous training. But Kent Peterson's sacrifice was not something you would find in any medical school textbook.

Peterson's father, Gordy, had battled chronic kidney disease for as long as Kent could remember. Kent's decision to go to medical school was sparked, in part, by accompanying his dad to frequent medical appointments.

His mother, Margo, a nurse, encouraged his interest by introducing him to a surgeon in their rural Minnesota community. He jumped at the invitation to watch a gastric bypass procedure, which left an indelible impression in his mind.

"I had never been more amazed by what human hands can accomplish," says Peterson. "I witnessed this patient transform his lifestyle following the surgery. After seeing the immediate and life-changing impact surgery can have, I knew this is where I was meant to be."

Peterson's first year at the University of Minnesota Medical School was challenging, yet rewarding. But just as he was about to start his second year, his dad's condition worsened.

Doctors told the family that a kidney transplant was Gordy's best chance for a normal life. Unfortunately, no one in the family had a compatible blood type. Doctors warned that the wait for a donor could be three to five years, and that Gordy would likely have to start dialysis, a cumbersome process that can increase the risk of complications following a kidney transplant.

But there was another option. Peterson learned of a program that would allow him to donate on his father's behalf instead of directly to his father. This concept, called a paired kidney exchange, increased the chances of finding compatible donors for patients whose families could not provide a match.

# Kent Peterson



PHOTO: COURTESY OF KENT PETERSON

Kent Peterson, second from left, with his fiancée, Mariah Nelson; mom, Margo Peterson; and dad, Gordy Peterson

## SPECIAL FRIENDSHIPS

In August 2015, the Peterson family learned that a donor kidney was available for Gordy. During Gordy's surgery, the Petersons connected with the family of the donor, a Minnesota man whose children and grandchildren had gathered in the hospital waiting room.

"The donor's family was so gracious and provided invaluable support and camaraderie to my mom, brother, and me during the stressful days following my dad's transplant surgery," Peterson says.

Two weeks after his dad's surgery, Kent Peterson was back in the operating room, this time as a kidney donor. After the procedure, Peterson reached out to the person who had received his kidney, a Missouri woman who had been on dialysis for years. An unlikely friendship blossomed and continues to this day. Peterson cherishes the heartfelt messages his friend sends each year on the anniversary of the transplant.

## CHANGE OF PLANS

Now a fourth-year medical student, Peterson is enormously grateful for the support he's received, including financial assistance through the Dr. William C. and Ruth Anne Nelson Scholarship and the Dr. Richard A. and Mari Carlson Scholarship.

Richard Carlson was himself the recipient of a scholarship from the Minnesota Medical Foundation when he attended medical school at the U of M. "It made a huge difference to my wife and me because we were struggling to make ends meet solely through her income as a public school teacher," he says. "Because of our gratitude for this scholarship assistance, we decided to 'give back' by establishing this named scholarship. Our goal is to eventually fund the scholarship to provide full tuition support for a medical student each year."

Gordy Peterson has regained his strength and vigor, thanks to the paired kidney exchange. "My dad has returned to his former energetic self," Kent says. "He loves fishing and hunting, and it's wonderful to see him enjoying the outdoors again."

And the transplant experience itself has set Peterson on a different career path than he originally imagined. Although he had planned to practice as a general surgeon in a rural community, Peterson is now interested in becoming a transplant surgeon. He is preparing for a May wedding with his fiancée, Mariah Nelson, a nurse at University of

Minnesota Masonic Children's Hospital, and a surgical residency at the Medical College of Wisconsin.

Peterson says he is grateful for the support of his fiancée, family, friends, numerous physician mentors, and scholarships. "The financial support has made medical school less stressful, allowing me to pursue my dreams," he says. "It's an honor to be recognized among my outstanding peers with these scholarship awards." <sup>MB</sup>

By Charlotte Fransen, a Twin Cities-based writer and communications consultant

*I had never been more amazed by what human hands can accomplish. I witnessed this patient transform his lifestyle following the surgery. After seeing the immediate and life-changing impact surgery can have, I knew this is where I was meant to be.*

– Kent Peterson, on observing surgery for the first time

## New Alumni Relations Office

Meet the Medical School's new alumni relations staff:

**CHRISTINE KIEL**, the Medical School's deputy chief of staff, has been with the University of Minnesota for five years. Before moving to the Medical School to lead alumni relations, she worked in the Office of Government and Community Relations, where she lobbied on the University's behalf at the state Legislature. Contact Christine at [ckiel@umn.edu](mailto:ckiel@umn.edu) or 612-626-3807.

**MAUREEN LONG**, assistant director of alumni relations, has worked at the University for 15 years, most recently in the College of Science and Engineering's Technological Leadership Institute, where she managed educational services, alumni relations, and many other duties. Contact Maureen at [mlong@umn.edu](mailto:mlong@umn.edu) or 612-626-8045.

**LYNDSAY STEVENS**, alumni relations manager, joined the alumni relations team from the University's Earl E. Bakken Medical Devices Center, an interdisciplinary program housed in the Institute for Engineering in Medicine. Contact Lyndsay at [lstevens@umn.edu](mailto:lstevens@umn.edu) or 612-625-2841.

**CHRISTIANA KAPSNER** became alumni relations director of the Medical School, Duluth Campus in January 2017. Previously, she was with University of Minnesota Duluth Alumni Relations and worked with external affairs in public relations and marketing. Contact Christiana at [ckapsner@d.umn.edu](mailto:ckapsner@d.umn.edu) or 218-726-8806. 



## Government Relations working for U

**Representing the U of M:** The University of Minnesota's Government Relations team represents the entire University system before Congress, at the state Capitol, and in city halls. We build support for the University among elected and community leaders, advance the Board of Regents' priorities, and provide strategic advice to University faculty, staff, and students.

**News from the Capitol:** The 2018 legislative session is in full swing. During this bonding year, the Government Relations team is solely focused on maximizing the effectiveness and life of the nearly 29 million square feet of infrastructure that make up our system campuses. Through our #renewUMN campaign, we are seeking bonding to update obsolete and outdated academic buildings to create innovative spaces that foster learning and enhance our ability to attract top talent to our state's only R1 research institution.

Bolstering these goals, Gov. Mark Dayton included in his proposed budget \$10 million for pre-design of a new clinical research facility for the University's Academic Health Center that would support clinical trials and team-based clinical and translational health science research. In 2015, the governor's blue ribbon commission on the University of Minnesota Medical School identified this type of building as one of its priorities.

**UMN Advocates:** Join UMN Advocates to make your voice heard at the Legislature: [advocates.umn.edu](http://advocates.umn.edu). UMN Advocates engages students, alumni, faculty, and community members in building a stronger U of M. You will find what you need to stay informed about politics, higher education, and the legislative process – as well as easy steps to follow for telling your own U of M story to legislators so they can see alumni's tremendous statewide influence. 

– Genevieve Plumadore, director of state relations, University of Minnesota

## Match madness

Emotion filled the air March 16 as the medical students who had been waiting anxiously with sealed Match Day envelopes in hand finally opened them. It was a moment that signified years of hard work, determination, and, for some, major life changes.

Of the 220 students in the Medical School Class of 2018, 45.9 percent matched to primary care residency programs. In fact, the most popular specialties were family medicine (19.5 percent), internal medicine (11.8 percent), pediatrics (10.5 percent), and obstetrics and gynecology (9.1 percent), followed by emergency medicine, general surgery, psychiatry, and anesthesiology. More than half (51.4 percent) of those who matched will stay in Minnesota residency programs. 



**TOP** (From left) Medical students Hope Ukatu, Annah Adanene, Elizabeth Berrick, Laura Zavala, and Jia-Shyuan Su pose with Dean Jakub Tolar, M.D., Ph.D.

**MIDDLE** Brooke Jensen, Erick Marigi, and Will Freking matched to surgical residency programs.

**BOTTOM** Danielle Hron (right), with her fiancé, Alexander Vechinski, matched to an internal medicine residency at the U – her first choice. “My aunt is the longest-surviving heart transplant recipient in the world, and she received her care at the University of Minnesota! So my whole family and I are very excited and proud that I will be continuing my training at the medical institution that has had such an impact on our lives.”



### WEB EXTRA

See more photos from Match Day at [med.umn.edu/matchday2018](http://med.umn.edu/matchday2018).



# In Memoriam

**LEON J. ABRAM, M.D.**, Class of 1982, Danville, Va., died Sept. 9 at age 61. Dr. Abram was a spinal surgeon. He is survived by his husband, Matthew R. Warren; and 3 children.

**C. KNIGHT ALDRICH, M.D.**, former faculty member, Charlottesville, Va., died Nov. 3 at age 103. Dr. Aldrich was an assistant professor of psychiatry and neurology at the U of M. He is predeceased by his wife, Julie; and 2 children. He is survived by 2 children, 8 grandchildren, and 3 great-grandchildren.

**C. ARTHUR ANDERSON, M.D.**, Class of 1962, Redlands, Calif., died Sept. 23 at age 80. Dr. Anderson had his own obstetrics and gynecology practice. He is survived by his wife, Marianne; 2 children; 6 grandchildren; and 1 great-grandchild.

**KENNETH G. BERGE, M.S., M.D.**, Class of 1951, Rochester, Minn., died Sept. 24 at age 91. Dr. Berge was an internal medicine practitioner and a medical editor at the Mayo Clinic. Dr. Berge is predeceased by his wife, Aline. He is survived by 3 children, 5 grandchildren, and 6 great-grandchildren.

**PHILLIP M. BLOOM, M.D.**, Class of 1959, Hopkins, Minn., died Aug. 4 at age 84. Dr. Bloom was a nephrologist and known as a pioneer in kidney transplant and dialysis. He is survived by his wife, Bobby; 4 children; and 8 grandchildren.

**CHARLES T. BROWN, M.D.**, Class of 1957, Afton, Minn., died Nov. 24 at age 85. Dr. Brown practiced obstetrics and gynecology in St. Paul. He is survived by his loving friend Joan Roe, 6 children, and 4 grandchildren.

**ANITA S. BUCKLER, M.D.**, Class of 1981, Minneapolis, died Sept. 1 at age 67. Dr. Buckler practiced internal medicine in Cambridge and Coon Rapids, Minn. In addition to her doctor of medicine degree, Dr. Buckler received a master's degree in library science at the U of M. She is survived by her husband, Robert; 3 children; and 2 grandchildren.

**ERIC W. BURTON, M.D.**, Class of 1988, Welch, Minn., died Oct. 24 at age 58. Dr. Burton was a pathologist at Hennepin County Medical Center. He is survived by his wife, Karen.

**DAVID G. CONNOR, M.D.**, Class of 1966, Petaluma, Calif., died Oct. 8 at age 77. Dr. Connor was a nephrologist.

**JAMES A. DANIEL, M.D.**, Class of 1966, Minneapolis, died Nov. 24 at age 77. Dr. Daniel was a cardiologist and founding member of the Minneapolis Heart Institute and Foundation. He completed his residency and a cardiology fellowship at the U of M. He is predeceased by his first wife, Bobbi. Dr. Daniel is survived by his wife, Judy McMahon; 3 children; 4 grandchildren; and 3 stepchildren.

**GEORGE C. DORSEY Jr., M.D.**, Class of 1954, Chanhassen, Minn., died Dec. 5 at age 90. Dr. Dorsey was a psychiatrist and partner at the Minneapolis Clinic of Neurology and Psychiatry. He is predeceased by his wife, Patricia Mae; and 2 children. He is survived by 10 children, 23 grandchildren, and 3 great-grandchildren.

**MARK R. ECKMAN, M.D.**, Class of 1967, Duluth, Minn., died Feb. 3 at age 75. Dr. Eckman practiced internal medicine with an infectious disease specialty at the Duluth Clinic. He is survived by his wife, Mary; 5 children; and 5 grandchildren.

**JAMES A. FISCHER, M.D.**, Class of 1966, Sacramento, Calif., died Sept. 8 at age 77. Dr. Fischer was a cardiologist and internal medicine practitioner in Sacramento and later came out of retirement to join the staff at the University of California, Davis, School of Medicine. He is survived by his wife, Karen; 2 children; and 1 grandchild.

**ROBERT J. GOLDISH, M.D.**, Class of 1946, St. Louis Park, Minn., died Oct. 15 at age 93. Dr. Goldish practiced internal medicine. He was a member of the University of Minnesota Duluth Medical School Founders Group, chief of staff at Miller Memorial Hospital and St. Luke's Hospital, president of the St. Louis County Medical Society, and adjunct professor at the Medical School, Duluth Campus. He is survived by his wife, Selma; 4 children; and 3 grandchildren.

**RICHARD D. GRANQUIST, M.D.**, Class of 1953, Fridley, Minn., died Dec. 24 at age 90. Dr. Granquist was an orthopaedic surgeon. His wife, Corinne, died on Dec. 25. Dr. Granquist is predeceased by his daughter, Mary. He is survived by 6 children and 18 grandchildren.

**JOHN D. GRISWOLD, M.D.**, Class of 1980, White Hall, Md., died Aug. 22 at age 64. Dr. Griswold practiced emergency and occupational medicine. He is survived by his wife, Terry Gessner; 3 children; 2 stepchildren; and 1 stepgrandchild.

**HAROLD C. "Pete" HABEIN Jr., M.D., M.S.**, Class of 1946, Billings, Mont., died Dec. 4 at age 94. Dr. Habein was a surgeon. He helped lead a statewide initiative to improve trauma care in Montana. Before retiring, he joined the staff at a mission hospital in Tanzania. He is survived by his wife, Jeanne; 3 sons; 7 grandchildren; and 3 great-grandchildren.

**BURTON L. HAUGEN, M.D.**, Class of 1978, Walker, Minn., died Feb. 1 at age 67. Dr. Haugen practiced family medicine in Walker, Minn. He is survived by his wife, Rollie; 3 children; and 3 grandchildren.

**LYLE F. JACOBSON, M.D.**, Class of 1946, Santa Rosa, Calif., died Dec. 30 at age 94. Dr. Jacobson was a cardiothoracic surgeon in Detroit before retiring to California. He is predeceased by his daughter, Elizabeth. He is survived by his wife, Liz; 2 daughters; and 7 grandchildren.

**MARGARET C. KEENAN, M.D.**, Class of 1971, Oceanside, Calif., died Oct. 9 at age 72. Dr. Keenan was a psychiatrist and Minnesota's first female psychoanalyst. Dr. Keenan is survived by 3 children.

**JOHN W. LADWIG, M.D.**, Class of 1972, Moorhead, Minn., died Oct. 24 at age 70. Dr. Ladwig was a primary care physician who also practiced geriatric medicine. He completed his internal medicine residency at Hennepin County Medical Center in 1976 and his clinical cardiology fellowship at the U of M in 1977. In 2002, he became a clinical professor of internal medicine at the University of North Dakota School of Medicine and Health Sciences. He is survived by his wife, Carol; 3 children; and 4 grandchildren.

**NEIL C. LEERSSEN, M.D.**, Class of 1971, Newport, R.I., died Nov. 5 at age 73. Dr. Leerssen was an emergency room physician. He is survived by his wife, Betsy; 2 children; 3 stepchildren; and 9 grandchildren.

**LEONARD S. LINNELL, M.D.**, Class of 1953, New Hope, Minn., died Dec. 18 at age 89. Dr. Linnell was a psychiatrist. In the 1950s, he served as a medical missionary in Kiomboi, Tanzania. He is predeceased by his wife, Clarice; and his granddaughter, Marta. He is survived by 6 children, 4 foster children, 12 grandchildren, and 6 great-grandchildren.

**WILLIAM T. MCKENNA, M.D.**, Class of 1946, Palo Alto, Calif., died Dec. 5 at age 95. Dr. McKenna practiced internal medicine. He is predeceased by his wife, Mary Ann; and his son, William. Dr. McKenna is survived by 4 children, 9 grandchildren, and many great-grandchildren.

**THOMAS M. PARKER, M.D., M.S.**, Class of 1954, Roseau, Minn., died Aug. 3 at age 88. Dr. Parker practiced pathology. Dr. Parker is predeceased by his wife, Louise. He is survived by 6 children and 4 grandchildren.

**BRYANT I. PICKERING, M.D.**, Class of 1958, San Diego, Calif., died Sept. 11 at age 88. Dr. Pickering was an endocrinologist and practiced medicine in Arizona for many years before retiring in California. Dr. Pickering is survived by 3 children, 6 grandchildren, and 1 great-grandchild.

**THOMAS A. POLTA, M.D.**, Class of 1971, Spring Lake Park, Minn., died Oct. 25 at age 70. Dr. Polta was an anesthesiologist at Unity and Mercy hospitals in the Twin Cities. He is predeceased by his wife, Mary, and survived by 4 children.

**JOEL S. PRAWER, M.D.**, Class of 1978, Fort Myers Beach, Fla., died Oct. 11 at age 66. Dr. Praver practiced family medicine. He is survived by his wife, Cathy; 2 children; and 3 grandchildren.

**V. TERRANCE RHODES, M.D.**, Class of 1970, Minneapolis, died Sept. 2 at age 75. Dr. Rhodes, an otolaryngologist, practiced in the Twin Cities, Crosby, and New Prague, Minn. He is survived by his wife, Sharon; 4 children; and 7 grandchildren.

**JEAN C. SAUER, M.D.**, Class of 1956, Edina, Minn., died Dec. 9 at age 86. Dr. Sauer completed her residency in psychiatry at the U of M. She is survived by a daughter and 2 grandchildren.

**LEIGHTON G. SIEGEL, M.D.**, Class of 1962, St. Paul, Minn., died June 16 at age 79. Dr. Siegel was an ear, nose, and throat specialist. He is survived by his wife, Dianne; 3 children; and 7 grandchildren.

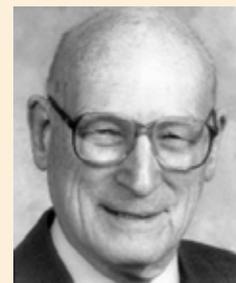
**BARBARA R. (KAHN) VISSCHER, M.D.**, Class of 1951, Minneapolis, died Aug. 12 at age 90. She earned an M.P.H. and Dr.P.H. in epidemiology from the University of California, Los Angeles School of Public Health, where she taught and did research until 2010. Dr. Visscher is survived by 3 children and 3 grandchildren.

**FRANK L. WALKER Jr., M.D.**, Class of 1969, Missoula, Mont., died Aug. 19 at age 74. Dr. Walker practiced emergency medicine. During the Vietnam War, he served as a Public Health Service doctor for the Navajo Nation in Chinle, Ariz. He is survived by his wife, Jeanine; 4 children; 3 stepchildren; and 4 grandchildren.

**THEODORE W. WILSON, M.D.**, Class of 1947, Sarasota, Fla., died Aug. 27 at age 93. Dr. Wilson was a radiologist in Sarasota. He is predeceased by his wife, Nan, and is survived by 3 children, 5 grandchildren, and 5 great-grandchildren.

**RICHARD M. MAGRAW, M.D.**, Class of 1943, Spring Park, Minn., died Nov. 30 at age 98.

Dr. Magraw completed his residency in psychiatry in 1951 and a fellowship in internal medicine in 1953 at the U of M. He served as director of the comprehensive clinic program at the U of M Medical School, assistant director of the Bureau of Medical Services and deputy assistant secretary for health manpower at the U.S. Department of Health, Education, and Welfare (now Health and Human Services), dean of the University of Illinois Medical School, president of the Eastern Virginia Medical School, chair of the American Medical Association's Committee of Undergraduate Education, consultant for the Indian Health Service, and chief of psychiatry at the Minneapolis VA Hospital. He returned to teaching at the U of M in retirement and was an emeritus director of the Center for Victims of Torture. In 1966, he wrote *Ferment in Medicine: A Study of the Essence of Medical Practice and of Its New Dilemmas*, for which he received the Norman Welch Award for the most distinguished writing in medical care and economics. He received the Harold S. Diehl Award from the Medical Alumni Society in 2000. Dr. Magraw is predeceased by his wife, Shirley. He is survived by 4 children, 6 grandchildren, and 6 great-grandchildren.



# Heart transplant's Minnesota roots



PHOTO: COURTESY OF UNIVERSITY ARCHIVES



PHOTO: COURTESY OF STANFORD MEDICAL HISTORY CENTER

(Top) Legendary U of M surgery teacher Owen Wangenstein, M.D., Ph.D., trained Christiaan Barnard, M.D., who performed the world's first successful heart transplant, and (bottom) Norman Shumway, M.D., Ph.D., who performed the first successful heart transplant in the United States.

FIFTY YEARS AGO, two renowned heart surgeons who learned their skills at the University of Minnesota Medical School vied – whether they acknowledged the competition or not – to complete the first successful human heart transplant.

Christiaan Barnard, M.D., Ph.D., a South African surgeon working at Groote Schuur Hospital in Cape Town, on December 3, 1967, implanted the heart of a 25-year-old woman, killed crossing a street, into the chest of grocer Louis Washkansky, who was in his mid-50s.

Barely more than a month later, Stanford University surgeon Norman Shumway, M.D., Ph.D., performed the first successful heart transplant in the United States, on Mike Kasperak, a 54-year-old steelworker.

Success was a breakthrough – but relative: Washkansky died from pneumonia 18 days after his operation. Kasperak died after only 14 from, in Shumway's words, "a fantastic galaxy of complications." Nonetheless, even that short-term success demonstrated the promise of a procedure that is now tried and true, though still risky.

## A NEW FIELD OF SURGERY

Both Barnard and Shumway had been surgical residents at the University of Minnesota in the decade before the transplants. They studied and worked under Owen Wangenstein, M.D., Ph.D., the renowned chairman of the Department of Surgery, and C. Walton Lillehei, M.D., Ph.D., often called the father of open-heart surgery.

Wangenstein and Lillehei "started an entire field of surgery," says Rosemary Kelly, M.D., who is now chief of the Division of Cardiothoracic Surgery at the University. "Because of their influence and teaching, surgeons from around the world came

to Minnesota. We were it!"

By some accounts, the relationship between Barnard and Shumway was fraught, a dynamic that set up a story of competition to successfully transplant a heart. But one of Shumway's daughters, Sara Shumway, M.D., now vice chair of cardiothoracic surgery at the University, says she doesn't believe that to be true.

The South African's groundbreaking surgery excited her father because it helped surmount legal barriers over the definition of death that blocked surgeons at Stanford from recovering donor hearts. "Once Barnard was able to do a heart transplant, it paved the way for other transplants to occur," she says.

## ROOM FOR IMPROVEMENT

Clearly, the time was ripe. During the rest of 1968, 107 heart transplants were performed in 24 countries. But it was still a long time before patients began to live longer than a few weeks or months.

The most important advance in improving the procedure, experts agree, was the development of better drugs to suppress the immune system and prevent the body from rejecting the transplanted heart. The University's transplant program came into its own in the late 1970s, with the advent of the immunosuppressant cyclosporine. (This year marks the 40th anniversary of the University's first heart transplant, performed by William Lindsay, M.D., and Demetre Nicoloff, M.D.) Says Kelly, "Cyclosporine changed cardiac transplantation."

Also important were heart biopsies to monitor for signs of rejection and determine whether stronger immunosuppression therapy was required, as well as the invention of the left ventricular assist device (LVAD), a mechanical, implantable pump that boosts the power of the heart. An LVAD can improve the health of a patient awaiting a transplant.



PHOTO: JOSE MERCADO, STANFORD NEWS SERVICE

Norman Shumway, M.D., Ph.D., went on to an illustrious career in heart transplant surgery at Stanford University.

### SEEING SUCCESS

By the time Barnard died in 2001 and Shumway in 2006, heart transplants had become much more common and successful. Today, about 3,000 such operations are performed in the United States each year. Average survival is 13.6 years for patients at the U of M, about three years longer than the national average. The University has performed more than 900 heart transplants, putting it among the leading transplant centers in the country.

One reason for the U's prominence, Kelly says, is that senior cardiac transplant surgeons Kenneth Liao, M.D., Ph.D., Ranjit John, M.D., and Sara Shumway work extremely well together. "I would put them against any cardiac surgery group in the country.

"Also critical to the success is the high caliber of heart failure and transplant cardiologists," she adds. "We have a heart failure team at the University that truly is second to none. You need an entire community dedicated to the care of these very complex patients. We have had that dedicated and talented team from the very beginning, 40 years ago."

Says Liao: "We all feel very passionate about caring for this group of patients. I think that's the success of this program."

### ON THE HORIZON

New developments may make treatment for heart failure even more effective. The University and other centers are testing the TransMedics Organ Care System – also known as the "heart-in-a-box" – a mobile transport cart that keeps a donor heart warm, oxygenated, and beating. It is designed to keep the heart in better condition during transport, and it provides a way to monitor the heart before implantation.

Other discoveries may delay the need for transplants or make them unnecessary. More durable LVADs would push back the need for a transplant in younger patients or serve as a transplant substitute in older patients, says Shumway. Researchers are also looking to stem cells to help heal damaged hearts.

"It's great if you can offer someone something that is not a heart transplant," Shumway says. That's because, although heart transplantation is well-established, long-term immunosuppression can be tough on patients.

Yet when a heart is failing, a transplant is often still the treatment of choice.

"I think it will be around for another 50 years," Shumway says. MIB

By Greg Breining, a journalist and author based in St. Paul

*The most important advance in improving the heart transplant procedure, experts agree, was the development of better drugs to suppress the immune system and prevent the body from rejecting the transplanted heart.*

*"Also critical to the success is the high caliber of heart failure and transplant cardiologists. We have a heart failure team at the University that truly is second to none."*

–Rosemary Kelly, M.D., chief of cardiothoracic surgery, University of Minnesota



### WEB EXTRA

Read about Emson Juma, the recipient of the 900th heart transplant at the University, at [z.umn.edu/juma](http://z.umn.edu/juma).

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