

KANSAS

# MEDICINE+SCIENCE

News from the University of Kansas Medical Center

SPRING/SUMMER 2018



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THE UNIVERSITY OF  
KANSAS HEALTH SYSTEM



## FROM THE EXECUTIVE VICE CHANCELLOR

The past several months have been a time of great change and excitement at the University of Kansas Medical Center. Last summer, our Executive Vice Chancellor, Dr. Doug Girod, was named the new Chancellor at the University of Kansas. I was appointed to serve as interim Executive Vice Chancellor at KU Medical Center, while continuing my duties as Executive Dean of the KU School of Medicine. In January 2018, it was the highest honor of my career to be named as the new Executive Vice Chancellor at KU Medical Center.

As a proud alumnus of the KU School of Medicine, it has been exhilarating to see the incredible advances our nationally ranked Schools of Medicine, Nursing and Health Professions have made in the past few years. It was with tremendous pride that we opened our stunning new Health Education Building in the summer of 2017. The state-of-the-art building is now our primary teaching facility for three schools, using a simulation center and flexible, state-of-the-art learning space to support our modern interprofessional approach to health care education.

In this issue of Kansas Medicine + Science, you can learn more about our Health Education Building. In our cover story, we explore how researchers at the KU Alzheimer's Disease Center are leading the way on a new approach to finding a cure and effective treatments for Alzheimer's.

We also get a firsthand look into the experience of being a standardized patient, and we travel to Philmont Ranch in New Mexico, where medical students and faculty from KU have been providing health care for Boy Scouts and their leaders for more than 60 years.

We hope you enjoy this issue of Kansas Medicine + Science. We always appreciate your feedback, so please drop us an email at [kmands@kumc.edu](mailto:kmands@kumc.edu). We look forward to hearing from you.

Robert D. Simari  
Executive Vice Chancellor  
University of Kansas Medical Center

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# PULSE

NEWS FROM KU MEDICAL CENTER

## KU SCHOOL OF NURSING EARNS CENTER OF EXCELLENCE IN NURSING EDUCATION DESIGNATION FROM THE NATIONAL LEAGUE OF NURSING

The University of Kansas School of Nursing has earned the National League of Nursing (NLN) designation as a Center of Excellence for 2017-2022. Schools of nursing apply for Center of Excellence status based on demonstrated and sustained excellence in faculty development, nursing education research, or student learning and professional development. The designation of a school or health care organization as an NLN Center of Excellence in Nursing Education is a voluntary process that involves preparation of material by the organization itself and peer review. The KU School of Nursing is one of only 15 schools or organizations to have achieved NLN Center of Excellence designation in 2017 and one of only 62 total to have attained Center of Excellence status. The KU School of Nursing has received continuing designation as a Center of Excellence in Creating Environments that Enhance Student Learning and Professional Development. It received its first such designation in 2013.

## UNIVERSITY OF KANSAS CANCER CENTER JOINS PARTNERSHIP TO OFFER INNOVATIVE BLOOD CANCER CLINICAL TRIALS

The University of Kansas Cancer Center has announced that it will join a consortium with the Dana-Farber Cancer Institute, in collaboration with The Leukemia & Lymphoma Society (LLS), to bring clinical trials testing innovative blood cancer therapies to Kansas City. The groundbreaking Blood Cancer Research Partnership (BCRP) brings clinical trials closer to where patients live and helps to address one of the primary bottlenecks in the development of new cancer therapies: the need for more patients to take part in trials. There are six clinical trials currently open for accrual that are available to the consortium members. A number of additional clinical trial proposals are currently in development. One of the trials involves immunotherapy for patients who relapse after donor stem cell transplantation. The partners are hopeful the collaboration will create a new pathway of collaboration between community oncologists, academic centers and foundations to improve cancer therapy for patients throughout the United States.

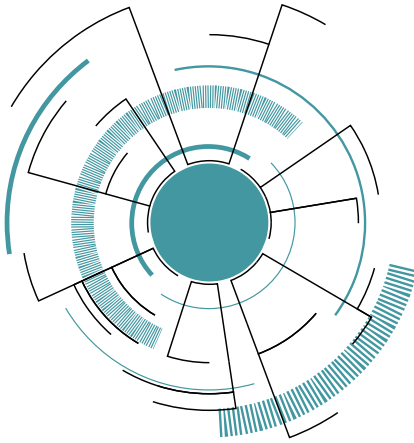
## THE UNIVERSITY OF KANSAS MEDICAL CENTER'S PROJECT ECHO IS HELPING ASTHMA EXPERTS BUILD A VIRTUAL COMMUNITY THROUGHOUT KANSAS

An interprofessional team of health care professionals at KU Medical Center is creating a virtual community to share the latest in asthma management and treatment with their peers throughout the state. Health care professionals from the University of Kansas Asthma Center, the KU Department of Respiratory Care Education, the KU Department of Internal Medicine's Division of Pulmonary Diseases and Critical Care Medicine, and the KU Office of Rural Medicine Education presented a series of four one-hour interactive teaching teleconferences titled "Project ECHO Asthma" designed to build a community of doctors, nurses, school nurses, social workers and other health care colleagues throughout Kansas who work with asthma patients. The goal is to build and increase a community of people with the knowledge to work with asthma patients, so that they can learn from one another and reduce the disparities in patient care.

## KU SCHOOL OF MEDICINE FULBRIGHT SCHOLAR TO STUDY CANCER CARE FOR ADOLESCENTS AND YOUNG ADULTS IN DENMARK

Abbey Elsbernd, a third-year student at the KU School of Medicine, is one of seven University of Kansas students who were named Fulbright Scholars for the 2017-2018 school year. Elsbernd is spending her Fulbright year at the University of Copenhagen in Denmark studying how a special oncology ward designed specifically for adolescents and young adults at Rigshospitalet, one of Denmark's largest hospitals, benefits those patients and how it can be improved. Ultimately, Elsbernd would like to see her work used to create a framework to develop similar oncology units in the United States and elsewhere. The research that Elsbernd is conducting as a Fulbright Scholar is a continuation of the work she began as Clendening Summer Fellow in 2016. She spent half of the summer of 2016 in Copenhagen and the other half in Kansas City studying and comparing stress levels in adolescent and young adult oncology patients within the context of each country's health care system and on the basis of their insurance situation.



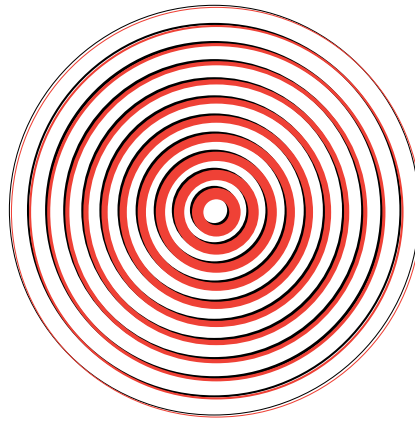


### KU SCHOOL OF MEDICINE RANKS AMONG THE NATION'S LEADERS IN EDUCATING PRIMARY CARE, RURAL CARE AND FAMILY PHYSICIANS

Serving the people of Kansas through the creation and promotion of model health care programs is a primary tenant in the mission of the University of Kansas Medical Center. To that end, the KU School of Medicine takes particular pride in being among the nation's leaders in educating primary care physicians, many of whom will stay in the Sunflower State, thus fulfilling the medical center's goal of providing high-quality patient-centered care to the citizens of Kansas. While there is no perfect metric to judge how well a medical school is meeting the needs of its constituency, the KU School of Medicine, which includes campuses in Kansas City, Salina and Wichita, fares among the nation's finest in the areas of primary care (95th percentile), producing doctors who are working in rural settings 10 to 15 years after graduation (96th percentile) and family medicine physicians (98th percentile) as determined by the American Association of Medical Colleges (AAMC). Each year, the AAMC uses its Missions Management Tool to provide a granular evaluation of each of its member medical schools so they can assess how they are faring in meeting the institution's own specific goals based on the history, location, faculty and governing body, among other factors. Because of the varying nature and missions of its members, the AAMC forgoes a single overall ranking and looks at 48 different data measures in six mission categories as a way of painting a more complete picture.

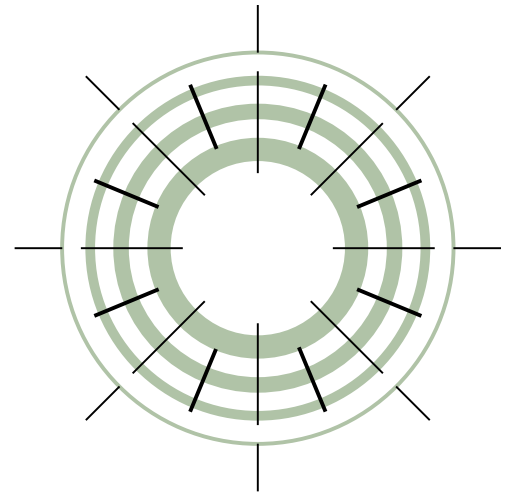
### KU CANCER CENTER RECEIVES RENEWAL OF NATIONAL CANCER INSTITUTE DESIGNATION

The National Cancer Institute (NCI) renewed The University of Kansas Cancer Center's national cancer center designation for five years. As part of the re-designation, Children's Mercy was formally approved as a cancer center consortium partner. The KU Cancer Center remains one of only 70 nationally designated centers by the National Cancer Institute, a part of the National Institutes of Health. As part of a multi-year effort, the KU Cancer Center submitted an application in September 2016 seeking renewal of its National Cancer Institute designation, the addition of Children's Mercy as a consortium partner and consideration for Comprehensive Cancer Center status. The award results in an 11 percent funding increase from NCI to the KU Cancer Center, which improved its overall score from "excellent" to "outstanding." The KU Cancer Center's other consortium partner, the Stowers Institute for Medical Research, remains a significant part of the community-wide effort to transform cancer research and clinical care.



### THE KU SCHOOL OF MEDICINE NAMES WEIJING SUN AS MEDICAL ONCOLOGY DIVISION DIRECTOR

The KU School of Medicine and The University of Kansas Cancer Center appointed Weijing Sun, M.D., the new Sprint Foundation Professor of Medical Oncology and the director of the Division of Medical Oncology. He is also associate director for clinical research for the KU Cancer Center. Before coming to KU, Sun was a professor of medicine and medical oncologist at the University of Pittsburgh, where he served as director of the gastrointestinal cancers section of hematology-oncology and co-director of the University of Pittsburgh Medical Center Gastrointestinal Cancer Center of Excellence. Sun was also the director of the National Cancer Institute Experiment Therapeutics Clinical Trials Network for the Pennsylvania Cancer Consortium at the University of Pittsburgh Cancer Institute. Sun, who specializes in the treatment of gastrointestinal cancers, has authored numerous journal articles and has served as the primary investigator of a wide range of clinical trials. He also is board-certified in internal medicine and in medical oncology. Sun earned his medical degree from Shanghai Medical University, now Fudan University, in Shanghai, China. He completed a master of science in immunology and microbiology at the University of Nebraska-Lincoln, and he was a post-doctoral research scientist at the University of Pennsylvania School of Medicine. He completed his residency in internal medicine at Loyola University Medical Center, and he served his hematology-oncology fellowship at the University of Pennsylvania in Philadelphia.



### KU MEDICAL CENTER PLAYS A KEY ROLE IN THE FDA APPROVAL OF THE FIRST TREATMENT FOR POLYCYSTIC KIDNEY DISEASE

A drug with a decades-long history of research and testing at the University of Kansas Medical Center has been approved by the Food and Drug Administration as the first treatment for autosomal dominant polycystic kidney disease, the most common form of PKD. The two forms of PKD – autosomal dominant (ADPKD) and autosomal recessive (ARPKD) – affect 600,000 people in the United States and millions worldwide. In April 2018, the FDA approved the use of tolvaptan, a targeted treatment that has shown it can slow the growth of cysts on the kidney and the progression of the disease. While tolvaptan is not being touted as a cure, it is a significant breakthrough in the treatment of PKD. Patients taking tolvaptan twice a day often experience a longer period of time before they need kidney dialysis or a transplant, according to the Japanese drug manufacturer Otsuka Pharmaceutical Co. Ltd., which markets the drug under the name JYNARQUETM.

## KU MEDICAL CENTER STUDENTS WIN AWARDS AT RESEARCH DAY AT THE CAPITOL

Two students from the University of Kansas Medical Center received awards at the 15th Annual Capitol Graduate Research Summit in March 2018. Judges from academia and industry identified two students from each Kansas Board of Regents' school in attendance to win scholarships from BioKansas and their respective schools. Shireen Usman was honored with the BioKansas Award, and Nicholas Marchello garnered the KU Medical Center Award. Usman, a School of Medicine student in the Department of Otolaryngology-Head and Neck Surgery, presented "Transcriptome Characterization and Development of Targeted Therapy in Juvenile Nasopharyngeal Angiofibroma (JNA)." Marchello, who is a doctoral student in the Department of Dietetics and Nutrition, presented "Diet Quality During Weight Maintenance in Rural Breast Cancer Survivors."

## RESEARCH FINDS HEAVY DRINKING IN COLLEGE CAN LEAD TO OBESITY LATER IN LIFE

Research by Tera Fazzino, Ph.D., a post-doctoral researcher in the Department of Preventive Medicine and Public Health at KU Medical Center, shows that heavy episodic drinking during early adulthood increases the risk of transitioning from a healthy weight to overweight or obesity five years later. KU researchers say this is the first study examining the effect of heavy episodic drinking – defined as five or more drinks in one episode for males, four or more for females – over time. Fazzino found that heavy episodic drinking was associated with a 41 percent increased risk of transitioning from normal weight in people aged 18-26 to overweight in people aged 24-32. Most alarming, the study showed a 36 percent increased risk of transitioning from overweight to obese during that 5-6 year span. In addition, heavy episodic drinking was associated with higher odds of excess weight gain in general. Kimberly Fleming, Ph.D., Kenneth Sher, Ph.D., Debra Sullivan, Ph.D., and Christie Befort, Ph.D., are co-authors on the study, which was published in the August 2017 issue of the American Journal of Preventive Medicine.

## KU MEDICAL CENTER HONORS FOUR FACULTY AS UNIVERSITY DISTINGUISHED PROFESSORS

KU Medical Center named four long-time faculty members University Distinguished Professors, an honor reserved for faculty who have made significant and sustained contributions to research, scholarship and teaching at the medical center. The honorees are: Randolph J. Nudo, Ph.D., professor and vice chair of research in the KU School of Medicine's Department of Rehabilitation Medicine and director of the Landon Center on Aging and director of the Institute for Neurological Discoveries; James P. Calvet, Ph.D., professor in the KU School of Medicine's Department of Biochemistry and Molecular Biology, and the Jared Grantham Kidney Institute; Janet D. Pierce, Ph.D., APRN, CCRN, FAAN, the Christine A. Hartley Centennial Professor in Nursing for the KU School of Nursing; and Susan Carlson, Ph.D., the AJ Rice Professor of Nutrition in the KU School of Health Professions' Department of Dietetics and Nutrition.

## NEW RESEARCH SEEKS TO MINIMIZE THE EFFECTS OF RADIATION INJURY

New research conducted at KU Medical Center could make treatment for gastrointestinal cancers safer—while also helping to mitigate the dangers of nuclear accidents and terrorist attacks.

The research, led by Subhrajit Saha, Ph.D., assistant professor in the Department of Radiation Oncology at KU Medical Center, began more than five years ago when his team embarked on a quest to understand the biology behind radiation-induced gastrointestinal syndrome (RIGS) – a serious risk for people being treated for stomach, pancreatic, colorectal and other cancers in the abdominal area.

RIGS prevents the body from absorbing nutrients and often causes nausea, vomiting and diarrhea. RIGS occurs primarily when radiation treatment for these abdominal cancers destroys healthy tissue in the GI tract, especially the outer layer of the intestines, known as the epithelium. And when the epithelium is lost, bacteria can spill into the body and cause sepsis, which can kill a patient. Because there is no drug treatment for RIGS, doctors must turn to radiation to treat their patients, which requires them to use extreme caution up to the point of compromising on the necessary treatment. This is of specific concern to cancer patients as more than half of patients treated with abdominal radiotherapy are affected by RIGS. RIGS also occurs when people are subjected to radiation through a nuclear accident or attack.

## KU MEDICAL CENTER BECOMES THE THIRD SCHOOL IN THE NATION TO LAUNCH SPECIALIZED MULTIPLE SCLEROSIS TRAINING PROGRAM FOR DPT STUDENTS

The Department of Physical Therapy and Rehabilitation Science at KU Medical Center has embarked on an innovative program to address the needs of people throughout Kansas and the region who are living with multiple sclerosis (MS). This fall, the University of Kansas became only the third university in the country to implement the MS Standardized Training and Education Program with University Partners (STEP UP) as part of its entry-level education for doctor of physical therapy (DPT) students. KU joins the University of North Carolina-Chapel Hill, where the program began, and the University of South Florida in adopting this program to address the specific needs of people with MS.

STEP UP was founded in 2008 by the physical therapy department at the University of North Carolina and was added by the University of South Florida in 2014. While most physical therapists receive some training for working with clients who have neurological disorders as part of their basic education, experts say MS patients benefit greatly when cared for by physical therapists who have advanced training in MS treatment or experience working MS patients.

At KU Medical Center, the KUMC STEP UP program will be embedded into the School of Health Professions doctor of physical therapy curriculum over six semesters. The training will include clinical, research, ethical and advocacy components.







# ROLE PLAYING

BY GREG PETERS  
ILLUSTRATION BY MARIO WAGNER

## BEING A STANDARDIZED PATIENT FOR STUDENTS AT KU MEDICAL CENTER CAN BE A CHALLENGING AND REWARDING EXPERIENCE

*Greg Peters, a senior communications specialist at the University of Kansas Medical Center, leads a double life. In his spare time, he works as a standardized patient for KU Medical Center. A standardized patient is an individual trained to portray the personal history, physical symptoms, emotional characteristics and everyday concerns of an actual patient. The teaching tool allows medical students to practice physical exam skills, the correct way to take a medical history, communication skills and other exercises.*

*Howard S. Barrows, M.D., a neurologist and medical educator, created the first standardized patient program in 1963 for his third-year neurology clerkship while teaching at the University of Southern California. Since then, hundreds of health care education programs, including KU Medical Center, have used standardized patients as part of their medical school curricula.*

*For this issue of Kansas Medicine + Science, Greg writes about his involvement with the standardized patient program at KU Medical Center and also talked to some of his fellow standardized patients about their experiences.*

Don't tell anybody, but I have a little black bag in my office where a stranger lives. He only comes out a few times a year, but when he does, it's as if a force of nature has been unleashed on the latest batch of unprepared and uncertain first-year medical students who have come to the University of Kansas School of Medicine to learn their trade.

For a few afternoons each year, I morph into this stranger and have a lot of fun working with medical students to help them learn how to cope with challenging patients.

Yes, I am a standardized patient – or an SP – as we are often called.

Most institutions that train health care professionals employ people like myself who play the role of patients, so that medical, nursing and other health care professions students can spend time honing their medical technique along with their bedside manner. Along the way, SPs are poked, prodded and listened to with countless icy stethoscopes in the name of modern medicine.

Although my acting chops were limited to playing a munchkin in the fifth grade as part of a local high school production of "The Wizard of Oz," I'd sat around in a enough hospital gowns with cold air blowing up my backside to know how to act like a patient – or at least I was bold enough to think I had. So why not get paid for my trouble instead of paying a doctor's office for being exposed to the indignity?

But what I perceived as just another paycheck was in fact, a very important service that variety of people provide to help support the schools at KU Medical Center, especially the KU School of Medicine. It took me a while to realize how important this job

is. Not only were the students being monitored by School of Medicine faculty members via video cameras to test their skills and knowledge, it was up to the standardized patients to be as demanding as possible in our role-playing so that KU produces the best health care professionals possible.

The KU School of Medicine faculty come up with the standardized patient scenarios, which are designed to work on a specific skill set the students need to master. The skills might be as simple as using a firm handshake when meeting a patient for the first time or remembering to wash their hands before starting an exam. But they can be as complex as conducting a prostate exam or providing a diagnosis to a dying patient.

My first role as an SP was as a patient with a horrible cough. It entailed coughing 20 minutes at a time, four hours straight. My throat was so sore after a few days, I thought I really did need to see a doctor.

My SP repertoire includes what are known as "difficult patients." Each of the four has a different set of quirks and foibles. For example, one of my SPs loves to tell stories and chat about everything. Stopping this character from telling his stories is about as impossible as spitting into a Texas-sized tornado. This is probably my favorite role – and it's a lot of fun because the students often laugh while they learn.



Greg Peters

Sometimes part of your job as an SP is to make the seas as choppy as possible for the students. It can be uncomfortable for all involved, but you grow to understand that the student's mettle is best tested when it is forged by facing a challenging patient situation head on and persevering.

There are certainly times when you wonder how much the standardized patient training you are part of really helps medical students as they transition to professional doctors. I recently talked with Jake Kenyon, M.D.,

who is a 2013 graduate of the KU School of Medicine. He is currently a clinical assistant professor in the KU Department of Internal Medicine. Kenyon was quick to credit his SP training as a prime resource when it came to showing compassion for a family who was about to receive some discouraging news about their loved one's prognosis.

Kenyon said he was nervous about going into the patient's room to talk to the family. He didn't know what to say. But when he got there, it was as if his training in

the standardized patient program kicked in. He said it wasn't like he had a script to refer to, but more that the situation had a familiarity because he had gone through similar scenarios in medical school. Because he had run through this scenario with standardized patients, he was able to provide comfort to a patient and his family and have a candid discussion about dying.

These are the kinds of anecdotes that warm the hearts of those of us who work as standardized patients.

Greg Peters talked to a few of the other people who work as standardized patients at KU Medical Center and found they had many common experiences in their second careers.



## RALPH

Ralph signed on to play the role of a man with bronchitis seven years ago for the KU School of Medicine. As a member of local bands over the years, Ralph was used to being on stage, but he said being an SP was something entirely different.

"I was not a trained actor. But I have a band, and I've played in front of a lot of people, so I was used to being put on the spot."

Ralph, who estimated he has played more than 25 patient roles at KU Medical Center over the years, said some of the roles are physically and emotionally demanding. He said there are times when it is difficult for the students to turn off the emotions they feel for the patient.

"I've had episodes where I play a depressed Army patient, and several of the students have really locked into the character and really wanted more than the 30 minutes they were allotted to be with me," he said. "It makes you feel good because it feels like you're getting the role across to them."

## WALTER

Walter goes back to the earliest days of the standardized patient program at KU Medical Center and has played more than 70 roles since he started in 2000. Walter said after nearly two decades as an SP, it's easy to get into character.

"The ones I enjoy the most are the ones where we can get the students to suspend disbelief," he said. "You're challenged to get to the point where the students are truly engaged and forget it's a simulation."

Over the years, Walter has proven to be a master at getting students to believe they are in the room with a patient. So much so, in fact, that many have left the examination room in tears or enraged by Walter's character only to be sent back in by an observing physician who was waiting in the hallway.

"It's better practice for a student to work with a live human being," Walter said. "They need to understand the patient they are dealing with and react accordingly. The reality is that for most of us interpersonal skills don't come naturally, but they are a critical part of health care."

## JOSÉ

José is a local visual artist and writer who got his start as a standardized patient about six years ago when somebody suggested he might be a good fit for some of its roles. Jose said being a standardized patient is less about acting and more of an extension of his art.

"When I first did it, I thought 'Oh, I'm just helping out,'" he said. "But there have been a few instances where you get caught up in what you are doing, and the student forgets that it's a make believe thing."

José doesn't really have a favorite role among the four patients he portrays at KU Medical Center, but there are some that he feels more emotionally invested in than others. In one case, he plays a schizophrenic patient who has an incident in his life that makes him go off his medication after years with his condition under control.

"The thing that makes it intense is that you're supposed to make it believable. He's hearing voices. I remember a student snickered, and I really went off on her. It frightened her. You really get caught up in the moment."

## JAN

Being a retired critical care nurse and currently serving as a physical examination teaching assistant at KU Medical Center, Jan has pretty much been seen and done everything when it comes to practicing day-to-day medicine.

"I was a student myself, not knowing what the right thing is to do or how to handle a situation. A lot of the confidence you need comes with years of doing it, and they don't have the experience yet."

Jan helps students get past the awkwardness many of them feel when faced with having to talk about delicate subjects with a patient or when performing physical examinations. These can be particularly stressful times for students who may not have any experience working one-on-one with a patient.

"For me, the hardest part of being an SP is watching a student struggle. Particularly with the first- and second-year students, they are nervous. They're hesitant and not sure what to do. Because it's a learning process I can't jump out of character and give them a hug and say it's okay."

## ED

Ed is a chameleon of sorts when it comes to the standardized patient business. One minute he's dressed in an Army jacket with frizzy hair and a scruffy beard playing a crazy-eyed, drug-seeking vet, and then next minute he's a slick lawyer trying to enforce his father's do-not-resuscitate order. Regardless of the role, Ed helps to bring out the human side of medical school training.

One of his roles is playing a patient where the student must break the bad news to Ed that he is dying of cancer. It's one of his favorites but also one of the most intense.

"You have to play all of the emotions," he said. "You have to first be in denial – 'Oh no, it can't be me.' Then regret, like 'What did I do to deserve this?' Then you go to grief – 'What is my wife going to do?'"

"On one occasion, this poor kid just kept asking 'Is there anything else I can do? Can I call your wife?' He's gradually backing out the door, and I'm sobbing in my hand and looking down. And just as he's walking out the door he says, 'Have a nice day!'"

## MARIE

Marie has been a standardized patient for longer than she can remember. Like many of the people who become standardized patients, she got into the job to earn a little extra money, but somewhere along the way she fell in love with helping students become doctors and nurses.

Over the years of being a standardized patient, Marie has watched numerous doctors and nurses progress and graduate from their programs. She's proud of the work she's done and the success of her students. Once in a while she'll meet one of them on the street, and she never tires of hearing their appreciation for her work.

"One day my mother and I had just finished doing a role together, and we were walking across the street from the medical center when a lady said, 'Are you Marie? Do you remember me?'" Marie recalled. "The woman said, 'I remember when you were giving me feedback. You were so nice and encouraging to me. That's what made me go on to become a nurse practitioner.'"

"Then she gave me a big hug."



# Prepared for ADVENTURE

BY KAY HAWES  
PHOTOS BY ELISSA MONROE

## KU School of Medicine and Philmont Scout Ranch Celebrate 60 Years of Wilderness Medical Education

### INFIRMARY AT PHILMONT SCOUT RANCH NEAR CIMARRON, NEW MEXICO, AUGUST 8, 2017

When Kyle Dack hears the bell ring, he immediately heads back to the infirmary radio room. The bell means a trek participant is injured or ill, and decisions must be made quickly. The dispatcher, one of many emergency medical technicians (EMT) at Philmont for the summer, briefs him on the incoming call. This time it's a young man whose symptoms have arisen suddenly.

Dack begins assessing the situation. His questions go through the dispatcher, who this time is on a satellite phone with one of the adult advisors for the crew.

When did he last eat? When did he drink? Can he talk? Does he have other symptoms? How long has he been vomiting? Is he cold, hot, in pain? None of this is easy, as Dack cannot see the young man himself. But Dack works quickly to ascertain whether the teen is seriously ill and what actions must be taken immediately.

Today Dack is Medic 1 at Philmont Scout Ranch, a 250,000-square mile, high-adventure camp in northern New Mexico owned by the

Boy Scouts of America. As Medic 1, he is first to the radio and first deployed on any backcountry calls. At the beginning of his fourth year at the University of Kansas School of Medicine, Dack is learning to be a physician. There is no better place to learn than Philmont.

### *Learning and growing*

The KU School of Medicine and Philmont formally celebrated a 60-year relationship in the summer of 2017 when the Philmont Staff Association gave KU its Silver Sage Award for service. Although the answer to how KU became involved with Philmont seems lost in time, there are stories involving a former KU dean who talked a medical student into coming out in the 1950s after a doctor from Loma Linda, California, wouldn't cover Saturdays. A tradition was born, and Jayhawks have been at Philmont ever since. As the property grew over time into the largest youth camp in the world, the relationship formalized into a four-hour elective in adolescent pediatrics for fourth-year medical students from all three campuses of the KU School of Medicine.

Philmont is a unique experience. Trek participants, often from the same scout troop, engage in a 12-day trip that typically involves 10 days of hiking a pre-planned itin-

erary that covers from 55 to 103 miles, all while toting a backpack that weighs 50 to 65 pounds. Participants travel in crews with anywhere from eight to 12 teenage members and up to four adult advisors. Girls who are Venturer Scouts participate, as do both male and female advisors. There are specialty treks and horseback treks, but most of the crews are on foot.

After a day of orientation, the crew traverses the vast property, summiting mountains and sleeping under the stars at one of 55 trail camps or 35 staffed camps, where Philmont staff lead a variety of programs, from fly fishing to rock climbing, black-powder shooting and horseback riding. Accompanied for the first three days by a Philmont Ranger—an experienced summer staff member who shows them the ropes—they prepare their meals over a backcountry stove, filter water from streams, resupply at staffed camps and sleep in Philmont-issued tents, being sure to hang a bear bag every night that includes all of their “smellables.” Other wildlife include elk, antelope, curious mountain lions and chipmunks that are so aggressive they are known as “mini-bears.”

The journey is difficult, with elevations up to 12,441 feet over rocky trails, and it is





Andrew Sheets and Abigayle Sytsma





punctuated by frequent thunderstorms and occasional hail the size of golf balls. The trek always includes summits of iconic landmarks and concludes with a day of celebration and gear return. For many of the participants, it is simultaneously the most difficult and most wonderful experience of their lives.

The medics from the KU School of Medicine say the same thing.

"I don't think I realized just how much I would learn and how much I would grow at Philmont," said Samantha King, a fourth-year KU School of Medicine student who was chief medic in August 2017. "I didn't realize how much autonomy we would have. It's the experience most like a residency of anything we have done. When you are out in the wilderness on a trail, it's a very unique experience."

#### **RADIO ROOM IN THE INFIRMARY AT PHILMONT, AUGUST 8**

Kyle Dack has moved on to the more complicated questions. Can the young man be assisted without leaving his crew? Does he need more care than can be provided by his crew or by the staff at the nearest remote camp, all of which include staff trained in wilderness first aid? Can he be evacuated out on foot? How far is he from a road? It's monsoon season. Are the roads passable right now? Can a "hasty team" hike in to get him? His crew is at a "dry camp" and has run out of water. How far away is a water source? Can Philmont Rangers hike water in to them? The dispatcher calls Philmont logistics for their input.

#### *The only KU medical school class requiring hiking boots*

The consultation in the radio room is often the first step in medical care, and it's one that requires focus, attention to detail and a full grasp of the many kinds of illnesses and injuries that might befall either an adult advisor or a high-school youth participant in a typical 80-mile, 10-day trek in the high country of New Mexico. Injuries include the mundane but debilitating—severe blisters, sprained ankles, strained calves and gastrointestinal trouble. Also common is altitude sickness and dehydration from exertion or illness. Once in a while, someone has chest pains, a broken bone, anaphylactic shock, diabetic pancreatitis or even the rare high-altitude pulmonary edema. In short, it's great training for budding physicians.

In the summer of 2017, the 24 KU medical students treated 1,708 patients out of the more than 25,000 people who came through Philmont. The students, known at Philmont as medics, serve eight at a time in four-week rotations beginning in May and concluding in August. There are five on call at a time, and every day the medics rotate duties.

"It's very competitive," said David Naylor, M.D., assistant professor at the KU School of Medicine and associate course director. Naylor recruits, selects





Maria Gallegos



Andrew Sheets with scout

and schedules the medical students for Peds 914, the only KU medical school class that requires hiking boots. He's also a KU grad and a former Philmont medic. Naylor noted that this year 60 School of Medicine students vied for the 24 spots.

"The experience is unlike most others medical students have, and there's a recognition that it's challenging, but you learn a lot."

Dack, who hopes to become a neurologist after graduating, agreed.

"This is the rotation where I have learned the most. I've learned the importance of staying confident and being able to evaluate and treat patients without someone supporting me all of the time. Also, the triage, the calls to family—all of those are completely different because of the wilderness aspect."

The medics officially learn under the tutelage of attending physicians who are volunteer clinical faculty with the KU School of Medicine. Unofficially, they also are learning from Philmont nurses, dispatchers, drivers and chaplains. For Dack and his classmates, learning is a constant and the lessons range from the medical and psychological to the logistical, spiritual and even the culinary.

#### STAFF KITCHEN, INFIRMARY AT PHILMONT, AUGUST 8

Dack and Brooke Banning, another KU School of Medicine student who is Medic 3 today, are in the staff kitchen at the infirmary taking advantage of a few minutes of down time. As Medic 3, Banning is in charge of the clinic, and she is the only

medic not wearing hiking boots. She represents the home team, making rounds on patients in the infirmary, seeing walk-ins and reporting out to the large medical administrative team at the morning meeting. At the nurses' station, Lucy Brazil, the chief nurse, is going over paperwork with Shandi Appier, who is Medic 2 today. As Medic 2, Appier is second out if there's a backcountry call. Appier and Dack head to the pharmacy room and prepare the med bags for the day, making sure to replenish any used supplies and double-check that the bags, which accompany the medics into the back country, contain the appropriate medications and materials. Brazil helps them locate additional supplies.

#### *Being prepared*

The infirmary, one of only three licensed in New Mexico, looks like what you would expect a small hospital to look like, with a few added touches. There's a waiting area, a clinic area, a 15-bed in-patient wing, offices, a large nurses' station, a supply room, on-call rooms and a trauma room. But there's also a radio room, a training room where procedures are mastered and even a room stuffed with what looks like climbing gear. That's PHILSAR, short for Philmont Search and Rescue. And the red and blue packs held here allow medics, rangers and EMTs to treat those who are injured or ill on the remotest parts of Philmont.

"You've heard of the Boy Scout motto, 'Be Prepared,' Naylor said. "All of Philmont is like that. The people who work there have often worked there every summer for years, and they are the most well-trained and prepared people you will ever see."

#### DEAN COW ROAD, PHILMONT, AUGUST 8

Kyle Dack is on his way to meet a trek participant in the back country. Riding shotgun in a large, white Chevy Suburban, Dack has his med bag that he packed earlier, along with his own backpack with his jacket and water bottle. The large 4-wheel-drive Suburbans, outfitted with a wilderness package, serve as the backcountry ambulances used at Philmont. In the back is a litter and additional medical and rescue gear that take up half of the second row and all of the third.

The driver on this trip is Carl Joice, an EMT from Littleton, Colorado, who is in his seventh year at Philmont and his second as a driver. Rain is coming down in sheets, and the road is dirt with massive potholes. Dack hops out to open a Philmont gate and let the Suburban through. A few miles later, rain lets up a bit as Joice gets out to assess whether it's possible for the Suburban to cross a stream that's out of its banks. The crossing made, Joice takes the Suburban up a mountain road and can't make it to the first switchback. Dack gets out to push. The 45-degree angle and the deep mud interspersed with rocks the size of file cabinets bring the Suburban to a dead halt. Joice backs down the road and pulls off. It's time to hike to the site. But dispatch says 'no, not this time.' A more urgent call has come in, and Dack is needed back at the infirmary. Another medic will respond later.

#### *Pairing perspectives*

The radio room at Philmont, staffed 24 hours a day, is where you will find the drivers and dispatchers, who are on duty four at a time,



Kyle Dack

with rotating assignments similar to those of the medics. They are experienced EMTs, many with a connection to Kansas City. In 2017, 995 calls came into dispatch, with 655 of those ultimately transported and the remainder treated on the trail. Forty-seven cases were severe enough to transport to outside facilities, usually in Raton or Albuquerque. Every few years, someone gets evacuated by helicopter for a life-threatening injury such as a skull fracture or seizures.

Bridget Hogan, associate chief of medical services, is on point for many of those decisions. Hogan, who trained as an EMT, is originally from Wichita, Kansas, and has just finished her 10th year on staff at Philmont. She spent six years as a Philmont Ranger and has carried more than her share of patients out of the backcountry on litters. Hogan is familiar with every corner of the Philmont property.

"I just love our medic/driver relationship," Hogan said. "I love how open the medical students are to both learning from and educating the people around them. The medical students and the EMTs come at everything from a whole different perspective. When you pair those two perspectives, you have a whole different level of patient care."

According to the medics, Maria Gallegos is one of the best drivers at Philmont. She is a paramedic and is originally from Cimarron, the town just down the road from Philmont. In addition to knowing the roads well, she also is part of the medics' training staff.

"We train the medics on how to use all of our gear. We take them out on extended training hikes and make sure they are trained in all of the procedures and best practices,

including using a compass," she said. "That way, they have a sense for the environment that their patients are in, and they also can feel comfortable going out and enjoying the back country on their off days."

Gallegos appreciates the student medics from the KU School of Medicine as much as they appreciate her.

"As much as the medics learn from their time here, we also learn from them," she said. "We do a lot of skills, like IV starts, and are more familiar with those. But when it comes to knowledge behind the skill, we learn from them. They will say, 'here's why I want to do this or ask this additional question and then we learn the why behind what we are doing.'"

#### MAXWELL TURNAROUND, PHILMONT, AUGUST 8

KU School of Medicine student Andrew Sheets is Medic 4 today, which means he is on from 3 p.m. to 11 p.m. Dark is falling as Sheets is headed into the back country to pick up an adult advisor with chest pain. The participant is coming down in a Suburban from a staffed camp while Sheets and Carl Joice are going up. Sheets' Suburban gets stuck on a switchback, so Sheets must walk the remaining half mile while Joice and another driver get it unstuck. As Sheets leaves the vehicle, another chest pain call comes in over the radio. Another medic and driver need to head out from the infirmary. Sheets starts assessing the first chest pain patient, who has already been advised to take a large dose of aspirin. Joice relays the patient's vitals. An attending physician at base wants him on oxygen, so Sheets gets his oxygen started, while Joice shows him



Bridget Hogan

how to secure the bottle for the jolting ride down the mountain.

#### *Medicine in real-life terms*

The attending physicians at Philmont this summer included David Ferraro, M.D., a pulmonologist from San Antonio who also is a KU Medical School graduate, a Boy Scout and a former Philmont medic. He remembers how much Philmont meant to his educational experience, so he tries to give back by volunteering to serve for a week in the summer.

"You have to learn many things in medical school," Ferraro said. "But when you come here, you have to put medicine in real-life terms, make it come alive and understand what your treatment and recommendations mean to patients—that's a challenge. Philmont helps the students do that quickly."

Mark Anderson, program manager at Philmont, oversees the infirmary from the Boy Scouts' perspective.

"We have tried to be conscious of thinking about, 'What does the medical student need?' We know we must support the University of Kansas' educational mission," he said.

And KU School of Medicine also has supported the Boy Scouts' mission. Ken Goertz, M.D. and associate professor of pediatric cardiology at KU, served as the liaison between Philmont and KU from 1988 to 2013. He still serves as chair of the Infirmary's Task Force Committee.

"The Boy Scouts and KU are always working to mitigate injuries and provide better care," Goertz said, noting that KU professors have helped develop scout risk advisories that





have been used all across Boy Scout programming, not just at Philmont.

#### NURSING STATION, INFIRMARY, PHILMONT, AUGUST 8

Kyle Dack, who went off duty at 7 p.m., has been called back within the hour. Both Andrew Sheets and KU School of Medicine student Abby Serpan, who is Medic 5 and on duty from 7 p.m. to 7 a.m. tomorrow, are in the field, and there are multiple patients in the clinic. Dack's first action when he returned was to call in an attending physician and another medic, Shandi Appier, who also went off duty at 7. The two adults with chest pains are headed into the infirmary, and three other walk-in patients need care. The radio room bell just went off indicating Dack has another call from the back country. At 10:20 p.m., with all radio calls managed, all clinic patients settled, and Serpan scheduled to arrive around 3 a.m. with the last chest pain patient, Dack finishes his dinner and heads for his bunk.

#### *Counseling the counselors*

Fr. Don Hummel, a Catholic pastor from Paramus, New Jersey, is an integral part of the infirmary, as are the other chaplains. Chaplains from the Catholic, Latter-day Saints, Jewish and Protestant faiths reside at Philmont, offering worship services and also rotating by week to assist the infirmary. They sit in on rounds, provide nondenominational pastoral care and go fetch trek participants who need the less urgent "next available" transport to the infirmary. When there's an extreme emergency or a negative outcome, Hummel and the other chaplains counsel everyone from the medics to the dispatchers and rangers.

Hummel first came to Philmont Ranch in 1972 as an advisor on a trek, and he's been coming back for the past 26 years as a chaplain. He listens – sometimes officially and sometimes unofficially – and provides counsel to patients.

"Our first goal is to always, if possible, reunite them with their crews so they can complete the experience," he said.


#### INFIRMARY TENT CITY, PHILMONT, AUGUST 9

There's a crunchy gravel path leading past a tiny cabin with a porch. Beyond it are two groups of perma-tents, arranged so that tent occupants have to walk past the cabin to reach the restrooms, showers or recreation tent. It's the domain of Ronnie Fye, the infirmary tent city manager, who has overseen the tent city for the past 17 years.

"I am the eyes and ears of the medics," she says. "I let them know who is better and who isn't, and I can hear if someone is up in the middle of the night."

Today, Laura Rennison, an adult advisor from Springfield, Illinois, is checking out after one night at the tent city and one night in the infirmary. Rennison, who severely strained both calf muscles and had to seek medical care 50 miles into her trek, has recovered enough to return to her crew—and to her teenage son.

"Everything about the infirmary was top-notch," she said. "Now I will get to go over the Tooth of Time with my son. We trained together, and we will get to finish together. This whole experience has really made me think about encouraging my own son to go to KU someday."



25,717

Visitors to Philmont in 2017



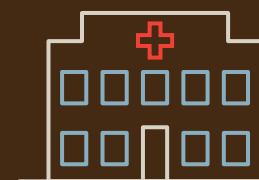
1,708

Patients treated by medics in 2017



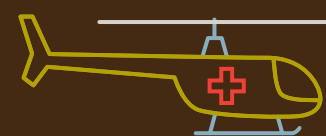
995

Radio or cell calls to medics in 2017



47

Transfers to outside medical facilities in 2017



2

Helicopter evacuations in 2017



# I QUESTIONS

WITH DINEO KHABELE, M.D.

BY DONNA PECK

**Dineo Khabele, M.D.**, is the new director of gynecological oncology at the University of Kansas School of Medicine. Her area of specialty is treating women diagnosed with ovarian and other gynecologic cancers. She is one of just a few clinically active gynecologic oncologists who also leads an ovarian cancer translational research program.

Khabele completed her residency in obstetrics and gynecology at The New York Presbyterian Hospital, Weill-Cornell University Medical Center, followed by a clinical fellowship in gynecologic oncology and post-doctoral research training in cancer biology at Albert Einstein College of Medicine and Montefiore Medical Center. Before coming to KU, Khabele was director of gynecological oncology translational research at Vanderbilt University.

Kansas Medicine + Science sat down with Khabele to talk about her work as a clinician, surgeon and researcher, her hopes for the future treatment of gynecological cancers and what she does in her spare time.

**Q Why were you interested in the field of gynecological oncology?**

**dk** When I was a medical student at Columbia, I did a rotation in gynecological oncology and instantly discovered a specialty I knew was for me. It was a challenging field that would allow me to treat patients from diagnosis through surgery to follow up care and, in far too many cases, palliative care.

**Q What drew you to academic medicine as opposed to being just a clinician and a surgeon?**

**dk** I can't imagine doing anything other than academic medicine. I was inspired by so many of my teachers in medical school, and I aspired to serve as a mentor to others. I wanted to be in a position to celebrate the work we are doing as physicians and researchers and draw more promising young doctors to this field.

**Q What does your research focus on right now?**

**dk** In a broad sense, my research centers on ovarian cancer and discovering new ways to treat and diagnose it. But what I'm really fascinated by is the biology of ovarian cancer. One of my current grants is to study how to overcome ovarian tumor resistance to chemotherapy. Up to 20 percent of all ovarian tumors are resistant from the start, and eventually all tumors become resistant to chemotherapy.

**Q Why were you interested in leaving Vanderbilt and coming to KU?**

**dk** I was excited to see that all the elements of ovarian cancer research were in place here. You had talented ovarian cancer researchers like Andrew Godwin and Kathy Roby, and I felt like the opportunity to collaborate with them and others was too good to pass up.

**Q And did the fact that the director of The University of Kansas Cancer Center, Roy Jensen, also came to Kansas City from Vanderbilt help?**

**dk** That was definitely a factor! Dr. Jensen and I certainly share some common experiences.

**Q Do you see any potential breakthroughs on the horizon for diagnosing and treating gynecological cancers?**

**dk** I think we are beginning to better understand the complexity of ovarian tumors. There isn't just one type of tumor – there are many. We are also gaining an understanding of the tissue surrounding these tumors and how they are helping tumors grow. If we can find ways to prevent those tissues from aiding the tumors, we will have a huge breakthrough.

**Q How are you working to increase awareness around gynecological cancers, particularly in communities with health disparities?**

**dk** It's a challenge. Ovarian cancer is less prevalent among African American women, but they are far more likely to die of the disease. That's because they are diagnosed later, and there are more barriers to effective and timely treatment. I'm part of the health equity steering committee at the KU Cancer Center, and we're working hard to address these socioeconomic barriers.

**Q One of the things you emphasize in your clinical practice is how a healthy lifestyle can help prevent many cancers.**

**dk** Absolutely! For example, endometrial cancer is three to six times more prevalent in obese women. And, of course, if you have to undergo cancer surgery, your chance of having post-surgical complications is less if you are at a healthy weight.

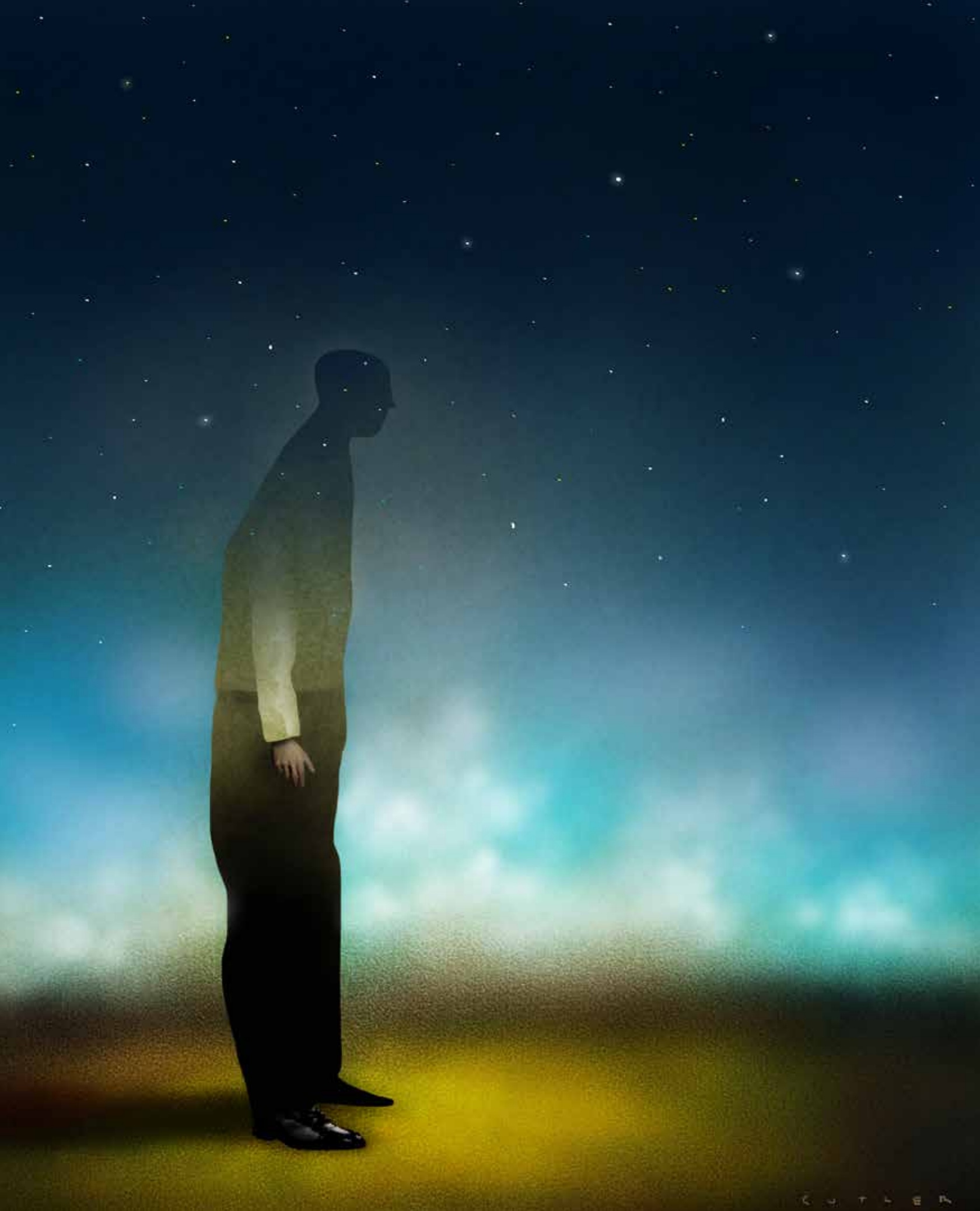
**Q How do you like Kansas City so far?**

**dk** I love it! I love the music and the food. One of my favorite things is running in Loose Park.

**Q What else do you do in your down time?**

**dk** As I said, I'm a runner, and I like to participate in competitive runs when I can. I also love to read novels and biographies. I just finished the George Saunders' novel "Lincoln in the Bardo" which I really enjoyed. And I love to eat – which is why I have to run!









# A NEW APPROACH

An innovative theory about what  
causes Alzheimer's disease may lead  
to better treatments and a cure

BY KRISTI BIRCH  
ILLUSTRATION BY DAVE CUTLER



Russell Swerdlow, M.D.

# "Of course, we want to be right, but mostly we want to cure Alzheimer's"

In November 2016, an experimental drug that had been heralded as a potential blockbuster treatment for Alzheimer's disease failed in a clinical trial. The Phase 3 trial was large, and the results were definitive: the drug, solanezumab, did not halt or slow the cognitive decline in the more than 2,000 patients in the early stages of the disease who were treated with it. Solanezumab, since abandoned by Eli Lilly and Company, was the latest dashed hope for patients with Alzheimer's, a progressive brain disease with no known cure.

The results of the Lilly trial were the latest in a series of defeats for researchers basing their work on the long-prevailing theory about what causes the disease. This theory, known as the "amyloid cascade hypothesis," posits that Alzheimer's is triggered by a build-up in the brain of a protein called beta-amyloid that accumulates around neurons, disrupts communication between brain cells and eventually destroys them. Sticky clumps of this protein, called amyloid plaques, have been found to be present in the brains of all people who have the disease. Clearing the amyloid out of the brain or curtailing its production, the theory goes, could reverse the disease or least put the brakes on its progression.

Solanezumab was an antibody designed to attack amyloid in the brain before it clumped into plaques. When the drug curbed plaque formation without curbing the cognitive decline of the patients who took it, it was hardly the first anti-amyloid drug to flop.

"There have been more than 10 years of failed trials that attack amyloid, including antibodies, vaccines, drugs that remove it,

drugs that prevent it from being produced, drugs that keep it from clumping," pointed out Russell Swerdlow, M.D., the director of the University of Kansas Alzheimer's Disease Center. "But they have had, at best, very limited clinical benefits."

That's one reason why a growing minority of researchers are looking beyond the amyloid cascade hypothesis for clues about the pathogenesis of the disease and how to stop it. Swerdlow and researchers at the KU Alzheimer's Disease Center have been thinking outside that box for over a decade. In 2011, the National Institute on Aging, a division of the National Institutes of Health (NIH), awarded the center designation as one of just 29 National Alzheimer's Disease Centers. That designation was renewed in 2016.

The KU Alzheimer's Disease Center is recognized as world leader with a different focus: the role of brain energy metabolism in the disease, and specifically, the role of mitochondria. Mitochondria, often called the energy powerhouses of the cell, are mini-organs in the cell that take in fuel such as glucose and produce energy. The ability of cells to make energy declines as people age, and that decline is even more profound in people with Alzheimer's.

Swerdlow, an affable, unassuming guy, is quick to point out that the amyloid remains important to study because its presence is a major feature of the disease. For him, it just isn't likely to be the cause of the dementia; it's more likely a byproduct. Amyloid is the smoke, not the fire. But it isn't even the failed trials, he said, that are the main reason he firmly believes that.

The most important factor, he said, is that the amyloid hypothesis simply doesn't explain enough, such as how those plaques appear in the first place. People aren't born with plaques. Something happens.

The biology of Alzheimer's is, said Swerdlow, "a story without a beginning."

To understand that, though, you have to hear the story.

## The story

In 1906 Alois Alzheimer, a German psychiatrist, conducted a postmortem analysis of the brain of a 50-year-old woman who'd suffered rapid and severe dementia. Looking at her brain under a microscope, Alzheimer found hard protein plaques, as well as spaghetti-like tangles of protein fibers extending from nerve cells. These two features—plaques and tangles—became the hallmark of the disease, which was then named after Alzheimer and applied only to people under the age of 65 who had dementia. These patients, who account for only 10 percent of all people with the disease, have what we now call "early-onset" Alzheimer's. For decades, dementia in older people was considered a natural part of aging.

Fast-forward to 1974, when the National Institute on Aging was formed. By this time, it was known that older people with dementia also had plaques and tangles. These older people were then also grouped under the Alzheimer's umbrella, and because they vastly outnumbered early-onset patients, Alzheimer's became known as a disease of elderly people.

"The COX enzyme is a part of mitochondria; it consumes oxygen in order to make energy. It's the engine to the engine."

By the mid-1980s, scientists knew that the sticky plaques were composed of brain protein fragments known as beta-amyloid, and that the tangles were composed of a protein known as tau. At the end of the 1980s, British researchers studied a family in which several members had early-onset Alzheimer's. They found that they all had the same mutations on the same gene, resulting in the overproduction of beta-amyloid, and concluded that the protein must be driving the disease. This gene was dubbed APP, for amyloid precursor protein.

In the 1990s, the plaques really earned their reputation. In 1992, British researchers published the amyloid cascade hypothesis in the journal *Science*, asserting that beta-amyloid is what triggers the disease and that the tau tangles, cell loss and damage, and dementia are the result.

Subsequent findings included a study from Michael Wolfe, Ph.D., then at Harvard and now the Mathias P. Mertes Professor of Medicinal Chemistry at the University of Kansas in Lawrence. Wolfe identified a protein, presenilin, that interacts with the APP—it acts like a pair of scissors to chop APP into fragments—and the result is amyloid in these early-onset patients.

"That [finding] really bolstered the hypothesis," said Swerdlow.

As did the advent of transgenic mouse technology, which allowed scientists to put mutated APP and presenilin genes into a mouse and observe cognitive function.

In 1993, researchers at Duke University tackled the genetics of late-onset Alzheimer's, the more common form of the disease. They

identified a mutant form of the ApoE4 as the first gene that raises the risk for late-onset Alzheimer's in healthy people. When this gene doesn't function properly, excessive beta-amyloid is one of the results.

"So throughout the 1990s, the amyloid cascade hypothesis was the dominant hypothesis in the field," said Swerdlow. "But it was not accepted by everyone."

That included Allen Roses, the chief researcher at Duke who made the discovery about ApoE4. Roses, who died in 2016 on his way to a medical conference in Greece, always saw amyloid-beta as a byproduct rather than a cause. And it wasn't accepted by Swerdlow, who in the 1990s was a neurology resident at the University of Virginia, or by his mentor, W. Parker Davis, M.D.

Davis, now retired, was one of the first people to postulate that defective mitochondria might be contributing to a variety of neurodegenerative diseases. Davis had examined blood samples from Alzheimer's patients and found a defect in the electron transport chain that mitochondria use to produce energy for cells. He and Swerdlow published a number of papers in the 1990s about the relationship between mitochondria and neurodegenerative diseases.

#### **Mighty mitochondria**

It had been known since the 1970s that brain energy metabolism and mitochondria are altered in the brains of people with Alzheimer's.

"If you look at the Alzheimer's brain under a microscope, you can see that the mitochondria don't look right," said Swerdlow.

"But most people thought it just wasn't that important, or that the problem came from the amyloid. I thought a good case could be made that mitochondria were actually the upstream problem in Alzheimer's disease."

So Swerdlow began making that case. He began publishing papers establishing that problems with brain energy metabolism—the processes by which the brain uses energy—were a key feature of the disease. In one experiment, he and Davis transferred mitochondrial genes taken from the blood of Alzheimer's patients into nerve cells cultured in the lab. The result? The cells produced beta amyloid.

In 2004, Swerdlow published the Mitochondrial Cascade Hypothesis, asserting the theory that mitochondria are responsible for amyloid plaques and tau tangles and articulating the shortcomings of the amyloid hypothesis. The amyloid hypothesis doesn't explain how some people have amyloid plaques in their brain yet never get the disease. Either the plaques take a very long time to cause the disease, or, as Swerdlow suspects, the disease is caused by something else and the plaques are merely a byproduct. The amyloid hypothesis also does not explain why aging is a risk factor for the disease. Defective mitochondria, however, have long been associated with aging, suggesting that aging and Alzheimer's could be driven by that common factor.

Since then, while the amyloid cascade hypothesis has remained dominant, more scientists are developing other alternative hypotheses—and more people have been studying mitochondria.

Hemachandra Reddy, Ph.D., executive director of the Garrison Institute on Aging at





Heather Wilkins, Ph.D.

Texas Tech University Health Science Center, is investigating defective mitochondria.

“When I started doing gene expression analyses and looking at amyloid-beta, what I saw was that mitochondrial genes were dysregulated in postmortem brains. That made me think differently,” he said. “At the end of the day, you need to keep the brain’s synapses healthy and functioning. And these functions need APT [a high molecule that stores energy], which is coming from mitochondria. If the mitochondria is defective at the synapses, the synapses disintegrate. When you look at the synapses, it’s all about energy metabolism. Nobody can

deny that fact, whether they are working on amyloid or tau tangles.”

In 2007, Swerdlow moved from Charlottesville to Kansas City to direct the KU Alzheimer’s Disease Center. He would be working with Jeffrey Burns, M.D., MS, whom he had mentored when Burns was a neurology resident at the University of Virginia. Burns is now co-director of KU Alzheimer’s Disease Center and also directs the center’s Memory Care Clinic.

Under the direction of Swerdlow and Burns, much of the research conducted at the KU Alzheimer’s Disease Center focuses on the

relationship between brain energy metabolism and Alzheimer’s. The center is looking at the ways that the parts of brain cells that produce energy are linked to the disease.

#### **Targeting mitochondria directly**

In 2013, knowing KU’s reputation for mitochondrial research, AUSIO Pharmaceuticals asked the KU Alzheimer’s Disease Center to conduct a clinical trial to see if a synthetic estrogen supplement known as S-Equol could improve mitochondrial function in Alzheimer’s patients. S-equol, an estrogen agonist (meaning it activates estrogen receptors), had been shown to stimulate energy fluxes in rats.

This study targeted a specific mitochondrial biomarker, the COX enzyme, in patients with Alzheimer's.

"The COX enzyme is a part of mitochondria; it consumes oxygen in order to make energy. It's the engine to the engine," explained Heather Wilkins, Ph.D., a post-doctoral fellow in the KU Alzheimer's Disease Center who was the lead author on the study. "We have known it's dysfunctional in Alzheimer's for a long time. You can see that in the brain in an autopsy and in the blood."

In the pilot study, S-Equol was administered twice a day to 15 women with Alzheimer's for two weeks. Their COX activity was measured via a blood test before, during and after. Eleven of the 15 had a positive response. When the pilot study was published in the *Journal of Alzheimer's Disease* in July 2017, the editors recommended it for a press release because it is the first therapeutic trial for Alzheimer's with a mitochondrial target.

Wilkins is now enrolling patients for the second phase of the study, a larger trial that will include men, to see if they can reproduce the results. (Because researchers already knew the estrogen supplement was safe for women, they were the only ones included in the first study.) In addition, because people in the first study who had the ApoE4 gene had a "blunted response," as Wilkins put it, they will be screened out of the second study. Their blood will be examined in a separate study to see how changes in mitochondria differ between these genotypes. Future findings, they hope, could lead to drug designs that target this biomarker.

### Kissing TOADs

One possible treatment strategy the KU Alzheimer's Disease Center is exploring is revving up brain energy metabolism. The researchers are looking specifically at Oxaloacetate (OAA), a natural chemical that is part of the Krebs cycle, a series of chemical reactions used by all aerobic organisms to release stored energy.

The researchers knew that two of the main energy fluxes—glycolysis (breaking down glucose) and respiration—were reciprocal. If one went up, the other went down. They wanted to find a substance or drug that would make both energy fluxes increase.

Three years ago, they administered the OAA to mice, and the results were encouraging.

Now researchers are testing OAA on people, through the Trial of Oxaloacetate in Alzheimer's Disease (TOAD) study. Participants take up to two grams of OAA daily. As with any clinical trial, the first phase is safety, and so far even the high end of their dosing range seems to be safe. The next phase is determining a dosage that engages brain energy metabolism.

To measure the effects of OAA on brain energy and cognitive skills, trial participants will undergo positron emission tomography (PET) and magnetic resonance spectroscopy scans, which are similar to MRIs, at the Hoglund Brain Imaging Center, as well as blood draws and pen-and-paper tests. This phase of the TOAD study will be completed in 2018. The ultimate goal? To increase brain energy and slow the disease.

### Finding alternative fuel for the brain

Swerdlow is also looking at ways to give the brain an alternative fuel source, one other than glucose. The Alzheimer's brain loses its ability to use glucose for energy. So, why not give it a new energy source, such as ketones?

A ketogenic diet, which is sometimes used to treat epilepsy, is one very low in carbohydrates but high in fat. The reduced carbs put the body into a state of ketosis, which means the body produces ketones instead of glucose. These ketones can then be used for fuel.

Swerdlow had been interested in the ketogenic diet since he learned about it in his biochemistry class his first year of medical school, and he also was working in a lab studying why the brain doesn't use sugar well in Alzheimer's disease. He thought that maybe the ketogenic diet could supplement energy metabolism in the Alzheimer's brain.

Working with Debra Sullivan, Ph.D., the chair of the Department of Dietetics and Nutrition at KU Medical Center, they conducted a pilot study, Ketogenic Diet Retention and Feasibility Trial (K-DRAFT), with participants from the KU Alzheimer's Disease Center in 2016. One of the big issues in the study was determining how likely it was that people to follow such a diet.

"The diet is a dramatic departure," noted Swerdlow. "You increase fat and that just doesn't seem right to a lot of people."

The 15 participants followed the ketogenic diet for three months. They found that the participants with mild impairment, rather than moderate impairment, were better able to adhere to the diet; it seemed to work better when the study subjects could actively make food choices.

The participating Alzheimer's patients took standard cognitive tests throughout the study. Not only did their cognitive scores cease to decline, they actually improved over the three months. And when they returned to their regular diet and the cognitive testing was repeated, their scores reverted to their starting point.

Swerdlow stresses that a larger study is needed, but so far, they seem to have established proof of principle that a fuel other than glucose can rescue brain metabolism.

### Boosting brain function through diet

Sullivan also is working with the KU Alzheimer's Disease Center on exploring the benefits of a different kind of diet: the Mediterranean diet, which is high in fruits, vegetables, whole grains, legumes, nuts, seafood, and olive oil, and low in red meat, sugar, processed food and solid fats. In 2015, a study conducted in Spain showed that the diet could delay cognitive decline. Sullivan wanted to test it in the United States.

"I absolutely believe the diet can improve cognition," she said. "And I think we could see even greater benefits here, because of the American diet we are starting with."

Brains with Alzheimer's disease have a lot of oxidative stress and damage, which is a result of metabolism. The Mediterranean diet, which is largely plant-based, is high in antioxidants, which thus could halt the damage.

"It's like rust on a car," said Sullivan. "If you don't maintain the car, you'll get oxidative damage, which is rust. If you eat a diet high in antioxidants, you can also reduce the rust on your brain."

In the pilot study, she worked out a partnership with Balls Foods, which operates Hen

House and Price Chopper grocery stores, to prepare Mediterranean diet-based food boxes. Participants picked up a box once a week and then kept track of what they ate. The purpose of this phase of the study was to see if it is feasible for these older adults to change their eating habits.

So far, Sullivan said, the participants are doing well. Future studies will measure cognition, and Sullivan is hopeful.

### Exercising the brain

Burns has been studying how exercise affects aging and Alzheimer's for years. When a person is physically fit, he or she processes hormones such as insulin differently, which affects brain metabolism. Burns noted that their studies now are especially focused on prevention. He said that 10 years ago, most of their research participants had Alzheimer's disease, but now two-thirds of their current study participants are healthier older adults.

"We need prevention trials to see if we can delay the onset of Alzheimer's," he said.

Burns said the biggest finding so far is that exercise seems to slow cognitive aging as people get older as well as slow Alzheimer's progression. It appears that aerobic exercise—such as walking, running on a treadmill, biking—improves the brain's functional ability, just as it benefits the heart.

"I think the field of brain health is where cardiovascular health was 40 years ago," said Burns. "Exercise is a powerful risk reducer. The same gains to cardiovascular health that we get from fitness, we could have for brain health, and we need to leverage that."

But, he cautioned, while they have evidence, they do not yet have definitive proof.

"There is a lot of observational data that supports the idea, but we don't yet have full proof or know the parameters, such as determining how much exercise is enough to slow cognitive decline."

The KU Alzheimer's Disease Center is will soon launch a study with two other sites that will be the largest trial to date on brain health and exercise. The plan is to enroll 640

people for a year of exercise and cognitive testing. They are also beginning a study of people age 65 and over with hypertension, and treat them for their high blood pressure and cholesterol, and then measure the effect on brain health.

In addition, Burns said they now have funding for LEAP-rx, a tool that will enable doctors to actually prescribe exercise. The prescription would go to the YMCA, for example, and then the patient would do the prescribed exercise there.

"If we could improve health that way," said Burns, "then it's possible insurance would pay for it."

### Looking ahead

These efforts do not mean that the center is ignoring amyloid. Wolfe and Swerdlow are now working together on a project looking at the connection between mitochondria and amyloid. For Wolfe, mitochondria is important, but amyloid is still the disease's trigger and the more critical factor.

"There are decades of research that amyloid is critical to the disease process," he said. "It's just hard to argue that it's just a bystander or something that happens coincidentally."

Meanwhile, the center's focus on energy metabolism is what appeals to post-docs like Wilkins.

"The mitochondria hypothesis explains why age is a risk factor and why diabetes is a risk factor for the disease, because that's a metabolic disease. Then there's ApoE4—which is known to interact with mitochondria to cause dysfunction in general," she said. "I think it's all interrelated, that when you have mitochondrial dysfunction, you get plaques and tangles and inflammation. It's the common thread that links all these things together, and we are working on providing evidence to see if it's true."

The answer, obviously, lies in the research yet to be done.

"Of course, we want to be right, but mostly we want to cure Alzheimer's," said Swerdlow. "Fortunately, the two tend to go together."

## Fifth Floor

5

Part of the Zamierowski Institute for Experiential Learning, this floor includes a practice laboratory with six exam stations outfitted to represent a medical office building and seven stations equipped as a general hospital ward. A home suite is designed to facilitate training of health care that occurs within a patient's home environment.

## Fourth Floor

4

Part of the Zamierowski Institute for Experiential Learning, the fourth floor is designed as a simulation hospital and includes four patient suites and four debriefing rooms that can be adapted to a simulated operating room; a labor and delivery suite; an intensive care unit; a general ward and emergency room. Additional areas include a nurse's station, medication dispensing room, inpatient lab and patient waiting areas.

## Third Floor

3

Part of the Zamierowski Institute for Experiential Learning, the third floor includes the Neis Clinical Skills Laboratory which uses 19 exam rooms where students develop clinical skills through standardized patient and physical exam interactions; additional study rooms; and administrative offices.

## Second Floor

2

The second floor includes classrooms; study rooms; virtual conference areas; and a kitchenette for students, faculty and staff.

## First Floor

1

The first floor includes small group rooms for group learning activities; study rooms; and a walking bridge designed as a pedestrian highway and social hub that connects the south and north parts of the KU Medical Center campus.

## Ground Floor and Lower Level

G

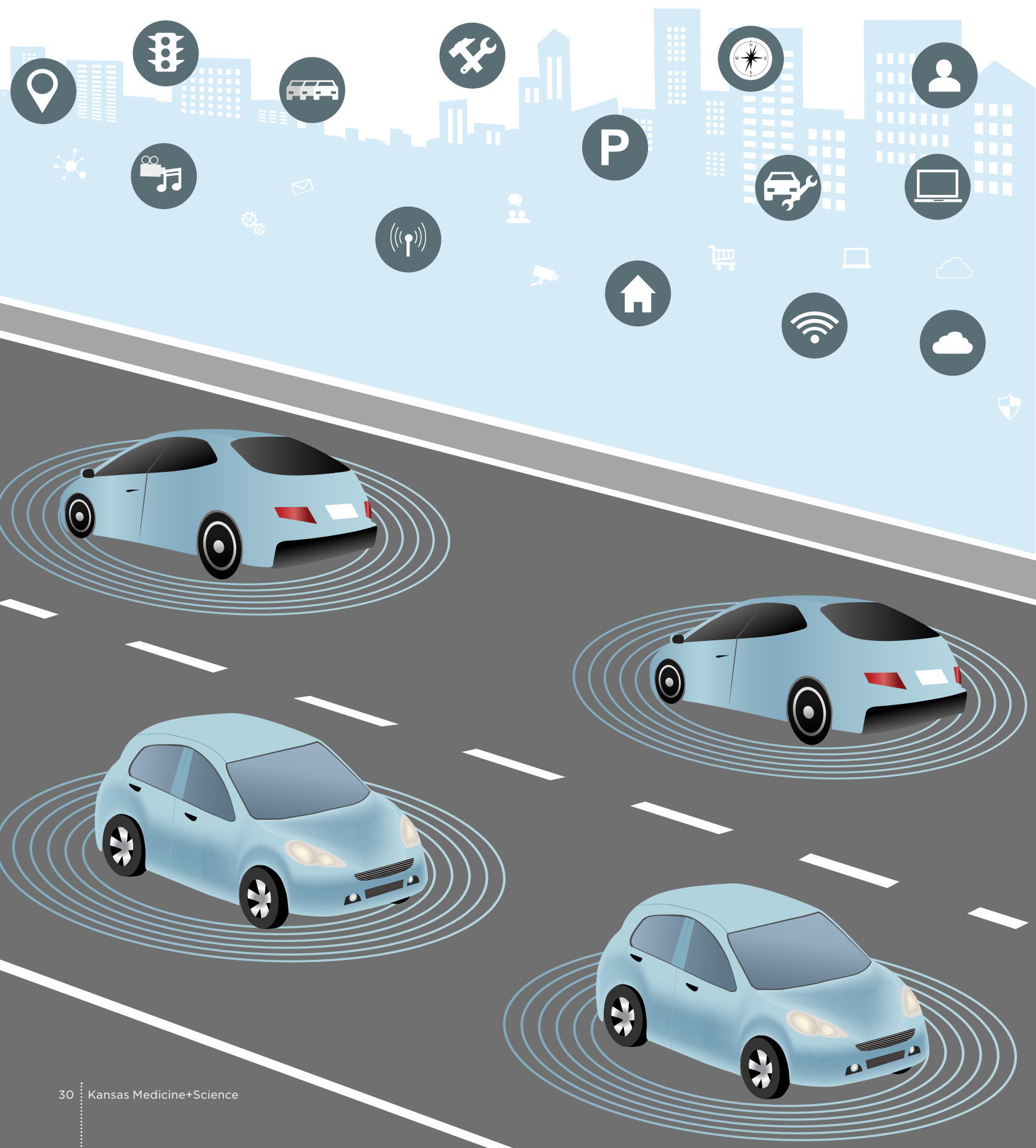
The ground floor and lower level include a large learning studio that can accommodate an entire medical school class for lectures and interactive learning; two additional large learning studios; a green roof where landscaping has been installed and maintained to provide aesthetic and environmental benefits; and a retail restaurant space.





# KU's Health Education Hub

In July 2017, the University of Kansas Medical Center officially opened its new Health Education Building. The 170,000-square-foot, six story structure is now the center of modern learning at KU Medical Center and will accelerate the education of a greater number of physicians, nurses and allied health care professionals. The building is the primary teaching facility for the KU Schools of Medicine, Nursing and Health Professions and includes 40,000-square-foot of simulation space and flexible, state-of-the-art learning facilities to support new models of teaching.



# taking the WHEEL

## *New clinic and research laboratory features driving simulator to help drivers who face physical and cognitive issues*

BY GREG PETERS

Drivers will literally be able to take the wheel in their own hands when it comes to evaluating their ability to drive safely on the open road. That is because a new research, assessment and rehabilitation facility has opened at the University of Kansas Medical Center.

The KU Health Partners Driving and Mobility Service provides clinical services to its clients, while its associated research partner, the Laboratory for Advanced Rehabilitation Research in Simulation (LARRS), will employ virtual and augmented reality-equipped devices to assess and treat people with visual, cognitive and mobility issues, ranging from Parkinson's and Alzheimer's diseases to dementia, stroke, concussions, glaucoma and macular degeneration.

The KU Health Partners Driving and Mobility Service started accepting clients in September 2017. All clients must be referred to the service for assessment or treatment by a physician.

"There are three major components to our services," said Abiodun Akinwuntan, Ph.D., MPH, MBA, dean of the KU School of Health Professions. "First, we need to determine whether a person has adequate physical, visual and cognitive skills for safe driving. Second, in cases where these skills appear impaired but possibly retrainable, our services will offer training options for the clients."

Akinwuntan said because the lab uses a fully integrated driving simulator, clients will be advised on the most effective adaptive devices they can use

to make driving safer and will receive training on how to use the devices before they are installed in their own cars.

### *In the driver's seat*

The centerpiece of the facility is a driving simulator (STISIM Drive), featuring a car cockpit surrounded by three large computer screens where simulated road conditions can be produced while an eye-scanning device tracks a person's gaze during testing. Akinwuntan began thinking about the concept for the driving simulator as a doctoral student in Belgium before building and programming the first-generation simulator while teaching at Augusta University in Georgia prior to coming to KU.

Amber Conn, an occupational therapist who is also a certified driving and rehabilitation director, is leading the KU Health Partners Driving and Mobility Service. Conn said the facility will give more people in the community access to in-depth comprehensive driving evaluations.

This testing will help determine whether drivers are fully capable of driving on their own, require restrictions such as daylight only driving, or need medical rehabilitation and accommodations like spinner knobs for one-handed driving. The service could prove to be of great importance to elderly drivers and their caregivers.

"There was a need for evidence-based research on driving for individuals with functional deficits as a result of medical conditions or aging," explained LARRS director Hannes Devos, Ph.D., who was part of Akinwuntan's team at Augusta University.

ty. "Driving simulators give us the unique advantage of testing driving skills in an environment that resembles real-world performance, without the real-world hazards."

### *Mission to LARRS*

The lab also is equipped with several other devices to help people with different modes of mobility issues, including a specially made treadmill that is equipped with a virtual reality surface that allows patterns and obstacles to be projected by researchers and clinicians to test a person's cognitive and motor responses. The treadmill faces an oversized video monitor where items can be projected while the subject is walking, so researchers can use eye-tracking devices to assess cognitive behavior.

Researchers in the lab also have access to an electroencephalogram (EEG), which looks a bit like a swim cap with electrodes attached, that they will use to track brain function in subjects while they are put through a battery of tests using simulations displayed on computer screens or virtual-reality devices.

A participant's vision can be assessed using a Keystone Vision Screener, a FOVIO Eye Tracker, an SMI Eye Tracker and a host of paper- and computer-based tests. The lab also has access to two portable versions of the driving simulator that can be taken to sites off-campus allowing for remote assessments and therapies.

Devos and the lab team have been working with a variety of colleagues both on and off campus. The lab has international collaborations with the Belgian Road Safety Institute, the French Institute of Science and Technology for Transport, Development and Networks, and the University of Osaka.

### *On the road to tomorrow*

The work LARRS is taking on has the potential to touch many lives across the country. The lab is part of a multi-campus consortium, funded by the United States Department of Transportation, which is investigating ways to make the nation's roadways safer by creating a driving fitness test to measure the visual and cognitive skills of transportation workers. In the near future, KU Medical Center hopes to launch the Driver's Safety Institute, a community resource to improve the fitness of drivers, especially those hauling hazardous materials.





# A NEW CAMPUS IN SALINA

THE KU SCHOOL OF NURSING WELCOMED STUDENTS  
THIS YEAR TO ITS NEW CAMPUS IN SALINA, KANSAS

BY KRISTI BIRCH

Vanessa Torres was still in high school when she began working as certified nurse's assistant in Salina, Kansas, and discovered how much she loved taking care of patients. She was finishing up her prerequisites at Cloud County Community College and getting ready to apply to nursing programs when she learned that the University of Kansas School of Nursing was opening a new campus right in Salina.

"It was perfect timing," said Torres. "It has always been a dream of mine to attend KU, and I had heard amazing things about their nursing program."

Torres is one of the 12 members of the first class of students attending the KU School of Nursing on the Salina campus, which opened its doors to students last fall. The school offers students a bachelor of science in nursing, a program that accepts students who have already completed two years of undergraduate study at any regionally accredited college or university. The new school shares existing facilities with the KU School of Medicine's Salina program.

One of the missions of the new satellite campus is to help address nursing shortages in Kansas, which are particularly acute in rural areas and western parts of the state. The program will also help supply the state with more BSN-trained nurses in particular. Nurses can be licensed with two-year associate degrees, but research has shown that hospitals that employ nurses with a bachelor's degree or higher are experiencing better patient outcomes.

In 2010, the Institute of Medicine issued a report including a call for 80 percent of registered nurses to hold bachelor's degrees by 2020. In 2014, 55 percent of RNs had a bachelor's degree or higher, according to the American Nurses Association.

"And the gap is even greater in rural areas and in Kansas," said Sally Maliski, Ph.D., RN, dean of the KU School of Nursing. "We need to increase the number of BSN nurses and to do that, we need multiple pathways."

## New pathways

Bringing education to these underserved areas, using interactive technology, is one of those pathways. The BSN curriculum in Salina is identical to the one offered on the Kansas City campus. Currently, the Salina students have one classroom and connect live with nursing classrooms on the Kansas City campus via interactive TV. Salina students can raise their hands virtually by holding up a red sign with an image of a hand on it, and they can ask and answer questions by tossing a throwable microphone in a large cube to whoever wants to speak. In addition, there is always a co-instructor in the Salina classroom to help facilitate group discussions.

There are four nursing faculty members in Salina, and occasionally classes are taught from Salina and then broadcast via iTV to the nursing students in Kansas City.

So far, instructors and students say the technology is working amazingly well.

"When I was first told I would be in class remotely via TV, I was like, 'There is no way I can sit there and watch a lecture for two hours on a TV!'" said Torres. "To my surprise, it has been better than I imagined. It's very interactive and the instructors in Kansas City really make us feel like we're part of their campus."

The students in Salina will gain most of their clinical experience working at Salina Regional Health Center, a 223-bed hospital with multiple affiliated hospitals and



Esmeralda Tovar-Contreras and Vanessa Torres

clinics. Salina Regional offers scholarships to students – as well as a loan forgiveness program – in exchange for students working at the hospital after graduation.

“We have had such a nursing shortage, it’s not unusual for us to have 35 to 40 nursing openings here,” said Luanne Smith, RN, vice president of patient care and chief nursing officer at Salina Regional. “But one thing we hear from nursing students is how well they were treated when they were here. We know if we can get them in the door, we’ll be able to recruit some students.”

### Diverse opportunity

Smith said Salina Regional serves patients from a wide surrounding area and offers a broader clinical learning opportunities for students than one might expect.

“We are a level 3 trauma center so we get a lot of trauma patients, plus we have neurosurgeons, an open heart program and an 18-bed ICU for high-acuity patients,” said Smith. “Our students really get a lot of good experience, and they always say everyone here is so friendly.”

The nursing students will also have the opportunity to participate in interprofessional education with the KU School of Medicine students. According to Lisa Larson, Ph.D., RN, assistant dean of academic affairs for the KU School of Nursing in Salina, those opportunities will increase in the summer of 2018 when both

the schools of nursing and medicine are scheduled to move into a new building, a renovated former bank that will afford them 40,000 square feet of space—including a dedicated simulation lab. In this lab, nursing and medical students can work together, as they will after graduation, to respond to such situations as a diabetic patient with dangerously low blood sugar.

“There’s a communication component as well as a clinical component to be learned between the two professions,” said Larson. “For us to have the opportunity for this sort of collaboration in a rural area this size is just phenomenal.”

The BSN degree also positions students to work in rural settings, said Larson.

“One of the advantages of critical access hospitals is that you actually get out into the community,” she said. “You work as inpatient nurse, and then you have to work as an outpatient nurse or run to the ER to see ER patients. A truly rural nurse has to be a generalist, which is what the BSN prepares you for.”

And it positions students to go on to an advanced degree, which will be necessary to produce new faculty to address the looming shortage of faculty, as many nursing instructors of the baby-boomer generation near retirement. U.S. nursing schools turned away nearly 65,000 qualified applicants from nursing programs in 2016 because of an insufficient number of faculty, facilities

and budget, according to the American Association of Colleges of Nursing.

### Stay where you are

Educating students in the Salina area also increases the chances that they will remain in the state to practice after graduation. The school plans to increase enrollment yearly so that there are 48 students enrolled by the fifth year of the program.

Esmeralda Tovar-Contreras, a Salina nursing student from Hutchinson, Kansas, said that even though the class size is small, students come from different backgrounds.

“The diversity that everyone brings is so awesome,” she said. “We have one student originally from China who was a respiratory therapist, another student from Niger, and then another who used to work in a laboratory before the program. So they bring all those experiences.”

A scholarship recipient, Tovar-Contreras said that she would like to specialize in neo-natal care and maybe eventually pursue a doctor of nursing practice (DNP) degree. She will be the first college graduate in her family.

Both Tovar-Contreras and Torres plan to work in the Salina area for at least a year after graduation.

“What better way to give back to my community than to dedicate my first year as a nurse to them,” said Torres.

## Alumni Spotlight Nicholas Tejada

Chief executive officer of  
The Hospitals of Providence  
Transmountain Campus  
in El Paso, Texas



Nicholas Tejada, who earned his Master of Health Services Administration (MHSA) degree from the University of Kansas School of Medicine in 2007, has seen a meteoric rise over the past decade as one of the country's most influential young hospital executives.

Tejada grew up in Wichita, Kansas. His father is a pharmacist, so Tejada has been around health care his entire life. But he said it was a fortunate accident that he found out about the field of health services administration.

"When I was in college at Wichita State, I worked as a patient registration clerk in a busy emergency room," he said. "One day I had a chance encounter with the hospital's chief executive officer. I wasn't even aware that hospitals had CEOs. That opened my eyes to the field of health services administration."

After graduating from Wichita State, Tejada worked for a health care software company for four years. He decided he wanted to do more with his career and enrolled in KU's MHSA program.

"I looked at many schools, but KU's program was the clear choice," he said. "It's consistently ranked among the top MHSA programs in the country. And the curriculum

covers all aspects of the health care system, from hospitals to health insurance to health information technology."

Ellen Averett, Ph.D., MHSA, an associate professor of health policy and management at the KU School of Medicine, said that Tejada made quite an impression on the faculty and his fellow students.

"Nico was such a talented and bright student who had a clear vision of what he wanted to do with his life," Averett said. "We are so thrilled that he has continued to be a part of our program as an active member of our department's external advisory board. He's always there when we need him."

After earning his MHSA degree from KU, Tejada worked as an executive at several hospitals in California and Texas before accepting his current position as chief executive officer of The Hospitals of Providence Transmountain Campus in El Paso, Texas. In his role as CEO, Tejada has overseen the construction of a new teaching hospital in El Paso, which opened on time and on budget. His position also allows him to focus on his passion of addressing health care disparities.

"Our new teaching hospital is literally located along the El Paso and Ciudad Juarez,

Mexico border," Tejada said. "The region has half as many physicians as it should, and significant inequities exist across all spheres, most notably access to health care."

Tejada said his hospital is trying to fundamentally change the area's health care environment by increasing the number of physicians and educating students on how to deliver culturally competent care to diverse populations.

For his efforts, Tejada was awarded the American College of Healthcare Executives' Young Healthcare Executive of the Year in 2017. He was named to Becker's Hospital Review's 25 Healthcare Leaders Under 40 in 2014 and 2015. And he was recently elected chair for the American Hospital Association's Institute for Diversity and Health Equity.

Tejada said would love to remain in El Paso as they develop a culture and infrastructure to train the next generation of physicians and nurses. He also hopes to establish an endowment at KU to support students in health services administration.

"My wife and I are both proud graduates of KU," Tejada said. "We are deeply appreciative of the tremendous impact the school has had on our lives."





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