MESSAGE FROM the EXECUTIVE VICE CHANCELLOR

For many institutions, summer is a time when things slow down, and everyone can kick back a little and take it easy. That is not the case at the University of Kansas Medical Center. Summer is when we begin the extensive preparations for the incoming classes in the Schools of Medicine, Nursing, and Allied Health.

This year’s planning is extraordinarily special because our medical class of 2015 will include the first students at our School of Medicine–Salina campus and our expanded School of Medicine–Wichita campus. Our Salina campus, which is the smallest four-year medical education site in the country, has the potential to be a model for other states dealing with a shortage of rural physicians. We have accepted the first class of eight students at Salina, and they are all outstanding individuals who we believe will become exceptional rural physicians in a few years. For this program, we recruited students from rural areas who are more likely to return to those areas after being trained in a smaller city and experiencing the rewards and challenges of rural practice.

The School of Medicine–Salina campus will be housed primarily in space provided by the Salina Regional Health Center, where clinical faculty will facilitate small-group learning. Students will listen to lectures along with their peers in Kansas City and Wichita via interactive television and podcasts, while web-based systems will support most of the curriculum’s laboratory components.

Meanwhile, the School of Medicine–Wichita campus – for the first time in its 37-year history – is preparing to welcome first-year medical students. The Wichita campus has done an outstanding job over the years in providing clinical training for many of our third- and fourth-year medical students and has already served as a model for other medical schools that have started community-based, branch campuses.

Like so many other states, Kansas is facing a critical shortage of primary care physicians. As a matter of fact, most of the 105 counties in the state – nearly all of them rural – are designated medical shortage areas. It is our sincere hope that with the expansion of our medical education program, we will be able to better fulfill our mission to train doctors for all of Kansas.

Invest In the Future.
Consider a bequest for KU Medical Center.

“I had choices for medical school, and getting the scholarship reinforced my decision to come to KU. It felt great being recognized for my undergraduate achievements.”

Anne Miller
Class of 2011,
KU School of Medicine
William Gordon Garnett Scholarship, established by bequest in 1990

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In June, KU Medical Center joined an elite group of research institutions across the country when it received a Clinical and Translational Science Award (CTSA) from the National Institutes of Health. The medical center will receive $20 million over five years to intensify its translational research—research that transforms laboratory discoveries into treatments and cures. With the new grant, KU Medical Center will create a program called Frontiers, greatly expanding the reach of its existing Heartland Institute for Clinical and Translational Research, which has been the center of clinical and translational research for Kansas and the greater Kansas City region. The CTSA, launched in 2006, supports a national group of medical research institutions across the country and was designed to include a total of 60 institutions. KU Medical Center received one of the last five slots remaining. The grant’s principal investigators are Richard J. Barohn, MD, chair of the KU Medical Center Department of Neurology, and Lauren S. Aaronson, PhD, RN, professor in the KU School of Nursing and Department of Health Policy and Management. The Frontiers program will move into the University of Kansas Clinical Research Center in Fairway when it is completed in early 2012. The building anchors the northern point of the Johnson County Education and Research Triangle, created after Johnson County voters passed a one-eighth-cent sales tax in 2008 to expand higher education and research in the county.

Pediatric bipolar disorder has long been treated with lithium, even though the drug has never been tested for use in children—until now. The KU School of Medicine–Wichita has been awarded an $800,000 grant to study the use of lithium in children, groundbreaking research that could change the labeling and nationwide product information for the drug. Russell Scheffer, MD, chair and professor in the Department of Psychiatry and Behavioral Sciences at the School of Medicine–Wichita, received the grant from the National Institute of Child Health and Human Development (NICHD) to study the drug and create guidelines on its use, determine possible side effects and establish dosing instructions. One out of every 100 children in the United States has some kind of bipolar disorder. Without any kind of treatment, many struggle at school and home. Scheffer says lithium has been approved for use in children as young as age 12, but it has never been formally studied in children younger than age 18. He adds that because lithium has not been studied in children, its potential side effects are not well delineated. But he believes there are indications that the drug can be effective in some children. For example, there is some evidence that patients with bipolar disorder who were treated with lithium have lower suicide rates. Dr. Scheffer is recruiting patients who have a clear pediatric bipolar disorder diagnosis and who are not currently on medication to enroll in the study, which will need 25 to 30 patients during the next three years.
Researchers at the University of Kansas Medical Center have been awarded more than $8.4 million from the National Institutes of Health (NIH) to improve prevention and the odds of surviving cancer for rural Latin American and Indian communities in Kansas.

A group of scientists at KU Medical Center has spent years establishing partnerships with Latin American and Indian communities throughout the state. This work has led to innovative, culturally appropriate initiatives such as All Nations Breath of Life, a smoking-cessation program for American Indians that recognizes the traditional use of tobacco for spiritual and cultural purposes, and a Touch to Screen project that uses Spanish-language computer keyboards to inform Latinos of medication, cancer screening, and counseling resources in safety-net clinics. The KU Medical Center-based Midwest Cancer Alliance has also strengthened its network of health professionals leading the fight against cancer throughout Kansas, building a clinical trial infrastructure and support system for cancer patients from Kansas City, Mo., to Goodland, Kan., near the Colorado border.

With the NIH grant, researchers will benefit from these relationships to create the Kansans Community Cancer Health Disparities Network to address the needs of populations that are drastically underserved. The Kansans Community Cancer Health Disparities Network includes an array of collaborating organizations, including the United Mexican American Ministries Clinic in Garden City, Kan., the Iowa Tribe of Kansas and Nebraska, the regional Coalition of Hispanic Women Across Kansas and the Kansas Physicians Engaged in Prevention Research (KPEPR, a rural primary care practice-based research network), the Kansas Association for the Medically Underserved, and the KU Center for Medicine and Telehealth, among others.

Allen Greiner, MD, associate professor of family medicine and the principal investigator on the project, says it can be a tremendous hallmark when patients have the diagnosis and have driven to a couple of hours for treatment. Greiner says KU Medical Center is developing a strong collaboration for building cancer prevention, treatment, and research programs across rural and underserved parts of Kansas.

Stephanie Wyggoner, chief executive officer of the United Mexican American Ministries Clinic in Garden City, says partnering with the KU Medical Center will allow additional services and education for reach uninsured and underinsured populations in southwest Kansas. She says the network will assist those who don’t have the resources to obtain health care and don’t really know how to navigate the health care system.

Beyond funding the efforts to meet a crucial need for underserved Kansans, the new award strengthens The University of Kansas Cancer Center’s position as it works to earn National Cancer Institute (NCI) designation.

Randolph J. Nado, PhD, professor of molecular and integrative physiology and director of the Landon Center on Aging, has been getting local media attention for a project that could determine it’s possible to use a miniature electronic device to help the brain recover itself after a traumatic injury. Along with Pedram Mohseni, PhD, a professor of electrical engineering and computer science at Case Western Reserve University, Nado was recently awarded a $1.44 million grant from the Department of Defense to test whether micro-electronic circuitry can guide axons as they create new processes to communicate with other neurons after an injury. Nado is well known for his research on how certain types of physical activity can help the brain repair itself after a stroke.

Researchers have non-research-related involvement (NRI) in the project. This includes the following:

- The Landon Center on Aging, at the University of Kansas Medical Center, and Kansas Medical Center (KMC) are leading institutions in the project.
- The University of Kansas Cancer Center (KUMC) is also involved in the project.
- KMC and KUMC collaborate on many research projects.
- The project involves partnerships with other institutions, including Case Western Reserve University, University of California, San Francisco, and others.
Marilyn Dunstan admits a cardiac patient to the hospital and moves on to set a broken arm. It’s a typical Saturday for Dunstan. She’s the only medical provider on call this weekend in Jewell County, which is home to 3,077 Kansans. Before the weekend is up, Dunstan will treat a patient injured in a motorcycle accident, stitch up a laceration for a child who’s fallen out of a tree, set another broken arm and treat a couple of people with run-of-the-mill colds.

Medical school did not prepare Marilyn Dunstan for her work in Jewell County. That’s because she didn’t go.

Dunstan is a nurse practitioner and one of only two advanced medical providers registered in the county. The other is her practicing partner Leon Hughes, a physician assistant. Together, Dunstan and Hughes manage care for Jewell County residents from the county seat of Mankato, where they staff the Jewell County Rural Health Clinic, Jewell County Hospital, and the long-term care facility.

“We get everything and anything,” Dunstan says of her patient responsibilities. “It’s a different ballgame out here. Sometimes you’re working at 3 a.m., knowing you’re the only medical person in the county that’s awake. And sometimes you’re the only medical person in the country.”

To Dunstan, it’s all in a day’s work. To others, Dunstan’s expansive scope of practice as a nurse practitioner is a reminder that primary care providers in general, and primary care physicians in particular, are in very short supply in Kansas and across the country.

Unfortunately, the primary care shortage is not expected to reverse anytime soon. Demand for primary care services is predicted to increase over the next few decades, in part due to the estimated 32 million Americans expected to gain health insurance under the Affordable Care Act. With the nationwide supply of primary care physicians already struggling to meet current demand in parts of the country, intense debate surrounds the issue of how to meet the expected increase in demand.

Or, rather, who can meet the demand.

Sixteen states and the District of Columbia currently allow nurse practitioners to provide care and prescribe independently.

Chrystal Adams is an advanced practice nurse in Maine, one of the states allowing independent practice.

“Allowing nurse practitioners to practice independently is helping alleviate the physician shortage in Maine,” says Adams, MSN, FNP-BC, who is also director of the family and community nurse practitioner program at Husson University in Bangor, Maine.

Maine and Kansas have more in common than one might think. Each state is home to only one school that trains physicians. And Maine, like Kansas, has a substantial rural population that experiences a significant shortage of physicians.

Currently, Kansas requires a nurse practitioner to have signed collaborative agreements with a supervising physician. Dunstan’s collaborating physician, Andy Walker, MD, is 30 miles east in neighboring Republic County. He and other physicians from his group spend a collective total of six days each month staffing the Jewell County Rural Health Clinic.

“Without the nurse practitioners and physician assistants in rural America, we couldn’t make it,” says Jim McDermott, DO, in Chautauqua County, Kan. “We’d have to give it up.”

Although Kansas and Maine have different practice restrictions for nurse practitioners, both rely on nurse practitioners to help meet citizens’ health care needs.

In fact, Kansas has about 2,000 advanced registered nurse practitioners who help meet health care needs throughout the state.
The projected growth in demand for primary care services has reinvigorated an age-old tension between the physician and nursing professions, particularly in states like Kansas that currently require nurse practitioners to collaborate with or be supervised by physicians.

The dispute dates back to the 1870s when some doctors opposed standardizing nurse education because they believed better-educated nurses would be competing with or be supervised by physicians, posing a threat to their authority. A few decades earlier, physicians had earned the American public’s trust by standardizing medical training.

“Physicians are protecting their boundaries. They want to maintain autonomy,” says medical sociologist Mary Ziemer, PhD, professor of health policy and management in the KU School of Medicine. “Medicine has tried to do that for years by working to control the practice conditions of competing professions around it, such as nursing, physical therapy, clinical psychology and pharmacy.”

Michael Kennedy, MD, opposes the independence of competing professions around it, such as nursing, physical therapy, clinical psychology and pharmacy. “Medical professionals have been down this path before, and it hasn’t worked out very well.”

Today, a nurse practitioner must have at least 1,000 hours of clinical practice to graduate. A physician, however, has logged more than 10,000 clinical practice hours on completion of residency. The value of residency training is recognized by many practitioners, regardless of discipline. In fact, Dunstan says she’s had the opportunity “to think a residency would be good for a nurse practitioner, especially if they would be going out autonomously.”  

“We have been down this path before, and it hasn’t worked out very well.”

The report may mark the beginning of another movement to propel the nursing profession beyond his or her capabilities.

“This is nurse education, especially if they would be going out autonomously,” Dunstan says. “I would have enjoyed something like that.”

Somewhere nurse practitioners may have the opportunity to complete a residency. Last October, the Institute of Medicine (IOM) published “The Future of Nursing: Leading Change, Advocating Health,” a report that makes eight recommendations to advance the nursing profession. Among those recommendations is implementing a national nurse residency program. But the most controversial recommendation urges states to allow nurse practitioners to provide care to the “fullest extent of their education and training.” The committee responsible for the report was chaired by former Health and Human Services Secretary Donna Shalala, PhD.

“They’ve committed to the Institute of Medicine recommendations for the future of nursing,” says Karen Miller, RN, PhD, FAAN, dean of the KU School of Nursing. “I believe that the public’s need for health care, especially in Kansas, will demand that we create a better system using all of our providers, and the IOM recommendations will help us do that.”

“We were able to put together our regional action coalition within a short period of time because of the strong relationships we have,” Teel says. “We have trust in one another and each other’s abilities.”

Teel and the Kansas Regional Action Coalition plan to focus first on the IOM recommendations that will have the most positive impact for Kansas. Those recommendations include establishing what Teel calls “a seamless transition” for nurses seeking higher levels of nursing education, expanding the number of doctoral prepared nurses, and enhancing opportunities for nurses to lead in the health care system.

“When nurses are more highly educated, evidence shows that patient outcomes are better,” Teel says.

Research behind Teel’s assertion that nurses need to be well-educated supports another controversial recommendation by the IOM: Increase the proportion of nurses with bachelor’s degrees to 80 percent by 2020.

In Kansas, more than half of the enrolled nurses have an associate degree, while only 30% have a bachelor’s degree or higher.

“Health care is going to dramatically change in our country. We can’t afford the system that’s currently organized.”

“We are going to have to rethink health care delivery from a primary care standpoint,” says Michael Kennedy. “And we’ll need every member of the health care team to help with that.”

That’s why Dunstan is glad to have a second opinion when she needs it.

“Then I’m glad I’m not an MD with all of their responsibility. I feel like I have the responsibility of a doctor, but I don’t need the last word,” Dunstan says.

Dunstan says she’d probably swing towards doing the work required for a collaborative physician if it meant that nurse practitioners would establish clinics in high-need areas. “I can see there is a real need for small counties and underserved areas to have clinics like well-woman or well-baby clinics.”

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Dunstan is making preparations for her workload to double – Hughes is retiring in September.

Dunstan is educated to handle the cases but is struggling to find faith that she can handle the challenges of packing in twice as many patients and being constantly on call. Despite her ability to thrive in what she calls a career of “blood and tears,” Dunstan knows going it alone will be her toughest test yet, and she’s seeking help. “Pray for me.”

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That can make researching headaches a challenge, because 75 percent of the country’s migraine sufferers are women.

Berman and her colleagues at KU Medical Center are taking the problem of women’s pain seriously. The group of 18 researchers is attacking migraines — along with fibromyalgia, endometriosis and pelvic pain — as part of the Women’s Pain Division at the medical center’s Institute for Neurological Disorders (IND). In addition to basic scientists such as Berman, the team includes pharmacologists and surgeons, as well as experts in gynecology and obstetrics, neurology, psychology, psychiatry and behavioral science, allergies, immunology and rheumatology, trauma and critical care, integrative medicine and pediatrics.

Besides the research going on in the Women’s Pain Division, five other similarly massive efforts are under way at the Institute for Neurological Disorders. Researchers have teamed up in divisions dedicated to brain injury and repair, neuromuscular and movement disorders, neurodegenerative disorders, hearing and equilibrium disorders, and cognitive and behavioral health.

But the mission in the Women’s Pain Division is to come up with better treatments and cures for pain problems that disproportionately affect women.

“We’ve already proven that estrogen increases the number of pain-sensing connections that bring information into the central nervous system,” says Peter Smith, PhD, professor of molecular and integrative physiology and director of both the Institute for Neurological Disorders and its Women’s Pain Division.

More than 10 years ago, Smith says, tryptamine-based drugs revolutionized the treatment of migraines by blocking inflammatory molecules from acting on pain receptors. Nevers drugs awaiting approval may be able to block the early events in migraines, possibly preventing migraines in the very early stages. But none of the common treatments is ideal. The most common treatments, opiates and nonsteroidal anti-inflammatory pain medications (NSAIDs, such as ibuprofen and naproxen), all have downsides.

Berman knew that migraines were related to serotonin levels, so she focused on the cells surrounding the brain’s largest nerve. Studying female mice, she found links between the natural hormonal cycle and expression of genes related to serotonin function. Berman has since developed an animal model for testing new headache drugs. “We can check a drug’s effects on any organ and determine if it has unanticipated effects,” she says. “We can compare several migraine drugs and learn more about the mechanism of their action.”

Now Berman knows when a mouse has a headache. In the process of developing the animal model, Berman discovered that rodents with headaches behave much the same as humans — they avoid light and sound, and they are agitated by routine movements.

Another IND study is looking at how vitamin D could be a source of hope for migraine sufferers. “We know that if you’re vitamin D deficient, you have more wires in your muscles to receive pain signals,” Smith notes. “There is evidence that increasing vitamin D reduces or eliminates pain, but it’s anecdotal. We hope to be the first to have a good randomized clinical trial in place, which should provide us with evidence to show what’s going on.”

All of which add up to a relatively new area of interest within the National Institutes of Health. The NIH’s National Center for Complementary and Alternative Medicine (NCCAM), established in 1998, is funding research on approaches that are “not generally considered part of conventional medicine.”

Last year, the agency committed to strengthening its research portfolios in the area of chronic pain treatment. When the agency issued a request for proposals to fund Centers for Excellence to conduct new research on pain, it caught the attention of the IND scientists, who knew they had already had an expert in complementary and alternative medicine.

Before joining KU Medical Center in November 2009, Joy Weydert, PhD, now associate professor of pediatrics, spent more than a decade using complementary and alternative medicine to treat young patients between the ages of 8 and 20, first in private practice and then at Children’s Mercy Hospital & Clinics in Kansas City.

“One of the kids that I was seeing had already been to multiple other doctors — primary care doctors, neurologists, orthopedists, neurosurgeons, rheumatologists, psychiatrists,” Weydert says. “They had been on multiple combinations of drugs to treat pain — headaches, fibromyalgia, back pain, limb pain. The pain was just enough that it was interfering with their daily lives.”

Weydert combines a psychological approach with therapies such as acupuncture, herbs, dietary supplements and massage. She, too, is intrigued about the therapeutic potential of vitamin D. “We recognize that vitamin D likely could help because of its known effects on the anti-inflammatory pathways and how it may affect the serotonin pathways and neurotransmitter pathways.”

Michael Rapoff, PhD, a specialist in behavioral pediatrics and the Ralph L. Smith Professor of Pediatrics, has been teaching children how to change their behavior to fight their own headaches. He uses cognitive therapy and is the co-inventor of an online “e-health intervention” called Headstrong that guides patients through relaxation techniques.

“Before puberty, migraines affect boys and girls equally,” Rapoff notes. “After puberty, though, it’s a different story — and disabling pain is especially hard on female teens. ‘It compromises their quality of life, and they’re more likely to develop secondary depression and feel isolated and discouraged,’” Rapoff says.

As a clinician, Weydert says working with basic scientists to solve problems is the way of the future. “This is the first time in my professional experience to have this breadth of knowledge and to have so many different groups coming together,” Weydert says of her colleagues in the Institute for Neurological Disorders.

For 22 million U.S. women, the effort is long overdue.

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A SCHOOL OF PUBLIC HEALTH

In late 2010, the Kansas Board of Regents endorsed KU’s proposal to create a dedicated School of Public Health. Under the plan, KU Medical Center would reorganize the Departments of Preventive Medicine and Public Health, Biostatistics, and Health Policy and Management into a School of Public Health. Launching the school has been a top priority for KU Chancellor Bernadette Gray-Little, PhD, and KU Medical Center Executive Vice Chancellor Barbara Atkinson, MD, who recently talked about the new venture.

You came to KU from the University of North Carolina, which has one of the country’s premiere schools of public health. What benefits did you see in North Carolina because the school existed?

North Carolina’s School of Public Health is one of the clear areas of pride for the university, and I believe that will be true at KU. I have to admit that when I first came to KU two years ago, I was delighted to see that extensive thought and planning had already been given to developing a school of public health.

What sort of benefits do you expect Kansas to see from the school?

There is such a strong demand for public health professionals in our state, so right off the bat, we will be filling that gap and educating the people who will go out into their communities to help others learn how to live healthier, longer lives. Additionally, many health challenges are best addressed early, so if we can improve our public health efforts in Kansas, we can reduce medical costs.

How do you think a School of Public Health can address the wide health disparities we see in our state?

Health education and prevention are more important in poorer communities than elsewhere, because citizens often cannot afford to pay the cost of health care or insurance and are less likely to be informed about healthy behaviors. Improving education and providing opportunities for prevention are among the best strategies to reduce those disparities.

I know many people wonder why KU needs a separate School of Public Health outside of the School of Medicine.

Public health has a distinctly different focus than medicine. It looks at the health of populations, rather than just individuals. Beyond the differences in the fields of study, there are also additional funding sources only available to schools of public health that would enable us to carry out projects that improve the health of Kansans.

A question many people have asked me is why start this school now – particularly in this economic climate?

There is not a better time to start up this school. Health care costs are growing and they are a drag on economic productivity and a huge factor in our national deficit. That makes an investment like this critical if we want to get at the root causes of these problems in our economy and society. And keep in mind, we aren’t starting from scratch. We have many of the crucial elements for a School of Public Health.

Exactly. I think it’s important to remember that we already have such a strong public health program at the medical center, so we are not starting from scratch.

Yes, the programs and outstanding teachers and researchers are in place. Additional programs will need to be created, but perhaps the next most important challenge will be to search for the inaugural dean. That person will help to bring all of the planning together, lead us in the accreditation effort, and help generate resources for the new school.

So, let’s see how this turns out. What kind of person are you going to look for in a dean?

This dean has to have a credible history in public health, one that reflects commitment to excellence in education and in research, and who values the important role that a school of public health plays in society. Because this is a new venture, this person must have exceptional organizational skills, the ability to bring people together, and the capability to find resources to do what needs to be done.

How do you think a School of Public Health will help advance the mission of the university?

Our mission is to educate the next generation of leaders and skilled workers, to conduct research that improves lives, and to serve the people of Kansas. A School of Public Health helps us achieve all aspects of that mission by educating public health professionals – for whom there is a growing need – and by leading to innovations that will result in better health for Kansans.

How does the School of Public Health support the university’s other strategic initiatives?

One of our strategic goals is for KU to address the grand challenges faced by Kansas, the nation and the world – and certainly health care falls into that area. Costs are rising while health outcomes are not. Public health programs can put KU at the center of addressing that crisis.

I think one of our challenges is encouraging more students interested in health care careers to consider pursuing an education in public health.

We definitely need to do a better job at making young people aware of public health as a career. I’m confident that we’ll be able to recruit many outstanding students who are excited about working in public health and improving the lives of the people in their communities.

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With Bernadette Gray-Little and Barbara Atkinson

Questions by Donna Peck
a new clinic is a bridge for diabetics moving from adolescence to adulthood

by cj janovy

david robbins, md, remembers a moment of profound insight. he was observing a focus group of diabetic patients and their families. "it was a young woman, a college student," he remembers. "there was a bowl of hershey’s kisses. she picked up one of the kisses, put it in her hand, brought it to her mouth and then put it back. she said, ‘i can control this.’ i would like to learn how to bring kids to that moment: when they feel like they have control.”

as a professor of medicine at the university of kansas medical center and director of the ku diabetes institute and its clinical arm, the cray diabetes self-management clinic, robbins knows that diabetes poses a complex psychological challenge. “there’s no other disease for which people actually call themselves the disease – they say, ‘i’m a diabetic.’ it reflects the way diabetes envelops their life – they become the disease.”

it’s especially difficult for young adults.

“adolescence is such a struggle over control,” he notes. “put on top of that a disease where you feel like you don’t have control over your body, and adolescence can be a psychological disaster.”

kurt midyett, md, was seeing a different side of the same problem. for the five years that midyett was medical director of the diabetes clinic at children’s mercy hospital & clinics in kansas city, he and his team of educators and social workers made sure that their young patients received the best possible care. but inevitably, there came a point when he couldn’t help them.

“at 18, by definition, they had to leave,” midyett says. “there was no way of continuing to help patients beyond a certain age.”

studies over the last decade have shown that almost a third of adolescents with type 1 diabetes sometimes went more than six months between their final visit with a pediatric provider and their first visit with an adult provider; more than one-tenth had no follow-up. in one study, out of the 90 percent of patients successfully transferred to adult care at age 17, just 61 percent were regularly seeing a physician two years later.

the consequences can be fatal. a british study found that, for diabetic adults between ages 20 and 29, the risk of mortality was three times higher for men and six times higher for women than in the general population.

most deaths were due to complications such as hypoglycemia and ketoacidosis – but psychosocial factors such as living alone, drug or alcohol abuse, and mental illness (predominantly depression) were contributing to the increased mortality. especially at risk are college students, due to their tendency to drink, their erratic schedules, their eating choices, their insecurity about sexuality, and their lack of social support.

robbins and midyett began working on the problem together. they met with their staffs for a year to talk about ways to help teens make the transition to adult care. in february 2010, when midyett joined the faculty at ku medical center, where he now chairs the division of pediatric endocrinology and genetics, they quickly implemented a formal study of managing diabetes transition for teens and young adults.

with funding from the john w. & effie e. speas memorial trust, robbins and several colleagues had already gathered focus groups of adolescents, young adults and their parents. focus-group participants talked about the ways that diabetes limits activities central to teenage and young-adult lifestyles. they opened up about the strain on families when teens argue with parents about diabetes management, and when resentful siblings complain...
that the child with diabetes gets special treatment. They discussed the ways in which managing diabetes is physically and emotionally demanding, and talked about the need for short- and long-term motivators to maintain glycemic control. There were myriad other issues, such as parents’ feelings of helplessness and young adults’ inability to get medical insurance.

With continued funding from the Speas Memorial Trust, Robbins and Midyett began a research project comparing two approaches for helping patients move from the supportive, family- and team-based environment of pediatric care to the adult model requiring independent self-management of the disease.

A key addition to the team was health psychologist Albert Buddy Poje, an assistant professor in KU Medical Center’s Department of Psychiatry and Behavioral Sciences.

One approach takes a standard-of-care clinic model and adds intensive education, behavioral evaluation and support, with a gradual transition from pediatric to adult staff and some joint pediatric-adult visits. Poje is the first person patients see. This gives them a chance to open up and helps the team understand individual challenges in advance. Patients then see Poje throughout the next six months.

“After their first session, people walk out with a different perspective,” Poje says.

“The health psychologist turned out to be a much more critical part of this than we had envisioned,” says Virginia Lavis, chief operating officer of the KU Diabetes Institute and executive director of the Midwest Diabetes Coalition.

“The transition clinic is a bridge,” Midyett explains. “Patients communicate with nurses, social workers, psychologists and educators to develop a common language, so when they move to the adult world, it’s not foreign to them. It’s a conversation that can’t happen on a patient’s last visit to a pediatrician. It has to start when they’re around 14.”

For the other arm of the study, Robbins built on extensive research suggesting the importance of peer support and social networking in chronic disease management, particularly for young people. This is an area of interest to the National Institutes of Health (NIH), and Robbins anticipates that the current study will provide preliminary data for proposing a much larger study to the NIH.

Participants in the social behavioral part of the study meet for five or six hours on two Saturdays, about a month apart, on the University of Kansas’ main campus in Lawrence. They don’t come for medical care or counseling, but to learn about diabetes.

As an introductory exercise, patients divide into teams at the Jaybowl in Lawrence. Part of their task: to communicate about their individual skills and, taking those into account, set a goal for their team bowling score. The team that wins isn’t the one with the highest score but the one that comes closest to its goal.

The teens and young adults in the Saturday sessions exchange cell-phone numbers and e-mail addresses and are encouraged to stay in close touch and support each other. They also learn how to responsibly use social networking sites such as TuDiabetes.org.

The most important goal for both arms of the study is to begin to take ownership of diabetes and its demands.

Although formal evaluations and outcomes for the first 40 participants are not yet available, patients seem enthusiastic.

One clinic patient, Ashlee (she asked that her last name not be used), learned of her diabetes just before she graduated from high school.

“It was the summer right before I left for college,” says Ashlee, who will be a college senior this fall. “It was scary. I didn’t really know anything about diabetes. They said, ‘It can cause this, it can cause that.’ And I didn’t know how to control the blood sugar as well as they were telling me I needed to control it.”

On a trip to the campus pharmacy, she saw a flyer for the transition clinic and came in to see Robbins and Poje. “I’m busy and don’t always have time to call the doctors.”

Midyett hopes that the diabetes transition clinic can be a model for children managing other chronic diseases as they become adults.

But things didn’t go so well her sophomore year. “I really went downhill. I was on and off the insulin pump and couldn’t figure out whether I wanted to do that or the shots. I didn’t really even know what to do anymore because I just kept getting sick. I got sick with [H1N1] flu and thought there was no way I was going to control this, so I kind of gave up.”

Although his study is still in its early stages, Robbins hopes to expand it to serve 40 patients and incorporate social media—which presents another layer of complication. Networking with peers via texting, Facebook and other outlets affords little privacy and can’t substitute for talking with a medical professional, but it’s now the norm for young people. And Robbins believes it can be used to strengthen peer-to-peer support systems.

Midyett hopes that the transition clinic can be a model for children managing other chronic diseases as they become adults.

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ON THE SURFACE, it didn’t seem like a particularly logical career move.

Andrew Godwin, PhD, was a leading scientist in the field of personalized cancer medicine and drug development. For more than 25 years, he had worked at Fox Chase Cancer Center in Philadelphia, one of the country’s first National Cancer Institute (NCI)-designated Comprehensive Cancer Centers. Godwin was the director of the Clinical Molecular Genetics Laboratory, the co-leader of the Women’s Cancer Program, and the initiator and director of one of the country’s top biospecimen repositories. Among his many accomplishments, Godwin’s lab had successfully developed a test for colon cancer patients that would determine whether they had a particular defect in a gene—known as KRAS—which could serve as a marker for targeted therapy.

Would one of the world’s top personalized cancer medicine researchers really be interested in leaving all that behind to come to The University of Kansas Cancer Center? When the director of the KU Cancer Center, Roy Jensen, MD, was trying to recruit a researcher with an international reputation in personalized cancer research, he was told that luring Godwin away from Fox Chase was pretty much impossible. “A colleague of mine advised me that we had zero chance of getting Andy Godwin to come to KU,” Jensen says.

Granted, KU’s is one of the fastest-rising cancer centers in the country. Its researchers and administrators had been working tirelessly for nearly a decade on attracting the required funding and personnel to apply for NCI designation in the fall of 2011. But why would Andrew Godwin want to come to a cancer center that is still years away from achieving the status of Fox Chase?

“Well, it certainly didn’t hurt that I am originally from Lawrence and went to school at KU, so it would be a bit like coming home,” Godwin says with
a laugh. “But more importantly, I was impressed with the expertise that the KU Cancer Center has when it comes to drug discovery. KU has one of the few cancer centers that is focused on moving discoveries to patients.”

In late 2010, after spending his entire career at Fox Chase, Godwin agreed to join the KU Cancer Center as its new associate director for translational research and the director of molecular oncology at KU Medical Center. Another physician-scientist with an international reputation in personalized medicine, Kapil Bhalla, MD, also came onboard in 2010 to serve as deputy director and chief of the center’s Personalized Cancer Initiative.

So why has the cancer center gone to such lengths and expense to attract physicians and researchers with backgrounds in personalized medicine? “Because personalized medicine is the future of cancer research,” Jensen says. “Because personalized medicine is the future of cancer research,” he adds. “Because personalized medicine is the future of cancer research.”

For example, patients diagnosed with stage III colon cancer had traditionally undergone surgery to remove as much of the cancer as possible, and then received a particular medication—usually in the form of chemotherapy—delivered in an average dose. But a large percentage of patients didn’t respond well to that course of treatment, so doctors would then try something else or give up if the cancer was too advanced.

“Every case of lung cancer, colon cancer, ovarian cancer, breast cancer—their treatments were all pretty much the same way,” Godwin says. “We never had to define all the mutations in the genome of a cancer patient.”

In 2009, researchers at the Sanger Institute in Great Britain announced that they had decoded the genomes of lung cancer and skin cancer. Their findings, published in the journal Nature, found the DNA code for melanoma contained more than 50,000 errors caused almost entirely by too much sun exposure. The lung cancer DNA code had more than 25,000 errors largely triggered by exposure to cigarette smoke.

Even before the mapping of the human genome and The Cancer Genome Atlas (TCGA), an ambitious effort to catalogue all of the thousands of molecular glitches that turn normal healthy cells into cancers. It was the hope that by identifying the full spectrum of genetic errors that allow cancer cells to divide recklessly, spread and take root throughout the body, doctors could classify every cancer—not by where it forms and how fast it is growing—but according to hidden molecular hallmarks that can tell which drugs will work and which ones will not.

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Michael Stratin, who is co-leader of the Sanger Institute’s Cancer Genome Project, told the journal Science that researchers around the world would publish tens of thousands of cancer genomes by the year 2014. Andrew Godwin, who is helping identify ovarian cancer genomes for TCGA, believes that will lead to enormous gains in understanding and treating cancer.

“Genome sequencing is one of the most powerful diagnostic tools we’ve ever had to define all the mutations in the genome of a cancer patient,” Godwin says. “We will no longer have to strictly rely on techniques where we are guessing what could be wrong. Now, we can find all the genetic changes that contributed to a patient’s cancer. And as we decipher more cancer genomes, I think this will lead to more targeted and effective approaches to treating cancer patients.”

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EARLY CANCER GENOME RESEARCH

Even before the mapping of the human genome and The Cancer Genome Atlas, some researchers, including Godwin, had some experience in isolating and understanding the inner workings of cancer genes. In Godwin’s case, his laboratory has been focused on understanding the causes of several colorectal cancers, as well as tumors that are characterized by the presence of a gene called c-KIT or PDGFRA. When c-KIT or PDGFRA is mutated, it can cause proteins called receptor tyrosine kinases to be activated, which can result in carcinomas gastrointestinal stromal tumors.

Researchers have found genetic causes of the disease. “Up to 85 percent of GISTs arise because of a variety of different mutations in a gene called c-KIT and, to a lesser extent, a gene known as PDGFRA,” Godwin says. “A mutation of c-KIT or PDGFRA causes proteins called receptor tyrosine kinases to be activated, which can result in carcinomas gastrointestinal stromal tumors.”

Godwin’s first studies identified the genetic markers that could predict how patients with metastatic or recurrent GIST responded to imatinib mesylate, a drug used to treat certain types of leukemia and GIST. Imatinib is a member of a new class of drugs that act by specifically inhibiting a certain enzyme—in the case of GIST, tyrosine kinases—that is characteristic of a particular cancer cell. That’s different from traditional chemotherapy drugs, which nonspecifically inhibit and kill all rapidly dividing cells.

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What researchers began to see was that some cancers are caused by a mutation in a single gene. Others are caused by the mistaking duplication of a gene that promotes normal cell division, boosting its reproductive capacity to abnormal levels. In other cases, entire pieces of chromosomes—long, gene-bearing strands of DNA inside cells—break off and reattach to other chromosomes, inducing random and unregulated growth signals.

In 2005, the federal government launched The Cancer Genome Atlas (TCGA), an ambitious effort to catalogue all of the thousands of molecular glitches that turn normal healthy cells into cancers. It was the hope that by identifying the full spectrum of genetic errors that allow cancer cells to divide recklessly, spread and take root throughout the body, doctors could classify every cancer—not by where it forms and how fast it is growing—but according to hidden molecular hallmarks that can tell which drugs will work and which ones will not.

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“For patients, that could mean a more effective course of treatment with fewer side effects.”

Scientists who are firm believers that targeted drugs are the future of cancer treatment predict that tumors will one day be characterized by their molecular profiles—and which mutated genes they have—instead of where in the body they are located.

A good example is how antibiotics are prescribed for a particular pathogen rather than who the body is the infection occurring,” Jensen says. “Cancer treatment options are headed in that direction, and it is certainly within the realm of possibility that terms like breast cancer and colon cancer could become obsolete and be replaced by terms like BRAF-positive or KRAS-positive tumors.”

A DIFFICULT PATH

There is evidence that the road to effective and safe targeted drugs is not going to be an easy one. Despite the explosion of knowledge about cancer over the past 20 years, it remains a maddeningly complex disease that still has the ability to confound researchers and lead to devastating disappointments in laboratories and in clinical trials.
Peterson, PhD, with the KU Department of Medicinal Chemistry, to National Cancer Institute has awarded a $1 million grant to Blake project that is garnering national attention and support for KU. The Godwin’s work on GIST is not the only personalized cancer research cancer drug therapies we are currently working on all are in collaboration. “We firmly believe that folks have to partner. The six partnerships that KU and IAMI had developed with other academic institutions drug from the bench to the bedside,” Godwin says. “When I saw the part-
innovative therapies to market is a primary reason that Godwin was con-
history in drug development and partner with other institutions to take tool for getting drugs to patients’ bedsides. IAMI’s ability to build on the region’s impressive

“Nothing single academic institution has the expertise or resources to bring a drug from the bench to the bedside,” Godwin says. “When I saw the part-
nores that KU and IAMI had developed with other academic institutions

Scott Wein, PharmD, PhD, the director of IAMI, concurs that drug discovery is a team effort. “We firmly believe that folks have to partner. The six
cancer drug therapies we are currently working on all are in collaboration with industry, government, other academic institutions, or disease philan-

Godwin’s work on GIST is not the only personalized cancer research project that is garnering national attention and support for KU. The National Cancer Institute has awarded a $1 million grant to Blake Peterson, PhD, with the KU Department of Medicinal Chemistry, to study how to get chemotherapy drugs directly into cancer cells. Peterson is researching synthetic cell surface receptors as a new tool for drug delivery and studying small molecule-protein interactions to generate potential therapeutic leads.

“The delivery of drugs through the bloodstream to tumors is similar to paddling a kayak down a stream – there are often rocks and trees that stand in the way,” Peterson says. “What I hope is that this kind of drug delivery will essentially walk over these barriers to allow cancer-fighting drugs to reach tumors. This has the potential to revolutionize the way we treat certain types of cancers.”

Another research project generating excitement is led by Linberg Li, PhD, an investigator with the Stowers Institute and a professor of pathology and laboratory medicine at KU Medical Center. Li is studying how normal stem cells become cancer stem cells, how cancer stem cells can cause the formation of tumors, and how researchers might use that knowledge to target drug-resistant cancer stem cells. The theory that cancer stem cells initiate and drive cancer cell growth has been gaining popularity in both clinical and basic research.

“A key to completely curing cancer may depend on whether or not we can successfully target cancer stem cells,” Li says. “To this end, the identification and characterization of cancer stem cells will be an essential step.”

Whether it is identifying cancer stem cells or searching for alter-
native GIST therapies, the vast majority of KU cancer research-
eres are gravitating toward personalized cancer care. Even with-
out the full genome of cancers complete-
ed, many doctors are using knowledge about gene mutations to determine the most effective drugs to prescribe.

“It’s pretty simple,” Jensen says. “We are entering the age where the cells in cancer tumors are going to tell us how to treat cancer patients.”

And despite the astounding progress made since President Nixon declared the war on cancer 40 years ago, most researchers believe they are only begin-
ning to understand the biology of can-
cer. As that understanding deepens, the benefits to cancer patients will continue to multiply.

“We have learned more about cancer in the last two decades than we had in the previous 150 years,” Godwin says. “But in many ways, we really still are at the beginning of the journey.”

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The cell cycle, the process by which cells progress and divide, lies at the heart of cancer. In normal cells, the cell cycle is controlled by a complex series of signaling pathways by which a cell grows, replicates its DNA and divides. In cancer, as a result of genetic mutations, this regulatory process malfunctions, resulting in uncontrolled cell proliferation.

The cell cycle involves a complex series of molecular and biochemical signaling pathways. The cycle has four phases:
- the G1, or gap, phase, in which the cell grows and prepares to synthesize DNA;
- the S, or synthesis, phase, in which the cell synthesizes DNA;
- the G2, or second gap, phase, in which the cell prepares to divide; and
- the M, or mitosis, phase, in which cell division occurs.

As a cell comes to the end of the G1 phase, it is controlled at a vital checkpoint, called G1/S, where the cell determines whether to replicate its DNA. At this point, there is a check for DNA damage to ensure that the cell has all the necessary machinery to allow for successful cell division. As a result of this check, which involves the interactions of various proteins, a molecular switch is activated. Cells with intact DNA continue to the S phase; cells with damaged DNA that cannot be repaired die off through apoptosis, or programmed cell death.

A second such checkpoint occurs at the G2 phase, following the synthesis of DNA in the S phase but before cell division in the M phase. Cells use a complex set of enzymes called kinases to control various steps in the cell cycle. Cyclin dependent kinases, or CDKs, are a specific family of enzymes that use signals to switch on cell cycle mechanisms. CDKs themselves are activated by forming complexes with cyclins, another group of regulatory proteins present only for short periods in the cell cycle.

When functioning properly, a cell’s regulatory proteins, including CDKs and cyclins, act as the body’s tumor suppressors by inducing the death of damaged cells. Genetic mutations that cause the malfunction or absence of one or more of the proteins at cell cycle checkpoints can result in the molecular switch being turned permanently on, permitting uncontrolled multiplication of the cell, leading to carcinogenesis, or tumor development.
The surgeon told us that Brice had a tumor," Staggs says. "He didn’t mention After X-rays, Brice was referred to an orthopedic surgeon.

When he complained about his leg hurting, his mother, Jenny Staggs, -

"It was one of my favorite things to do," he says. He wasn’t good enough on a career in sports medicine. That was until her oncology rotation at Templeton, who had played competitive tennis in college, was planning another way to save limbs.

Templeton was the first doctor in the United States to use the German-made OsteoBridge implant to replace part of a cancer patient’s humerus, in 2008. She and Carolyn Yang, MD, a fifth-year orthopedic surgery resi-

The key is adapting the treatment to a patient’s life. “It doesn’t work to slow the growth in his good leg. “He would never grow,” Staggs says of Brice’s as he grew. Alternatively, to keep his legs of equal length, she could have amputated a leg.”

For the farmer, amputation and a prosthetic leg allowed him to live alone, in a community removed from any immediate health care resources. That’s not somebody for whom you want to take out the thigh bone and put in a piece of metal.” -

Sometimes people ask how it feels not to have a leg. “I tell them my leg just feels numb. That’s what it feels like, except it’s not there.”

Brice says when he learned he had cancer, he never doubted himself. “I was going to make it,” he says. “I know that I have something to live for. I just want to live my life and keep on going.”

Templeton remembers a patient who was a farmer. “He lived alone, in a community removed from any immediate health care resources. That’s not somebody for whom you want to take out the thigh bone and put in a piece of metal.” A replacement wouldn’t hold up to the farmer’s hard physical labor. Also, joint replacements sometimes become infected. “If you’re living in a remote community and don’t have access to health care or a family who can get you to health care, that’s a bad scenario,” she says. For the farmer, amputation and a prosthetic leg allowed him to stand independent.

Templeton, who directs KU Medical Center’s orthopedic residency pro-

"I WAS GOING TO MAKE IT," BRICE SAYS.
The rugged South Asian country of Nepal is more than 9,000 miles and 11 time zones away. It might seem remote and inaccessible to many Americans, but Prakash Neupane, MD, still calls it home. Neupane, an assistant professor of hematology/oncology at KU Medical Center, came to the United States 20 years ago to practice medicine. But he still returns to Nepal numerous times each year to visit family and friends. On those trips back home, he also visits Nepalese hospitals and meets with Nepal’s health care professionals.

During one of his visits, Neupane began investigating the possibility of a telemedicine connection to Nepal. Neupane frequently uses telemedicine to visit with cancer patients at Goodland Regional Medical Center in Goodland, Kan., 380 miles away from his office in Kansas City, Kan. With support from KU Medical Center’s Department of Outreach and the KU Center for Telemedicine and Telehealth, he was able to make the Nepal connection a reality. Neupane now has held a series of monthly, interactive video conferences from his office in Kansas City with a team of his physician colleagues in Katmandu.

Neupane feels fortunate to be able to help critically ill people halfway around the world away without leaving his office. “Telemedicine, I believe, is going to help Nepal gain access to the expert opinion and consultation needed to improve levels of care, as well as enhance training,” he says.
COME ON INSIDE.

Learn more about the new world of personalized cancer medicine, the growing number of nurse practitioners providing health care, research that could help end migraine misery, and more.