

Battling the Silent Killer

By Jerri Culpepper

The Harold Hamm Oklahoma Diabetes Center is at war with the disease that is placing an alarming number of state residents at risk.



Real men do not get sick. At least, that is what Ronnie Valdez of Enid would have told you 14 years ago.

He recalls his diagnosis with type 2 diabetes at age 40: “It was a pretty confusing time. All my life I’d been a bull, never had any problems. All of a sudden, I fell sick with a series of colds, flu, then pneumonia.”

Finally, sick of being sick, he went to his doctor who, after running tests, told Valdez that he had type 2 diabetes. Yet for years after his diagnosis, he pretty much refused to let it change the way he did things.

“I didn’t understand diabetes. It’s such an elusive illness,” he says. “You do what you’re supposed to do, but even then, you may have high blood sugar days, and there’s nothing you can do about it. So I’d just roll up my sleeves and say to myself, ‘It’s going to be a tough day.’”

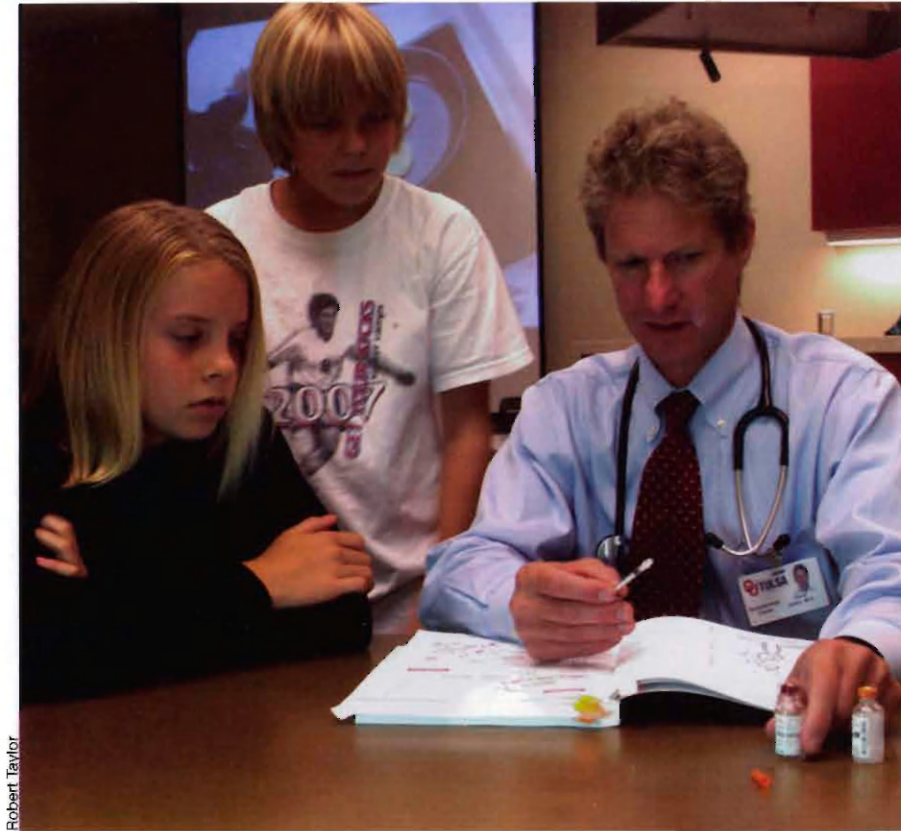
He recalls a long period in which his doctor tried different means of controlling his diabetes. “One year turned into two, which turned into five, which turned into 10, and I got frustrated because nothing seemed to work,” he says. “Why follow all the rules about exercise and eating—like ‘white not right’ (a phrase commonly given to diabetics to remind them to steer away from low-nutrient, carbohydrate-heavy foods like white rice and white bread)—if nothing seems to work?” Besides, he rationalized, “How can a bologna sandwich bother you?”

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Dr. Timothy Lyons of the Harold Hamm Oklahoma Diabetes Center is a man on a mission. Since coming to OU in 2002, Lyons has been on the frontline in the fight against diabetes, utilizing the resources at the University of Oklahoma Health Sciences Center to advance education, research and clinical care.



Photo provided



Robert Taylor

Dr. David Jelley, the Hille Chair of Diabetes and associate professor of pediatrics at OU-Tulsa, discusses options for diabetes treatment and prevention with children visiting the clinic. Type 1, or juvenile diabetes, is on the rise in Oklahoma at an alarming rate.

He continues: "I was so erratic and would get so frustrated with these huge swings in my blood sugar."

Finally, on his doctor's recommendation, Valdez scheduled an appointment at the Harold Hamm Oklahoma Diabetes Center (HHODC) at the University of Oklahoma Health Sciences Center in Oklahoma City. During his first visit with Dr. Madona Azar, assistant professor of endocrinology and diabetes in the OU College of Medicine and junior researcher at the diabetes center, he knew he had come to the right place.

"She was right on about everything," he says, impressed with the time she spent listening to him describe his experiences with the illness.

After Valdez's initial workup, Dr. Azar expressed concern that he was at risk of having what is called "a silent heart attack." People with diabetes face a far greater risk of having a heart attack than the general population. Because diabetes can damage pain-sensing nerves, some heart attacks can occur without any accompanying pain.

The heart attack is caused by progres-

sive narrowing of the heart's arteries from accumulations of cholesterol plaque. This process is accelerated by diabetes—and victims of one episode are prone to later, more serious, even fatal, attacks unless the problem is addressed.

Two days prior to his scheduled appointment with a heart specialist, he passed out while atop a ladder at work. True to Dr. Azar's prediction, he had suffered a heart attack.

Valdez now knows he can count on not just Dr. Azar, but also a team of health care specialists, nurses and dietitians at the HHODC, to work with him on the complicated issues facing those with the disease.

An insulin pump now helps regulate his blood sugars, which he still has to monitor diligently, while watching his diet. He has learned the importance of a healthy lifestyle and of monitoring other risks that are major threats in the presence of diabetes: blood pressure and cholesterol levels.

Valdez credits the diabetes center and Dr. Azar with saving his life and giving him the tools to allow him to live his life to the fullest.

Shortly after beginning his treatment at the HHODC, Valdez says he made it a point to visit personally with Harold Hamm—whom he has known for years through the Enid Rotary Club and through shared involvement in their community—to thank him for his role in making the diabetes center a reality.

"I couldn't wait to see him and to tell him thank you for the diabetes center," Valdez says. "I told him it had changed my world, that it had saved my life. . . . He's such a low-key guy, a regular guy. He just thanked me back for thanking him."

Valdez has advice for newly diagnosed people with diabetes.

"The problem with diabetes is that not everybody understands it," he says. "Get to the Harold Hamm Oklahoma Diabetes Center, where they understand it, where they will teach you. Learn what it is from the beginning. You will survive with it—but the longer you have it, the greater a toll it takes on your body. It's going to be a part of your life from now on, so you'd better understand it. Don't be Mr. Tough Guy."

Valdez confesses that he did not understand that not everyone with diabetes is the same, that levels vary and care needs to be tailored for each person. "The people at the HHODC understand these individual differences. They are on top of the latest advances in medical care."

Ronnie Valdez's story drives home the personal component of a complex disease that has become an epidemic in the United States and throughout the world as traditional, rural lifestyles give way to urbanization.

In addition to an increasingly overweight and less physically fit populace, Americans' lifestyle changes also have led to a host of other undesirable health outcomes, among them higher incidences of heart disease, some types of cancers and diabetes.



Robert Taylor



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Oklahoma is among the states most severely affected by diabetes and “pre-diabetes” (blood sugar above normal, but not yet at diabetic levels). Among some Native American communities, the prevalence is as high as 80 percent.

While a myriad of factors contribute to diabetes—including a mother’s diet during pregnancy—one of the most important is genetics: people who are of Native American, African American and Hispanic American descent are at a much greater risk of developing type 2 diabetes than their Caucasian counterparts.

Left uncontrolled or poorly managed, people with diabetes face devastating health effects including vision loss, heart attacks, strokes, amputations, blindness, kidney failure, nerve damage and increased fetal mortality. The economic costs are staggering as well, pulling countless un- or under-insured individuals and their families into poverty and straining government coffers at all levels through direct medical costs and lost productivity.

Addressing this epidemic requires a coordinated, concerted approach involving a broad cross-section of scientists, researchers, university- and community-based health care professionals from an array of specialties, the State Department of Health, leaders of tribal and minority communities.

It took considerable time, but through the commitment of the University of Oklahoma, state government, taxpayers, tribal governments and generous donors, critical mass was achieved. In 2006, the Oklahoma Legislature appropriated \$10.5 million for a comprehensive dia-

ABOVE: Steven Chernausek shows off the “Pea Pod,” a machine that helps determine diabetes risk in infants. **LEFT:** Martha Ogilvie, HHODC administrative director, works with Lancer Stephens, special populations outreach core director, to take diabetes education into communities across the state.

betes center in Oklahoma City and \$1.5 million for a facility at OU-Tulsa. Private donations quickly followed, including significant gifts from Hamm, for whom the center was named; the Children's Medical Research Foundation; the Chickasaw, Choctaw and Cherokee Nations of Oklahoma; and the Hille and Anne and Henry Zarrow foundations of Tulsa.

Among those who have played a critical role in the development of the Harold Hamm Oklahoma Diabetes Center is its director, Dr. Timothy Lyons, Chickasaw Chair in Diabetes Studies and chief of the section of endocrinology and diabetes at OU's Department of Medicine. Dr. Lyons came to OUHSC in 2002 with a mission: to develop diabetes research in Oklahoma and to address the critical need for a coordinating entity in the state to deal with the diabetes epidemic.

Also leading the efforts of the diabetes center are Dr. Kenneth C. Copeland, director of the pediatrics diabetes program in Oklahoma City, and Dr. David H. Jelley, director of the OU-Tulsa component.

While the creation of the diabetes center was a huge step forward for the state—and Dr. Lyons is proud of the increase in diabetes education, research and outreach that has taken place since its formation—he knows that the diabetes epidemic in Oklahoma will not be stanchied in a few years' time. The problems that created the epidemic are complex, and so, too, will be its fix.

While Native Americans, Hispanic Americans and African Americans are at much higher genetic risk of type 2 diabetes than are Caucasians, both type 1 (which generally strikes young people) and type 2 are on the rise among Caucasians as well, Dr. Lyons says. He notes that 40 years ago, type 2 diabetes in white, older Americans (over age 65) occurred in only about 10 percent of people; today, in Oklahoma, that number has increased three-fold.

Then there are the cultural issues. Oklahomans tend to exercise less than



Kenneth C. Copeland, director of the pediatrics diabetes program at HHODC, proudly displays the American Indian artwork given him by Oklahoma tribes at the dedication of the building. Since 2002, Dr. Copeland has served as the national co-chair and Oklahoma principal investigator of the NIH-sponsored Treatment Options for type 2 Diabetes in Adolescents and Youth.

people in many other states, and the traditional "Southern" diet, which includes a lot of fried and high-fat foods, has led to a high percentage of the population being overweight or obese. "And it's not easy to change a lifetime of bad eating habits," Dr. Lyons acknowledges.

Other factors include Oklahoma's relative lack of doctors (too few primary care physicians and specialists, especially in rural areas) and the state's large numbers of un- or under-insured, who often do not seek help until serious symptoms, such as chest pain or loss of vision, appear. People do not get tested early for markers that may indicate they are predisposed to diabetes or another serious health issue. Many of those with diabetes are reluctant to seek treatment for a chronic disease, resulting in their becoming uninsurable upon a loss or change of jobs.

Add a lack of nearby or safe places to exercise, and a culture that does not stress the importance of preventive care, or of the need for healthy diet and exercise at all ages, and the situation becomes even more dire.

One of the frustrating things about the diabetes epidemic, Dr. Lyons says, is that

in many cases, type 2 diabetes—which usually comes on in adulthood, but is occurring at younger and younger ages—may be entirely preventable through simple diet and lifestyle changes. If caught and treated early, both type 1 and type 2 diabetes usually can be treated and managed quite successfully, at relatively little cost to the patient. Medications for diabetes, high blood pressure and high cholesterol, for example, are readily available for a \$4 a month co-pay.

The team at the HHODC emphasizes the importance of early detection of risk factors. There are some relatively simple things Oklahomans can do to lessen the probability that they will develop diabetes or other serious health conditions, such as heart attack and stroke, during their lifetimes. One of the most important, Dr. Lyons says, is to have three things tested—fasting blood sugar, blood pressure and cholesterol—before your 30th birthday, and regularly thereafter.

Through its education, prevention and outreach components, the HHODC hopes to arm the state's citizens with the knowledge and tools needed to prevent the disease in the first place, and also



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Proper diet and exercise are key components to minimizing the onset of type 2 diabetes in adults. An exercise facility at HHODC will soon be available to staff and patients alike.

care and treat those with diabetes or pre-diabetes, with a special focus on the most at-risk populations. The center has brought together physicians, diabetes educators and researchers to help patients control their diabetes. Classes are offered on a range of topics, including cardiovascular disease, renal disease, insulin initiation, diabetes and pregnancy, weight loss/diabetes prevention, insulin pump therapy, and basic diabetes education.

Educational efforts of the HHODC also are being directed toward current and future health care professionals and those involved in public health policymaking.

The other major components of the diabetes center, which includes adult and pediatrics programs in Oklahoma City and Tulsa, are basic and translational research and clinical research. By 2009, the center's researchers had attracted some \$60 million in federal grants. Its investigators are at the forefront, nationally and internationally, in several areas of diabetes research, including the mechanisms of why people with diabe-

tes suffer a disproportionate number of heart attacks, strokes and blindness.

Dr. Lyons and Dr. Steven Chernausek, OU professor of pediatrics, director of the CMRI Diabetes and Metabolic Research Program, and holder of the CMRI Edith Kinney Gaylord Chair, are studying the effect of high blood glucose levels during pregnancy on both the mother and baby. Among the findings: uncontrolled high glucose levels during pregnancy increase risks for the mother, such as fetal malformations and higher incidents of preeclampsia, a complication that typically arises after the 20th week of gestation and is characterized by high blood pressure, protein in the urine and kidney damage.

Additionally, studies suggest that a mother's high blood glucose levels during pregnancy can have profound implications for the baby. In middle age or later, that baby is more likely to develop type 2 diabetes and cardiovascular disease than would otherwise be the case.


Dr. Chernausek says one surprising finding was that low birth-weight babies, and low birth-weight babies who gain the most weight in the first few months of life, are at a higher risk of developing diabetes later on.

HHODC pediatric diabetes researchers also are conducting studies to determine genetics' role in the development of diabetes versus other factors, such as diet and exercise. To accomplish this, they employ a wide range of tests to determine body mass index, metabolic rate, caloric expenditure at rest and during exercise, and when blood vessels begin to lose their elasticity (the precursor to hardening of

the arteries later in life), to name a few.

"The message is this," Dr. Chernausek says. "The processes that lead to diabetes and its associated problems found in adults actually begin much earlier, in the womb and during the first four years of life. So now, we need to direct our efforts on the very young."

"Unfortunately, diabetes is still increasing in Oklahoma, as in most other states," Dr. Lyons concludes. "Unless we address this issue and put into place realistic preventive measures, our ability to compete effectively in the world will be seriously impaired by health care costs and lost productivity. And on a personal basis, it's a tragedy to suffer a preventable heart attack or stroke, to be on dialysis, to go blind, or to suffer any of the other complications that can come with this disease if left untreated. We need to function as a community, not just as individuals. We need as a community to invest in these issues."

He cited the newly opened Chickasaw Nation Medical Center, which serves all members of the tribal community and promotes early disease detection, prevention and treatment, and asks, "If they can do it, then why can't everyone? This is a war, and we need a response that's war-like. We need a systematic approach to make sure medical care is getting where it needs to be." 

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Learn more about type 1, or juvenile, diabetes through the life of one young man, Jacob Snyder, as well as some basic facts about diabetes and HHODC education/outreach efforts, online at: "More about Diabetes" <http://www.oufoundation.org/summer2010>.

For the HHODC website, go to <http://hhodc.ouhsc.ouhsc.edu>.