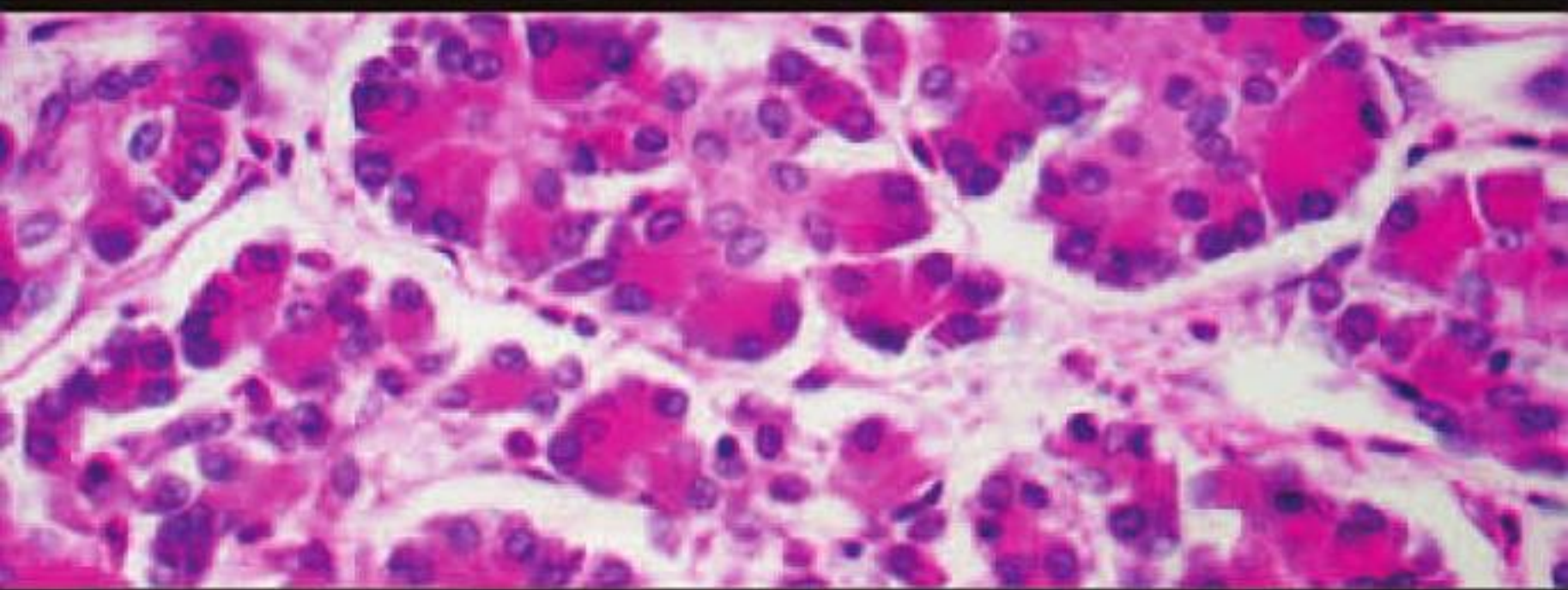




HEALTH REPORTS:
DISEASES AND DISORDERS

DIABETES



MARLENE TARG BRILL

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THE SUGAR DISEASE

At birth, Brandy was a healthy, beautiful 9-pound (4-kilogram) baby girl. As she grew into a tall, strong toddler, she never even had a cold. Her parents rarely let her have candy, soda, or other sweet foods. Yet at four and a half years old, Brandy developed a lifelong disease involving sugar. Now she required constant supervision of her blood sugar, or blood glucose, and daily injections. Her parents often wondered what they did wrong.

Jared was in seventh grade when his mother noticed that he ate and drank constantly. As a result, the increase in liquids made him urinate more often. The more Jared ate, the more he lost weight and felt tired. Jared never complained of feeling sick. So his mother thought he was a normal athletic thirteen-year-old. During a routine physical exam, the doctor asked Jared for a urine sample. Later, the nurse called Jared's mother. She asked that Jared return for a blood test the next morning before eating. The test showed high levels of sugar in Jared's blood. The doctor said Jared had diabetes. Jared and his mother were shocked.

A diagnosis of diabetes can be overwhelming. Families wonder what diabetes is. They worry about what the disease means for the person who has it and their family. Finding answers to these questions offers the first step to understanding and managing diabetes.

DIABETES BASICS

Diabetes occurs when the body cannot use sugar properly. The disease is marked by high levels of glucose. Glucose provides the energy needed to carry out daily activities. Usually, glucose enters the bloodstream from foods and drinks. Diabetes interferes with the way

the body makes or uses the chemical insulin to regulate blood sugar.

Insulin is produced by the pancreas. This small organ lies behind the lower part of the stomach. In healthy individuals, insulin allows glucose to move from blood into the body's cells. Inside the cells, glucose is converted into energy. When cells cannot absorb glucose, sugar collects in the bloodstream or leaves the body in urine. Without sugar, the body loses energy, resulting in a host of symptoms.

Records dating as far back as 1500 B.C. describe symptoms of diabetes. Ancient Egyptian medical papers refer to a disease in which people "cannot stop either . . . drinking or making water." In the second century A.D., the Greek doctor Aretaeus noted that in some patients, "flesh and limbs melt into urine." Aretaeus named the condition "diabetes," from the Greek word for siphon, or passing through. The term referred to the way diabetes draws water from the body, similar to liquid moving through a siphon.

In a 1674 medical book on diabetes, English doctor Thomas Willis reported that his patients' urine "was wonderfully sweet as . . . Honey or Sugar." Scientists debated the idea of sweet urine and its origins for years. In 1776 another British doctor, Matthew Dobson, conducted a different experiment. Dobson collected 2 quarts (1.9 liters) of urine from a patient who complained of excessive thirst, frequent urination, weakness, and cracked skin. Dobson heated the urine sample until all the liquid evaporated. What remained was a layer of white, sweet-smelling granules. In a bold move, he tasted the substance and confirmed that it tasted like sugar. Dobson reasoned that the sugar hadn't formed in the kidneys, as earlier doctors had proposed. Instead, Dobson argued that sugar in urine originated in the blood. Scientists still had no idea how sugar got into the bloodstream, what changes the sugar caused, or what to do about it. But Dobson's declaration linked diabetes to sugar in urine and blood. Later, doctors added the Latin term *mellitus*, or "honey sweet," to the term *diabetes* to describe the sweet taste.

GLUCOSE AND INSULIN

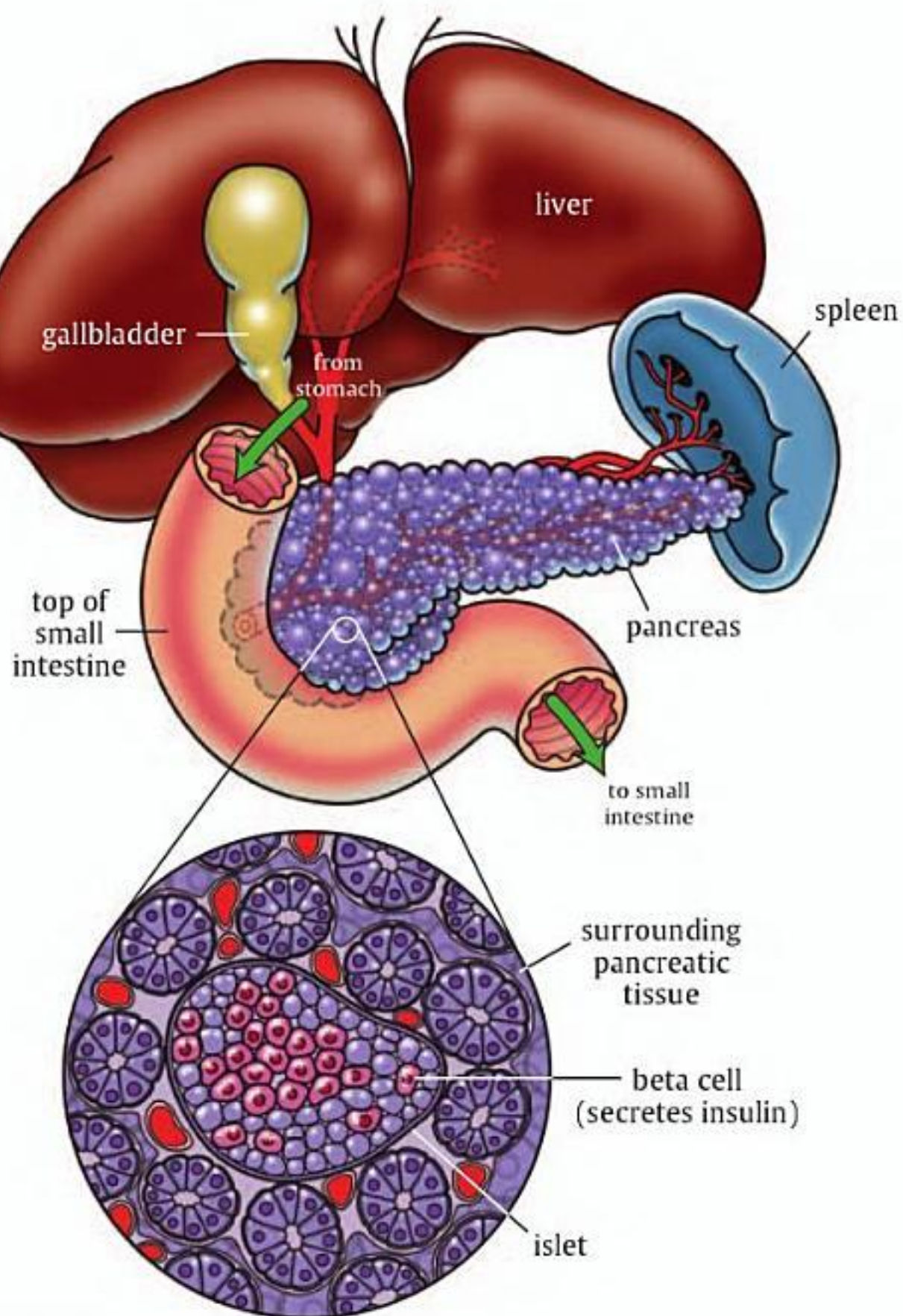
Blood sugar is important because it serves as the body's main source of fuel for growth and activity. Glucose from food converts into energy during the process of digestion. When eating, the organs involved in digestion release chemicals that break down food into smaller, usable particles. The particles—including blood sugar—go to different parts of the body to help them function. Glucose enters the bloodstream and travels throughout the body. As it travels, blood sugar nourishes individual cells in muscles and tissues.

For cells to accept glucose, however, they must receive signals from hormones that aid digestion. Hormones are chemical messengers that travel in body fluids and stimulate cells to do their job. Hormones control many body processes, such as growth, sexual functions, and metabolism (the way the body chemically changes food into nutrients and energy). Glands and organs that produce hormones make up the endocrine system. These glands and organs release hormones directly into the bloodstream. Most hormones circulate throughout the body. But each hormone affects only a limited kind and number of cells.

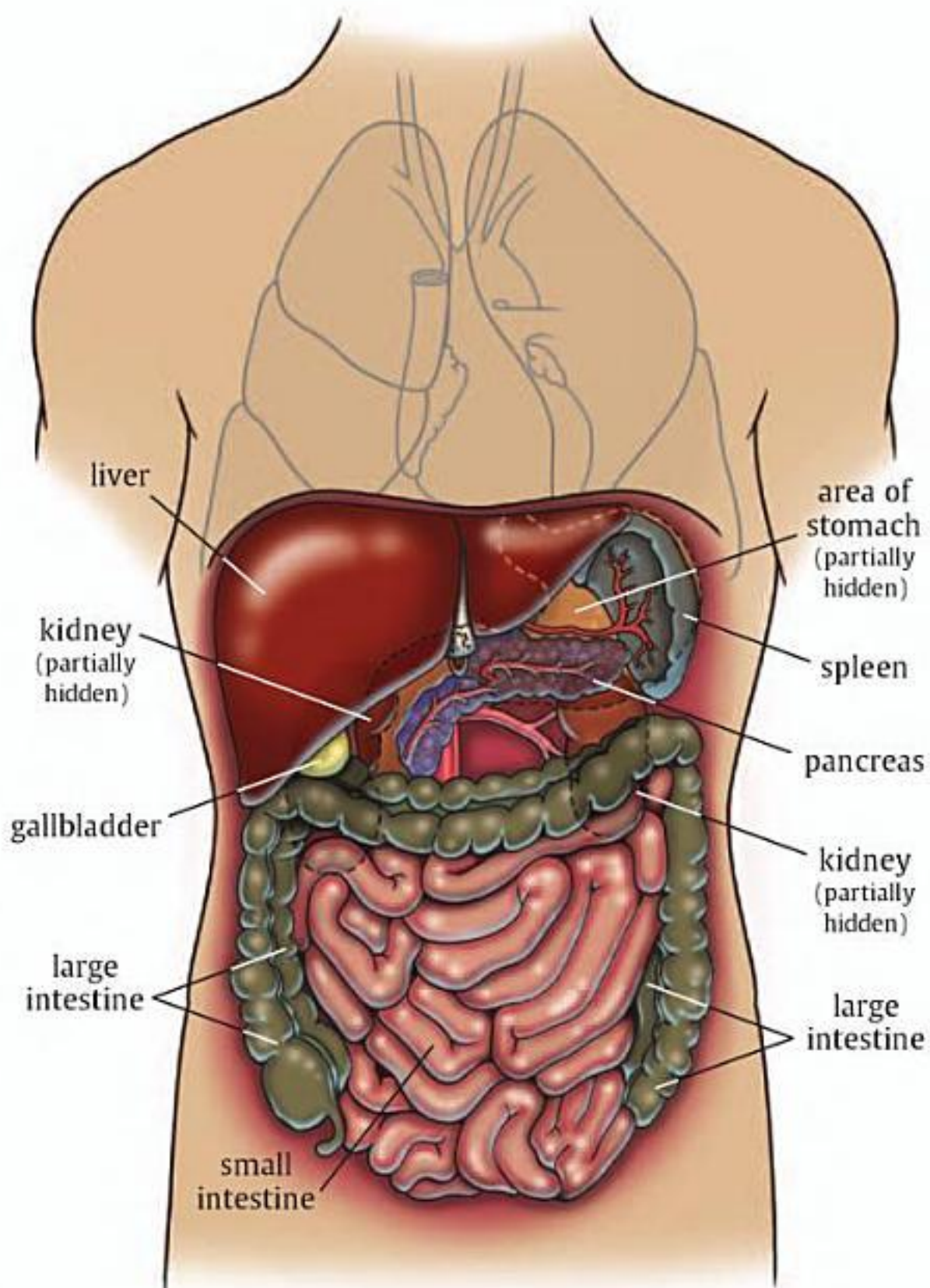
The hormone insulin allows cells to receive glucose. Insulin is produced in the pancreas by clusters of cells called islets, or islets of Langerhans. Within the islets, beta cells manufacture insulin. Insulin acts as the gatekeeper that allows sugar into cells. The hormone helps regulate glucose levels in the bloodstream so just enough provides cells with fuel for energy. Throughout the day, blood glucose levels vary, depending on what you eat and how active you are. Too little glucose leaves the body without proper energy to function.

Other organs and chemicals also play roles in controlling glucose levels. The liver, an organ above the stomach, stores extra sugar for use in between meals and snacks.

THE PANCREAS AND ASSOCIATED ORGANS



DIGESTIVE ORGANS



When blood glucose levels drop and the body needs energy, the liver converts stored sugar—called glycogen—into glucose. The liver then releases the needed glycogen into the bloodstream. This process restores blood sugar levels to a healthy range.

Insulin and other hormones perform a balancing act to regulate blood sugar levels and provide fuel for cells. In healthy people, this process occurs automatically. Blood sugar levels stay within a set range. In people with diabetes, the body either cannot manufacture enough insulin or cannot use it properly. Glucose collects in the bloodstream instead of going into cells. Over time, high levels of blood sugar damage organs and body systems.

SIGNS AND SYMPTOMS

Elevated levels or not enough sugar in the blood to fuel body cells can cause a range of diabetes symptoms. They may appear abruptly or gradually, depending on how well the body produces and uses insulin. Some types of diabetes can go undetected for years. With others, people know immediately that something is wrong.

The most common first signs of diabetes are excessive thirst and a need to urinate frequently. Jared likes to tell people that diabetes is the “drinking and peeing disease.”

INCREASED THIRST AND URINATION

Excess sugar draws water from body tissues. The sugary water is eliminated into urine. If urine contains too much sugar, the kidneys flush out extra water to make the urine less sugary. This creates even more urine, prompting extra trips to the bathroom. Excessive urination leads to increased thirst to replace the body’s water supply. The cycle of drinking more liquids and urinating continues until the disease is detected and under control.

FATIGUE

Without proper fuel, the body tires more easily. People with poorly controlled diabetes often have less energy than others their age. As a result, they might feel tired or irritable. They may perspire, tremble, or feel weak and confused. Sometimes diabetes causes symptoms similar to those of the flu.

WEIGHT CHANGES AND INCREASED HUNGER

Without life-giving sugar, starved cells search to replace the necessary fuel. The need for fuel leads to increased appetite. Depending on the type of diabetes, some people gain weight from excessive eating to replace nutrients that leave the body. Others eat more food than usual and still lose weight. Without enough glucose for nourishment, their bodies burn fat for energy instead.

BLURRED VISION

High blood sugar levels interfere with the balance of fluids in the eyes. Elevated glucose draws liquid from the eyes' lenses. In some people, this thins the lenses and contributes to problems with focusing. Over time, increased blood sugar may cause blood vessels in the eyes to weaken and bleed. Bleeding or leaking of fluid can damage vessels and trigger light flashes, spots, or halos around lights. Blurry vision from thinning lenses improves as blood sugar levels return to normal. But these and other vision problems require immediate attention from an eye doctor.

HEALING DIFFICULTIES

Uncontrolled diabetes impairs the body's ability to battle germs and heal from infections, cuts, and bruises. People with diabetes face more frequent infections, such as in the bladder or skin. Their gums may become red, swollen, and tender. They may experience other dental and mouth problems as well.

WHAT'S IN A NAME?

Many people with diabetes dislike being labeled “diabetic.” They believe the term limits who they are and what they can accomplish. A better way to talk about diabetes is to put the person first, by saying “people with diabetes” or “a person who has diabetes.” The term *diabetic* can be reserved to describe supplies or complications linked to the disease.

OTHER SIGNS AND SYMPTOMS

Other signs and symptoms of diabetes may include:

- headache
- dry, itchy skin
- tingling feet and hands
- abdominal pain
- nausea
- vomiting

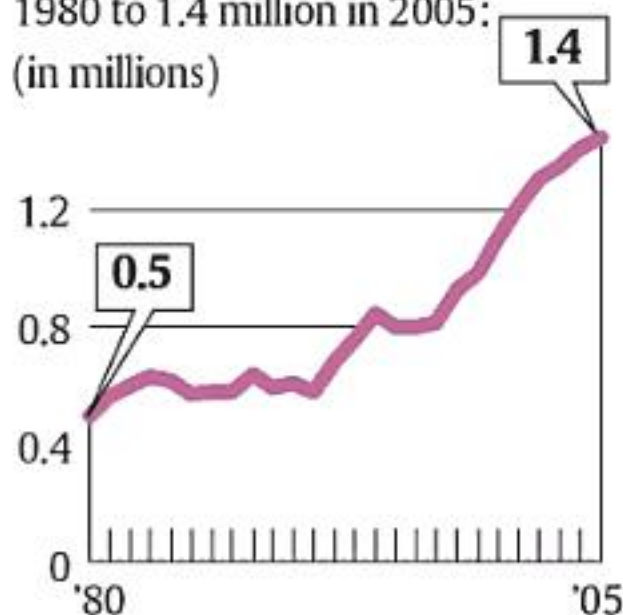
A GROWING EPIDEMIC

In recent years, the number of people with diabetes worldwide has skyrocketed from 30 million to 230 million. The World Health Organization estimates that this number could reach 366 million by 2030. Cases in the U.S. alone approached 25.8 million in 2010, 2 million more than in 2007. Another 79 million tested with blood sugar levels high enough to be diagnosed with prediabetes. This term refers to people with an increased risk of developing the disease.

Cases skyrocket

The number of adults ages 18 to 79 newly diagnosed with diabetes nearly tripled from 493,000 in 1980 to 1.4 million in 2005:

(in millions)



Source: Centers for Disease Control and Prevention

By Adrienne Lewis, USA TODAY, 2007

Health officials fear that diabetes has become an epidemic. "Diabetes is this massive tidal wave hitting the country," said Dr. Aldo Rossini, from the University of Miami. The Centers for Disease Control and Prevention (CDC) projects that one in three U.S. children under the age five of will test with high sugar sometime during his or her lifetime.

This epidemic brings grave consequences. Diabetes is the seventh-deadliest illness in the United States. It can lead to heart disease, kidney disease, blindness, loss of limbs, and

other serious problems that disrupt lives and are expensive to treat.

The medical community faces challenges in communicating the message about soaring rates of diabetes and what the diagnosis means. Many people with diabetes do not realize that high blood sugar can harm them, because they feel fine. Without concrete signs, newly diagnosed patients and those with prediabetes refuse to believe they are really sick. Yet early treatment remains important for preventing further damage. Changes in diet and activity, as well as medications, can help prevent or reduce complications of diabetes.

LEARNING ABOUT DIABETES

Diabetes is a chronic, or lifelong, disease without a cure. Treatment requires individuals and families to make life-altering changes. A



December 14, 2009

From the Pages of USA TODAY

Diabetes at a glance

23.6 million Estimated number of people in the United States who have diabetes

7.8% of the population who have diabetes

17.9 million Diagnosed cases

5.7 million Undiagnosed cases

57 million People with prediabetes, which puts them at risk for developing type 2 diabetes

Other facts:

Diabetes is the seventh-leading cause

of death.

Diabetes is the leading cause of new cases of blindness among adults over 20.

Diabetes is the leading cause of kidney failure.

60% to 70% of people with diabetes have mild to severe forms of nervous-system damage.

Tens of thousands of limb amputations are done every year in people with diabetes.

Source: American Diabetes Association

valuable first step toward getting help is to learn how diabetes works, what signs to watch for, and how to keep sugar levels in check.

"You can't depend upon anyone else to find out what's right for your body," says Carl, aged fifty-eight, who has had sugar-related problems since he turned nineteen. "You need to read for yourself or explore on the Internet. Knowledge insures a healthier life."

TYPES OF DIABETES

Eleven-year-old Shawna was thirsty all the time. Because she drank a lot of liquids, she made frequent trips to the bathroom. After her twelfth birthday, Shawna's parents took her and a friend on a summer vacation. One day Shawna's friend watched in surprise as Shawna drank five large glasses of iced tea in one hour. Shawna looked weak. She said her eyes felt funny, and her mouth seemed dry. Her friend suggested that maybe Shawna had diabetes.

Back home, Shawna's mother took her to the doctor. He tested Shawna's blood and learned that she had type 1 diabetes. Her treatment involved testing her blood throughout the day and watching her diet. Because she had type 1 diabetes, Shawna also needed daily injections of insulin to replace what her body did not produce.

Jay was a successful computer technician and passionate gamer. He often got so involved in his work and computer games that he forgot to prepare healthy meals. For lunch he grabbed a burger to eat at his desk. For supper he'd pick up carry-out meals on his way home. Because Jay spent most of his time in front of the computer, he rarely exercised. Over the years, he steadily gained weight. By the time he turned forty years old, he was overweight.

Suddenly Jay dropped 20 pounds (9 kg) without trying. He felt thirsty all the time. Yet his eating and exercise habits never changed. Jay turned to his doctor for answers. She discovered that Jay had type 2 diabetes. She prescribed pills to lower his blood sugar. She also referred Jay to a nutritionist, a specialist in managing food choices. The nutritionist helped him learn to control his glucose levels by following a healthy diet and exercising regularly.



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TYPE 1 AND TYPE 2 DIABETES

	Age of Onset	Symptoms	Cause	Treatment
Type 1	Children/ teens	Appears suddenly	No or little insulin production	Insulin
Type 2	Adults/ some kids	Develops over years	Not enough insulin; cells resist insulin	Exercise, diet, pills, insulin

Rejection of insulin is known as insulin resistance. When sugar cannot enter cells, it remains in the bloodstream. Dangerous amounts of sugar result in diabetes symptoms. While symptoms of type 1 diabetes usually appear abruptly, type 2 symptoms may emerge and progress slowly. Insulin resistance increases as production gradually decreases. As a result, type 2 diabetes can go undetected for years.

Scientists are unsure why cells resist insulin. They do know that excess weight and body fat contribute to developing this form of the disease. Being overweight forces the pancreas to work harder to manufacture extra insulin to balance sugar going into the cells. As demand for insulin rises, the pancreas loses its ability to produce enough. People who are overweight are more likely to have insulin resistance. Their excess fat interferes with the body's ability to use insulin.



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insulin, just not enough. People with MODY are often able to control their blood sugar levels with diet and exercise. If these recommendations fail, doctors prescribe insulin therapy. Injected insulin works better for MODY than medication, which helps with type 2 diabetes.

RISK FACTORS

Unlike the flu or colds, diabetes cannot spread from one person to another. But certain factors increase the risk of developing diabetes, particularly type 2. Some risk factors, such as aging or ethnic background, cannot be avoided. But other factors involve lifestyle choices, such as lack of physical activity and excess weight, that can be controlled.

FAMILY HISTORY

A key factor in developing the disease is family history. Individuals whose family members have type 1 or type 2 diabetes are more likely to develop the condition themselves. If a parent, a brother, or a sister has type 1 diabetes, a person's risk is fifteen times greater than for someone without a family history of type 1 diabetes. The link between family history and type 2 diabetes is strong but less clear.

Scientists continue to explore whether a defect in one or more genes contributes to the disease. Genes are basic units of heredity, the passing of traits from parents to offspring. Every human body contains trillions of cells. Each cell includes a set of rod-shaped chromosomes that contain many genes. Genes carry instructions for making proteins that perform most life functions. Genes ensure that the body grows, develops, and works properly. Genes determine physical characteristics, such as hair color, height, voice quality, and other traits.



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study followed 122,000 women. Those who gained between 11 and 18 pounds (5 to 8 kg) over a fourteen-year period were nearly twice as likely to develop diabetes as women who gained less than 11 pounds during the same period. Women who gained between 24 and 44 pounds (11 to 20 kg) had five times the risk of developing diabetes.

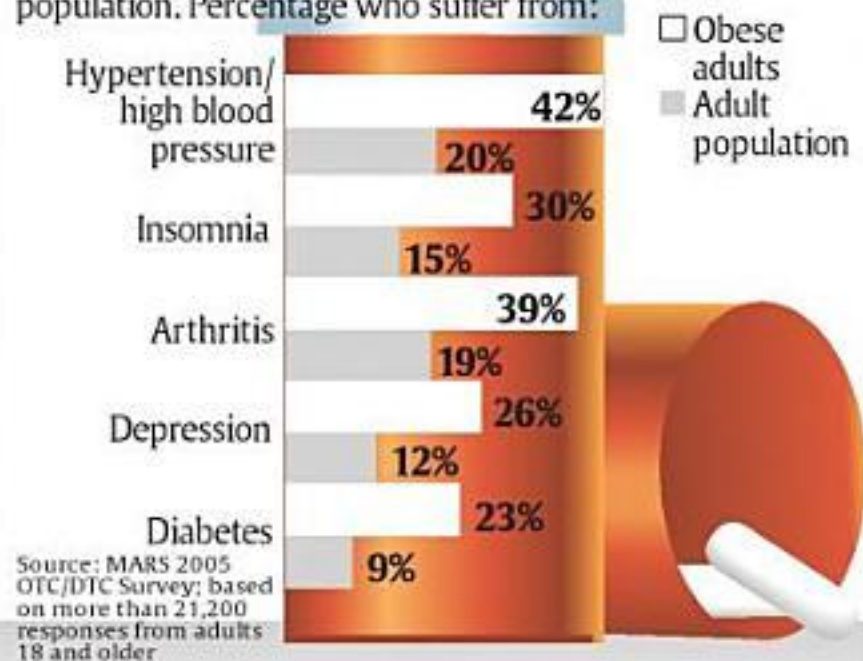
Being overweight increases the risk of diabetes. This is particularly true if the extra weight collects around the middle. Doctors call this shape an “apple” figure, rather than a “pear” figure with a flat stomach and fuller hips. Fat cells in the abdomen release fat into the bloodstream more easily than those elsewhere. Fat cells are less able than muscle cells to accept signals from insulin. This inability contributes to insulin resistance.

Another problem with excess weight occurs when fat cells collect in the liver. A healthy liver contains less than 5 percent of fat. A liver at risk of disease may comprise up to 50 percent fat. The higher amount makes the body resistant to its own insulin. Without the ability to regulate blood sugar, the body becomes open to type 2 diabetes. Studies indicate that about 30 percent of adults and children test with too much liver fat.

USA TODAY Snapshots®

Obese people more likely to get ailments

People who consider themselves obese suffer from some ailments at a higher rate than the general population. Percentage who suffer from:



By Shannon Reilly and Adrienne Lewis, USA TODAY, 2005



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Many people with diabetes need to check their blood sugar level several times a day.

Normally, if you haven't eaten overnight, your glucose level the next morning measures between 70 to 100 milligrams per deciliter (mg/dl) of blood. That figure equals about 1 teaspoon of sugar per gallon (4 l) of water. Anything outside this range spells trouble. A blood glucose measurement higher than 100 mg/dl following an overnight fast signals hyperglycemia, or high blood sugar. Glucose levels below 70 mg/dl indicate hypoglycemia, or low blood sugar. Both extremes cause a variety of symptoms that, left untreated, can lead to serious illness or death.

TESTING FOR DIABETES

Doctors identify and monitor diabetes through various tests that measure glucose levels in the blood.

FASTING PLASMA GLUCOSE TEST

The fasting plasma glucose test is easy to perform and the most reliable. The patient does not eat or drink anything except water for eight to twelve hours before the test.



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The U.S. government estimates that 40 percent of Americans ages forty to seventy-four test in the prediabetic range. That's about 41 million people, a very large number of Americans. Many of these adults will develop type 2 diabetes within the next ten years. By then, they probably will experience diabetes-related problems, such as diseases of the heart, blood pressure, and eyes.

People with prediabetes can take action to prevent full-blown diabetes from developing. The most important steps involve losing weight, choosing healthier foods, and exercising regularly. According to the National Institute of Diabetes and Digestive and Kidney Diseases, the risk of diabetes drops after losing 5 to 7 percent of body weight through diet and increased physical activity. In one study, three thousand people with impaired glucose tolerance lost 10 to 14 pounds (5 to 6 kg) and walked at least thirty minutes each day for five days a week. They reduced their risk of diabetes by almost 60 percent. Another group in the same study took medication but did not follow the diet and exercise program. Results for this group revealed only half the success (31 percent reduced risk). These studies bring hope to the medical community that individuals can influence control of their blood sugar levels.

THE DIABETES CARE TEAM

After learning of high blood sugar, patients need to gather information. People with diabetes have a lot to learn about their disease and treatment. Anyone with such a serious, long-term disease may want support to help manage their condition and stick with a treatment plan. They can benefit from regular visits to their family doctor as well as various specialists. These are physicians who concentrate on a particular area of medicine, such as feet or eye health. In some cities, doctors send newly diagnosed patients to training sessions at a hospital



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safely trim their toenails and deal with corns and calluses. People with diabetes may see a dermatologist, or skin doctor, to treat skin infections. And they visit the dentist regularly to help them prevent mouth-related problems.

LEADING THE DIABETES CARE TEAM

In the end, the patient is the most important person on the care team. If you have diabetes, even as a young person, it's up to you to take charge of your treatment. You are the team leader.

As leader, your first step is to admit you have a chronic illness that will require lifelong attention. Next, you must be willing to follow your treatment program. This usually means adapting diet and physical activities as your disease changes. You can get help, support, and guidance from a diabetes care team or through agencies, such as the American Diabetes Association. But controlling blood sugar is a personal journey, one guided by the person with the condition.



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Complex carbohydrates contain three or more sugars. The body is able to absorb these slower than simple carbohydrates. Complex carbohydrates form the basis of whole-grain products, including whole-wheat bread, oatmeal, and brown rice. They are found in beans, peas, legumes, and other starchy vegetables, such as potatoes and corn.

Nonstarchy vegetables, such as broccoli, celery, zucchini, and carrots, are complex carbohydrates that are mostly fiber. Fiber comes from cells of plant walls that stay largely undigested in the human digestive system. Examples of fibrous foods include oatmeal, beans, and fresh vegetables. Because fibrous foods remain mostly undigested, they take longer to travel through the digestive system. The result from eating them is a slower rise in blood glucose than from eating foods consisting of simple carbohydrates.

As an added bonus, complex carbohydrates and high-fiber foods make a person feel full more quickly and for longer. These foods contain many important vitamins and minerals. Complex carbohydrates provide excellent nutrition naturally. In contrast, refined sugars, such as candy, lack vitamins, minerals, and fiber. Refined sugars are often referred to as empty calories because they have little or no nutritional value. But they do have calories that contribute to weight gain.

People with diabetes find they maintain better control of blood sugar by eating a variety of complex carbohydrates and fiber-rich foods. In one study, participants reduced their blood sugar levels by about 10 percent by increasing their intake of high-fiber foods. Based on this and other studies, dietitians recommend a diet rich in fibrous foods to stabilize blood sugar levels. Nutrition experts advise that between 40 and 60 percent of daily calories come from carbohydrates.



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these guidelines, you can choose your favorite foods and decide portions to eat.

Every meal plan is different. For example, people who are overweight may want a plan that includes meals and snacks throughout the day but provides fewer calories overall. But insulin users must balance food choices and timing with amounts of insulin and activity.

"I became more aware of what I ate and how it affected me after learning I had diabetes," says Emily, Jared's younger sister, who also has diabetes. "I've been to a dietitian several times, and we adjust my meal plan. It helps to have a meal plan because then I know how much insulin to take."

A meal plan begins with keeping a log of everything you eat and any reactions these foods cause. A log helps people with diabetes and their dietitian choose foods and mealtimes that ensure stable blood glucose levels. Some people with diabetes can eat three meals a day without snacking and keep their blood sugar levels under control. Others require several smaller meals and snacks between meals. A complete log helps determine correct portion sizes and the healthiest balance of carbohydrates, proteins, and fats to eat.

USA TODAY Snapshots®

Fast-food buyers

Adults younger than 35 spend the most each week on fast food:



Source: Greenfield Online survey of 1,000 adults for Jenny Craig. Margin of error $\pm 3\%$ percentage points.

By Michelle Healy and Julie Snider, USA TODAY, 2009



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December 14, 2009

From the Pages of USA TODAY

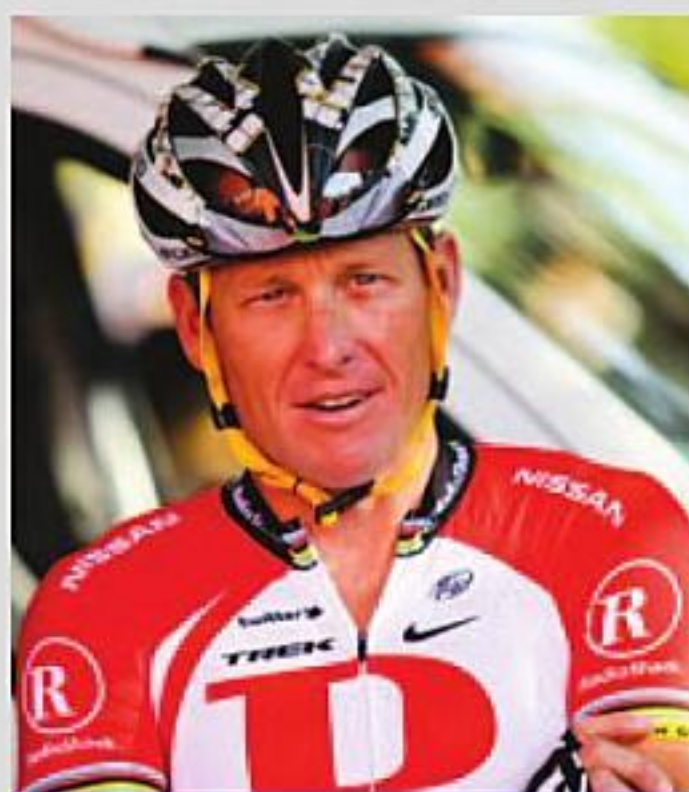
Armstrong has a new passion: Diabetes

Anyone who has heard of him—and millions have—knows Lance Armstrong is all about cancer advocacy. Now the seven-time Tour de France winner and cancer survivor is directing his star power and reputation for vitality at another disease: diabetes.

Armstrong introduced a feature called MyPlate D on his popular website, Livestrong.com. It is an extension of Livestrong.com's current tool that let users track food intake and exercise. The website encourages visitors to communicate with others who have similar health and fitness objectives.

MyPlate D was developed for people who have type 2 diabetes to help them break food down to its nutritional components beyond just calories to include carbohydrates, fats, proteins, and sodium. It also lets people track insulin use and monitor glucose.

"Users will start to recognize trends in their diet that may lead to spikes in glucose levels and be able to change their daily habits," says registered dietitian Alyse Levine, nutrition consultant for Livestrong.com who helped develop MyPlate D. "The site is free and is the



Lance Armstrong, shown here before a race in 2011, has used his website to help people with diabetes make healthy food choices.

largest food and fitness database online."

"Much like with cancer survivors, people with diabetes have been dealt this hand, a health challenge," Armstrong says. "Ultimately, we wanted to help them achieve a healthy quality of life, help them live to their fullest."

—Mary Brophy Marcus



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December 22, 2008

From the Pages of USA TODAY

QB keeps type 1 diabetes in check, stays on his game

Jay Cutler has a cannon for an arm. You'd never know that the quarterback for the Denver Broncos spends a good portion of every game on the sidelines keeping tabs on his type 1 diabetes, a condition, that if left unmonitored, can cause severe health problems.

Cutler, who was diagnosed just before his 25th birthday, uses a fingerprick kit to check his blood sugar levels, sometimes half a dozen times during a game. If the reading is too low, he gulps down enough Gatorade to push it up. His medication is always on hand in case his blood sugar jets abnormally high.

Being an athlete with type 1 has its complexities, but research shows exercise improves the health of patients with diabetes, says Michael Jensen, professor of medicine at the Mayo Clinic.

Snacking, hydrating [getting enough liquids], and protecting vulnerable body parts become lifelines for athletes with diabetes. But Cutler and experts say the condition doesn't have to stop a person from becoming a star athlete—or even enjoying a game of flag football now and again.

"When you and I exercise for any period of time, whether it's light or hard, our body needs less insulin. The pancreas



With the Chicago Bears since 2009, quarterback Jay Cutler gets ready to throw a pass in a game in 2011. Cutler closely monitors his type 1 diabetes to stay healthy while playing.

automatically does that for us," Jensen says. With type 1 diabetes, that doesn't happen naturally. Blood sugar can drop super-low during sports, and the only way to correct it is with food. If it jumps too high, Jensen says, insulin is needed.

Type 1 athletes should know their bodies and what's right for their sports routine, Jensen says. "It varies immensely depending on the sport you're in."

—Mary Brophy Marcus



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sample. Blood sugar meters contain small computers that process and store information. Depending upon the amount of memory in the meter, it may store results for several weeks. Some meters allow you to download data onto your personal computer and track blood sugar trends over time.

A range of lightweight, palm-sized meters is available in different sizes and colors. Special versions offer larger screens for easy viewing and talking meters for those who have a visual impairment.

KEEPING A LOG

Doctors encourage patients to record their test results in a log, or a diary. Tracking the numbers with behaviors lets you see how various foods, activities, medications, illness, and other situations affect your blood sugar. The American Diabetes Association sells a color-coded desk diabetes management planner that highlights daily food intake, testing results, medication, and exercise. A log helps you and your diabetes care team evaluate a new treatment routine or change in medication. As one man with diabetes said, “No news is not good news as a diabetic. The more we know about our condition, the better our condition.”



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December 10, 2008

From the Pages of USA TODAY

Diabetes drugs double women's fracture risk

Long-term use of a popular class of oral diabetes drugs doubles the risk of bone fractures in women with type 2 diabetes, a study reports.

Researchers at Wake Forest University School of Medicine [in North Carolina] reviewed 10 previous drug trials. They found that for every 20 women in their 70s with type 2 diabetes who took thiazolidinediones (brand-names Avandia and Actos) for at least one year, one of them has a chance of suffering a fracture. In women in their mid-50s, the figure equals one fracture in every 55 women. That's more than double the normal risk for those age groups.

Avandia has been shown to increase the risk of heart attacks as well.

—Mary Brophy Marcus



Researchers have found that some diabetes drugs, such as Avandia, can make women taking the medication more susceptible to fractures.

might also take drugs to prevent heart, kidney, and other diseases that increase with diabetes. These drugs can cause their own problems and need constant monitoring by a doctor.

Researchers constantly test new and improved diabetes medications. In the early twenty-first century, two promising drugs came on the market. They are exenatide (Byetta) and sitagliptin phosphate (Januvia). These two drugs belong to a class of drugs



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A pen injector looks like a fat marker. Users select the correct dose on a dial before injecting the insulin. Pens store easily and require fewer supplies. Jet injectors shoot insulin through the skin with high-pressure air rather than a needle. This method is expensive and can be painful.

Insulin works best when injected into fatty tissue under the skin. From there, the insulin goes directly into the bloodstream. The abdomen offers the most effective place to distribute insulin evenly. But many people find it easier to inject insulin into their hips, thighs, or upper arms.

Another delivery method is the insulin pump. The pump looks like a pager-sized electronic device. Users wear the pump outside the body on a belt or inside a pocket. Pumps deliver a small, steady flow of insulin throughout the day. Each pump can be programmed to deliver varying amounts of glucose into the system. Insulin goes through a flexible plastic tube inserted under the skin, usually in the abdomen. Programming ensures better blood sugar control by allowing users to customize their insulin delivery based on changes, such as with physical activity, meals, and illness.

Newer models of pumps combine insulin delivery with a glucose meter. Parents of children with diabetes often prefer using a pump because they can give insulin without repeated injections. Pumps allow for a more normal lifestyle. But they cost more than pens, need additional supplies, and may require more attention.

"Pumps are best for people who take the time to constantly monitor their blood sugar," said Melissa, a social worker who's had diabetes since the age of twelve. "It forces you to test more, which is probably why people who prefer pumps have better control. You can give yourself smaller amounts of insulin, like quarters and eighths. But you feel constantly burdened. The pump is what kids start with when it's up to parents to test."



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glycogen: sugar stored in the liver that is released when blood sugar levels drop too low and the body needs energy

hormones: chemicals produced in cells that travel in body fluids and stimulate other cells to do their job

hyperglycemia: high blood sugar

hypoglycemia: low blood sugar

immune system: the units of the body that work together to fight disease

injections: the use of a needle and syringe or pen to put liquid into the body

insulin: a hormone produced in the pancreas that acts as a gatekeeper to allow sugar to pass into cells

insulin pump: a device that delivers a continuous supply of rapid-acting insulin into the body through a thin, flexible plastic tube that is inserted into the skin

insulin resistance: a condition common in people with type 2 diabetes in which the body does not respond to insulin

interstitial fluid: clear fluid under the skin that carries glucose and other nutrients from the bloodstream to the cells

islets: clumps, or islands, of cells, also known as islets of Langerhans, found in the pancreas. Islets hold beta cells, which produce insulin.

ketoacidosis: a severe, life-threatening disorder, also called diabetic ketoacidosis (DKA), caused by a lack of circulating insulin. The body uses stored fat for fuel, which results in production of toxic fatty acids called ketones.

ketones: fatty acids produced from the breakdown of fat for fuel

lancet: a sharp, fine needle that pricks the skin to draw blood for glucose testing

meditation: a form of relaxation that involves focusing on the breath, a word, or an object

metabolism: the way the body chemically changes food into the nutrients and energy needed to sustain life

nephropathy: kidney disease

neuropathy: nerve damage

pancreas: a small organ that lies behind the lower part of the stomach. As part of the endocrine system, the pancreas makes insulin and digestive enzymes.

plasma: the liquid part of blood



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ABOUT THE AUTHOR

Marlene Targ Brill is an award-winning author of sixty-five books. She especially likes to write about ways to help readers feel better and understand how their bodies function. As a young student, she enjoyed learning about the body and wanted to work in medicine. Instead, she became a teacher of children with special needs. She writes about a variety of topics, especially in the health-care field, including Alzheimer's disease, Down syndrome, and autism.

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Main body text set in USA TODAY Roman 10/15

Heart disease, hypertension, nerve damage, vision problems, liver damage

These are some of the complications of diabetes—a chronic and growing disease in which the body cannot use sugar properly. Worldwide, health experts estimate that cases of the disease have rocketed from 30 million to 230 million in recent years. In the United States, more than 23 million children and adults—nearly 8% of the population—have diabetes. “Diabetes is this massive tidal wave hitting the country,” reports USA TODAY, the Nation’s No. 1 newspaper.

In this book, you’ll read case studies of people living with diabetes and follow the diagnoses, medical interventions, and lifestyle changes that help bring the disease under control. You’ll learn about the history of the disease and factors driving its increased prevalence. And you’ll discover what the risk factors and treatment options are so you and your friends and family can avoid contracting diabetes and support those who do have it.



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