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# diabetes

SUMMER 2018  
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NEW  
GADGETS  
SIMPLIFY  
THE WAY  
PEOPLE  
MANAGE  
DIABETES

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MISGUIDING GENES

More than one in 10 African Americans have a variant of the G6PD gene that might cause inaccurate results on an HbA1c test, a blood-sugar test that doctors use to diagnose diabetes and monitor effectiveness of treatment. In people who have this gene variant, HbA1c tests read lower than accurate, according to a new study. That means that if every American took this diabetes test, 650,000 African Americans with diabetes would be missed.

Source: PLOS Medicine

\$7,888

Annual diabetes-related health care costs of a person with type 2 diabetes.

Source: American Diabetes Association



HUNGER HAPPENS

Trying to lose weight? Prepare yourself: You'll be hungrier after the weight loss, says new research from Norway. When you lose weight, your stomach releases more ghrelin, the hormone that makes you feel hungry. The ghrelin levels don't balance out over time, which may be one reason why many people find it so hard to keep weight off after a diet. Researchers say that those who were once obese should see weight maintenance as a lifelong pursuit—not just the end goal of a short-term diet.

Source: American Journal of Physiology, Endocrinology, and Metabolism



DIET INTO REMISSION

It's possible to put type 2 diabetes in remission. In an experiment, 150 overweight adults with type 2 diabetes went on a liquid diet of 850 calories per day for up to five months. (An average woman needs about 2,000 calories a day to maintain her weight.) The dieters then went back to solid food while continuing on a low-calorie diet for up to two more months. After the diet phase, they had ongoing counseling and exercise to help maintain weight loss. The dieters lost an average of 22 pounds and half reverted to non-diabetic status and stopped medications.

Source: The Lancet

227 CALORIES

Amount a 150-pound person burns during 50 minutes of brisk walking.

Source: USDA

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EXERCISE ISN'T JUST FOR WEIGHT LOSS

Not shedding pounds with your workout? Don't throw in the towel. Exercise still has major benefits for overweight people. In a study, 853 adults took a treadmill test to measure their heart and lung fitness—a benefit of regular exercise. Researchers checked their blood pressure, blood sugar, and fats in the bloodstream to get an overall picture of each person's health. Obesity was only connected to worse health for those in the bottom 20% of heart and lung fitness. Getting 150 minutes of weekly exercise could bring substantial health benefits to obese people regardless of weight loss.

Source: BMC Obesity

9.4%

Percentage of Americans who have diabetes. Up from 3.5% in 1980, the increase is mostly because people with diabetes now live longer.

Source: CDC



BREAST CANCER RISK

Among 54,337 African American women, those with type 2 diabetes were 43% more likely to develop estrogen receptor negative (ER-) breast cancer during an 18-year study than the average woman without diabetes. Because diabetes rates are twice as high among African Americans as

Caucasians, this study could explain the higher rates of this rare but aggressive breast cancer in this population, too. The risk was greatest among African American women with diabetes who were not obese. This could mean that metabolic health—blood pressure, blood sugar, and cholesterol—could be a more important risk factor than weight.

Source: Cancer Research

1 in 4

People who have diabetes but don't know it.

Source: CDC



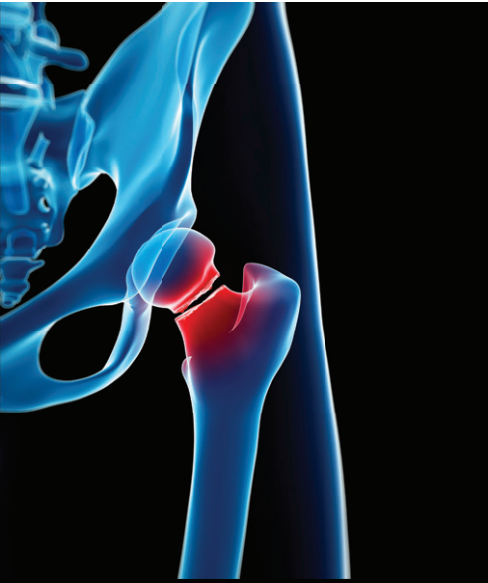
THE BEST DIET: ONE THAT STICKS

Looking for the best diet plan? An international team of researchers compared 54 different clinical trials for weight loss to see why some worked better than others. The most effective programs had two things in common: They provided healthy meals for the dieters, rather than leaving them to their own devices, and offered the most interaction with support staff, such as counselors or dietitians. Since you can't stay on pre-made diet meals for life, the researchers suggest you look for a program that teaches you how to shop for and prepare the type of food that will keep the weight off.

Source: Diabetes Care

27 Grams of carbohydrate in a medium banana. Compare that to 19 in a medium apple.

Source: USDA



FRACTURE FINDINGS

Your risk of bone fracture rises as you age. Type 2 diabetes further increases that risk, including up to 50% greater chance of hip break, the most serious bone fracture. Yet people with diabetes have the same bone density as anyone else their age. New research might explain this mystery. In a study of 1,069 seniors, those

with diabetes had weaknesses in the outer surface of their bones, a problem that typical bone density tests do not detect. The study suggests that people with type 2 diabetes might need new strategies for fracture prevention. The CDC recommends that all seniors ask their doctors about their individual fracture risk.

Source: Journal of Bone and Mineral Research

1.5 MILLION Number of Americans diagnosed with diabetes every year.

Source: American Diabetes Association

KEEP AN EYE ON YOUR VISION

Diabetes doubles your risk for cataracts, according to a study that analyzed the medical records of 56,510 adults with diabetes. While the vision-blurring eye condition is most common among older adults in the general population, diabetes increased risk the most in adults ages 45 to 54, the study found. Keeping blood sugar in the safe range can help reduce risk. Avoiding sun damage by wearing sunglasses with UV protection reduces risk, too.

Source: Eye



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## ASK YOUR DOCTOR

**Do my current medications provide the best control for diabetes?**

"If you're spending money on three or four medications, you may not be on the most effective ones," says Wendy Mobley-Bukstein, PharmD, a certified diabetes educator. The most effective drug might be an injectable. "A lot of people think an injectable means they're doing worse, but it's just about making sure their medications are working for them," she says.

**Can you prescribe a weight loss program?**

If you have a health savings account or a flex savings account through your employer, you might be permitted to use it to join a weight-loss program that your doctor prescribes. Ask your employer or the bank that holds the account.

# Cost Savers

Expert advice on minimizing the cost of type 2 diabetes treatment

BY SONYA COLLINS



People with diabetes now live longer than ever before thanks to medical advancements. But better care and a longer lifespan come with higher costs. People with diabetes incur more than twice the health-care expenses of other people. Some of that money comes out of your pocket. These tips can help you save.

### Stick to your diet

About 20% of diabetes costs are for medications to treat other diabetes-related conditions. That's one reason controlling your condition is so important.

"Eating right will help control your blood sugar, which can reduce the number of medications you need to take and prevent complications you could eventually have," says Wendy Mobley-Bukstein, PharmD, certified diabetes educator and associate professor at Drake University College of Pharmacy and Health Sciences.

"It can be expensive to eat healthy, but if you plan, you can do it on a budget," says Mobley-Bukstein. Use supermarket apps to find coupons and see which items are on sale before you go shopping. Plan meals around coupons and sale-priced items.

Canned and frozen vegetables are usually cheaper than fresh. If you have a choice, says Mobley-Bukstein, "a bag of fresh frozen vegetables is great because it doesn't have added salt." If you've got to go canned, "drain and rinse the vegetables to remove some of the salt before you cook them," she says.

### Burn calories, not your savings

Gym memberships are sometimes negotiable. "Don't be afraid to talk to someone about the price," says Mobley-Bukstein. The YMCA offers scholarships

based on need. Silver Sneakers provides free access to participating gyms for adults age 65 and up with certain Medicare Advantage plans.

But you don't need a gym to exercise. Check your local parks department, community center, and other local, non-profit organizations for free or low-cost fitness classes. Or, "form your own group at work or through any organization you interact with, for a brisk walk or to do an exercise video together," says Mobley-Bukstein.

### Get more bang for your prescription-drug buck

If you take medications, take generic whenever available, and make sure all your prescriptions are on your health plan's preferred list. Your insurance plan might charge a lower co-pay for one medication over another, even if both options are generic.

You could be eligible for free or low-cost medication through a prescription assistance program. Ask your health care provider or pharmacist for more information or check the drug manufacturer's website. Buying medications and supplies online, and enrolling in auto-refill programs, might cut costs, too. It may take a little more research and legwork upfront, but it can lead to real savings in the long run.

REVIEWED BY BRUNILDA NAZARIO, MD, WEBMD LEAD MEDICAL DIRECTOR

➔ Search for the video [Eat Smart on the Cheap with Diabetes](#) at [WebMD.com](#).

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## QUESTIONS FOR YOUR DOCTOR

**What are my chances of developing heart disease?** Diabetes raises your risk, but so does family history, cholesterol levels, blood pressure, and more.

**What cardiovascular screening tests do I need?** Depending on your personal risks, your doctor might suggest tests such as an EKG or a stress test.

**Is my blood sugar well-controlled?** An A1c test will give you an idea of your levels over the past few months.

**What signs might indicate that I'm having a heart attack?** Not everyone gets chest pain. Watch out for breathlessness, fatigue, nausea, and back/jaw pain as well.

# Heed Your Heart

Diabetes can strain your heart. Take steps to protect it.

BY BARBARA BRODY

If you have type 2 diabetes, you should know that your heart is at risk, too. About 68% of people over 65 who have diabetes will die from some form of heart disease, and another 16% will die from a stroke. That means you should worry about your ticker just as much as your blood sugar levels.

The connection between heart disease and diabetes is strong for two main reasons, says Stacey Rosen, MD, a cardiologist at Northwell Health in New York. For starters, chronic high blood sugar harms blood vessels and accelerates atherosclerosis. “Blood vessel damage is what leads to complications of diabetes, such as blindness and kidney failure, as well as heart disease,” says Rosen, who’s also the vice president of women’s health, Katz Institute for Women’s Health, at Northwell Health.

The second issue is that many risk factors for type 2 diabetes and heart disease overlap. Being overweight, having high blood pressure, having low HDL (“good”) cholesterol, and not getting enough physical activity all increase the chances of developing both conditions.

## Tipping the scales in your favor

You can, however, take steps to protect your heart. Losing weight if you need to and maintaining a healthy body mass index (BMI) will help a lot. Even shedding 10 pounds can make a big difference for managing your blood sugar levels and reducing your risk of heart disease. Rosen recommends having a nutritionist or certified diabetes educator help you devise meal plans based on your needs and preferences.

Exercise is also extremely important for heart health and diabetes management. The American Heart Association recommends at least 150 minutes per week of moderate aerobic activity, plus strength training at least twice a week. But smaller amounts of exercise can add up over the course of the day or week, says Rosen. “You don’t have to do everything perfectly; anything you do right counts,” she says. A 15-minute walk after lunch is a great start; so is lifting “weights” using soda bottles or cans of veggies.

Also, your doctor may prescribe a statin, a type of medication designed to lower cholesterol. Most people with diabetes benefit from these drugs even if their cholesterol levels seem OK, says Rosen. That’s because the diabetes-heart disease connection is so strong, and statins do more than just lower LDL (“bad”) cholesterol levels—they also stabilize plaque in the blood vessels, so it’s less likely to break off and lead to a heart attack or stroke. Your doctor can help you weigh the risks and benefits.



REVIEWED BY MICHAEL W. SMITH, MD, CPT, WEBMD CHIEF MEDICAL DIRECTOR

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# Understand Your Skin

Learn about common skin conditions associated with diabetes

BY BRENDA CONAWAY

## SELF CARE

What's the best way to fight infections that cause skin problems? Try these tips.

**Check your feet and any areas of your body that get damp and sweaty every day.**

**Use moisturizer on dry skin daily to keep it from cracking and itching.**

**If you think you have an infection anywhere on your body, call your doctor.**

**Don't try to treat skin infections at home with over-the-counter products, because they may not be strong enough.**

Diabetes gives you a good reason to pamper your skin. You're more prone to skin problems like dryness. And because diabetes raises your chances of infection, even a minor skin condition can become a more serious problem. This guide will fill you in on common skin conditions linked to diabetes.

## Skin conditions

### Diabetic dermopathy

This appears as light brown, scaly, round spots on the shins. They look a lot like age spots but are caused by changes in your small blood vessels. "It's more of a cosmetic issue and doesn't really require treatment," says Margo S. Hudson, MD, an instructor at Harvard Medical School.

### Disseminated granuloma annulare

This causes red, red-brown, or skin-colored raised rings or arcs on the skin. They're likely to show up on your fingers, ears, or lower legs, but can also appear on the trunk of your body. Your doctor can prescribe a cortisone skin cream or another treatment.

### Digital sclerosis

About one-third of people with type 1 diabetes have this condition. It can make the skin on the back of your hands thick, waxy, and tight. Your finger joints may become stiff and hard to move. You can also get it on your forehead and toes



and, more rarely, your elbows, knees, or ankles. To treat it, get your blood sugar under control.

### Acanthosis nigricans

With this condition, the skin on your neck, armpits, or groin thickens and becomes brown or tan. "People think it's dirt and wonder why they can't clean it off," Hudson says. Insulin-resistance causes it, and it's most likely to occur if you are overweight. Treatment includes losing weight and taking diabetes drugs, which help the body use insulin better.

### Skin infections

Bacterial skin infections are common with diabetes, says Betul Hatipoglu, MD, of the Endocrinology and Metabolic Institute at Cleveland Clinic in Ohio. "It can be as simple as a boil in the armpit or on the face, infection of the hair follicles, or infection of the nail bed," she says.

Fungal infections are common, too, she says. You are most likely to have them in areas that get hot and sweaty, including under the breasts, between fingers and toes, in the armpits, in the groin area, and around the tip of the penis, if you are an uncircumcised man.

➔ Search for the slideshow  
What Your Skin Says  
About Your Health at  
WebMD.com.

REVIEWED BY BRUNILDA NAZARIO, MD, WEBMD LEAD MEDICAL DIRECTOR

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## QUESTIONS FOR YOUR DOCTOR

**What do each of my medications do?** Understanding why you take a certain medication and how it works in the body is crucial to good diabetes management, says Hughes.

**What are options for me when my blood sugar goes higher?** Ask your care team what you can do to keep blood sugar from spiking.

**What will happen to my blood sugar if I get sick?** Generally, blood sugar goes up when you're sick, says Hughes. But reach out for advice. "We want to help you navigate that journey of an illness," she says.

# Stress Alert

Diabetes-related tension and burn out can elevate blood sugar. What can you do to get out of this catch-22?

BY CHRISTINA BOUFIS

"Would you rather work seven days a week, or do you enjoy vacations and weekends off?" asks diabetes educator Lucille Hughes, MSN/Ed, director of diabetes education at South Nassau Communities Hospital.

No doubt you relish your downtime. But when you have diabetes, you do work 24 hours a day, seven days a week, 365 days a year, because you're managing your condition, says Hughes.

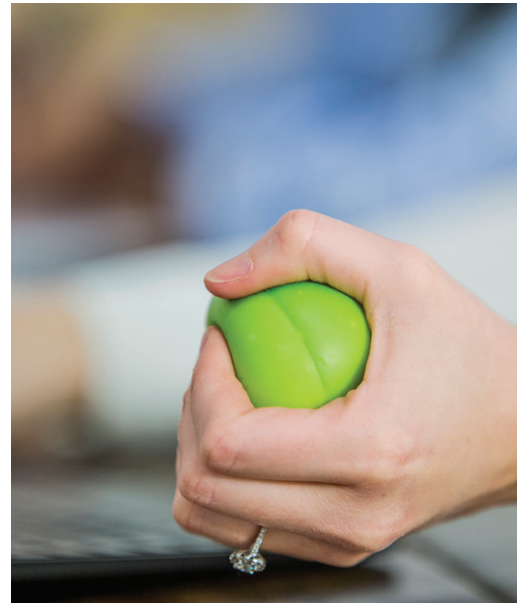
That can be stressful. And stress can raise blood sugar, she says. When you're stressed—whether from an illness or emotional strain—your body goes into fight-or-flight mode and releases hormones that send sugar into the bloodstream.

"When you have diabetes, the ability to respond to that sugar with insulin is impaired," explains Hughes. "Your blood sugar goes up and sometimes can stay up depending on the stress."

Here's how to combat diabetes-related and other life stressors.

**Study up.** "Education is the key to managing diabetes," says Hughes. Understanding how your body responds to different foods, exercise, and stress can help you be proactive about managing blood sugar.

What do to next? Talk to your certified diabetes educator, doctor, or care team, says Hughes. You may need your medication adjusted. Or perhaps it's time to increase physical activity.



**Reach out.** "It's extremely important for people to discuss their feelings, especially if they're living with diabetes," says Hughes. Diabetes burnout and stress from diabetes is nothing to be ashamed of.

Talk to your diabetes educator or doctor, who may refer you to counseling or a social worker. You can also join a diabetes support group or read books about diabetes-related stress, says Hughes.

**Learn ways to de-stress.** "Sometimes it's as simple as going for a walk around the block," says Hughes. Exercise, like walking, is a proven stress-buster.

Or release tension by squeezing a stress ball at your desk. Do some meditation or deep breathing—anything to help put the brakes on stress, says Hughes.

**Take time for yourself.** If your daily to-do list is long, and the amount of time you spend on yourself almost nonexistent, consider a timeout. "Are you taking time for yourself each day? Or doing something fun?" asks Hughes.

You could spend five minutes meditating, drink a soothing cup of tea, or watch a comedy show. Maybe you can sit quietly and think about the positive things in your life, or strategize how to overcome challenges you face managing diabetes, suggests Hughes.

"It's so important that there's something in your day that makes you happy," she says.

REVIEWED BY NEHA PATHAK, MD, WEBMD MEDICAL EDITOR

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# Golden Rules

Exercise is an excellent tool for managing diabetes. But can you work out smarter? Try these tips to maximize results.

BY KARA MAYER ROBINSON



## ASK YOUR DOCTOR

Your doctor or diabetes educator can tailor your fitness routine to your needs. Start with these questions:

**Do I need to change the type, intensity, or duration of exercise because of my diabetes complications?**

**How will my medication impact my ability to exercise?**

**Which blood glucose levels are safe for me?**

**What should I do if they're out of range?**

➤ Search for the slideshow [The Best Exercises if You Have Diabetes](#) at [WebMD.com](#).

Getting off the couch and into the gym is a smart move when you have diabetes. Diabetes puts you at a higher risk of cardiovascular disease, but being active cuts the risk. Monet S. Bland, MS, a clinical exercise physiologist at Joslin Diabetes Center in Boston, Massachusetts, shares her top tips for exercising with diabetes.

### Log your glucose

"Always check your blood glucose before and after exercise," says Bland. "We generally recommend blood glucose over 100 mg/dL before exercise and under 250 mg/dL after."

Check with your doctor to be sure. She may adjust her recommendations based on complications like hypertension, peripheral vascular disease, advanced retinopathy, and peripheral neuropathy.

Don't just check your levels—jot them down, along with which type of exercise you're

doing. You'll notice patterns that help you understand how exercise affects your body.

### Exercise for dessert

The best time to work out might be after you eat. "It can have a profound effect on blood glucose and counteract the effect of your meal," says Bland.

Instead of curling up on the couch after dinner, top off your meal by lacing up your shoes. Walk your dog or simply walk in place while watching TV.

### Beat the clock

Short on time? Break up your routine. "If you have 15 minutes in the morning and 15 minutes at night, that works," says Bland. If you're really squeezed for time, try chunks of 10 minutes.

Or try interval training or circuit training. Interval training alternates between short bursts of intense exercise and short periods of rest. With circuit training, you move quickly

through eight to 10 exercises that alternate muscle groups. Both have powerful health benefits and can be done quickly.

### Carry a snack

Exercise can put you at risk of hypoglycemia, so always carry a snack if you have type 2 diabetes and use insulin or a medication in the sulfonylureas drug class.

If your blood glucose is less than 100 mg/dL before you work out, have a snack. If not, you can probably have one midway through or post-exercise.

"We generally recommend 15 grams of carbohydrates for every 30 minutes of exercise," says Bland. But ask your doctor which target levels are best for you.

### Strive for a healthy mix

To maximize the benefits of exercise, do a mix of cardio and strength training. Aim for 30 minutes most days of the week.

Try to do five days of cardio. Doing what you love, like walking, dancing, or swimming, helps you stick with it over time.

Add strength training at least twice a week. "Strength training helps you build muscle, which increases your metabolism," says Bland. A faster metabolism helps you burn more calories all day long. You'll be less likely to gain weight and keep insulin resistance at bay.

REVIEWED BY MICHAEL W. SMITH, MD, CPT, WEBMD CHIEF MEDICAL DIRECTOR



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# Summer SIZZLE

The backyard cookout is synonymous with summer. And while burgers are a no-brainer, a little planning helps to mix those hot-weather standbys with healthier and more exciting options.



PHOTOGRAPHY: RICK LOZIER, FOOD STYLING: CHARLIE WORTHINGTON

BY Kerri-Ann Jennings REVIEWED by Hansa Bhargava, MD, WebMD Senior Medical Director

## SPICY BEEF KEBABS

This flavorful marinade layers lean meat with a complex depth. If you like heat, you can add a pinch of cayenne or a hot pepper to the marinade. **SERVES 8**

1 medium fresh tomato, chopped  
½ cup cilantro  
Juice of 1 lemon  
2 tbsp ginger, minced  
1 tbsp curry powder  
1 tbsp sunflower oil  
4 cloves garlic, peeled and minced  
Pinch of salt  
2 pounds lean beef, such as sirloin, cut into 2-inch chunks

Blend tomato, cilantro, lemon juice, ginger, curry powder, sunflower oil, garlic, and salt in blender until smooth. Marinate meat 1 to 5 hours. If using bamboo skewers, soak in water for at least 30 minutes.

Thread meat onto skewers. Grease grill rack of a gas or charcoal grill. Bring a gas grill to medium-high heat. If using charcoal, spread gray ash-covered coals evenly over the grill, place the grate, then cover and heat the grill for 5 minutes. Grill kebabs about 6 minutes, turning once halfway through grilling, until internal temperature reaches 145°F.

Per serving: 156 calories, 26 g protein, 2 g carbohydrate, 5 g fat (2 g saturated fat), 62 mg cholesterol, 361 mg sodium, 1 g fiber, 1 g sugar. Calories from fat: 29%

## FRESH SPIN ON SALADS

Think beyond lettuce when whipping up a summer salad. These combinations use a variety of fresh veggies.

**Tomato-Peach Caprese:** Spread a layer of fresh pesto onto a platter and arrange slices of tomatoes, peaches, and fresh mozzarella on top. Drizzle with olive oil, salt, and pepper.

**Green Bean/Cherry Tomato Salad:** Combine blanched green beans and halved cherry tomatoes with a dressing of olive oil, red wine vinegar, minced shallots, and a touch of mustard.

**Zucchini Carpaccio:** Shave thin ribbons of zucchini. Blot dry, sprinkle with lemon juice, coarse salt, and pepper, then drizzle with olive oil.

**Smoky Arugula Salad:** Top arugula with kernels of grilled corn, halved cherry tomatoes, and a little crumbled bacon. Dress with a balsamic vinaigrette.

**Mediterranean Cucumber Salad:** Toss coins of cucumber with thinly sliced radish, fresh dill, and crumbled feta. Dress with olive oil, red wine vinegar, crushed garlic, and a pinch each of sugar, salt, and pepper.

Leave it alone: To get grill marks, leave fruit alone for at least a few minutes before flipping.

For more tips on grilling fruit, turn the page!



## RED, WHITE & BLUE POTATO SALAD

Celebrate Independence Day with this festive—and healthful—potato salad. Potatoes are filled with fiber, which slows the digestion of carbohydrates. Plus, the blue-purple potatoes get their color from antioxidant-rich anthocyanins. **SERVES 8**

2 pounds small, mixed-color potatoes (red, yellow, and purple), halved  
1 cup lowfat plain Greek yogurt  
½ cup fresh herbs (dill and/or parsley)

2 tbsp Dijon mustard  
1½ tbsp apple cider vinegar  
Salt and pepper, to taste  
1 small red onion, diced  
2 celery stalks, chopped  
3 hard-boiled eggs, peeled and chopped

Place potatoes in a medium pot and cover with water by one inch. Bring to a boil and cook until tender, about 15 minutes. Drain and set aside.

Meanwhile, combine yogurt, herbs, mustard, vinegar, salt, and pepper in a large bowl. Add semi-cooled potatoes and mix with dressing to coat. Mix in onion, celery, and eggs. Chill until ready to serve.

Per serving: 146 calories, 8 g protein, 22 g carbohydrate, 3 g fat (1 g saturated fat), 71 mg cholesterol, 319 mg sodium, 3 g fiber, 2 g sugar. Calories from fat: 18%

## GINGER-LIME SLAW

This fresh alternative to a creamy coleslaw is brightened with lime juice and ginger and gets an extra crunch with the addition of sunflower seeds. **SERVES 6**

1 tbsp sesame oil  
2 tsp grated ginger  
1 tsp lime juice  
1 tsp soy sauce  
1 tsp maple syrup  
Salt and pepper, to taste  
3 cups mixed shredded kale and red cabbage

1 carrot, peeled and julienned  
¼ cup fresh cilantro leaves (or mixture of basil and cilantro)  
¼ cup toasted sunflower seeds  
2 tbsp diced red onion

In a large bowl, whisk together sesame oil, ginger, lime juice, soy sauce, maple syrup, salt, and pepper. Add kale and cabbage, carrot, cilantro, sunflower seeds, and red onion. Toss to combine.

Per serving: 75 calories, 2 g protein, 6 g carbohydrate, 6 g fat (1 g saturated fat), 0 mg cholesterol, 223 mg sodium, 2 g fiber, 3 g sugar. Calories from fat: 72%

## GET FRUIT ON THE GRILL

Grilling fruit brings out its natural sweetness, plus it elevates a ho-hum ingredient into a special dessert. Here's how to do it.

**Choose sturdy fruit:** Best bets for the grill hold their structure, like stone fruit (peaches, apricots), pears, melons, pineapples, and mangoes.

**Go large:** Grilling larger pieces of fruit, such as watermelon wedges and halved nectarines, will make them easier to flip.

**Use a neutral oil:** Sunflower oil, which has a high smoke point and a neutral flavor, is a good choice.

**Keep it hot:** Make sure your grill is preheated—a hot, oiled grill will minimize sticking.



# Weight Loss Surgery for Diabetes

Have you thought about whether weight loss surgery might be right for you? This primer explains how the procedures work and what to expect.

BY MATT McMILLEN



For obese people with type 2 diabetes, weight loss surgery does much more than its name implies. It also drastically reduces the symptoms of diabetes.

“The effect of bariatric, or weight loss, surgery on diabetes is one of our most celebrated accomplishments,” says Samer Mattar, MD, a bariatric surgeon at Swedish Medical Center in Seattle and the president of the American Society of Bariatric and Metabolic Surgeons. “Many patients leave the hospital off insulin or other diabetes medications.”

The major benefits of surgery include:

- Dramatic weight loss
- Better control of blood glucose, blood pressure, and cholesterol
- Boosts in quality of life
- Reduced appetite, which helps prevent overeating
- Reduced need for diabetes medications
- Longer life

More than 95% of diabetes patients who opt for bariatric surgery undergo one of two procedures: Roux-en-Y gastric bypass or sleeve gastrectomy. Though bypass has been around for much longer and remains the gold standard treatment, recent research shows that the two surgeries offer comparable results.

“We’ve come to recognize that both surgeries are fairly equivalent,” says Mattar.

### How they’re done

During gastric bypass, surgeons use a small part of the stomach to create a new stomach pouch, roughly the size of an egg. The new smaller stomach is connected directly to the middle portion of the small intestine (jejunum), bypassing the rest of the stomach and the upper portion of the small intestine (duodenum). The smaller stomach size restricts how much food it can hold and produces less ghrelin, a type of hormone that stimulates the appetite. Also, because food now bypasses much of

the stomach and intestine, fewer calories are absorbed. The result: significant weight loss.

In sleeve gastrectomy, a shorter and less complicated surgery than bypass, surgeons remove about 80% of the stomach. They form the remaining portion of the stomach into a tube. Just like in bypass, this newly formed—and much smaller—stomach can only hold small meals. This surgery also reduces hunger-triggering hormones made in the lining of the stomach.

### Selecting a procedure

To determine the right surgery for you, your doctor will evaluate your diabetes status and medical history. Those with mild or severe diabetes do equally well with either bypass or sleeve, says Ali Aminian, MD, a bariatric surgeon at the Cleveland Clinic. He highly recommends bypass for patients with moderate diabetes.

“But,” says Aminian, “we need to

consider all factors when deciding on a procedure.”

For example, patients with gastroesophageal reflux disease (GERD), which causes stomach acid to irritate the lining of the esophagus, or related conditions like Barrett’s esophagus, should opt for bypass. Sleeve can worsen the symptoms of such conditions.

However, the sleeve makes a better choice for people who rely on non-steroidal anti-inflammatory drugs (NSAIDs), a common variety of painkiller that includes aspirin and ibuprofen. Bypass patients have a higher risk of developing ulcers, which can be exacerbated by NSAIDs.

Your surgeon should review your medical history to identify other factors that will help decide which procedure will be more appropriate.

### Risks following surgery

Along with benefits, each surgery brings some risks. Bypass surgery, for example, increases the chances of small bowel obstructions and hernias, says Mattar. Both complications, which occur rarely, may require emergency surgery.

Dumping syndrome, which causes nausea and cramps when food passes too quickly from the stomach to the small intestine, happens much more frequently after bypass than sleeve

gastrectomy, says Mattar. Often, it can be controlled by eating slowly and avoiding the foods that trigger it. Those foods vary from patient to patient.

Your body will have more difficulty absorbing nutrients after surgery, no matter which procedure you undergo. While that can be offset by multivitamins, you should schedule annual nutrition evaluations to be certain you have no dietary deficiencies.

Overall, experts consider bypass and sleeve very safe procedures.

### Life after surgery

Before you undergo surgery, understand that it’s not a quick fix. You may lose an extraordinary amount of weight and see vast improvements in your diabetes symptoms, but it will be up to you to maintain those gains. That won’t be easy. While your appetite may demand much less food after surgery, it will likely return within six months to two years, says Samar Hafida, MD, an endocrinologist at the Joslin Diabetes Center in Boston. Use that time to learn to eat healthfully and mindfully and start an exercise program to help keep the weight off.

“Surgery’s not a magic procedure; it’s about starting over,” says Hafida. “It’s a lot of work, and the most important thing is to stay motivated.”

## QUESTIONS FOR YOUR DOCTOR

### Am I eligible for surgery?

The American Diabetes Association now recommends weight loss surgery if you have a body mass index (BMI) of 40 or above. In some cases, those with a lower BMI also should consider surgery.

### What may disqualify me?

Alcohol or substance abuse problems, as well as uncontrolled psychological problems, will require treatment prior to surgery.

### Who will be involved in my pre-op care?

In addition to your surgeon and endocrinologist, your team should include a dietitian and a psychologist to get a full picture of your health.

### Where should I have my surgery?

Select a multi-disciplinary center accredited by both the American College of Surgeons and the American Society for Metabolic and Bariatric Surgery.

➔ Search for the video [Weight Loss Surgery and Type 2 Diabetes](#) at WebMD.com.

## KNOW WHAT TO EXPECT

Weight loss surgery can bring remarkable benefits. Results, however, do vary. Keep the following in mind.

If your diabetes does not go into complete remission, you’re still likely to require far fewer medications than before surgery. That’s a huge positive.

If your weight does not drop as much as you’d hoped, you’ll still see big improvements in your blood glucose control, insulin resistance, and blood pressure.

If your weight loss begins to taper off, that’s normal. You’ll lose the most weight in the first few months after surgery.

If you find some foods less appetizing after surgery—some people develop an aversion to meat, for example—that’s normal, too.

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# TECH WATCH

Smarter devices are changing the way people manage diabetes

BY STEPHANIE WATSON

REVIEWED BY BRUNILDA NAZARIO, MD, WEBMD LEAD MEDICAL DIRECTOR

New technologies are created to make your life easier. Here are a few of the new gadgets that promise to streamline blood sugar control and simplify life for people with type 1 and type 2 diabetes.

## CLOSED-LOOP INSULIN PUMPS

Insulin is a mainstay of therapy for people with type 1 diabetes, and one way to deliver it is through a pump. Pumps are programmed to release a continuous dose of insulin (basal insulin) throughout the day. Users can also release insulin manually (a bolus dose) to adjust for the carbohydrates in their meals and snacks.

The future of insulin pumps is an automated, closed-loop system—also called an artificial pancreas, because it acts more like your real organ. In this system, a continu-

ous glucose monitor (CGM) constantly checks your blood sugar level. This future pump will use an algorithm to determine whether you need insulin to lower your blood sugar or glucagon (a hormone that releases sugar from your liver) to raise it, and then automatically deliver the correct dose to keep your blood sugar steady day and night.

“In a true closed loop, the person wouldn’t have to do anything. It would function on its own,” says Deborah Greenwood, PhD, RN, a certified diabetes educator and diabetes care consultant in Sacramento, California.

We’re not there yet, but we’re close. In 2016, the FDA approved the Medtronic MiniMed 670G. It’s the first hybrid closed-loop system, meaning that it continuously monitors blood sugar levels and automatically delivers insulin, though you still have to input the bolus insulin dose based on what you eat.

True closed-loop systems are in development. “Right now, there isn’t a stable [form of] glucagon they can use for the pump,” Greenwood says. “There’s still more work that needs to be done.”

## INSULIN PATCH PUMP

People with type 1 diabetes—and some with type 2—need to give themselves up to four injections of insulin a day. The fear and anxiety these needle sticks inspire can hinder or even prevent some people from following their treatment plan.

New pumps like the Omni-

pad and V-Go deliver insulin through a patch you wear on your skin—no injection needed. Once you’ve placed the patch, which inserts a thin tube into your skin to deliver insulin, it stays in place for three days. Basal doses of insulin are delivered automatically, and bolus doses require just a push of a button. Eliminating the needle stick and making dosing more discreet takes away some of the barriers to treatment, Greenwood says.

## SMART PENS

Pumps record your blood sugar levels and insulin doses over time as they deliver insulin, but some people get tired of being connected to a pump, Greenwood says. Syringes administer insulin without being attached to you, but they can’t keep track of your numbers.

The solution to both problems is a smart pen, which offers all the memory capability of a pump without tethering you to your device. Today’s smart pens are Bluetooth-connected to a smartphone app that records the time of your last injection, how many units of insulin you took, and other information and lets you share it with your healthcare team.

## GLUCOSE MONITORING WITHOUT THE STICK

Even if you don’t need insulin to manage your diabetes, you can’t totally avoid the needle. Blood sugar testing—often using a blood sample taken from your finger—is a critical part of diabetes management. You might have to stick yourself multiple times a day.

The Freestyle Libre, which the FDA approved in September 2017, is the first continuous glucose monitoring system that doesn’t require a fingerstick. Instead, it uses a sensor wire inserted under the skin to continuously check blood sugar levels. To get your number, you simply wave a sensor over the wire. You can wear the Freestyle Libre for up to 10 days.

In March 2018, the FDA approved the Dexcom G6—a quarter-sized device that continuously monitors your blood sugar level and sounds an alarm if it gets too high or low. The newest Dexcom incarnation is the first device to be approved as both a standalone continuous glucose monitor and for integration with automated insulin dosing systems.

## DIABETES MANAGEMENT PROGRAMS

Realizing that diabetes treatment isn’t one-size-fits-all, a few companies have created personalized care solutions. Programs like One Drop and Livongo pull data from your blood glucose monitor. These companies have diabetes coaches who track your blood sugar and offer advice on everything from diet to exercise to help you bring your numbers into a healthy range. “You’ll get real-time feedback, so if your glucose drops too low you’d get an immediate call from a coach to ask, ‘Are you okay?’” Greenwood says. Some services will even ship your test strips and other supplies to you automatically each month.

## ASK YOUR DOCTOR

**How often should I check my blood sugar level?** How frequently you test depends on your diabetes type and how well it’s managed. Typically, you’ll test before meals and snacks and before bedtime.

**Can I test my blood sugar without pricking my finger?** Some devices can test other parts of your body—like your forearm, thigh, or belly. Others use a patch that stays in place for a few days, helping you avoid repeated sticks.

**How do I bring down my blood sugar?** Blood sugar control incorporates diet, exercise, and medicine. Eat the right amount of carbohydrates. Stay active. And take the insulin or other medicines your doctor prescribed.

**How often should I see you?** If you take insulin, see your doctor at least once every three to four months. If you’re on pills, schedule a visit once every four to six months.

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## QUESTIONS TO ASK YOUR HEALTHCARE TEAM

If I only make one change in my daily routine, what would make the biggest difference? Elizabeth Halprin, MD, says this depends on the patient. That said, people who give up soda or incorporate at least 10 minutes of exercise into their daily routine tend to reap big benefits, she adds.

**My blood sugars are embarrassingly bad. What can I do?** Lose the value judgements about blood sugars and dietary choices, Halprin says. Think of those numbers as just numbers, without the “good” or “bad” label. “I’m not a proponent of thinking of food with any guilt at all,” she adds. “If you’re going to eat something, eat it and live with it. But be honest about what you’re doing.”

➔ Search for the WebMD Diabetes Community on the message boards at WebMD.com.

## Real Talk

It can be tempting to gloss over the truth with your medical team. Here’s a case for staying honest.

BY ERIN O'DONNELL

You’re at your appointment, and your endocrinologist or diabetes educator starts asking questions: How are your blood sugars? What are you eating for breakfast? How many times a week do you exercise? If you ever skip your meds or your walk, or your breakfasts are heavy on the doughnuts, you might feel the urge to respond with a fib or two.

But Elizabeth Halprin, MD, endocrinologist and clinical director of adult diabetes at Joslin Diabetes Center in Boston, makes the case for telling the truth. “It doesn’t help a patient to tell me what they think I want to hear,” she says. “You lose the opportunity for me to make recommendations based on your reality.”

Here are three topics where it’s useful to be honest with your medical team, Halprin says.

**Diet.** This is a hot-button topic, Halprin acknowledges. “There’s a lot of emotion and guilt around food,” she says. But leveling with your health care provider about what you usually eat and drink allows her to suggest small tweaks—say, giving up that glass of juice at breakfast—that can make a big difference in how you feel.

Similarly, it helps to be honest about how often you imbibe. “Alcohol does affect diabetes medications and increases the risk of hypoglycemia,” Halprin says. “Sometimes I will simply recommend that you eat food while drinking.”



**Medication.** Maybe you skip doses of insulin or take smaller amounts than prescribed. It’s risky to stay mum on this. “If your blood glucose levels are very high, our tendency as clinicians is to increase your medication,” Halprin says. “That leads us to add medications when they may not be necessary.” Another possible scenario: You’re unexpectedly admitted to the hospital and given the full dose your doctor intended. “This can lead to very low blood sugars because you’re not used to getting your actual dose,” Halprin adds.

She notes that cost is an all-too-common barrier to taking meds as prescribed. But your doctor may be able to switch you to a different medication covered by your insurance. Or you may be eligible for patient assistance programs run by pharmaceutical companies. Your physician must know you need help to sign you up.

**Exercise.** Physical activity increases insulin sensitivity and lowers your blood sugar levels. Over time, regular exercise can reduce your A1C. If you’re not already exercising, a good health care provider will help you brainstorm creative ways to get moving (the 10-minute dance party!), and troubleshoot problems such as joint pain that may be getting in your way.

If you really can’t level with your physician about these or other topics, it may be time to make a switch. “If you feel like you can’t be honest, or you’re being judged,” Halprin says, “then you need a different doctor.”

REVIEWED BY BRUNILDA NAZARIO, MD, WEBMD LEAD MEDICAL DIRECTOR



# How can the summer heat affect diabetes control?

*Avoid walking barefoot, especially if you have nerve damage that reduces your ability to feel sharp objects and hot surfaces.*

**Marwan Hamaty, MD**  
endocrinologist,  
Cleveland Clinic

Heat, especially extreme heat, is hard for anyone to tolerate. It's especially hard on people with diabetes. When your body is exposed to heat you lose more water and sodium (salt) through sweat, which can dehydrate you. Dehydration increases blood sugar levels. High blood sugar will make you urinate more often, which can dehydrate you even more. To stay hydrated, drink more fluids. You can tell when you're drinking enough because your urine will be lighter-colored.

Heat can also affect the way your body absorbs insulin. In hot weather, more blood flows to your skin. When you're dehydrated the opposite happens—less blood flows to the skin. Most types of insulin, especially short-acting insulin, don't work as well when blood flow is decreased.

The heat can affect your medicines, especially insulin, in other ways. If you leave insulin in a hot car, it

will start to degrade. Bring along a cooler to keep insulin at room temperature or below. Heat can also damage test strips, leading to false readings. That's going to affect your blood sugar management and how much insulin you take.

Be careful when you exercise in the heat. Watch for both high and low blood sugar. Your blood sugar can drop too much if you are on a medication that could cause low blood sugar. Being outside in hot weather and exercising produce similar symptoms, such as sweating and a fast heart rate, so it's easy to overlook the early symptoms of low blood sugar. That's why you need to check your blood sugar every hour or two while you exercise. Bring juice, glucose tablets, or glucose gel along for your workout, in case your blood sugar dips. If you take insulin, ask your provider how to adjust your dosage when exercising.

Avoid sunburn—both be-

cause of the damage it does to your skin and because it can affect diabetes control. A serious sunburn causes inflammation, which in turn raises blood sugar. Apply a broad-spectrum sunscreen and wear protective clothing and a wide-brimmed hat whenever you go outside.

Finally, take care of your feet. Avoid walking barefoot, especially if you have nerve damage that reduces your ability to feel sharp objects and hot surfaces. You might hurt yourself and not realize it. Wear protective shoes. Check your feet every day for cuts and other injuries. Also look for a scaly rash on your feet and white spots between your toes, which could be athlete's foot. Sweaty feet make you more likely to get athlete's foot and other fungal infections. Keep your feet dry, and treat athlete's foot as soon as you see it with an over-the-counter antifungal cream.

## Snack Right

Be smart about snacking to keep your blood sugar steady and your hunger in check

BY KERRI-ANN JENNINGS

Snacks can be an important part of your meal plan—or they can be the thing that derails your good intentions. Rather than snacking as an “add-on,” think of snacks as mini-meals that help you meet your blood sugar goals.

“Snacking really needs to be purposeful. It's a big mistake when it's recreational,” says registered dietitian Jill Weisenberger, MS, CDE, author of *Diabetes Weight Loss—Week by Week*. “Often people snack just because it's fun or tasty or a habit or because people around them are snacking. None of these is a good reason to snack.” Here are her main snacking dos and don'ts.

### **Don't: Snack to boost your metabolism**

A common myth is that eating more frequently revs your metabolism, leading you to burn more calories. While it is true that metabolic rate jumps slightly when you eat, that jump happens because it takes energy for your body to digest food. Eating more frequently doesn't change your metabolic rate. “Snacking is never going to boost your metabolic rate and lead to weight loss,” says Weisenberger. She adds that for some people the more often they eat, the more often they overeat.

### **Do: Let yourself get hungry**

When you eat, your blood sugar goes up—whether or not you have diabetes. And then after a while, it starts to go down again and return



to baseline. “But if you're eating every couple of hours, you're keeping your body in a fed state, and blood sugar levels will rise from eating before they've returned to baseline levels,” says Weisenberger. That leads to a pattern of overall elevated blood sugar levels.

### **Don't: Assume you need to snack to keep your blood sugar steady**

“Years ago, all diabetes medications caused low blood sugar, so people were rightly told to eat every few hours to prevent blood sugar from dipping dangerously low,” says Weisenberger. But today, fewer drugs cause this effect (insulin and sulfonylureas are an exception). Your best bet is to monitor your own blood sugar periodically before and a couple hours after meals, so you can know your personal blood sugar patterns.

Discuss your eating habits with your health care team to determine if regular snacks are a good idea for you.

### **Do: Use snacks to fill the gaps**

Snacking can be a great way to get foods that are otherwise lacking in your diet. Fruits and vegetables are a good place to start, since most people don't eat enough of them. While you don't need to eat specific amounts of carbohydrate, protein, and fat, says Weisenberger, “many people find that they manage hunger better if they eat a couple different foods that provide two or three of these macronutrients.”

### **5 SNACKS TO PACK**

Dietitian Jill Weisenberger recommends five smart snacks that balance protein, carbs, and fat.

**Spicy hummus:** Stir a bit of sriracha into hummus and enjoy with nonstarchy vegetables (celery, cucumbers, carrots).

**A piece of fruit:** It used to be taboo to eat a piece of fruit without pairing it with something rich in protein. But most of the time that doesn't matter, Weisenberger says.

**Nuts:** Stick with 1/4 cup and measure it out, since they can be easy to overdo.

**Vegetable juice:** It counts as a serving of vegetables (or two), and isn't as high in sugar as most fruit juices.

**Roasted chickpeas:** These savory snacks are crunchy, plus they are high in fiber and protein.

Search for the video *Eat Smart on the Cheap with Diabetes* at WebMD.com.

ASK YOUR DOCTOR OR DIABETES EDUCATOR

Should I change my medication dosing schedule during my trip? This could be an issue if you're changing time zones or planning to be more active than usual. Sites like [diabetestrip.org](http://diabetestrip.org) can help, but review the details with your own provider.

Can you provide a letter that details my condition and the medication and supplies I need? If you're flying, this kind of documentation can help ensure that you don't have a problem getting your essentials through airport security.

Can we talk about the foods I might encounter on my trip and how they might impact blood sugar? You'll probably eat differently on vacation than you do at home, and that's OK—as long as you understand carb counts and correct portion sizes. For info on the go, download an app like [MyFitnessPal](http://MyFitnessPal) or [CalorieKing](http://CalorieKing).

Travel On

Plan ahead and pack smart to get the most out of your trip

BY BARBARA BRODY

Gearing up for a road trip or an international adventure? People with type 2 diabetes need to do more than book a hotel and map out an itinerary. “Diabetes is not a static condition, and any time your routine is disrupted your blood sugars are going to be a bit wacky. Control what you can, prepare as much as possible, and be ready to adjust as needed,” says Marina Chaparro, MPH, a certified diabetes educator and registered dietitian who works in private practice and at Joe DiMaggio Children’s Hospital in Hollywood, Florida.

**Plan for the worst-case scenario**  
Think about what your trip entails and what might go wrong so you can side-step those pitfalls, says Chaparro. If you’re flying, consider the possibility that checked luggage could get lost. (Solution: All meds and supplies, like your glucose meter, stay in your carry-on.) If you’re headed far off the beaten path—perhaps on a hiking expedition—your blood sugar might drop when you’re nowhere near a restaurant or supermarket. (Carry hard candy or glucose gel.) And what would happen if you were to pass out and need emergency medical care? (Wear a medical ID bracelet or carry info about your condition in your wallet.)

If you travel abroad, research clinics or hospitals that are near your destination, and learn a few key phrases in the native language—or print them out and keep in your pocket or bag—in case you have an emergency.

REVIEWED BY BRUNILDA NAZARIO, MD, WEBMD LEAD MEDICAL DIRECTOR



**When in doubt, bring extra**  
“Pack light” might be your mantra when it comes to clothing, but medication is a different story. Chaparro suggests packing an extra week’s worth of medication and supplies such as glucose testing strips. (You may also want to check your blood sugar more frequently while you’re traveling.) That’s especially important if you’re leaving the country, since your doctor won’t be able to easily call in a refill. She also advises keeping all medication and supplies in their original packaging so that anyone who might inspect it, like a TSA agent, can easily identify it.

**Consider travel insurance**  
If you’re leaving the country and you need medical attention, will your regular health insurance cover any care you might need? It might, but call and ask before you leave, says Chaparro. If not, now’s the time to secure separate coverage for your trip.

**Don’t forget to eat—and drink**  
Hydration is key. “If you don’t drink enough, your blood sugar levels may rise,” says Chaparro, so carry a water bottle and keep sipping while you’re in transit. That might mean you visit a few more rest stops along the highway or have to use the airplane bathroom more, but it’s a good idea to move around every few hours anyway. And don’t forget to pack snacks for the journey—non-perishable items that combine carbs with protein will help keep your blood sugar stable. Chaparro likes dried fruit, whole fruit (like apples or oranges), and nuts or individual squeeze packs of peanut butter.

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## pop QUIZ

### ASK YOUR DOCTOR

**How can I prevent diabetes complications?** Keep your blood sugar within a healthy range. Ask your doctor how often you should test your levels.

**Which specialists do I need to see?**

Because diabetes affects so many parts of your body, you might need to visit a podiatrist, cardiologist, eye doctor, and dermatologist.

**What tests do I need?**

Along with regular blood sugar checks, have your blood pressure and cholesterol levels tested and get routine kidney tests, as well as eye and foot exams.

**What warning signs should I look out for?** Vision changes, numbness or tingling in your hands or feet, sores on your skin, and swelling are all signs you need to see your doctor about possible complications.



# How Diabetes Affects Your Body

Chronically high blood sugar takes its toll on every organ and system in your body, from your head to your feet. Do you know these signs of diabetes complications?

## QUIZ BY BARBARA BRODY

**1. [Eyes] You have floating spots in your vision.**

☐ Yes ☐ No

**2. [Skin] You have red, itchy patches on your skin.**

☐ Yes ☐ No

**3. [Heart] You have high blood pressure.**

☐ Yes ☐ No

**4. [Stomach] You have heartburn or a swollen belly.**

☐ Yes ☐ No

**5. [Kidneys] You've gained weight and/or your ankles are swollen.**

☐ Yes ☐ No

**6. [Feet/Hands] You have numbness, weakness, and/or tingling in your hands or feet.**

☐ Yes ☐ No

### ANSWERS

**1.** Diabetes damages blood vessels that feed the light-sensitive tissue—the retinas—in the back of your eyes. Diabetic retinopathy is the number one cause of vision loss in people with diabetes.

**2.** Diabetes leaves you more vulnerable to bacterial and fungal skin infections. Wash and dry your skin well every day. Watch for redness, itching, and raised areas of skin and report them to your dermatologist.

**3.** Two in three people with diabetes have high blood pressure, which puts them at risk for heart disease and stroke. Limit salt, exercise daily, and quit smoking. Take blood pressure medications as directed and talk to your doctor about daily aspirin use.

**4.** Diabetes can damage the nerve that helps food move through your stomach. As a result, your stomach won't empty as quickly as it should after you eat, leaving you bloated and feeling the burn.

**5.** Millions of tiny blood vessels in your kidneys filter wastes from your blood into your urine. Diabetes can damage these vessels and prevent them from filtering properly, causing your body to retain extra fluid.

**6.** High blood sugar damages blood vessels that supply nerves in your hands and feet, leading to nerve damage called diabetic neuropathy. Check your feet daily for signs of an injury you might not feel.

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\*Walgreens Pharmacist Survey, November 2014. 1. Data on file. 2015-2016 Prescription Drug Benefit Cost and Plan Design Report. †Rebate form in package. See form for terms, exclusions, expiration, restrictions, and details. Rebate offered by manufacturer. Card required for sale price but not to redeem rebate. Offer not valid for patients with prescriptions reimbursed by: (i) any government program, including without limitation Medicare or Medicaid or (ii) any third-party payer in the state of MA. Rebate amount cannot exceed: (i) purchase price and (ii) total-of-pocket expenses indicated on receipt. See rebate forms for additional terms and restrictions. 2. Insurance coverage required. Offer not valid in AR, CA and MA. Offer not valid for anyone who is: (i) a beneficiary of a Medicare Part B, Medicare Advantage, Medicaid, TRICARE or other federal healthcare program and/or (ii) a member of certain private health plans. Consult with your Walgreens pharmacist for details.

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