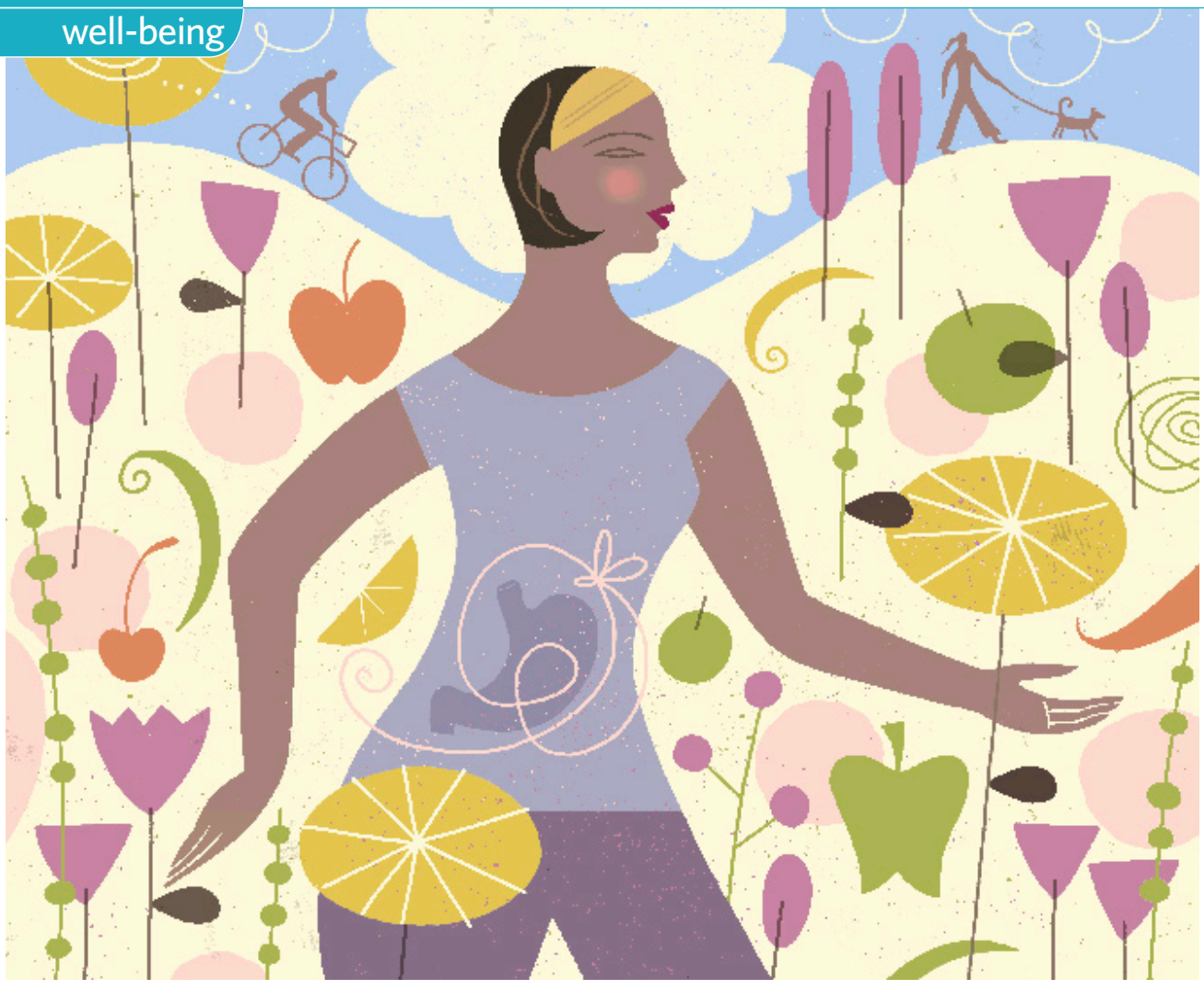

surgical solution

Weight-loss surgery can put type 2 diabetes in remission. But long-term postsurgery success requires a commitment to healthful food choices and daily exercise.

BY **Hope S. Warshaw, R.D., CDE** ILLUSTRATION BY **Tracy Walker**

What if there were a treatment for obese people that could put type 2 diabetes in remission, lower blood pressure, improve sleep apnea, and decrease the chance of death from diabetes complications? Philip R. Schauer, M.D., says research proves there is such a treatment—bariatric (or metabolic) surgery. But there is a caveat, says Schauer, director of the Cleveland Clinic Bariatric and Metabolic Institute and a past president of the American Society for Metabolic and Bariatric Surgery (ASMBS). To be effective, the treatment requires lifelong commitment to healthful eating and weight-maintenance.

"Though metabolic surgery has been pigeonholed as purely for weight loss, research dating back 60 years has shown it makes blood glucose plummet," says John Baker, M.D., medical director for Baptist Medical Center's Baptist Health Weight Loss Program in Little Rock, Arkansas, and president of ASMBS. The organization's name now includes the term "metabolic" to reflect the procedure's impact on insulin and other gut hormones

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related to weight, appetite, and glucose control.

"It took metabolic surgeons years to build their case and sway support for metabolic surgery in people with diabetes," Schauer says. The American Diabetes Association says metabolic surgery can be considered for adults with hard-to-control type 2 diabetes who have a body mass index (BMI) of 35 or greater.

Metabolic surgery is no cure-all, however. Gary Middleton, PWD type 2, knows this firsthand. "While this surgery improved my life immensely and helped me control my blood glucose on one-tenth of my presurgery insulin dose, I had to completely renovate my lifestyle," he says. "Ninety percent of my success was in my hands." (Read more of Gary's story on page 62.)

Improving safety

The most common metabolic surgery procedures work by restricting calorie intake, and some also cause the body to poorly use nutrients by bypassing a part of the small intestine called the duodenum. Weight loss and effects on diabetes vary among the surgeries (see "Metabolic Surgery Options," *page 59*).

The surgeries are getting safer. A recent analysis by the U.S. government's Agency for Healthcare Research and Quality (AHRQ) showed that complications after metabolic surgery have been declining, even as it's performed on older and sicker people. The most common complications are abdominal hernias, infections, and leakage around surgical staples. Lower complication rates are attributed to more surgeries being

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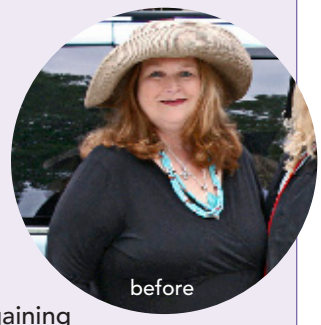
Are you a candidate? Metabolic surgery isn't for everyone. People who qualify include:

- Adults with body mass index (BMI) > 40
- Adults with type 2 diabetes, heart disease, or sleep apnea and BMI > 35

Diabetes remission



Name: Priscilla Pennington-Zytkowicz, 64, Ocean City, Maryland

Weight: 340 pounds at surgery (2008); 170 pounds now

Diabetes history: "Diabetes runs rampant in both sides of my family," Priscilla says. She's had type 2 diabetes about 10 years, and though she's now in remission and on no medication, "you always have diabetes," she says. Priscilla checks her blood glucose daily, and it runs in the 90s. Prior to surgery, she took metformin and Actos, yet still had out-of-control blood glucose levels.

Weight issues: Priscilla was unable to stop gaining weight; the more medicine she took, the more weight she seemed to gain. "I felt closer to death every day. The problem became bigger than me. I met someone who had the surgery and was successful. I made up my mind I wanted it, but it took me a while to advocate for myself through the medical system," she says.

Pluses: "I'm stronger and healthier," she says. "I'm more attracted to eating healthier foods. And since I can't eat that much, I don't waste my calories on lousy food. I've been told exercise is critical for success, so I walk every day."

Minuses: "I can't think of any," Priscilla says. "I want to tell anyone like me to give surgery serious consideration."

Advice: Priscilla wants people to know what her primary health care provider didn't tell her: Type 2 diabetes is progressive and potentially devastating. Determine your options and get referred to a reliable metabolic surgery center. Priscilla's motto: No food makes you feel as good as healthy feels.

@ Jump-start your weight loss with these tips from our experts: **DiabeticLivingOnline.com /motivate**

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Metabolic surgery options

Gastric Bypass

Description: Also known as Roux-en-Y, this metabolic surgery is the most common. The top part of the stomach is reduced from the size of a football to the size of a golf ball. The smaller stomach is attached to the jejunum (the middle part of the small intestine) to bypass the duodenum.

Weight loss: 33–77 percent of excess weight.

How it helps shed pounds: Less food is consumed because the stomach is smaller. Fewer calories are used because the duodenum can't absorb them.

Diabetes remission: 75–80 percent of patients with type 2.

How it lowers blood glucose: Bypasses the duodenum, suppressing appetite, and increases speed at which food reaches the end portion of the lower intestine, so there's less time for nutrients to be absorbed.

Surgical method: Incision or laparoscope (small incisions).

Biliopancreatic Diversion with Duodenal Switch

Description: A small sleeve-shape stomach is created and attached to the ileum to bypass the duodenum.

Weight loss: 70–90 percent of excess weight.

How it helps shed pounds: Less food is consumed because the stomach is smaller. Fewer calories are used because the duodenum can't absorb them.

Diabetes remission: 95–100 percent of patients with type 2.

How it lowers blood glucose: Bypasses the duodenum, suppressing appetite, and increases speed at which food reaches the end portion of the lower intestine, so there's less time for nutrients to be absorbed.

Surgical method: Incision.

Laparoscopic Adjustable Gastric Banding (LAGB)

Description: A silicone band filled with saline is wrapped around the upper part of the stomach to create a small pouch. The size of the pouch can be adjusted after surgery by adding or removing saline from the band. This requires a medical procedure.

Weight loss: 35–75 percent of excess weight.

How it helps shed pounds: Restricts amount of food that canbe consumed. People feel full more quickly and eat less.

Diabetes remission: 30–65 percent of patients with type 2.

How it lowers blood glucose: Health benefits related to weight loss.

Surgical method: Laparoscope.

Note: Statistics of weight loss and diabetes remission are estimated based on study results and consultation with metabolic surgeons.

Gastric Bypass

Biliopancreatic Diversion with Duodenal Switch

Laparoscopic Adjustable Gastric Banding (LAGB)

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done by laparoscope (operating through several small incisions), greater use of banding procedures, and experienced surgeons.

Diabetes in remission

Metabolic surgery that bypasses the duodenum can make blood glucose plummet just 24 hours after surgery, put type 2 diabetes in remission, and slash needs for blood glucose-lowering medication. The reason is unclear, but research offers clues.

"Bypassing the duodenum puts the hunger hormone, ghrelin, to rest," says Margaret Furtado, R.D., a clinical dietitian specialist at Johns Hopkins Bayview Medical Center in Baltimore and author of *The Complete Idiot's Guide to Eating Well After Weight Loss Surgery* (Alpha, 2010). Ghrelin increases appetite and the body's insulin output. When ghrelin is absent, food reaches the lower intestine more quickly. There's also an increase in hormones that tamp down appetite, control weight, and discourage the body from storing fat. The result is greater sensitivity to the body's insulin and less insulin resistance. Research shows that the surgery also preserves insulin-making beta cells.

For weight loss and maintenance after surgery, expect to maintain lifestyle changes: healthful eating of small portions and daily exercise.

"The long-term picture for most PWDs or those at risk [diagnosed with pre-diabetes] is improved for many years ahead," says Chris Edwards, M.D., an assistant professor at the University of North Carolina Mission Hospitals in Asheville, North Carolina. A recent study of nearly 200 PWDs type 2 showed that 60 percent were still in remission 5–16 years after surgery. This was especially true for those who, prior to surgery, took no blood glucose-lowering medications or used only oral medications. The PWDs most likely to have high blood glucose levels after surgery had regained some weight, had had diabetes longer, or required more blood glucose-lowering medication prior to surgery.

For all the good news, metabolic surgery requires drastic changes in food selection and portions, and a commitment to physical activity (see "Life After Surgery," *below*). "The surgery changes your body, but not the unhealthy environment we live in," says Sue Cummings, R.D., clinical programs director at the Weight Center, Massachusetts General Hospital, Boston. "You need to change your environment to make permanent changes."

Cost and coverage

The bill for metabolic surgery can range from $17,000 to $30,000—if all goes smoothly. Many clients are required to attend before- and after-surgery programs with dietitians and psychologists. Most

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Life after surgery

The days following metabolic surgery aren't easy, but slowly the pain subsides and the regimen becomes your new way of life. "Initially taking in enough fluids is key and may be a challenge due to pain and fear of stretching the now-much-smaller stomach," says Margaret Furtado, R.D., a clinical dietitian specialist at Johns Hopkins Bayview Medical Center in Baltimore. The next step is eating enough high-quality protein while continuing to sip plenty of fluids.

Within a few months, you can eat or drink 500–800 calories a day. The focus is on no-sugar-added fluids, protein, and healthful carbohydrate eaten at three meals and nearly no sweets or high-fat foods. A lunch or dinner may be 3 ounces of meat, ½ cup of vegetables, and ¼ cup of whole grain starch. "It's no cakewalk—you've got to be motivated to succeed," says Priscilla Pennington-Zytkowicz, 64, of Ocean City, Maryland. "But it's way easier to shed pounds because you aren't hungry and you feel full fast."

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people have to pay for these programs out of pocket.

Medicare will pay for metabolic surgery if you meet the eligibility criteria and have surgery in a Center of Excellence. In early 2009, Medicare added type 2 diabetes as a condition that qualifies a person for surgery. Centers of Excellence are certified by two organizations and can be located online (see *above right*).

Other health insurers' coverage varies by plan and state. Some people face insurance denials several times before their health plan agrees to cover the surgery, and some people who are denied coverage choose to pay for the surgery themselves.

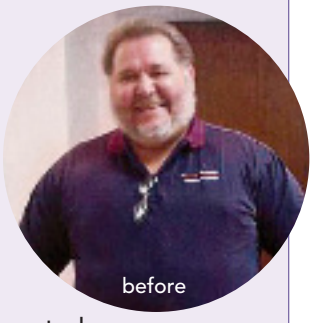
While experts suggest that obesity should be prevented in the first place, they recognize that millions of people are obese and their health is in jeopardy. For many PWDs type 2, metabolic surgery "offers people the opportunity to get their life back, take far fewer medicines, be less of a burden and cost to the health care system, have more healthier years to be a productive citizen, and enjoy their lives," Baker says.

Hope Warshaw, R.D., CDE, is a Diabetic Living *contributing editor and editorial advisory board member. She is also the author of several books published by the American Diabetes Association, including* Real-Life Guide to Diabetes *(2009).*

To find a certified surgery center: American Society for Metabolic and Bariatric Surgery, **surgicalreview.org,** and American College of Surgeons Bariatric Surgery Center Network, **acsbscn.org.**

Quality of life

after



before

Name: Gary Middleton, 63, Little Rock, Arkansas

Weight: 330 pounds at surgery (1999); 215 pounds now (197 lowest)

Diabetes history: Gary was diagnosed with type 2 diabetes in 1978. Before he had surgery, he used an insulin pump and 300 units of insulin—a full pump cartridge—each day. "After surgery, my insulin needs quickly fell until I was taking no insulin, which lasted for two years after surgery," he says. Gary now takes 25 units of insulin once a day, and his last A1C was 6.8 percent.

Weight issues: "My weight has been hard to control all my life," Gary says. "I've been on every diet and yo-yoed up and down the scale by 70 pounds. I knew it was last-resort time."

Pluses: "I have much more stamina. I can do simple things like bend over and tie my shoes, my clothes fit better, and people don't look at me like a big fat guy." Gary also eats much less. "I encourage people to not wait as long as I did" for surgery he says.

Minuses: Taking a handful of daily vitamins the rest of his life, having to exercise regularly, doctor visits, and medical tests.

Advice: "The surgeon does the surgery, but you choose the food and the portions, and you decide to hit the pavement to exercise regularly," Gary says.

Remission: Don't call it a cure

The term "cure" for type 2 diabetes is incorrect. If a person doesn't lose enough weight, regains weight, or has natural progression of diabetes, blood glucose-lowering medicines may be needed, although likely in smaller doses. The preferred term is "remission." Because of the success of weight-loss surgery to treat type 2 diabetes and transplant therapies to treat type 1 diabetes, a new American Diabetes Association consensus statement now defines partial, complete, and prolonged remission categories.