



# Diabetes Life Lines

## Weight Loss Surgery and Diabetes: is it right for you?

While it may seem extreme, weight loss surgery can be an effective way to treat type 2 diabetes. Many patients with type 2 diabetes have better control over their blood sugar after having weight loss surgery. In some cases, blood sugars improve so much that the patient no longer has diabetes.<sup>1</sup> For others, they may need less medication or insulin. By helping patients with long-term weight control, weight loss surgery can also improve other obesity-related problems such as those shown in the box. Patients may also notice improvement in mental health. Some studies show people who receive weight loss surgery have fewer depression and anxiety symptoms.<sup>2</sup> However, other studies say these changes may not be maintained over time.<sup>3</sup> Mental health is influenced by many factors, but it is good to know that weight loss surgery could play a part. All together, these changes in physical and mental health may lead to an improvement in quality of life. In this article we will talk about who is a good candidate for weight loss surgery, the types of surgery, and the potential risks.

### Inside this issue:

- **Weight Loss Surgery and Diabetes: is it right for you?**
- **Diet After Weight Loss Surgery**
- **Traveling With Diabetes**
- **Recipe: Pumpkin Roll**

### Is weight loss surgery for me?

In order to be considered for weight loss surgery, patients need to meet certain conditions. Patients must have a BMI  $\geq 40$  or a BMI  $\geq 35$  with one or more obesity-related comorbidities.<sup>5</sup> BMI, or body mass index, is a measure of weight for height and classifies a person as overweight or obese. People with a BMI greater than 30 are considered obese. So, you can see that this surgery is for people who have a lot of weight to lose.

Weight loss surgery can help with these obesity-related diseases and others:

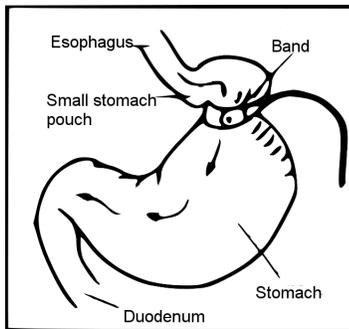
- High blood pressure
- Sleep apnea
- Asthma
- Arthritis
- Fatty liver disease
- Type 2 diabetes
- Heart disease
- Acid reflux/GERD

Each doctor also has their own requirements patients must meet before surgery.<sup>5</sup> These requirements show the patient is committed and ready for the long journey ahead. For example, your doctor may ask you to stop smoking, get more exercise, or lose weight before surgery. Doctors often have patients meet with specialists to prepare for life after surgery. These can include dietitians and mental health counselors.

Weight loss surgery is a helpful tool for weight loss and improving diabetes, but it is not a quick or easy fix. Patients must commit to life-long changes to achieve the best results. Healthy eating, exercise, enough sleep, and stress management are a few of the key components to maintaining weight loss. Supplements may also be needed right after surgery and for the rest of your life. It is critical to follow the advice of your doctors and other health professionals for long-term success.

## Types

There are four main types of weight loss surgery for you and your doctor to consider. In all four surgeries, the stomach is made much smaller. This is done by sectioning off a small portion of the upper stomach or completely removing a piece of it all together. The stomach will then be more like a small pouch that holds less than a cup of food or drink.<sup>5</sup> These changes usually mean a person feels full sooner and thus eats less. Some of these surgeries also include rerouting part of the small intestine. Doing so means you absorb less nutrients from the food you eat.<sup>5</sup> This can mean things like fat and sugar may pass through your digestive tract before they can be absorbed. By decreasing the calories consumed and absorbed, these surgeries help people lose weight. Let's talk about the most common types of weight loss surgery.



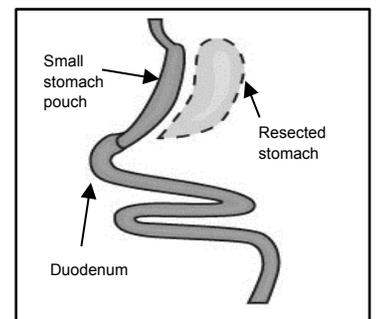
National Institute of Diabetes and Digestive and Kidney Disease (NIDDK), National Institutes of Health (NIH)

### Gastric Band

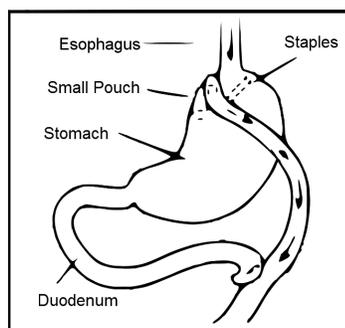
The gastric band procedure is where an inflatable band is wrapped around the upper portion of the stomach. This creates a small pouch. The band can be adjusted by injecting it with saline through a port placed under the skin. Some consider this surgery to be less invasive, but it does involve placing an object (the band) in the body. This type of surgery typically results in the smaller amount of weight loss over a longer period of time.<sup>6</sup> It also has the highest chances of needing another surgery because the person doesn't lose as much weight as he/she desires.

### Sleeve Gastrectomy

Similar to the gastric band, the sleeve gastrectomy also creates a small pouch in the stomach. However, in this procedure it is done by removing about 80% of the stomach. The remaining stomach resembles the shape of a banana.



Adapted from:  
<https://www.niddk.nih.gov/health-information/weight-management/bariatric-surgery/types>

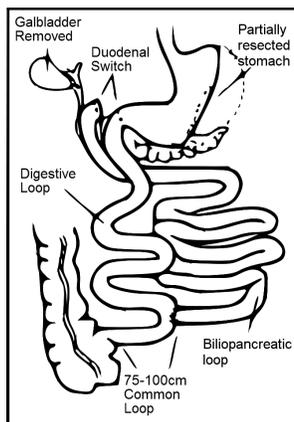


National Institute of Diabetes and Digestive and Kidney Disease (NIDDK), National Institutes of Health (NIH)

### Gastric Bypass (Roux-en-Y)

The final two surgeries involve rerouting part of the small intestine. In the gastric bypass, also known as the Roux-en-Y, a small section of the stomach is cut and sectioned off. The small intestine is then cut into two sections. The bottom section is brought up and connected to the stomach pouch. The top section, which is still attached to the piece of stomach that was cut off, is bound to the other half of the small intestine. This allows digestive chemicals from the stomach to still reach the food eaten by the patient and help break it down.





National Institute of Diabetes and Digestive and Kidney Disease (NIDDK), National Institutes of Health (NIH)

### Duodenal Switch

A duodenal switch is the other surgery involving rerouting of the small intestine. The stomach is cut into a thin sleeve similar to the one created in the sleeve gastrectomy. However, the duodenal switch has a second step. The small intestine is cut where it connects to the stomach. A section of the small intestine about  $\frac{3}{4}$  of the way down is then attached to the stomach. The top portion of the small intestine is then attached to the bottom portion to allow digestive aids to reach the food.

### Risks

As with any surgery, there are potential risks. Weight loss surgery is generally safe, and it is unlikely for something to go wrong. However, it is important to understand possible side effects that occur. The most common side effects after surgery include:<sup>6</sup>

- Bleeding
- Leaking from the stomach and/or small intestine
- Infection
- Blood clots

Other complications may develop later:<sup>7</sup>

- Vomiting
- Gallstones
- Diarrhea
- Nutrient deficiencies
- Hernias

Of the four types of weight loss surgery discussed, the gastric bypass and duodenal switch are the most successful in improving the control of type 2 diabetes.<sup>7</sup> This is a result of the combination of decreased food intake, new form and position of the stomach and small intestine, hormonal changes, and decreased nutrient absorption. However, the solution is not the same for everybody. Talk with your doctor to help decide if weight loss surgery is right for you.



## Diet After Weight Loss Surgery

Knowing what your diet will look like after weight loss surgery can help you decide if it is right for you. After surgery, it is important to strictly follow the diet plan given to you by your doctor and dietitian. At first, your diet will be very limited in both quantity and the types of food you can eat. Over time your diet will expand to include a larger variety of foods. However, there are lifelong changes that will have to be made. Not following the suggestions from your doctor and dietitian could lead to complications such as pain, nutrient deficiencies, dumping syndrome (discussed below), or re-gaining weight.

### Diet During Recovery

During the first days to weeks after your surgery, your diet will be very limited. You will progress from clear liquids to liquids during the first couple days. Then, you will move on to pureed foods and then to soft foods for the next several weeks. About 8 weeks after surgery, you can finally start eating solid foods again! You can see that one of the reasons people lose so much weight with these surgeries so quickly is because you really cannot eat much for up to two months after the surgery. That is a lot of calories to save!

Even then, starting to eat regular foods is a gradual process. It is recommended to introduce one food at a time to see what you can tolerate. If a food seems to bother you, do not continue eating it. For the healthy foods that you know you will need to eat eventually, like vegetables, fruits, lean meats, and whole grains, you can work with your doctor or dietitian about how to slowly introduce foods that seem to upset your stomach or how to prepare them in new ways that may be easier to tolerate. There are still a few foods you may want to stay away from. For example, you will need to avoid drinking carbonated beverages. The carbonation can cause air to build up in the newly formed stomach pouch. If this happens, it can lead to side effects such as upset stomach, bloating, gas, and severe pain. It may even damage the stomach pouch. You will also need to avoid nuts, seeds, popcorn, granola, fibrous vegetables\* and tough meats. These foods are very hard to digest after surgery. You may be able to start eating these again over time under the advisement of your doctor and/or dietitian.<sup>1</sup> Try not to get discouraged if your diet remains limited for longer than you expected. As you continue to heal, your stomach will be able to tolerate more foods.

**\*Fibrous vegetables are usually hard, stringy, or have a skin. A few examples include:**

- Broccoli
- Asparagus
- Corn
- Peas
- Carrots
- Squash

### Recovery and Type 2 Diabetes

After weight loss surgery, patients with type 2 diabetes will need to be extra careful about watching their blood sugar. There are several factors that can affect your blood sugar. First, there is a drastic decrease in the amount of food you can eat, so you will likely take in less carbohydrate per meal. Second, some food will pass through you undigested or unused by the body. You may not absorb all the carbohydrate from the food you eat. Lastly, your body may be more responsive to insulin after weight loss surgery. All of these combined can cause your blood sugar to look different than it used to and put you at risk for hypoglycemia. People taking insulin or other blood sugar-lowering medications are at greater risk. Be sure to talk with your doctor before your surgery about your diabetes



hypoglycemia and how to treat it in case it occurs.<sup>2</sup> Over time, you will learn how your changed body reacts to the carbohydrate you eat. These changes may mean that you can use less medication or insulin.

### Lifelong Changes

Even after you are fully recovered, there are several diet-related changes you will have to maintain. One example is size and frequency of meals. Several small meals throughout the day are recommended. A small meal could be about 1 cup of food, but this amount may vary from person to person.<sup>1</sup> One cup of food is about the size of a woman's fist. It is important to stop eating before you feel full to prevent stretching out the small pouch created in your stomach during surgery. You will also want to eat your meals slowly to prevent a problem called dumping syndrome. Dumping syndrome happens when large amounts of food enters the small intestine very quickly. Symptoms of dumping syndrome include nausea, vomiting, dizziness, sweating, and diarrhea.<sup>1</sup>

After surgery, many patients have a hard time drinking enough water because of how small their stomach is now. You will have to make a conscious effort to drink water throughout the day in order to prevent dehydration. Eight cups a day is typically the goal.<sup>3</sup> To reach this goal, drink sips of water even if you do not feel thirsty. Because of the small size of your stomach, you may no longer be able to eat and drink at the same time. Most people will need to wait 30 minutes after eating before drinking.<sup>1</sup>

Since you can only eat a small amount after weight loss surgery, you may not be able to get enough vitamins and minerals from food alone. You will need to start taking supplements every day. Common supplements taken after weight loss surgery include a multivitamin, vitamin D, calcium, iron, and vitamin B12.<sup>3</sup> Your doctor or dietitian will talk with you about which supplements you will need to take, how much, and how often. It is important to follow their advice to prevent nutrient deficiencies.

You should avoid alcohol after having weight loss surgery. For starters, it is high in calories with minimal nutritional value. This is a poor combination for those working to lose weight. Second, after weight loss surgery alcohol is absorbed much more quickly than it was before. Because it is absorbed more quickly, its effects are much stronger. Weight loss surgery patients experience higher blood alcohol levels after and maintain those levels for longer periods of time.<sup>3</sup>

Lastly, after weight loss surgery, you must eat a balanced diet. Because you can only eat a small amount it is even more important to choose healthy foods and limit junk foods. Protein rich foods will need to be included, especially in the early stages when you are not eating much. Some people have to use protein supplements to make sure they get enough. Just like your current diabetes diet, after surgery you should limit foods with lots of added sugars, refined carbs, and fat. These foods are generally high in calories and have little to no nutritional value. Limiting these foods will be essential in your weight loss journey.<sup>3</sup> As always, it is important to talk with your dietitian about any questions or concerns you have about your diet and to follow their advice very closely. They will help you find your balance and set you up for success in this new chapter of your life!

#### Common foods high in added sugars, refined grains, and/or fat:

- Desserts
- Soda
- Fried foods
- Pasta
- White bread
- Candy



## Traveling With Diabetes

As the holidays approach, many of us are organizing the final details of our travel plans. Whether you are planning a road trip to the mountains or flying across the country to visit family, travelers with diabetes have extra steps to prepare. Thinking about where to pack medicine, bringing diabetes-friendly snacks, and planning for time zone changes are just a few things to consider. This article will help you make sure you have planned accordingly so you stay safe and healthy on your trip!

### Visit With Your Doctor

It is always a good idea to talk to your doctor before you leave if you have any questions or concerns about your travel. It is recommended to get a letter from your doctor that says you have diabetes and lists any medications and medical equipment you will be traveling with. You will also want to ask for written prescriptions for any medications you take. This is important to have with you in case you lose or run out of medications while you are gone. If you are going into a different time zone, ask if you need to adjust your medication or insulin dose schedule.



### Medications

Besides making sure you pack your medications, there are a few other things you may want to think about. If you are traveling by plane, you always want to make sure you pack your medication in your carry-on bag! This is so important because it will make sure you still have your medication even if your checked bags get lost. It is also a good idea to pack more medication than you think you may need so you have enough if your trip ends up being longer than expected. Experts recommend you take twice the expected amount. Be sure to locate pharmacies close to where you will be in case you need anything while you are away.

If you are traveling with insulin, be sure to care for it properly. If insulin gets too hot or too cold, it may not work as well. Do not leave it in the car. If you are participating in outdoor activities where it may get hot, store it in a travel pack designed to keep it cool.

### Meals and Snacks

It is always a good idea to pack your own snacks while traveling to help avoid the temptations of the unhealthy choices in gas stations and airport gift shops. Remember, if you are traveling by plane, you cannot take liquids over 3 ounces, so you will not be able to bring drinks or foods like yogurt. However, many airports do have stations to fill water bottles. Bring an empty bottle and fill it up after you pass through security! If you are traveling with refrigerated foods, pack them in an insulated lunch box with an ice pack. However, be sure the ice pack follows the 3-ounce rule.



Most flights offer complimentary snacks on board. Common options include nuts, snack mix, granola bars, or cookies. If you chose to eat a snack offered on your flight, be sure to think about its carbohydrate content. Nuts are likely the lowest carbohydrate option available and your best go-to. If you are unsure about the carbohydrate content of anything served on your flight, don't hesitate to ask for the nutrition information.

Meals on the go can be a little trickier because you are less likely to bring your own. But that does not mean you can't make healthy choices! If you find yourself at a fast food restaurant during your travels, do not worry- most fast food restaurants have healthier options on the menu. Look for grilled chicken instead of fried and substitute your french fries for a side salad or fresh fruit if it will fit your carbohydrate choices for that meal. Remember to use condiments like ketchup, dressings, and sauces sparingly. Also think of ways you can control your portion sizes. Ordering from the kids menu is an easy way to control portions and still give you enough food to fill you up! You can also share a meal with a friend or family member. Lastly, be sure to choose water or other zero calorie beverage options.

### Packing List

There are lots of things to remember to pack when traveling, even if you don't have diabetes! Go through a diabetes packing list before you head out on your adventure to help make sure you didn't forget anything. Here's a brief list of the things we talked about plus a few other important things:

Medication/Insulin		Prescription Paperwork	
Syringes		Insurance Cards	
Alcohol Swabs		Local Medical Care Information	
Blood Glucose Meter		Medical Bracelet	
Lancets		Extra Batteries	
Test Strips		Snacks	
Treatment for Low Blood Sugar		Cords/Chargers for Medical Equipment	
Doctor's Letter			

Following these tips can help ensure you keep your diabetes under control while traveling so you can have a safe and happy holiday!

#### Contributors:

Alison C. Berg, PhD, RDN, LD, Assistant Professor and Extension Nutrition and Health Specialist, Writer and Editor  
Hayley Sanders, BFSCS, Graduate Student, Dietetic Intern, Writer

#### Editorial Board:

Ian C. Herskowitz, MD, FACE, University Health Care System, Augusta GA  
Melanie Cassity, RN, MSN, CDE, Piedmont, Athens Regional, Athens, GA



## References

### Weight Loss Surgery and Diabetes: is it right for you?

1. Jensen MD, Ryan DH, Apovain CM, Ard JD, Comuzzie AG, Donato, KA, et al. 2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obese Adults. *Circulation*. 2014 June 24; 129(25 Suppl 2): S102–S138.
2. Anderson JR, Aasprang A, Bergsholm P, Sletteskog N, Vage V, and Natvig GK. Anxiety and Depression in Association with Morbid Obesity: Changes with Improved Physical Health After Duodenal Switch. *Health and Quality of Life Outcomes*. 2010 May 21; 8: 52.
3. Aasprang A, Anderson JR, Vage V, Kolotkin RL, and Natvig GK. Five-year Changes in Health-related Quality of Life After Biliopancreatic Diversion with Duodenal Switch. *Obesity Surgery*. 2013 October; 23(10): 1662-8.
4. Sjostrom L. Review of the Key Results from the Swedish Obese Subjects (SOS) Trial- A Prospective Controlled Intervention Study of Bariatric Surgery. *Journal of Internal Medicine*. 2012 November 19; 273(2).
5. Buchwald H. Consensus Conference Statement Bariatric Surgery for Morbid Obesity: Health Implications for Patients, Health Professionals, and Third-Party Payers. *Surgery for Obesity and Related Diseases* 1. 2005; 371-381.
6. Chang SC, Stoll CRT, Song J, Varela JE, Eagon CJ, and Colditz GA. Bariatric Surgery: An Updated Systematic Review and Meta-analysis. *JAMA Surgery*. 2014 March 1; 149(3): 275-287.
7. van den Hout HC, Smorenberg A, Klempt-Kropp M. Long-term Complications of Bariatric Surgery. *Ned Tijdschr Geneeskd*. 2014; 158:A7559.

### Diet After Weight Loss Surgery

1. Mayo Clinic. Gastric Bypass Diet: What to Eat After the Surgery. 2018 September 21. Retrieved from: <https://www.mayoclinic.org/tests-procedures/gastric-bypass-surgery/in-depth/gastric-bypass-diet/art-20048472>
2. American Society for Metabolic and Bariatric Surgery. Life After Bariatric Surgery. Retrieved from: <https://asmbs.org/patients/life-after-bariatric-surgery>
3. Thorell A, Hagstrom-Toft E. Treatment of Diabetes Prior to and After Bariatric Surgery. *J Diabetes Sci Technol*. 2012 September; 6(5): 1226–1232.



## Pumpkin Roll

Serves 8

This recipe takes a classic holiday dessert and makes it diabetes-friendly! By substituting sugar for artificial sweetener and choosing reduced-fat dairy products, the product has fewer carbohydrates and fats than the original version, but still tastes great.

### Ingredients

#### CAKE:

- ¾ cup egg substitute
- 1 cup granulated artificial sweetener
- 1 cup canned pumpkin
- 1 teaspoon lemon juice
- 1 cup self-rising flour
- 2 teaspoons ground cinnamon
- 1 teaspoon ground nutmeg

#### FILLING:

- 4 ounces reduced fat cream cheese, softened
- 1 ½ cup frozen, light whipped topping, thawed
- 2 tablespoons granulated artificial sweetener

### Instructions:

1. Preheat oven to 350 degrees.
2. For cake, beat egg sub and 1 cup granulated artificial sweetener for 5 minutes in mixing bowl on medium speed of mixer.
3. Stir in pumpkin and lemon juice.
4. Blend in flour and spices until well combined.
5. Line jelly roll pan with waxed paper. Spread batter evenly in pan. Bake in oven for 5-8 minute or until wooden pick comes out clean. Cool 3 minutes in pan and turn out onto clean cloth and roll up from the narrow end.
6. Chill in refrigerator until completely cool.
7. For filling, beat cream cheese, whipped topping and 2 tablespoons of granulated artificial sweetener in mixing bowl on medium speed until smooth and spreadable.
8. Unroll pumpkin roll and remove from cloth. Spread with filling and re-roll. Cover and refrigerate until ready to serve. Slice into pinwheels.

Nutrition Facts per serving: Calories: 148 Total Fat: 5 grams Sodium: 284 milligrams  
Carbohydrates: 22 grams Fiber: 1 gram Protein: 6 grams



Photo by Sarah Sphar;  
<https://creativecommons.org/licenses/by-nd/2.0/legalcode>



# The University of Georgia Cooperative Extension

College of Agricultural and Environmental Sciences / Athens, Georgia 30602-4356

Dear Friend,

*Diabetes Life Lines* is a quarterly publication sent to you by your local county Extension agent.

It is written by an Extension Nutrition and Health Specialist and other health professionals from the University of Georgia. This newsletter brings you the latest information on diabetes self-management, healthy recipes and news about important diabetes-related events.

If you would like more information, please contact your local county Extension Office.

Sincerely,

County Extension Agent

The University of Georgia and Ft. Valley State University, the U.S. Department of Agriculture and counties of the state cooperating. Cooperative Extension, the University of Georgia Colleges of Agricultural and Environmental Sciences and Family and Consumer Sciences, offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, gender or disability.

An Equal Opportunity Employer/Affirmative Action Organization  
Committed to a Diverse Work Force

COOPERATIVE EXTENSION  
U.S. DEPARTMENT OF AGRICULTURE  
THE UNIVERSITY OF GEORGIA  
COLLEGES OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES &  
FAMILY & CONSUMER SCIENCES  
ATHENS, GEORGIA 30602

-----  
OFFICIAL BUSINESS

***Diabetes Life Lines: Your current issue is enclosed***

**U.G.A. ♦ Cooperative Extension ♦ College of Family and Consumer Sciences**



**UNIVERSITY OF GEORGIA**  
**EXTENSION**