

## **Dietary and Nutritional Recommendations For Patients with Gastroparesis**

Gastroparesis, or paralysis of the stomach, refers to a stomach that empties slowly. Gastroparesis is characterized by symptoms from the delayed emptying of food, namely: bloating, nausea, vomiting or feeling full after eating only a small amount of food. Gastroparesis can occur as a result of several conditions, especially in people with diabetes. However, in many individuals with gastroparesis, the cause of the disorder is not known. It is more common in women and can have a major impact on quality of life.

The general principles for treating symptomatic gastroparesis involve several strategies. First, attempts are made to correct fluid and nutritional deficiencies that may have occurred from chronic nausea and vomiting, and/or the inability to eat normally. Second, treatments are given for the unpleasant symptoms that accompany gastroparesis. Third, the underlying cause of gastroparesis, such as diabetes, thyroid disorders, etc., is treated if possible. The treatment of patients with gastroparesis generally relies on dietary modifications, medications that enhance gastric emptying, and medications that reduce nausea and vomiting.

A number of dietary recommendations have been developed based on the understanding of normal stomach emptying of different types of foods. These dietary recommendations are likely to be of greatest benefit to those with mild to moderate disease, but are also tried in patients with more severe gastroparesis to complement other medical treatments. It is recommended that anyone with gastroparesis, but especially those with other medical problems such as diabetes or kidney disease, seek dietary counseling with a dietician to help individualize nutrition therapy and maximize nutritional benefits.

### **Basic Dietary Guidelines for Patients with Gastroparesis:**

- ◆ Small, frequent meals. Reducing the meal size reduces the distention of the stomach from the meal. By eating smaller meals, patients may not feel as full or bloated and the stomach may empty faster. With the reduction in meal size, increasing the number of meals to 4-6 per day is needed to maintain adequate nutritional intake.

- ◆ Avoid foods high in fat. Fat can delay emptying of the stomach. Eating less fat-containing foods will decrease the amount of time food stays in the stomach. However, fat-containing liquids, such as milkshakes, may be tolerated and provide needed calories.
- ◆ A diet low in fiber is suggested. Fiber delays gastric emptying. In addition, fiber may bind together and cause a blockage of the stomach, called a bezoar in some patients.. Examples of high fiber foods that should be avoided include oranges, berries, green beans, potato peels, apples, sauerkraut, and Brussel sprouts. Fiber supplements for treatment of constipation should also be discontinued if possible.
- ◆ Chew food well before swallowing. Patients should avoid foods that may not easily chewed such as broccoli, corn, popcorn, nuts, and seeds. Solid food in the stomach does not empty well. Dental problems, such as missing or broken teeth, may lead to poorly chewed food; this may add to the problem of inadequate breakdown of food into smaller particles in the stomach for passage into the small intestine for absorption.
- ◆ Taking fluids throughout the meal and sitting upright or walking for 1-2 hours after meals may help in the emptying of the meal from the stomach.
- ◆ A daily multivitamin/mineral supplement can be taken if dietary intake is inadequate.

If these measures are ineffective, the patient may be advised to consume the bulk of their meals as semi-solids or liquids, such as puréed foods or soups. . Stomach emptying of liquids is often normal in patients with gastroparesis. Calorie-containing drinks, such as Hawaiian Punch or Hi C, provide fluid and calories, hence are better than water alone. Some options while on a liquid diet include milk, instant breakfast, milkshakes, yogurt, puddings, custard, cereals, and smoothies. To meet the nutritional needs of patients, it may be necessary to supplement the diet with a commercially available liquid nutrient preparation that is low in fiber such as Ensure, Boost, or even baby foods. Blenderized foods prepared by the patient may also be used as a liquid nutrient source. Any food can be blenderized; solid foods will need to be thinned with some type of liquid, such as broth, milk, juice, water. Remember to clean the blender well after each use.

There are quite a few medications that can delay stomach emptying. Ask your doctor if any of the medications you are taking could be slowing down your stomach emptying.

If the gastroparesis is due to diabetes, an important goal is to achieve or maintain good glucose control. This is achieved more easily by frequent monitoring of blood sugar levels and adjustment of insulin. Keeping your blood sugar under control may help stomach emptying. Let your doctor know if your blood sugar runs > 200 on a regular basis.

Patients with kidney disease need to follow additional dietary advice. The dietary restrictions will depend on your kidney doctor's assessment.. Adequate protein is needed for nourishment, but too much may increase a waste product called urea that your kidneys may not be able to get rid of. High sodium (salt) intake can increase blood pressure and fluid retention. Restriction of potassium varies depending on the stage of kidney disease. Generally, one should avoid high potassium foods such as bananas, oranges, kiwi, leafy greens, and broccoli. Kidneys may not be able to remove phosphorous from the blood. High phosphorous foods include dried beans, peas, nuts, and liver.

Patients with chronic symptoms of gastroparesis, despite these attempts at dietary intervention and medication, may develop dehydration and malnutrition. Occasionally, patients need an alternative method to obtain fluid and nutrition. This might involve delivering fluids and nutrients directly into the small intestine, bypassing the stomach, using a jejunostomy tube. In severe cases, intravenous fluids and nutrition may need to be provided.

For more in-depth diet information, go to:

- ◆ University of Virginia Health System Digestive Health Center web site at <http://www.healthsystem.virginia.edu/internet/digestive-health/nutrition/patientedu.cfm>.
- ◆ American Dietetic Association web site their web site at [www.eatright.org](http://www.eatright.org) or by telephone at 1-800-366-1655

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**Table 1: Dietary Recommendations for Gastroparesis**

Eat smaller, more frequent meals  
Eat less fatty foods  
Avoid fiber  
Avoid foods that cannot be chewed well.

**Table 2: Additional Dietary Recommendations for Gastroparesis**

Liquid nutrients are better tolerated over solid food  
Good glucose control in patients with diabetes (aim for blood sugars < 180 mg/dl)  
Avoid medications that can delay stomach emptying such as:  
    Aluminum-containing antacids (Amphojel)  
    Narcotic pain medications (Percocet, Tylenol #3, Tylox, Oxycontin, and others)  
    Anticholinergic agent (Bentyl, Levsin, Elavil, and others)  
    Bulk-forming agents (Metamucil, Perdiem, Fibercon, and others)

**Table 3: Foods that are encouraged**

Breads, Cereals, Crackers, ground or pureed meats  
Vegetables – cooked and, if necessary, blenderized/strained  
Fruits – cooked and, if necessary, blenderized/strained  
Juices, Beverages, Milk products, if tolerated

**Table 4: High fiber foods that should be avoided in gastroparesis**

Fruits - apples, berries, coconuts, figs, oranges, persimmons,  
Vegetables - Brussel sprouts, green beans, green peas, lettuce, potato peels, sauerkraut  
Bran/whole grain cereals  
Nuts and seeds  
Legumes/Dried Beans – baked beans, lentils, soy beans



# A Sample Diet for Patients with Gastroparesis

## Sample Meal Plan for 6 Small Meals

|           |  |
|-----------|--|
| Breakfast | 1 cup cream of wheat cereal<br>½ cup skim milk<br>½ cup grape juice<br>1 scrambled egg   |
| Snack     | 10 ounces of instant breakfast with skim milk  |
| Lunch     | ½ cup vegetable soup<br>½ turkey sandwich<br>½ cup applesauce<br>½ cup milk<br>1 tablespoon mayonnaise                                   |
| Snack     | 10 ounces banana shake made with 1 plain or vanilla yogurt, milk and sugar   |
| Dinner    | 2-3 ounces baked chicken or fish<br>½ cup mashed potatoes<br>1 teaspoon margarine<br>½ cup spinach<br>½ cup milk<br>½ cup fruit cocktail |
| Snack     | ½ cup pudding, custard or gelatin  |

# Gastroparesis

*National Digestive Diseases Information Clearinghouse*



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## What is gastroparesis?

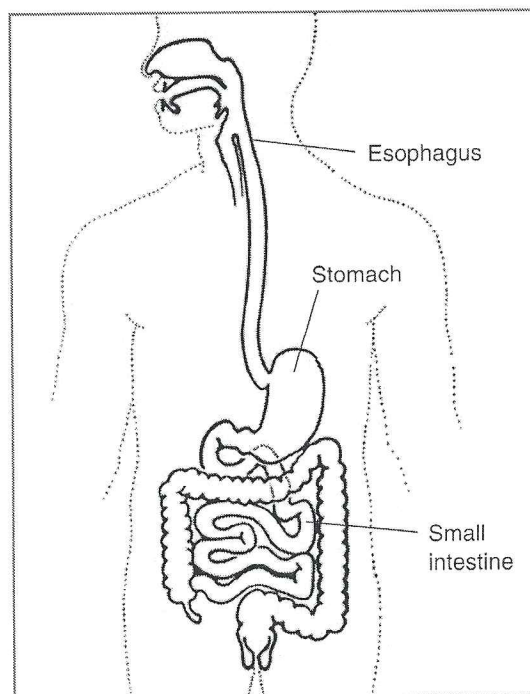
Gastroparesis, also called delayed gastric emptying, is a disorder in which the stomach takes too long to empty its contents. Normally, the stomach contracts to move food down into the small intestine for digestion. The vagus nerve controls the movement of food from the stomach through the digestive tract. Gastroparesis occurs when the vagus nerve is damaged and the muscles of the stomach and intestines do not work normally. Food then moves slowly or stops moving through the digestive tract.

## What causes gastroparesis?

The most common cause of gastroparesis is diabetes. People with diabetes have high blood glucose, also called blood sugar, which in turn causes chemical changes in nerves and damages the blood vessels that carry oxygen and nutrients to the nerves. Over time, high blood glucose can damage the vagus nerve.

Some other causes of gastroparesis are

- surgery on the stomach or vagus nerve
- viral infections
- anorexia nervosa or bulimia
- medications—anticholinergics and narcotics—that slow contractions in the intestine
- gastroesophageal reflux disease



*The digestive system.*

- smooth muscle disorders, such as amyloidosis and scleroderma
- nervous system diseases, including abdominal migraine and Parkinson's disease
- metabolic disorders, including hypothyroidism

Many people have what is called idiopathic gastroparesis, meaning the cause is unknown and cannot be found even after medical tests.



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## What are the symptoms of gastroparesis?

Signs and symptoms of gastroparesis are

- heartburn
- pain in the upper abdomen
- nausea
- vomiting of undigested food—sometimes several hours after a meal
- early feeling of fullness after only a few bites of food
- weight loss due to poor absorption of nutrients or low calorie intake
- abdominal bloating
- high and low blood glucose levels
- lack of appetite
- gastroesophageal reflux
- spasms in the stomach area

Eating solid foods, high-fiber foods such as raw fruits and vegetables, fatty foods, or drinks high in fat or carbonation may contribute to these symptoms.

The symptoms of gastroparesis may be mild or severe, depending on the person. Symptoms can happen frequently in some people and less often in others. Many people with gastroparesis experience a wide range of symptoms, and sometimes the disorder is difficult for the physician to diagnose.

## What are the complications of gastroparesis?

If food lingers too long in the stomach, it can cause bacterial overgrowth from the fermentation of food. Also, the food can harden into solid masses called bezoars that may cause nausea, vomiting, and obstruction in the stomach. Bezoars can be dangerous if they block the passage of food into the small intestine.

Gastroparesis can make diabetes worse by making blood glucose control more difficult. When food that has been delayed in the stomach finally enters the small intestine and is absorbed, blood glucose levels rise. Since gastroparesis makes stomach emptying unpredictable, a person's blood glucose levels can be erratic and difficult to control.

## How is gastroparesis diagnosed?

After performing a full physical exam and taking your medical history, your doctor may order several blood tests to check blood counts and chemical and electrolyte levels. To rule out an obstruction or other conditions, the doctor may perform the following tests:

- **Upper endoscopy.** After giving you a sedative to help you become drowsy, the doctor passes a long, thin tube called an endoscope through your mouth and gently guides it down the throat, also called the esophagus, into the stomach. Through the endoscope, the doctor can look at the lining of the stomach to check for any abnormalities.
- **Ultrasound.** To rule out gallbladder disease and pancreatitis as sources of the problem, you may have an ultrasound test, which uses harmless sound waves to outline and define the shape of the gallbladder and pancreas.
- **Barium x ray.** After fasting for 12 hours, you will drink a thick liquid called barium, which coats the stomach, making it show up on the x ray. If you have diabetes, your doctor may have special instructions about fasting. Normally, the stomach will be empty of all food after 12 hours of fasting.



Gastroparesis is likely if the x ray shows food in the stomach. Because a person with gastroparesis can sometimes have normal emptying, the doctor may repeat the test another day if gastroparesis is suspected.

Once other causes have been ruled out, the doctor will perform one of the following gastric emptying tests to confirm a diagnosis of gastroparesis.

- **Gastric emptying scintigraphy.** This test involves eating a bland meal, such as eggs or egg substitute, that contains a small amount of a radioactive substance, called radioisotope, that shows up on scans. The dose of radiation from the radioisotope is not dangerous. The scan measures the rate of gastric emptying at 1, 2, 3, and 4 hours. When more than 10 percent of the meal is still in the stomach at 4 hours, the diagnosis of gastroparesis is confirmed.
- **Breath test.** After ingestion of a meal containing a small amount of isotope, breath samples are taken to measure the presence of the isotope in carbon dioxide, which is expelled when a person exhales. The results reveal how fast the stomach is emptying.
- **SmartPill.** Approved by the U.S. Food and Drug Administration (FDA) in 2006, the SmartPill is a small device in capsule form that can be swallowed. The device then moves through the digestive tract and collects information about its progress that is sent to a cell phone-sized receiver worn around your waist or neck. When the capsule is passed from the body with the stool in a couple of days, you take the receiver back to the doctor, who enters the information into a computer.

## How is gastroparesis treated?

Treatment of gastroparesis depends on the severity of the symptoms. In most cases, treatment does not cure gastroparesis—it is usually a chronic condition. Treatment helps you manage the condition so you can be as healthy and comfortable as possible.

## Medication

Several medications are used to treat gastroparesis. Your doctor may try different medications or combinations to find the most effective treatment. Discussing the risk of side effects of any medication with your doctor is important.

- **Metoclopramide (Reglan).** This drug stimulates stomach muscle contractions to help emptying. Metoclopramide also helps reduce nausea and vomiting. Metoclopramide is taken 20 to 30 minutes before meals and at bedtime. Side effects of this drug include fatigue, sleepiness, depression, anxiety, and problems with physical movement.
- **Erythromycin.** This antibiotic also improves stomach emptying. It works by increasing the contractions that move food through the stomach. Side effects include nausea, vomiting, and abdominal cramps.
- **Domperidone.** This drug works like metoclopramide to improve stomach emptying and decrease nausea and vomiting. The FDA is reviewing domperidone, which has been used elsewhere in the world to treat gastroparesis. Use of the drug is restricted in the United States.



- **Other medications.** Other medications may be used to treat symptoms and problems related to gastroparesis. For example, an antiemetic can help with nausea and vomiting. Antibiotics will clear up a bacterial infection. If you have a bezoar in the stomach, the doctor may use an endoscope to inject medication into it to dissolve it.

### **Dietary Changes**

Changing your eating habits can help control gastroparesis. Your doctor or dietitian may prescribe six small meals a day instead of three large ones. If less food enters the stomach each time you eat, it may not become overly full. In more severe cases, a liquid or pureed diet may be prescribed.

The doctor may recommend that you avoid high-fat and high-fiber foods. Fat naturally slows digestion—a problem you do not need if you have gastroparesis—and fiber is difficult to digest. Some high-fiber foods like oranges and broccoli contain material that cannot be digested. Avoid these foods because the indigestible part will remain in the stomach too long and possibly form bezoars.

### **Feeding Tube**

If a liquid or pureed diet does not work, you may need surgery to insert a feeding tube. The tube, called a jejunostomy, is inserted through the skin on your abdomen into the small intestine. The feeding tube bypasses the stomach and places nutrients and medication directly into the small intestine. These products are then digested and delivered to your bloodstream quickly. You will receive special liquid food to use with the tube. The jejunostomy is used only when gastroparesis is severe or the tube is

necessary to stabilize blood glucose levels in people with diabetes.

### **Parenteral Nutrition**

Parenteral nutrition refers to delivering nutrients directly into the bloodstream, bypassing the digestive system. The doctor places a thin tube called a catheter in a chest vein, leaving an opening to it outside the skin. For feeding, you attach a bag containing liquid nutrients or medication to the catheter. The fluid enters your bloodstream through the vein. Your doctor will tell you what type of liquid nutrition to use.

This approach is an alternative to the jejunostomy tube and is usually a temporary method to get you through a difficult period with gastroparesis. Parenteral nutrition is used only when gastroparesis is severe and is not helped by other methods.

### **Gastric Electrical Stimulation**

A gastric neurostimulator is a surgically implanted battery-operated device that releases mild electrical pulses to help control nausea and vomiting associated with gastroparesis. This option is available to people whose nausea and vomiting do not improve with medications. Further studies will help determine who will benefit most from this procedure, which is available in a few centers across the United States.

### **Botulinum Toxin**

The use of botulinum toxin has been associated with improvement in symptoms of gastroparesis in some patients; however, further research on this form of therapy is needed.



## What if I have diabetes and gastroparesis?

The primary treatment goals for gastroparesis related to diabetes are to improve stomach emptying and regain control of blood glucose levels. Treatment includes dietary changes, insulin, oral medications, and, in severe cases, a feeding tube and parenteral nutrition.

### Dietary Changes

The doctor will suggest dietary changes such as six smaller meals to help restore your blood glucose to more normal levels before testing you for gastroparesis. In some cases, the doctor or dietitian may suggest you try eating several liquid or pureed meals a day until your blood glucose levels are stable and the symptoms improve. Liquid meals provide all the nutrients found in solid foods, but can pass through the stomach more easily and quickly.

### Insulin for Blood Glucose Control

If you have gastroparesis, food is being absorbed more slowly and at unpredictable times. To control blood glucose, you may need to

- take insulin more often or change the type of insulin you take
- take your insulin after you eat instead of before
- check your blood glucose levels frequently after you eat and administer insulin whenever necessary

Your doctor will give you specific instructions for taking insulin based on your particular needs.

## Hope Through Research

The National Institute of Diabetes and Digestive and Kidney Diseases' Division of Digestive Diseases and Nutrition supports basic and clinical research into gastrointestinal motility disorders, including gastroparesis. Among other areas, researchers are studying whether experimental medications can relieve or reduce symptoms of gastroparesis, such as bloating, abdominal pain, nausea, and vomiting, or shorten the time the stomach needs to empty its contents following a meal.

### Points to Remember

- Gastroparesis is the result of damage to the vagus nerve, which controls the movement of food through the digestive system. Instead of moving through the digestive tract normally, the food is retained in the stomach.
- Gastroparesis may occur in people with type 1 diabetes or type 2 diabetes. The vagus nerve becomes damaged after years of high blood glucose, resulting in gastroparesis. In turn, gastroparesis contributes to poor blood glucose control.
- Symptoms of gastroparesis include early fullness, abdominal pain, stomach spasms, heartburn, nausea, vomiting, bloating, gastroesophageal reflux, lack of appetite, and weight loss.
- Gastroparesis is diagnosed with tests such as x rays, manometry, and gastric emptying scans.
- Treatment includes dietary changes, oral medications, adjustments in insulin injections for people with diabetes, a jejunostomy tube, parenteral nutrition, gastric neurostimulators, or botulinum toxin.



## For More Information

### American College of Gastroenterology

P.O. Box 342260  
Bethesda, MD 20827-2260  
Phone: 301-263-9000  
Internet: [www.acg.gi.org](http://www.acg.gi.org)

### American Diabetes Association

1701 North Beauregard Street  
Alexandria, VA 22311  
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Email: [AskADA@diabetes.org](mailto:AskADA@diabetes.org)  
Internet: [www.diabetes.org](http://www.diabetes.org)

### International Foundation for Functional Gastrointestinal Disorders

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Milwaukee, WI 53217  
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Internet: [www.iffgd.org](http://www.iffgd.org)

You may also find additional information on this topic using the following databases:

The NIDDK Reference Collection is a collection of thousands of materials produced for patients and health care professionals, including fact sheets, brochures, and audiovisual materials. Visit [www.catalog.niddk.nih.gov/resources](http://www.catalog.niddk.nih.gov/resources).

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## National Digestive Diseases Information Clearinghouse

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