



GASTROPARESIS

Gastroparesis, also called delayed gastric emptying, is a disorder in which the stomach takes too long to empty its contents. The average time for the normal stomach to empty its contents into the small intestine is 3 hours. The stomach has to grind the ingested foods into an apple sauce like slime which has a semi-solid consistency. The vagus nerve controls the movement of food from the stomach through the digestive tract. Gastroparesis occurs when the vagus nerve is damaged and/or the muscles of the stomach do not work normally.

What causes gastroparesis? The most common cause of gastroparesis is post infectious, it occurs after a stomach or intestinal infection. Usually the infection is gone by the time the symptoms are felt. Some people with diabetes can get vagus nerve damage which can cause gastroparesis. This is not very common in diabetics and is usually 6-8 years after the initial diagnosis; furthermore, it is often intermittent among diabetics.

Common cause of gastroparesis:

- Surgery on the stomach or vagus nerve (antrectomy / vagotomy)
- Viral infections
- Anorexia nervosa or bulimia
- Medications – anticholinergics and narcotics – that slow contractions in the intestine
- Gastroesophageal reflux disease
- Smooth muscle disorders, such as amyloidosis and scleroderma
- Nervous system diseases, including abdominal migraine and Parkinson's disease
- Metabolic disorders, including hypothyroidism
- Chronic pancreatitis

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

What are the symptoms of gastroparesis?

Signs and symptoms of gastroparesis are:

- Abdominal bloating
- Nausea
- Abdominal distention: visible increased abdominal girth
- Heartburn
- Pain and/or pressure in the upper abdomen
- Vomiting of undigested food-sometimes several hours or days 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



- High and low blood glucose levels
- Lack of appetite
- Gastroesophageal reflux
- Spasms in the stomach area
- Flatulence and irregular bowel movements

Eating solid foods, high-fiber foods, such as raw or uncooked fruits and vegetables, fatty foods, cheesy, buttery, fried, fast foods or drinks that are 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. Many patients complain of fatigue and tiredness especially at the end of the day. Bloating and fullness are quite common; however, some patients may present with foul smelling flatulence and/or excessive burping.

What are the complications of gastroparesis?

If food lingers in the stomach, a common laboratory finding is anemia which is due to the malabsorption of iron. Abdominal pain, acid reflux and vomiting are not uncommon, but bacterial overgrowth from the fermentation of food is rarely seen. 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. Some medications may not be properly absorbed with the delay in stomach emptying.

How is gastroparesis diagnosed?

After performing a full physical examination 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 abnormalities such as ulcers, lymphoma, cancer or obstruction.
- **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.

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

- **Gastric emptying scintigraphy.** This test involves eating a solid meal, such as eggs or oatmeal, which contains a small amount of radioactive substance, called a radioisotope, which shows up on a scanner placed over



your abdomen. The dose of radiation from the isotope is not dangerous. The scan measures the rate of gastric emptying at 90 minutes. When more than 50 percent of the meal is still in the stomach at 90 minutes, the diagnosis of gastroparesis is confirmed. This is not recommended in pregnancy and may not be covered by your medical insurance. It can miss the diagnosis if the test is done on a day when the stomach is emptying normally or if the meal is too small or too easily emptied.

- **Gastroduodenal manometry.** In this test, your doctor threads a pressure-sensitive plastic tube down your throat and into your stomach and small intestine. The tube is connected to a computer that monitors the strength, frequency, and coordination of muscle contractions before and after you eat. Gastroduodenal manometry can distinguish among different motility disorders, but it isn't available everywhere and usually isn't necessary to diagnose gastroparesis.

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 manage the condition so you can be as healthy and comfortable as possible. The most effective treatment for gastroparesis is dietary changes.

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.
- **Pancreatic enzymes.** These can be used and may be quite effective and have few, if any, side effects.
- **Cisapride.** Commonly used to treat severe cases of gastroesophageal reflux, Cisapride has been linked to rare cases of fatal heart arrhythmias and is not appropriate for anyone with heart disease such as arrhythmias or kidney problems. Cisapride also has the potential to cause serious drug interactions especially with Erythromycin, Diflucan, grapefruit juice, etc. The drug has limited availability in the United States because of these risks.
- **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 infec-



tion. 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. This is generally the most effective method to achieve symptom relief. Your doctor may recommend three fairly small meals a day and nothing in between meals; i.e. snacks. 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.

- Avoid greasy foods, fast foods, Chinese foods
- Avoid fatty foods (no cheesy, buttery, fried foods)
- Avoid red meats, salami, sausages
- Avoid salads, lettuce, cabbage, etc.
- Avoid raw foods: no raw vegetables, no fresh or raw fruit, nothing uncooked
- Avoid oatmeal and whole milk
- Avoid large meals
- Avoid eating in between meals
- Avoid eating for 4 hours before going to bed

What can you eat?

- Baby food, soft foods, smoothies, Jamba juice (no wheat grass)
- Sandwiches, deli meats (no salami or sausage), chicken and turkey that's softer
- Breads, pancake, bagels, breakfast cereals except oatmeal (reduced fat milk only)
- Apple sauce, pudding
- Low-fat cottage cheese, yogurt
- Soups (without cheesy or fatty contents)
- Well-cooked veggies (soft to the touch)
- Rice without butter
- Pasta (without cheesy or oily Alfredo sauce)

The doctor may recommend that you avoid high-fat and high-fiber foods. Fat naturally slows digestion – a problem you don't need if you have gastroparesis- and fiber is difficult to digest. Some high-fiber foods like oranges, carrots, 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.



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. This is not approved by the FDA so it is only available as a humanitarian use and had to be classified as experimental. The manufacturer Medtronic may have more information on centers and physicians that are doing this surgery.

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. This is not widely used.

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

Liquid meals provide all the nutrients found in solid foods, but can pass through the stomach more easily and quickly. For patients with severe nausea and abdominal pains and pressure that are not improved with the above diet, hospitalization or a trial of juices and clear liquids for 48 hours is reasonable. Most patients with these symptoms improve after a 2 week trial of the above diet and this may be a quick way of diagnosing gastroparesis.

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.

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. The vagus nerve becomes damaged after years of



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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, flatulence, burping, and weight loss.
- Gastroparesis is diagnosed with tests such as EGD, manometry, and gastric emptying studies.
- 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

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