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## GASTROPARESIS

Gastroparesis is a disorder in which the stomach takes too long to empty its contents, a condition in which the muscles in the wall of your stomach don't function normally. Ordinarily, the **vagus nerve** controls the movement of food through the digestive tract. If the vagus nerve is damaged, the muscles in your stomach and intestines work poorly, or not at all, preventing your stomach from emptying properly. The movement of food is slowed or stopped. This can interfere with digestion, cause nausea and vomiting, and play havoc with blood sugar levels and nutrition. No available treatment can cure gastroparesis. Dietary changes and certain medications sometimes help control symptoms of gastroparesis, but they're not effective in every case.

Gastroparesis is most often a complication of type 1 diabetes; at least 20 percent of people with type 1 diabetes develop gastroparesis. It also occurs in people with type 2 diabetes, but less often. Diabetes can damage the vagus nerve if blood glucose (sugar) levels remain high over a long period of time. High blood glucose causes chemical changes in nerves and damages the blood vessels that carry oxygen and nutrients to the nerves.

### Signs and symptoms

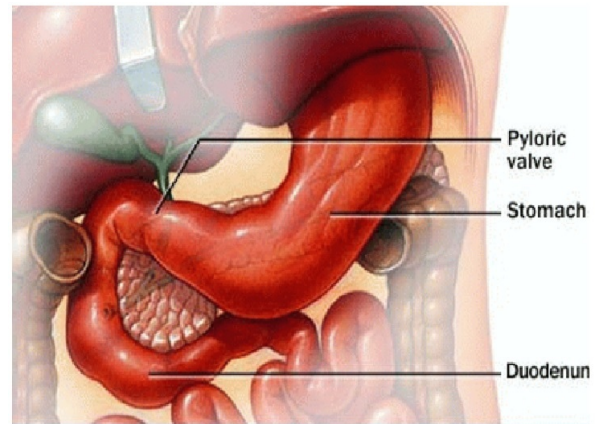
For most people, nausea and vomiting are the most common signs and symptoms of gastroparesis. Vomiting usually occurs several hours after you've eaten when your stomach is full of undigested food and normal stomach secretions. Sometimes, accumulated stomach enzymes and acids can cause vomiting even if you don't eat. Also, because different stomach muscles empty solid food and liquids, you may have problems with solids only, with both solids and liquids, or, in rare cases, with liquids alone. In addition to nausea and vomiting, gastroparesis often causes:

- A feeling of fullness after just a few bites
- Abdominal bloating
- Heartburn or gastroesophageal reflux
- Changes in blood sugar levels
- Lack of appetite
- Weight loss and malnutrition

### Causes

Your stomach is a muscular sac located in the upper middle of your abdomen, just below your ribs. For an average adult, it's about the size of a small melon, but can stretch to hold nearly 1 gallon of food and liquid. The stomach folds in on itself when it's empty and expands when you eat or drink.

The stomach walls are lined with three layers of powerful muscles that mix food with enzymes and acids produced by glands in the stomach's inner lining. Once the food is thoroughly pulverized—reduced to the consistency of pudding—strong muscular contractions (*peristaltic waves*) push it toward the *pyloric valve*, which leads to the upper portion of your small intestine (*duodenum*), where the real work of digestion takes place. The valve opens just enough to release a scant eighth of an ounce of food at a time.



It may take three to four hours for your stomach to empty after you eat, depending on your diet; foods high in fat can increase the emptying time considerably. The slowness of the process ensures that food is thoroughly mixed with digestive juices for the best possible absorption.

### Why the stomach stops working

Perhaps the most important nerve in the body, the *vagus nerve*, stretches from the brainstem to the colon. It helps orchestrate the complex microcircuits in the digestive tract, including signaling the smooth muscles in the stomach to contract in peristaltic waves, usually at the rate of about three contractions a minute. When these contractions slow or stop completely, food doesn't move out of the stomach into the duodenum as it should.

Damage to the vagus nerve is the leading cause of gastroparesis, although the disorder can also result from damage to the stomach muscles themselves. Factors that can damage nerves or muscles in the stomach include:

- **Diabetes.** Type 1 or type 2 diabetes is the most common cause of gastroparesis. Over time, high blood glucose levels and their metabolic effects can damage the vagus nerve and disrupt its normal functioning. Once gastroparesis develops, diabetes often becomes worse because erratic stomach emptying and poor absorption make blood sugar levels harder to control.
- **Surgery.** Operations involving the esophagus, the stomach or the upper part of the small intestine can injure the vagus nerve and lead to gastroparesis.
- **Medications.** Many commonly prescribed drugs slow stomach emptying. Chief among these are narcotic pain medications, tricyclic antidepressants, calcium channel blockers, antacids, some high blood pressure medications. Symptoms usually improve once the medication is stopped.
- **Cancer treatments.** Nausea and vomiting are common temporary side effects of chemotherapy. But some people receiving high doses of chemotherapy drugs may develop intractable nausea and vomiting as a result of chemotherapy-induced gastroparesis. In that case, problems with the stomach being able to move food (motility problems) problems originate in the nausea center of the brainstem, just above the spinal cord. Radiation therapy to the chest and abdomen can also cause gastroparesis.
- **Other disorders.** A number of other medical conditions can cause gastroparesis, including anorexia and bulimia, the connective tissue disease *scleroderma*, Parkinson's disease, hypothyroidism.

### Complications

Gastroparesis can cause several complications, such as:

- **Weight loss and malnutrition.** These problems can occur when delayed stomach emptying affects your body's ability to digest and absorb nutrients. Also contributing to poor absorption is bacterial overgrowth—the explosive growth of harmful microorganisms that normally inhabit the gut. These organisms usually are kept in check by beneficial bacteria, but fermenting food in the stomach disrupts the balance of good and bad bacteria.
- **Bezoars.** Undigested food in your stomach can harden into a bezoar, a solid mass that's similar to a hairball in a cat. Bezoars are likely to cause nausea and vomiting and may be life-threatening if they prevent food from passing into the small intestine.
- **Blood sugar fluctuations.** Although gastroparesis doesn't cause diabetes, inconsistent food absorption can cause erratic changes in blood sugar levels, which makes diabetes worse. In turn, poor control of blood sugar levels makes gastroparesis worse.

## Treatment

Diet remains one of the cornerstones of gastroparesis treatment, and most doctors recommend specific dietary changes.

1. **Small, frequent meals.** Reducing the meal size reduces the distention of the stomach from the meal. By eating smaller, more frequent meals, you may not feel as full or bloated, and the stomach may empty faster. Chew all food well before swallowing.
2. **Low-fat foods.** Fat slows digestion. Eating less fat-containing foods will decrease the amount of time food stays in your stomach.
3. **Low-fiber foods.** Fiber is difficult to digest. In addition, fiber may bind together and cause a blockage of the stomach, called a 'bezoar.' Fibrous foods should be cooked until soft and chewed well. Additionally, fiber supplements for treatment of constipation should also be discontinued, if possible.
4. **Taking fluids through the meal** and sitting upright or walking for 1-2 hours after meals may help in the emptying of the meal from the stomach. Additionally, the vomiting caused by gastroparesis can lead to dehydration so its especially important to drink plenty of water. Taking small sips or sucking on ice chips may make it easier to keep water down when you're nauseous.
5. **Foods simply prepared are advised.** The more acceptable methods of cooking would include baking, broiling, boiling/poaching/steaming and roasting.
6. **Pureed and liquid foods is a good option.** Almost any food can be pureed, including cooked fruits and vegetables, poached or baked chicken and fish(add chicken or fish broth to achieve a workable consistency), cereals (blend with milk or rice milk for flavor and texture), and even pasta dishes.
7. **A daily multivitamin and/or mineral supplement** might be recommended by your physician if dietary intake is inadequate.

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*Weight★No★More<sup>SM</sup> Diet Center provides this reference sheet for information purposes only. The degree of gastroparesis may range from severe and long-standing, to mild and easily corrected. We encourage you to see your physician for appropriate diagnosis and protocol.*