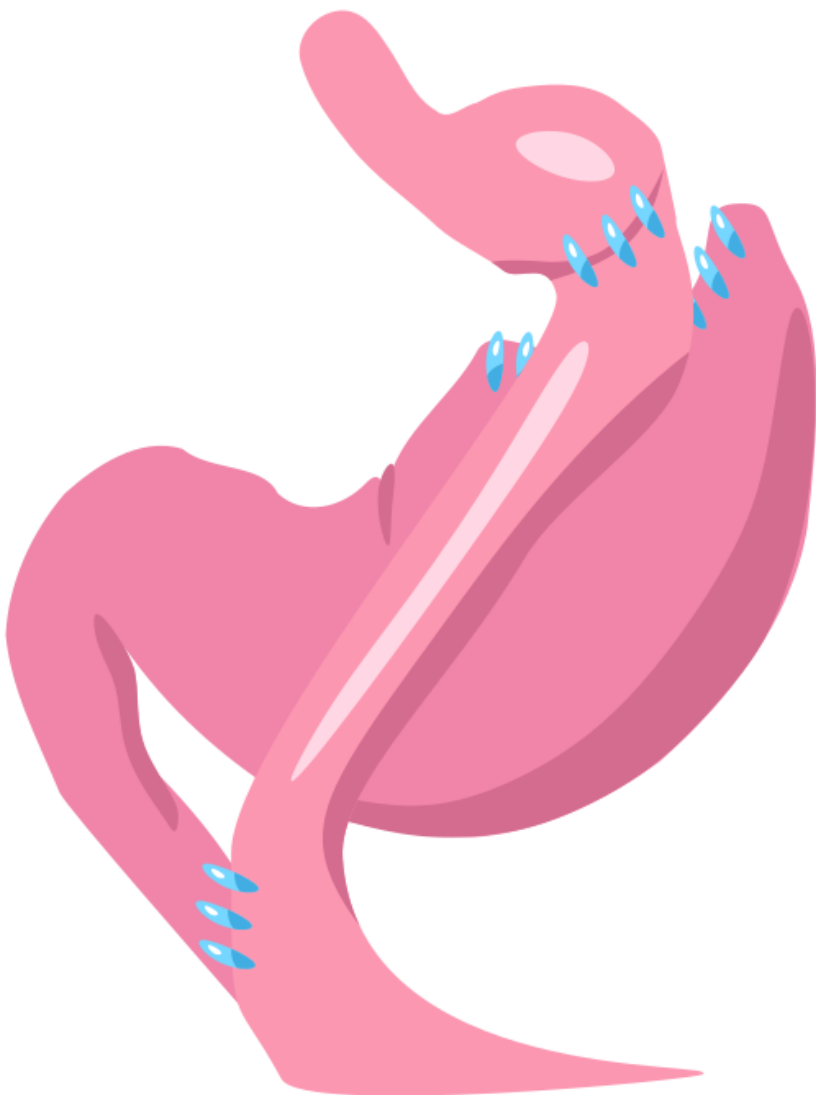


Dumping Syndrome: Causes and Treatment

[See online here](#)

Dumping syndrome, or “too rapid drainage of the stomach,” is a condition most often found in patients post-gastrectomy. Symptoms of this condition can be separated into vasomotor symptoms (such as palpitations, flushing or diaphoresis) and abdominal symptoms (such as diarrhea, nausea or cramps). The symptoms often resolve within several months. Medication is often helpful and surgical intervention is rarely necessary.



Background and Definitions

The stomach is hollow and muscular, and is the most dilated part of the gastrointestinal system. It is situated between the esophagus and duodenum (the first part of the small intestine). The stomach is divided into 3 main sections, each of which has a role to play in

the digestion of food: the cardia, the fundus and body, and the pylorus. Food enters the stomach from the esophagus through the cardia, which is the most proximal part of the stomach.

The fundus and body are a “storage tank” for consumed meals. The body churns the food and mixes it with digestive enzymes. The pylorus then systematically discharges the food into the duodenum. The pylorus is surrounded by a muscular valve, the pyloric sphincter, which controls the flow of food into the duodenum. Gastric movements are controlled by **myogenic, hormonal, and neural** activity.

In adults, the **stomach** can store approximately 2 liters of food content due to its greater distensibility. Any change in the gastric structure (eg, **gastrectomy**), hormonal status, or myogenic or neural activity can have significant effects on the gastric storage tank and pyloric sphincter function. This results in a constellation of symptoms that occur after a meal, called **dumping syndrome** or **rapid drainage of the stomach**. The condition was first described by Hertz in 1913. It is most common in patients with gastrectomy.

Pathophysiology

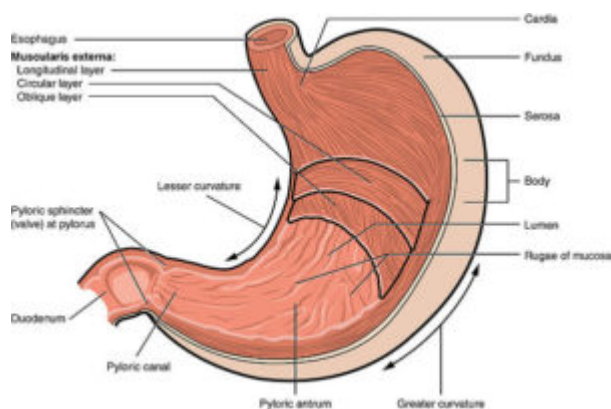


Image: The anatomy of the stomach. By: OpenStax College - Anatomy & Physiology, Connexions Web site. <http://cnx.org/content/col11496/1.6/>, Jun 19, 2013. License: [CC BY 3.0](https://creativecommons.org/licenses/by/3.0/)

The stomach acts as a food **reservoir**, beginning the **digestion** process by secreting gastric acid and enzymes and then grinding the food into smaller portions (around 1-2 mm) through organized muscular contractions (see image). This partially digested food then passes through the pylorus into the duodenum.

The pyloric sphincter ensures that only small food particles gradually pass into the duodenum so as not to overload the small intestine’s ability to properly digest and absorb food.

Gastric surgeries often reduce the storage capacity of the stomach, remove the gastric glands, and damage the pylorus so that it becomes unable to control the rate of passage of food into the duodenum, causing the stomach to empty rapidly. This **increased gastric emptying** is one of the main symptoms of dumping syndrome.

Epidemiology

In the United States, approximately **10%-40%** of patients who have undergone gastric surgery are diagnosed with dumping syndrome, with 5% of the cases exhibiting severe

symptoms. The frequency of dumping syndrome has been reported to be approximately 10%–14% in patients who have undergone **vagotomy surgery** and 14%–20% in patients who have a **partial gastrectomy**.

Reductions in the need for elective gastric surgery have led to a decline in the frequency of postgastrectomy syndromes. Since the early 2010s, gastric surgery has been reduced by about 30% through the use of newer drugs such as **proton pump inhibitors** and **anti-histamine 2**, along with efficacious eradication therapy for *Helicobacter pylori*. These have reduced the cases of peptic ulcers and hence the need for gastric surgeries, leading to a drastic decrease in the occurrence of this syndrome.

Clinical Features

Early Symptoms

Early dumping syndrome occurs due to rapid gastric emptying. Hyperosmolar food rapidly enters the small intestine, overwhelming its digestive and absorptive capabilities. Food contents also cause water to shift from cells into the intestinal lumen. Patients with early dumping syndrome often present with the following symptoms 30–60 minutes after a meal:

- Diarrhea
- Nausea
- Epigastric fullness
- Abdominal cramps
- Borborygmi
- Fatigue
- Faintness
- Syncope
- Flushing
- Headache
- [Palpitations](#)

Late Symptoms

Late dumping syndrome occurs due to reactive hypoglycemia that occurs 1–3 hours after a meal. As food containing carbohydrates quickly passes into the small intestine and is absorbed, hyperglycemia occurs, leading to a rapid secretion of insulin. This leads to a hyperinsulinemic state, which remains for a longer period of time than hyperglycemia and is responsible for hypoglycemia and the following symptoms:

- Perspiration
- Shivering
- Hunger
- Decreased consciousness
- Tiredness and fatigue

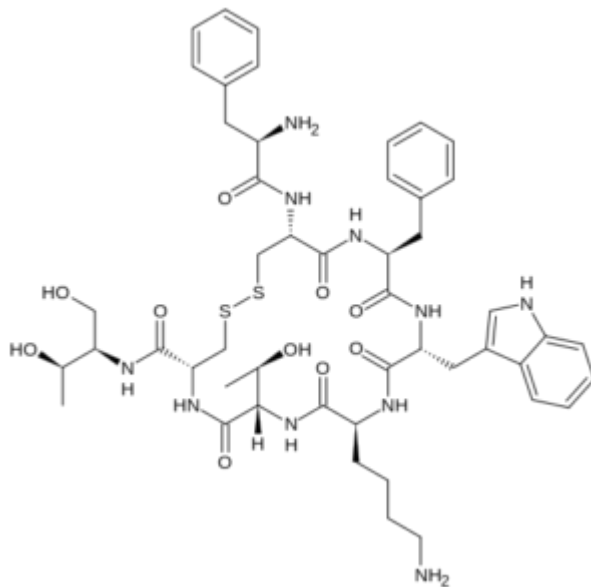
Management

Dumping syndrome can be managed in a number of ways, the most important of which are lifestyle and dietary modifications. The patient should be advised to eat frequent but small meals. Sugar content (carbohydrates) and fluid/water intake should be reduced

during meals.

Medical options that have shown good results in the management of dumping syndrome include the following:

- **Acarbose:** an alpha-glycoside hydrolase inhibitor that decreases the incidence of dumping syndrome by delaying carbohydrate absorption and reducing the time between hyperglycemia and the release of insulin.
- **Octreotide:** a somatostatin analog that decreases dumping syndrome mainly by inhibiting the release of insulin and other gastrointestinal hormones that delay gastric emptying and small intestinal transit time (see image). It further induces a fasting intestinal pattern and causes splanchnic vasoconstriction.



[Image:](#) Structural diagram of octreotide, By Fvasconcellos.
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Surgical intervention options that can help manage dumping syndrome include the following:

- Stomal revision
- Conversion of Billroth II to Billroth I anastomoses
- Pyloric reconstruction
- Jejunal interposition
- Roux-en-Y conversion
- Laparoscopic conversion

References

Hertz AF. IV. The Cause and Treatment of Certain Unfavorable After-effects of Gastroenterostomy. *Ann Surg.* 1913 Oct. 58(4):466-72.

[Dumping Syndrome](#) via [medscape.com](#)

[Dumping syndrome](#) via [mayoclinic.org](#)

[Dumping Syndrome](#) via [webmd.com](#)

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