

# THE Stomach

**1 Esophagus**  
The esophagus is a muscular tube that links the throat to the stomach.

**2 Lower Esophageal Sphincter**  
A specialized ring of muscle at the bottom of the esophagus called the lower esophageal sphincter (LES) opens to allow food to pass into the stomach and then quickly closes to prevent stomach contents from flowing back into the esophagus.

**3 Fundus**  
The fundus stores gas produced during digestion. It typically doesn't store any food; however, it can if the stomach is very full.

**4 Longitudinal muscle layer**

**5 Circular muscle layer**

**6 Oblique muscle layer**

**7 Body**  
The body's volume is ~50mL when empty. Food is stored in here until it is ready to move into the small intestine. Eating triggers receptive relaxation that allows the stomach to expand to ~1L. Consuming more than 1L of food can cause over-distension, creating a feeling of fullness and discomfort.

**8 Mucosa**

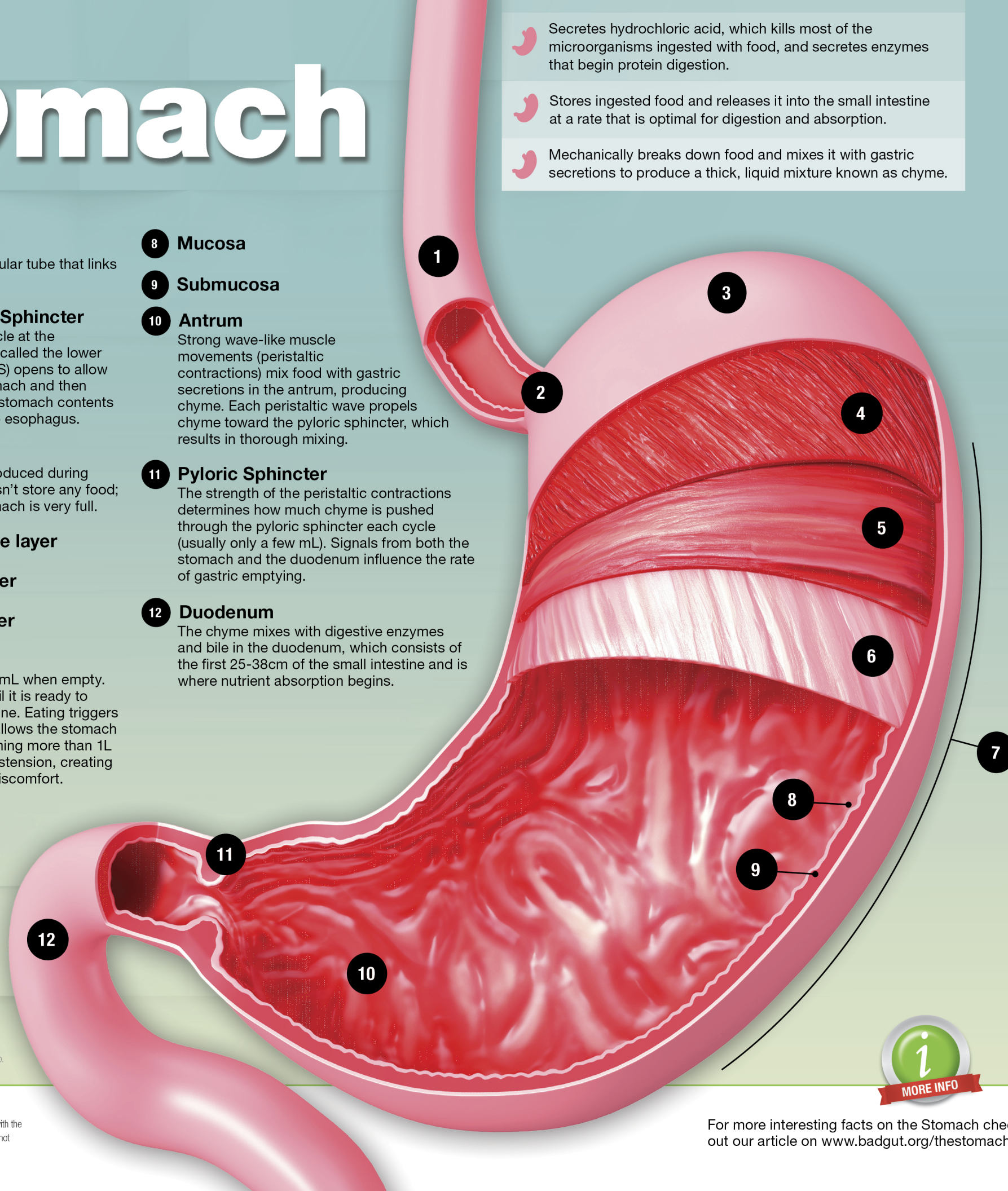
**9 Submucosa**

**10 Antrum**  
Strong wave-like muscle movements (peristaltic contractions) mix food with gastric secretions in the antrum, producing chyme. Each peristaltic wave propels chyme toward the pyloric sphincter, which results in thorough mixing.

**11 Pyloric Sphincter**  
The strength of the peristaltic contractions determines how much chyme is pushed through the pyloric sphincter each cycle (usually only a few mL). Signals from both the stomach and the duodenum influence the rate of gastric emptying.

**12 Duodenum**  
The chyme mixes with digestive enzymes and bile in the duodenum, which consists of the first 25-38cm of the small intestine and is where nutrient absorption begins.

- Secretes hydrochloric acid, which kills most of the microorganisms ingested with food, and secretes enzymes that begin protein digestion.
- Stores ingested food and releases it into the small intestine at a rate that is optimal for digestion and absorption.
- Mechanically breaks down food and mixes it with gastric secretions to produce a thick, liquid mixture known as chyme.



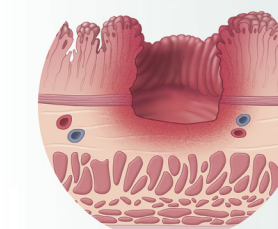
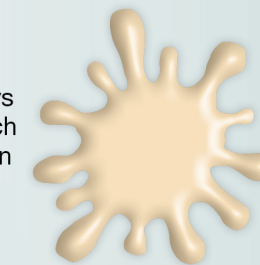
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## Interesting Facts About the Stomach



**Did you know?** Just thinking about tasting, smelling, chewing, and swallowing food increases gastric secretions before you even eat anything!

**Stomach acid** is very acidic and contains enzymes that break down proteins, so at least every three days a new protective layer of mucus covering the stomach lining forms. Without it, the gastric juices would begin to macerate your stomach! Amazingly, the stomach secretes 2L of gastric juice every day.



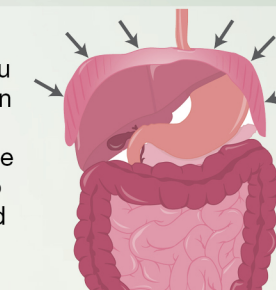
A **peptic ulcer** is a sore in the lining of the stomach (gastric ulcer) or duodenum (duodenal ulcer). Most ulcers result from infection with bacteria called *Helicobacter pylori*, but another common cause is non-steroidal anti-inflammatory drugs such as ibuprofen and aspirin. Stress and spicy food do NOT cause ulcers.

**Emotions** can influence gastric motility. Depending on the person, sadness and fear tend to decrease motility whereas anger and aggression tend to increase it. Intense pain in any part of the body inhibits motility throughout the digestive tract.



**Did you know?** The stomach only absorbs certain medications (like aspirin) and small amounts of alcohol.

**Vomiting** is not a result of reverse peristalsis as you might expect. The force comes from the contraction of the respiratory muscles, (mainly the diaphragm) and the abdominal muscles. The brain signals to the stomach, esophagus, and associated sphincters to relax, allowing the gastric contents to travel upward and out.



In 1868, Adolf Kussmaul, of Germany, performed what historians believe to be the first esophago-gastroscopy on a professional sword-swallower. This insightful choice of patient allowed him to complete the procedure with an inflexible device on someone who was used to having uncomfortable objects in his upper GI tract!



For more interesting facts on the Stomach check out our article on [www.badgut.org/thestomach](http://www.badgut.org/thestomach)