

General Disorders of the Gastrointestinal Tract

+ Vomiting

- Vomiting is due to excessively irritation, overdistension, or even increase excitability of stomach.
- The sensory signals : vagal and sympathetic afferent nerve fibers vomiting center.(brain stem)
- Motor impulses that cause the actual vomiting are transmitted from the vomiting center
- To the Upper GIT by way of the 5th, 9th, 10th, and 12th cranial nerves
- To the Lower GIT through Vagal and Sympathetic nerves.
- To the Diaphragm and abdominal muscles through Spinal nerves.

⦿ Antiperistalsis

Occurs often many minutes before vomiting appears.

Antiperistalsis means peristalsis up the digestive tract rather than downward.

Begins in the ileum, and the antiperistalsis wave travels backward up the intestine at a rate of **2 to 3 cm/sec** this process can actually push a large share of the lower small intestine contents all the way back to the duodenum and stomach within **3 to 5 minutes**. Then, as these upper portions of the GIT, especially the duodenum, become overly distended, this distention becomes the exciting factor that initiates the actual vomiting act.

Vomiting Act

1- The first effects are

- A deep breath,
- Raising of the hyoid bone and larynx to pull the Upper Esophageal Sphincter Open.
- Closing of the glottis to prevent vomitus flow into the lung.
- Lifting up the soft palate to close the posterior nares.

2-Next comes a strong downward contraction of the diaphragm along with simultaneous contraction of all the abdominal wall muscles. This squeezes the stomach between the diaphragm and the abdominal muscles, building the intragastric pressure to a high level.

3-Finally, the lower esophageal sphincter relaxes completely, allowing expulsion of the gastric contents upward through the esophagus.

Chemoreceptor Trigger Zone

- A small area located bilaterally on the floor of the fourth ventricle.
- Electrical stimulation of this area can initiate vomiting.
- Administration of certain drugs, including apomorphine, morphine, and some digitalis derivatives.
- Motion Sickness : The motion stimulates receptors in the vestibular labyrinth of the inner ear, and from here impulses are transmitted mainly by way of the brain stem *vestibular nuclei into the cerebellum*, then to the CTZ, and finally to the *vomiting center* to cause vomiting.

Nausea

-  Is the conscious recognition of subconscious excitation in an area of the medulla closely associated with or part of the vomiting center caused by
 - Irritative impulses coming from the GIT
 - Impulses that originate in the lower brain associated with motion sickness.
 - Impulses from the cerebral cortex to initiate vomiting.
-  Vomiting occasionally occurs without the prodromal sensation of nausea, indicating that only certain portions of the vomiting center are associated with the sensation of nausea. .

Gastrointestinal Obstruction

Causes

- **Cancer.**
- **Adhesions.**
- **Spasm of a segment of the gut.**
- **Paralysis of a segment of the gut(paralytic ileus).**

If the obstruction occurs at the pylorus:

Affects nutrition; it also causes excessive loss of hydrogen ions from the stomach (Metabolic Alkalosis).

If the obstruction is beyond the stomach

- **Loss of large amounts of water and electrolytes.**
- **Antiperistaltic reflux from the small intestine causes intestinal juices to flow backward into the stomach, and these juices are vomited along with the stomach secretions.**
- **little change in acid-base balance occurs.**

If the obstruction is near the distal end of the large intestine

- **Feces can accumulate in the colon for a week or more.**
- **The patient develops an intense feeling of constipation, but at first vomiting is not severe.**
- **After the large intestine has become completely filled and it finally becomes impossible for additional chyme to move from the small intestine into the large intestine, severe vomiting does then occur.**

Obstruction at pylorus
causes acid vomitus

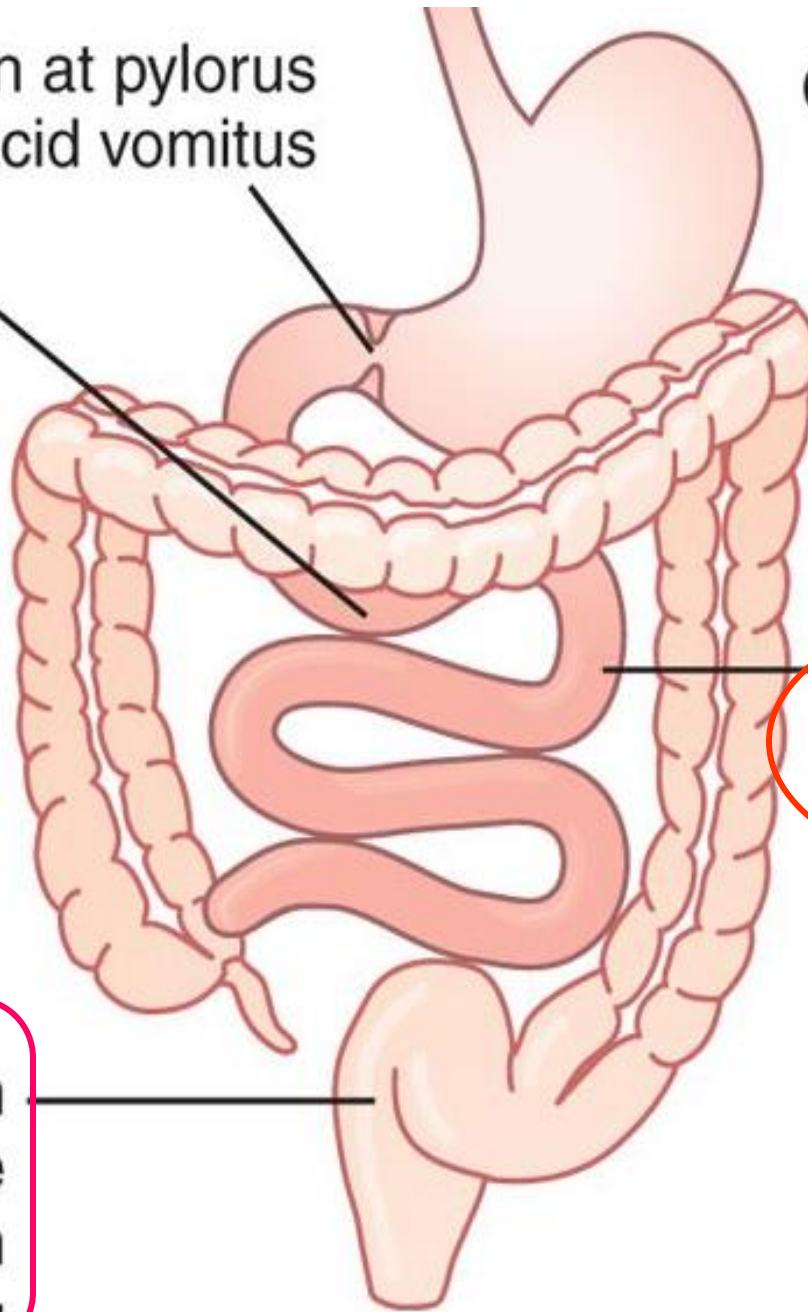
Causes

1. Cancer
2. Ulcer
3. Spasm
4. Paralytic ileus
5. Adhesions

Obstruction below
duodenum causes
neutral or basic
vomitus

High obstruction
causes extreme
vomiting

Low obstruction
causes extreme
constipation with
less vomiting





Flatus(Fart)

Sources of GIT gases

- Swallowed air.
- Gases formed in the gut as a result of bacterial action.
- Gases that diffuse from the blood into the gastrointestinal tract.
- *In the large intestine:* most of the gases are derived from bacterial action(*carbon dioxide, methane, and hydrogen.*
- When methane and hydrogen become suitably mixed with oxygen,) **explosive mixture** .

- Beans, Cabbage, Onion, Cauliflower, Corn, and certain irritant foods such as Vinegar.
- Medium for gas-forming bacteria.
- Irritation of the large intestine.

The amount of gases entering or forming in the large intestine each day averages 7 to 10 liters, whereas the average amount expelled through the anus is usually only about 0.6 liter. The remainder is normally absorbed into the blood through the intestinal mucosa and expelled through the lungs.

Composition of the Feces

- The feces normally are about three-fourths water and one-fourth solid matter that is composed of
 - About 30 percent *dead bacteria*
 - 10 to 20 percent *fat* .
 - 10 to 20 percent *inorganic matter*
 - 2 to 3 percent *protein*.
 - 30 percent *undigested roughage* from the food and dried constituents of digestive juices, such as bile pigment and sloughed epithelial cells.
- The brown color of feces is caused by *stercobilin* and *urobilin*, derivatives of bilirubin.
- The odor is caused principally by products of bacterial action include *indole*, *skatole*, *mercaptans*, and *hydrogen sulfide*.

Good luck