Postprandial Gastric Motility

The musculature of the stomach is comprised of 4 layers:

1) Oblique muscle layer (inner):

2) Circular muscle layer:

3) Longitudinal muscle layer:

4) Serosa:

Postprandial gastric motility serves multiple purposes, depending on the region of the stomach:

Gastric contraction waves originate in the __________________________

The gastric pacemaker region serves as the __________________________

Proximal gastric motility:

Distal gastric motility:
Postprandial Gastric Contractions: Proximal vs. Distal Stomach

Receptive Relaxation & Gastric Accommodation

The fundus serves an important purpose as a ______________, which is accomplished through two types of muscular activity:

1) Receptive Relaxation →

2) Gastric Accommodation →

The receptive relaxation and gastric accommodation processes allow for the stomach to hold ______________ without significant ______________.

After ingestion of a large meal, _________ of the meal will remain in the proximal stomach.
Gastric Peristaltic Contractions (Antral Contraction Waves)

The propulsive contractions that act to mix and break down ingested food particles are __________________________ that are also known as _________________________________.

Antral contraction waves, or ______________, begin at the __________________________ and propagate from the ________________ to the ________________.

The frequency of the ACWs follows the ________________________________, which is ________________________________.

Phases of Postprandial Gastric Motility

Similar to gastric secretions, there are also three phases of postprandial gastric motility:

1) Cephalic:

2) Gastric:

3) Intestinal
Fasting Gastric Motility

Between meals, as there are still__________________, and there is also__________________.

Fasting gastric motility is known as the______________________________, which is a 3-phase cycle that lasts about ____________________.

**Phase 1:** _______________ of the cycle
Characterized by ________________________________

**Phase 2:** _______________ of the cycle
Characterized by ________________________________

**Phase 3:** _______________ period
Characterized by ________________________________

During phase 3, the ________________________________

The frequency of phase 3 contractions is______________________________

Sometimes, the strong peristaltic contractions in Phase 3 of the MMC are referred to as: ________________________________

Once phase 3 is complete, the cycle repeats, and the stomach moves back to phase 1 where contractions are limited, until a meal is consumed.
Gastric Emptying

Gastric Emptying & Gastric Sieving

After a meal is consumed and begins to break down, the ___________ opens periodically to allow portions of the meal ________________________________.

During postprandial gastric motility, the pylorus opens __________________________ to allow digested materials to move into the duodenum.

Opening of the pylorus is coordinated with ________________________________ to allow material to enter. Typically, these contractions occur at __________________________.

When the pylorus opens, it does not completely relax; it only opens ________________.

This limited opening of the pylorus results in a phenomenon known as ________________, where small ________________________________and larger particles ________________________________.

In addition to the ________________________________, the fundus also aids in gastric emptying by ________________________________.

Factors that Impact Gastric Emptying

Gastric emptying of food components may vary based on:

- 
- 

<table>
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<th>% meal remaining in stomach</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
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**Models to Describe Gastric Emptying**

Why do we want to use empirical models to describe gastric emptying?

To determine the gastric emptying $t_{1/2}$, there are two equations that are commonly used:

1. **Power-Exponential Model**
   
   - $y(t)$ is
   - $t_{1/2}$ is
   - $\beta$ is
   - $t$ is

2. **Modified Power-Exponential Model**
   
   - $y(t)$ is
   - $k$ is
   - $\beta$ is
   - $t$ is

From the modified power-exponential model, the $t_{1/2}$ can be calculated as (using $k$ and $\beta$ above):
Gastric Food Breakdown Processes

- Esophagus
- Stomach
- Small Intestine