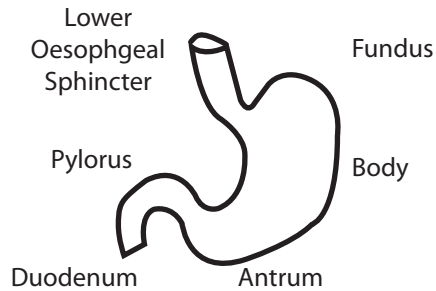


Sept 2010  
QUESTION 21

## Describe the control of gastric emptying

The stomach is a muscular hollow viscus with three major functions  
storage of food  
mixing and digestion of food  
emptying of food

### Gastric anatomy



The main effector of gastric emptying is the neuromuscular system

#### Neuro

Sympathetic input via coeliac plexus decreases gastric emptying  
PNS via the vagal nerve increases gastric emptying  
Intrinsic nervous system via the meissner (submucosal) and auerbach (myenteric)

#### Muscular

3 layers, oblique, longitudinal and circular layers  
under control of the intrinsic nervous system generates peristaltic motions, incl MMC  
antral/pyloric pump is the key to controlling the rate of emptying

The rate of emptying is dependent on the pressure gradient (developed by the antral pump) between the antrum and the pyloric resistance

Factors which determine the effector response are physicochemical/mechanical and hormonal

#### Mechanical

Liquids empty much faster than solids (exponential fashion)  
Gastric distension increases emptying (vagal mediation)  
Duodenal distension decreases emptying (hormonal mediation)  
Osmolality (quickest emptying is isotonic, extremes are delayed)

#### Hormonal (most important factor in overall gastric emptying)

Balance between the pro emptying gastric hormones and the inhibitory duodenum hormones  
Protein in the stomach causes gastrin release which increases emptying  
Fats (slowest) stimulates the potent CCK which inhibits emptying  
CHO (fastest) stimulates the weak gastric inhibitory peptide (GIP) which inhibits emptying  
Acid in duodenum stimulates secretin release - direct inhibitory effect on gastric smooth muscle