

The Digestive System

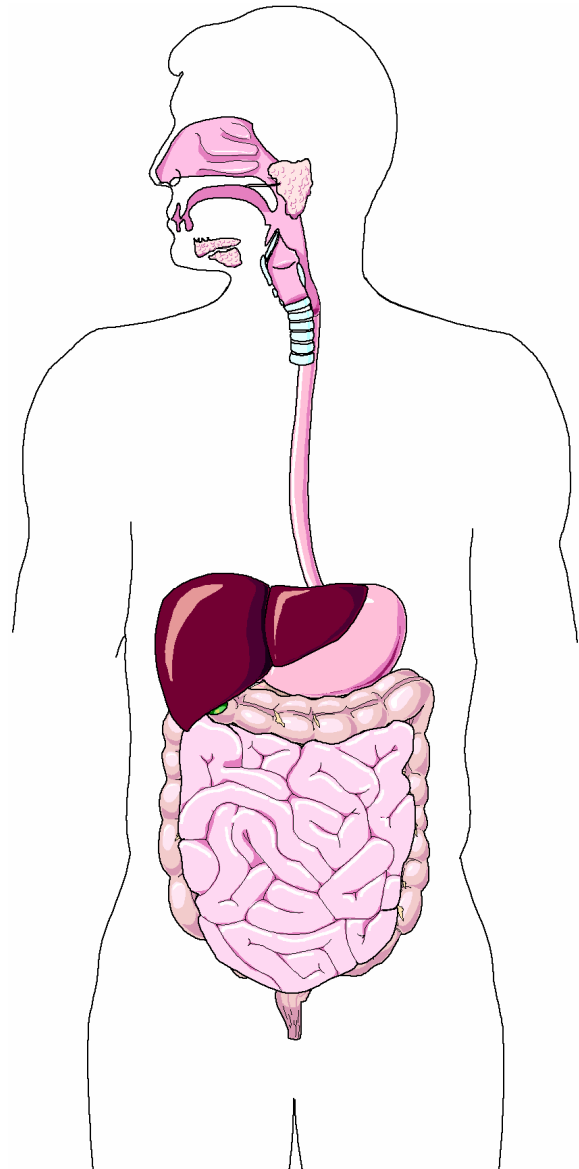
DIGESTION – the process of changing complex solid foods into simpler soluble forms which can be absorbed by body cells.

ENZYMES – chemical substances that promote chemical reactions in living things.

ALIMENTARY CANAL – digestive tract or gastrointestinal tract (GI Tract). A 30 ft. tube from mouth to anus.

Accessory organs of digestion:

- Tongue
- Teeth
- Salivary glands
- Pancreas
- Liver
- Gall bladder



Lining of the Digestive System

PERITONEUM – double-layered serous membrane that lines the abdominal cavity

Functions of the Digestive System

1. Physical breakdown of food
2. Chemical digestion of food into the end products of fat, carbohydrates and protein.
3. Absorb nutrients into blood capillaries of the small intestines
4. Eliminate waste products of digestion

Structure of Organs of Digestion

MOUTH

- Food enters digestive system through mouth
- Inside of mouth covered with mucous membrane
- Roof of mouth is HARD PALATE (bone) and soft palate
- UVULA – flap that hangs off soft palate – prevents food from going up the nose when you swallow

TONGUE

- Attached to floor of mouth
- Helps in chewing and swallowing
- Made of skeletal muscle attached to four bones
- Taste buds on the surface

SALIVARY GLANDS

- Three pairs of glands
- PAROTID – largest salivary glands, they become inflamed during mumps
- Secrete saliva

TEETH

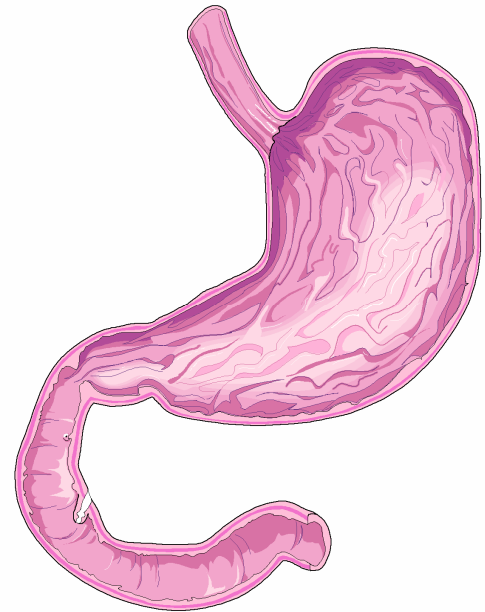
- GINGIVA – gums, support and protect teeth
- MASTICATION – chewing, teeth help in mechanical digestion
- DECIDUOUS teeth – baby teeth (#20)
- Adult mouth has 32 teeth

ESOPHAGUS

- Muscular tube, 10” long
- Connects pharynx and stomach

STOMACH

- Upper part of abdominal cavity
- **CARDIAC SPHINCTER** – circular layer of muscle, controls passage of food into stomach
- **PYLORIC SPHINCTER** – valve, regulates the entrance of food into duodenum
- **RUGAE** – mucous coat lining of stomach in folds when the stomach is empty
- Stomach has muscular coat that allows it to contract (peristalsis) and push food into the small intestine



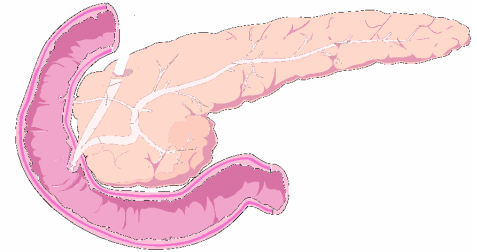
SMALL INTESTINE

- **DUODENUM** – first segment, curves around pancreas, 12” long
- **JEJUNUM** – next section, 8 ft. long
- **ILEUM** – final portion, 10-12 feet long
- **ABSORPTION** – in small intestine, digested food passes into bloodstream and on to body cells, undigestible passes on to large intestine

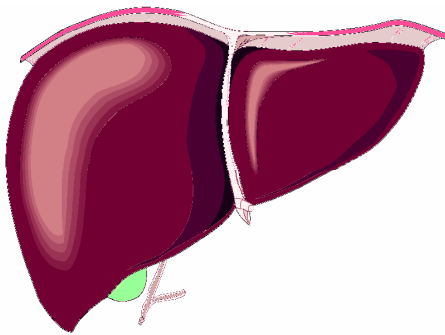
Accessory Organs of Digestion

PANCREAS

- Located behind stomach
- Exocrine function – secretes digestive enzymes
- Also has endocrine function



LIVER



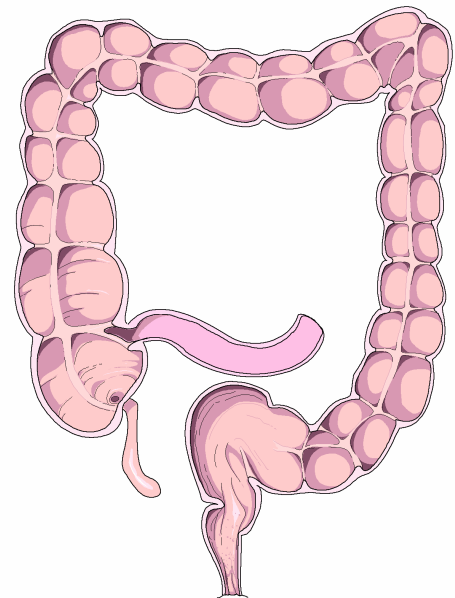
- Largest organ in the body
- Located below the diaphragm, upper right quadrant
- Connected to gallbladder and small intestine by ducts
- Functions:
 1. Produce and store glucose in the form of **GLYCOGEN**
 2. Detoxify alcohol, drugs and other harmful substances
 3. Manufacture blood proteins
 4. Manufactures bile
 5. Store Vitamins A, D and B complex

GALL BLADDER

- Small green organ, inferior surface of the liver
- Stores and concentrates bile until needed by the body
- When fatty foods digested, bile released by gallbladder

LARGE INTESTINE

- CHYME – semi-liquid food
- Approx 2” in diameter
- Also called the colon
- CECUM – lower right portion of large intestine
- APPENDIX is finger-like projection off cecum
- RECTUM – last portion of large intestine
- ANUS – external opening



Digestion

BOLUS – soft, pliable ball – creating from chewing and addition of saliva – it slides down esophagus

PERISTALSIS – wavelike motions, moves food along esophagus, stomach and intestines

In the mouth...

- saliva softens food to make it easier to swallow
- **PTYALIN** in saliva converts starches into simple sugar
- under nervous control – just thinking of food can cause your mouth to water



In the stomach...

- gastric (digestive) juices are released
- stomach walls churn and mix (This mixture is chyme)
- small amount of chyme enters duodenum at a time - controlled by pyloric sphincter
- takes 2-4 hours for stomach to empty

In the small intestine...

- where digestion is completed and absorption occurs
- addition of enzymes from pancreas and bile from liver/gallbladder

In the large intestine...

- regulation of H₂O balance by absorbing large quantities back into bloodstream
- bacterial action on undigested food – decomposed products excreted through colon – bacteria form moderate amounts of B complex and Vitamin K
- gas formation – 1-3 pints/day, pass it through rectum (flatulence) 14 times a day, bacteria produce the gas
- FECES – undigested semi-solid consisting of bacteria, waste products, mucous and cellulose
- DEFECATION – when lg intestine fills, defecation reflex triggered – colon and rectal muscles contract while internal sphincter relaxes – external anal sphincter under conscious control

Digestive Disorders

HEARTBURN

- Acid reflux
- Symp – burning sensation
- Rx – avoid chocolate and peppermint, coffee, citrus, fried or fatty foods, tomato products – stop smoking – take antacids – don't lay down 2-3 hours after eating

PYLORIC STENOSIS

- Narrowing of pyloric sphincter, often found in infants
- Symp – projectile vomiting
- Rx – surgery

GASTRITIS – acute or chronic inflammation of the stomach lining

GASTROENTERITIS

- Inflammation of mucous membrane lining of stomach and intestine
- Common cause = virus
- Symps – diarrhea and vomiting for 24-36 hours
- Complication = dehydration

ULCER

- Sore or lesion that forms in the mucosal lining of the stomach
- Gastric ulcers in the stomach and duodenal ulcers in the duodenum
- Cause – *H. pylori* (bacteria) is primary cause
- Lifestyle factors that contribute: cigarette smoking, alcohol, stress, certain drugs
- Symp – burning pain in abdomen, between meals and early morning, may be relieved by eating or taking antacid
- Diagnosis – x-ray, presence of bacteria
- Rx – H₂ blockers (drugs) that block release of histamine



COLITIS (IRRITABLE BOWEL SYNDROME)

- Large intestine inflamed
- Cause – unknown
- Symps – episodes of constipation or diarrhea

APPENDICITIS

- When appendix becomes inflamed
- If it ruptures, bacteria from appendix can spread to peritoneal cavity causing PERITONITIS

HEPATITIS A

- Infectious hepatitis
- Cause – virus
- Spread through contaminated food or H₂O

HEPATITIS B (Serum Hepatitis)

- Caused by virus found in blood
- Transmitted by blood transfusion or being stuck with contaminated needles (drug addicts)
- Health care workers at risk and should be vaccinated
- Use standard precautions for prevention

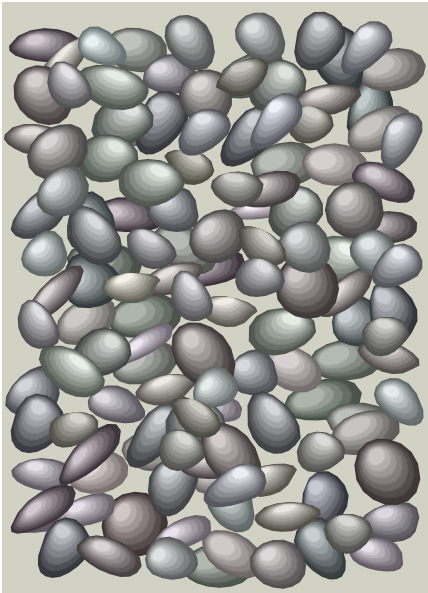
CIRRHOSIS

- Chronic, progressive disease of liver
- Normal tissue replaced by fibrous connective tissue
- 75% caused by excessive alcohol consumption

CHOLECYSTITIS

- Inflammation of gallbladder

CHOLELITHIASIS



- Gallstones
- Can block the bile duct causing pain and digestive disorders
- Small ones may pass on their own, large ones surgically removed
- Surgical removal of gallbladder =
CHOLECYSTECTOMY

PANCREATITIS

- Inflammation of pancreas
- 1/3 of cases = cause unknown
- Sometimes associated with chronic alcoholism

DIVERTICULOSIS

- Little sacs (diverticuli) develop in wall of colon
- Most people over age 60 have this
- When the sacs become inflamed =
DIVERTICULITIS

DIARRHEA

- Loose, watery, frequent bowel movements when feces pass along colon too rapidly
- Caused by infection, poor diet, nervousness, toxic substances or irritants in food

CONSTIPATION

- When defecation delayed, feces become dry and hard
- Rx – diet with cereals, fruits, vegetables, (roughage), drinking plenty of fluids, exercise, and avoiding tension

COLON CANCER

- Early detection critical – COLONOSCOPY after age 50
- HEMOCCULT – stool slide specimen to look for hidden blood
- Rx – colon resection
- COLOSTOMY – opening in abdomen, healthy bowel brought to skin after cancer removed, pouch worn to collect waste

CARIES – tooth decay (cavities)

GINGIVITIS – inflammation of the gums

JAUNDICE – yellow color when bile pigment gets in bloodstream

LAPAROSCOPIC CHOLECYSTECTOMY

- Most common method of cholecystectomy
- Small abdominal incisions allow insertion of surgical instruments and small video camera
- Surgeon performs procedure by watching monitor and manipulating instruments
- Stomach muscles are not cut, healing is quicker