The Digestive System

ALIMENTARY CANAL – DIGESTIVE TRACT OR GASTROINTESTINAL (GI) TRACT. A 30 FT. TUBE FROM MOUTH TO ANUS (ROOTER TO TOOTER).
ACCESSORY ORGANS OF DIGESTION:

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

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

GINGIVA – gums, support and protect teeth

MASTICATION – chewing, teeth help in mechanical digestion

DECIDUOUS teeth – baby teeth (#20)

Adult mouth has 32 teeth
- **SALIVARY GLANDS**
- Three pairs of glands
- **PAROTID** – largest salivary glands, they become inflamed during mumps
- Secrete saliva
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
LIVER

Functions:

- Produce and store glucose in the form of GLYCOGEN
- Detoxify alcohol, drugs and other harmful substances
- Manufacture blood proteins
- Manufactures bile
- 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
STRUCTURES / ORGANS OF DIGESTIVE SYSTEM

- 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
ESOPHAGUS
Muscular tube, 10” long
Connects pharynx and stomach
LINING OF THE DIGESTIVE SYSTEM

- PERITONEUM – double-layered serous membrane that lines the abdominal cavity
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
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
FUNCTIONS OF THE DIGESTIVE SYSTEM

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

- 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.
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 $\text{H}_2\text{O}$ 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
DISORDERS

- **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**
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
GASTROENTERITIS

- Inflammation of mucous membrane lining of stomach and intestine
- Common cause = virus
- Syms – 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 – **H**₂ blockers (drugs) that block release of histamine
DISORDERS

- APPENDICITIS
  - When appendix becomes inflamed
  - If it ruptures, bacteria from appendix can spread to peritoneal cavity
HEPATITIS A
Infectious hepatitis
Cause – virus
Spread through contaminated food or \( \text{H}_2\text{O} \)

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
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
CONSTIPATION......IT HURTS.
Jaundice is a yellow color of the skin, often caused by liver and gallbladder disorders.

Yellow color of the skin