

Gastrointestinal, Hepatobiliary, and Pancreatic Systems Function, Assessment, and Therapeutic Measures Chapter 32

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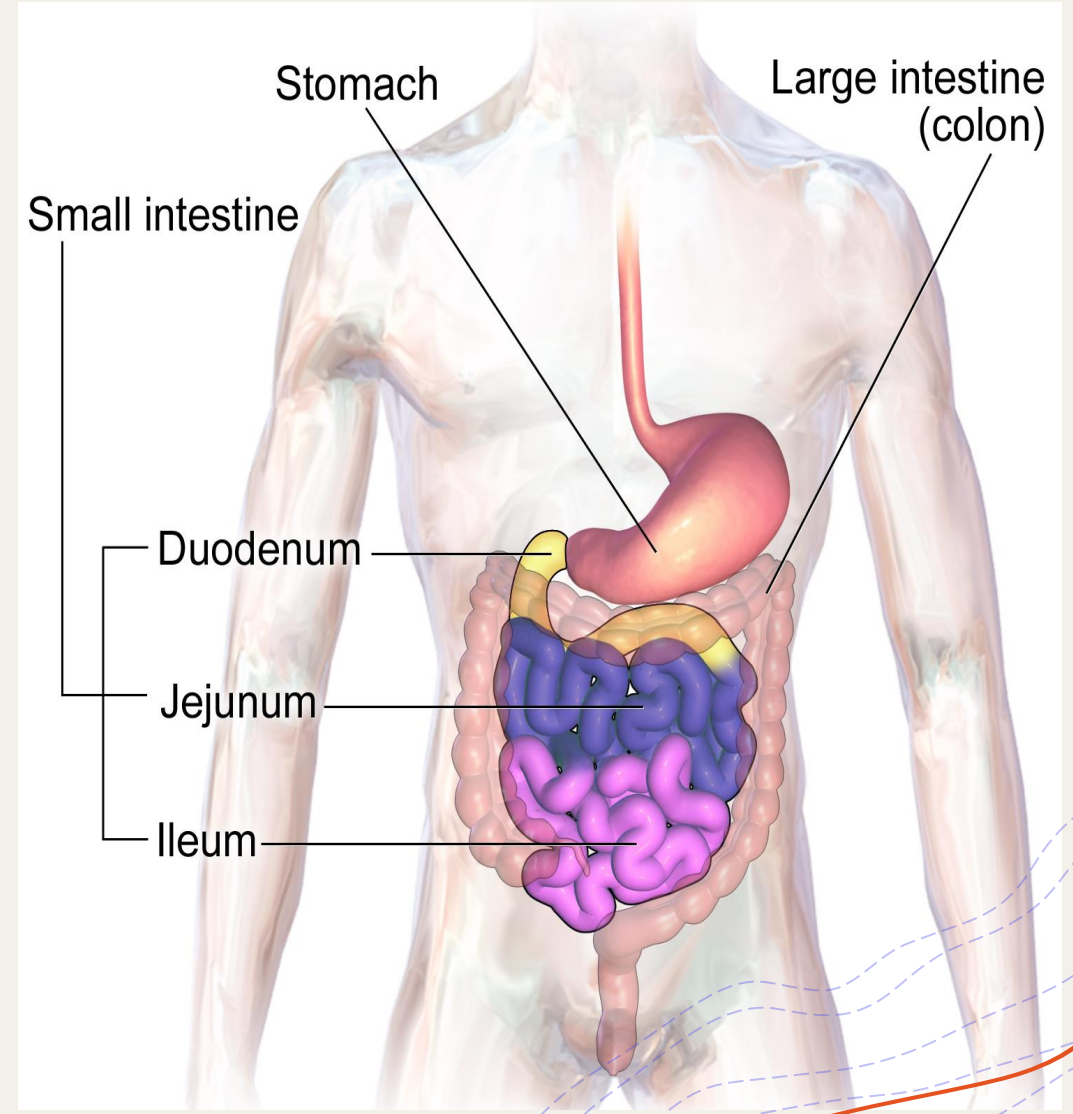
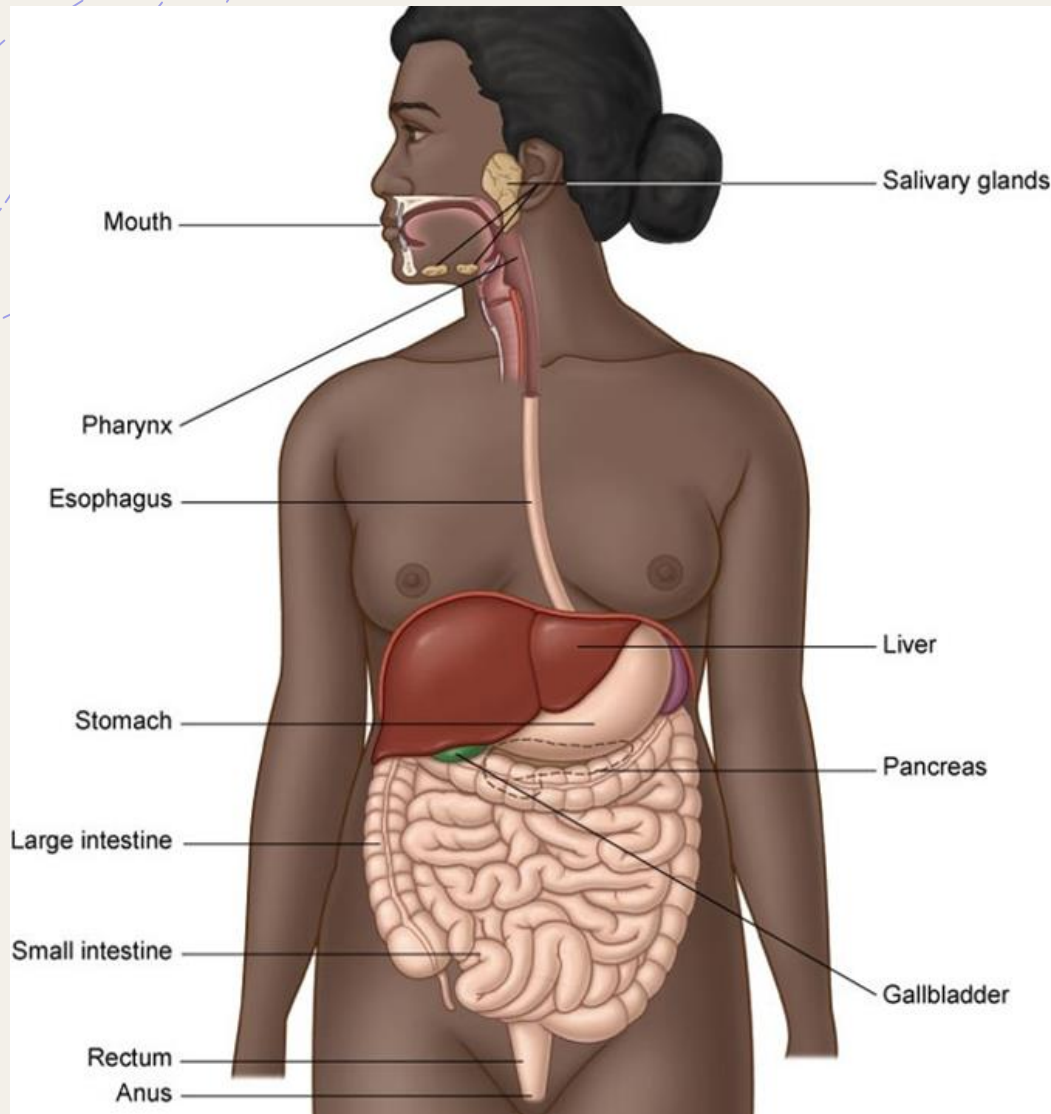
Objectives

- Describe the functions of each organ of the GI tract of the accessory glands: liver, gallbladder, and pancreas.
- Discuss how age affects the GI tract of the accessory glands.
- Consider data to collect when caring for a patient with a disorder of the gastrointestinal system and differentiate the normal and abnormal data collection findings.
- Review techniques used to conduct a physical examination of the abdomen.
- Explain types of nasogastric tubes, nursing care for their insertion, maintenance, and their uses

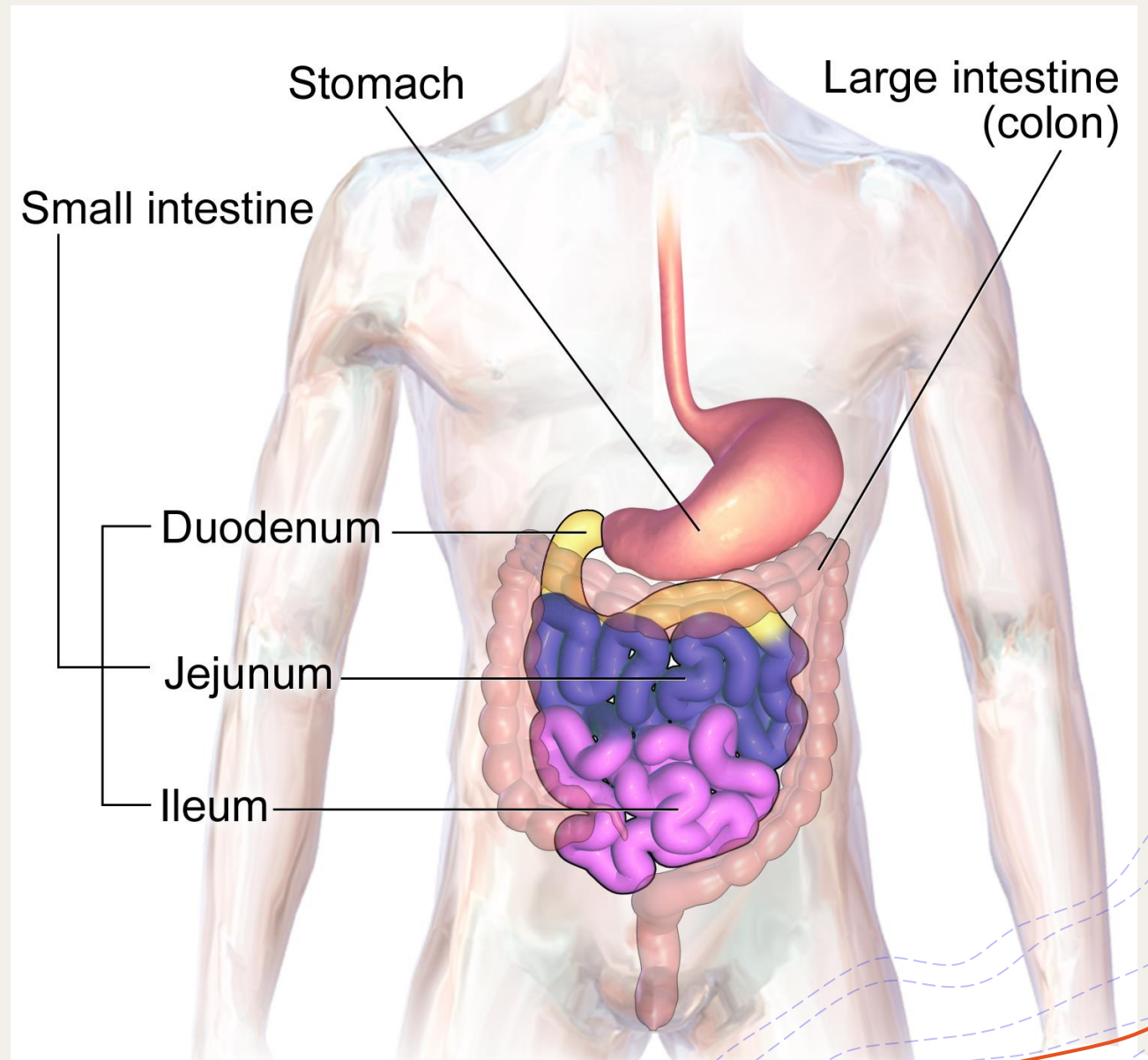


Functions of GI Tract: Liver, Gallbladder, Pancreas

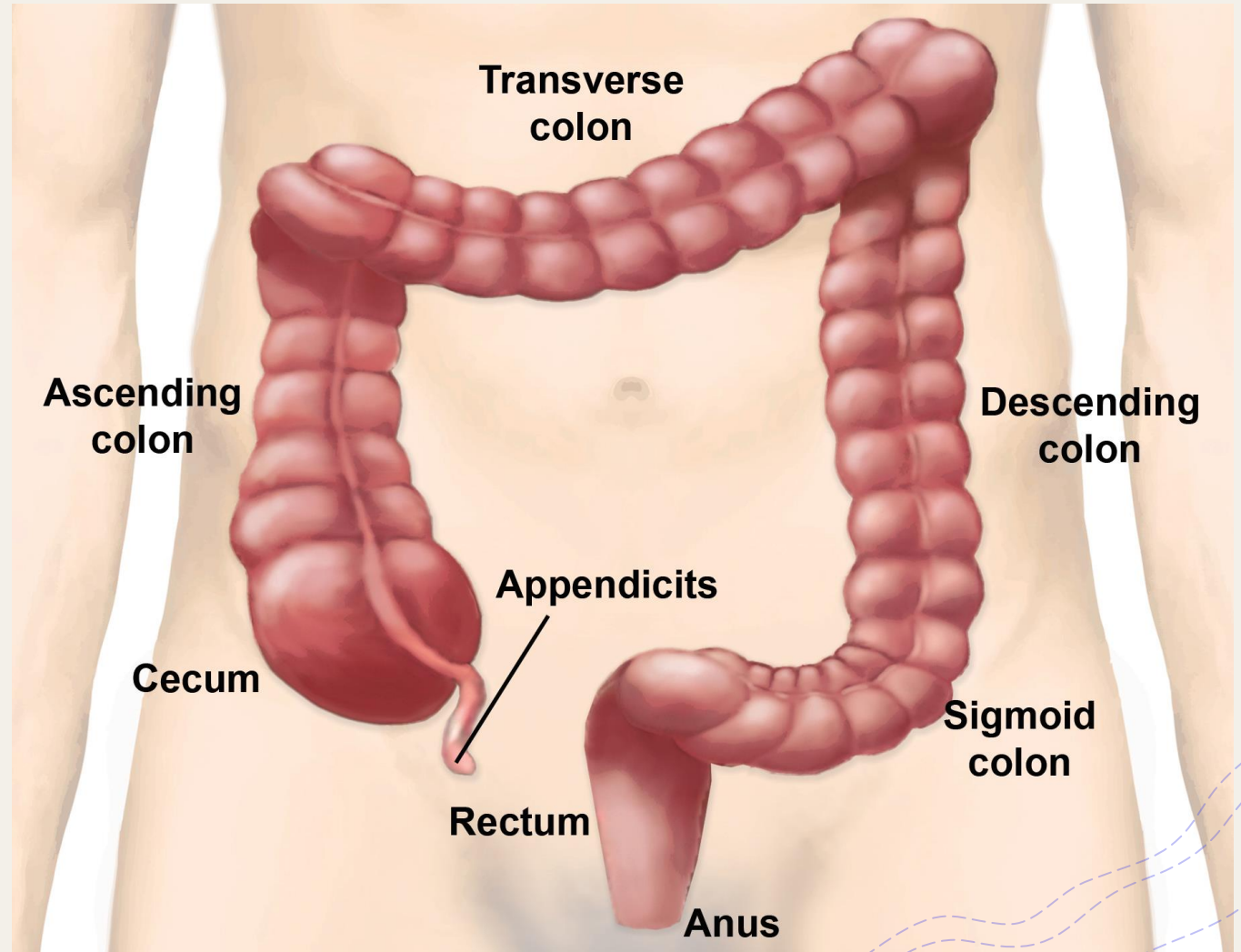
Digestive System



Small Intestine



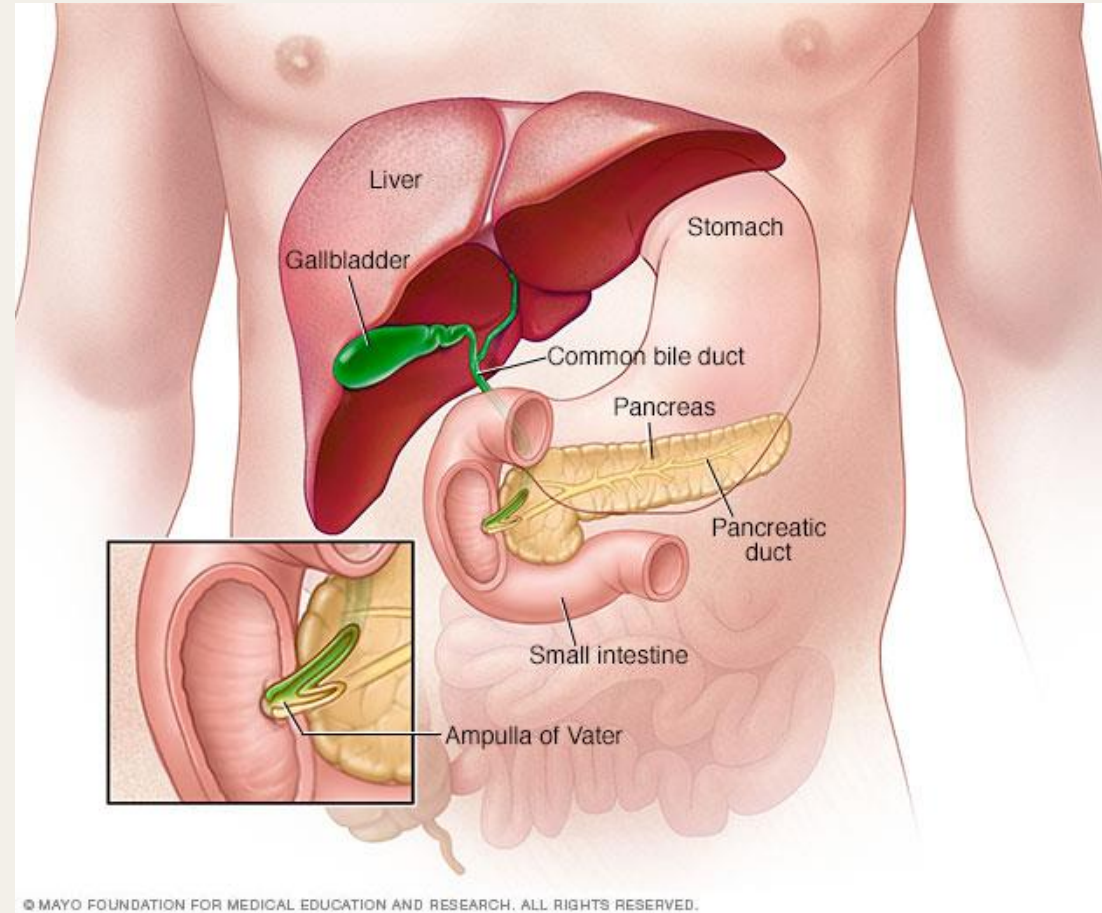
Large Intestine



Large Intestine



Ampulla of Vater



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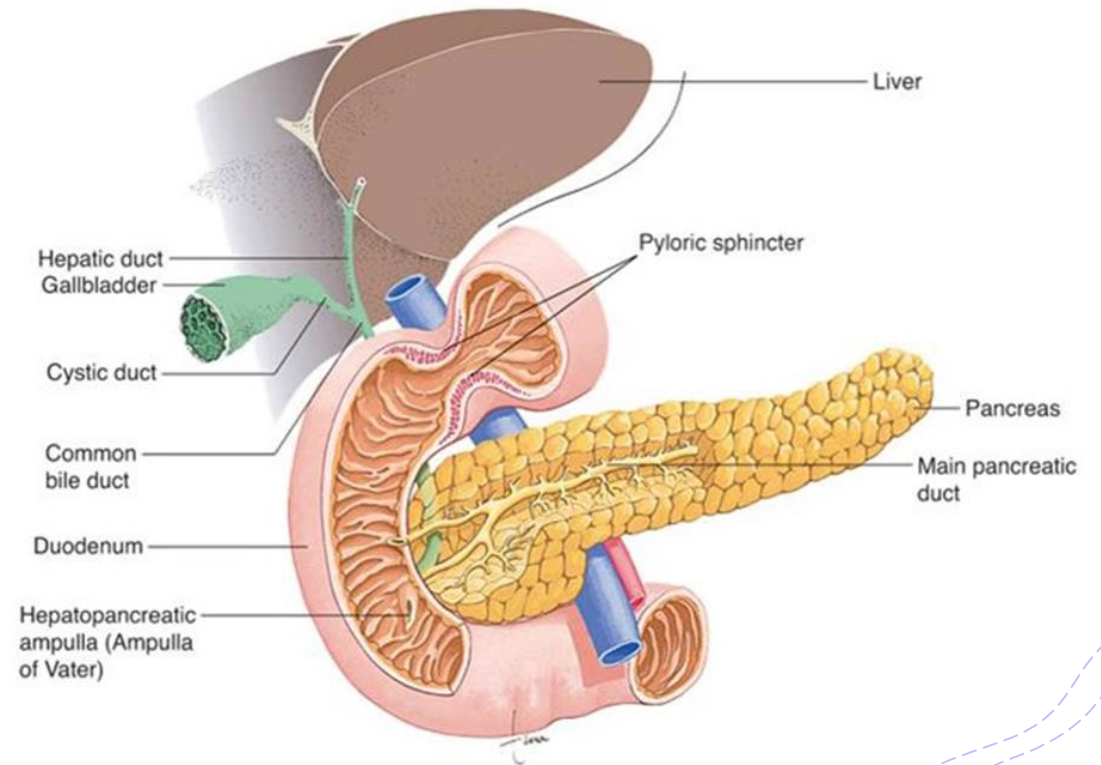
Liver, Gallbladder, Pancreas, and Duodenum

+

Liver, Gallbladder, and Pancreas

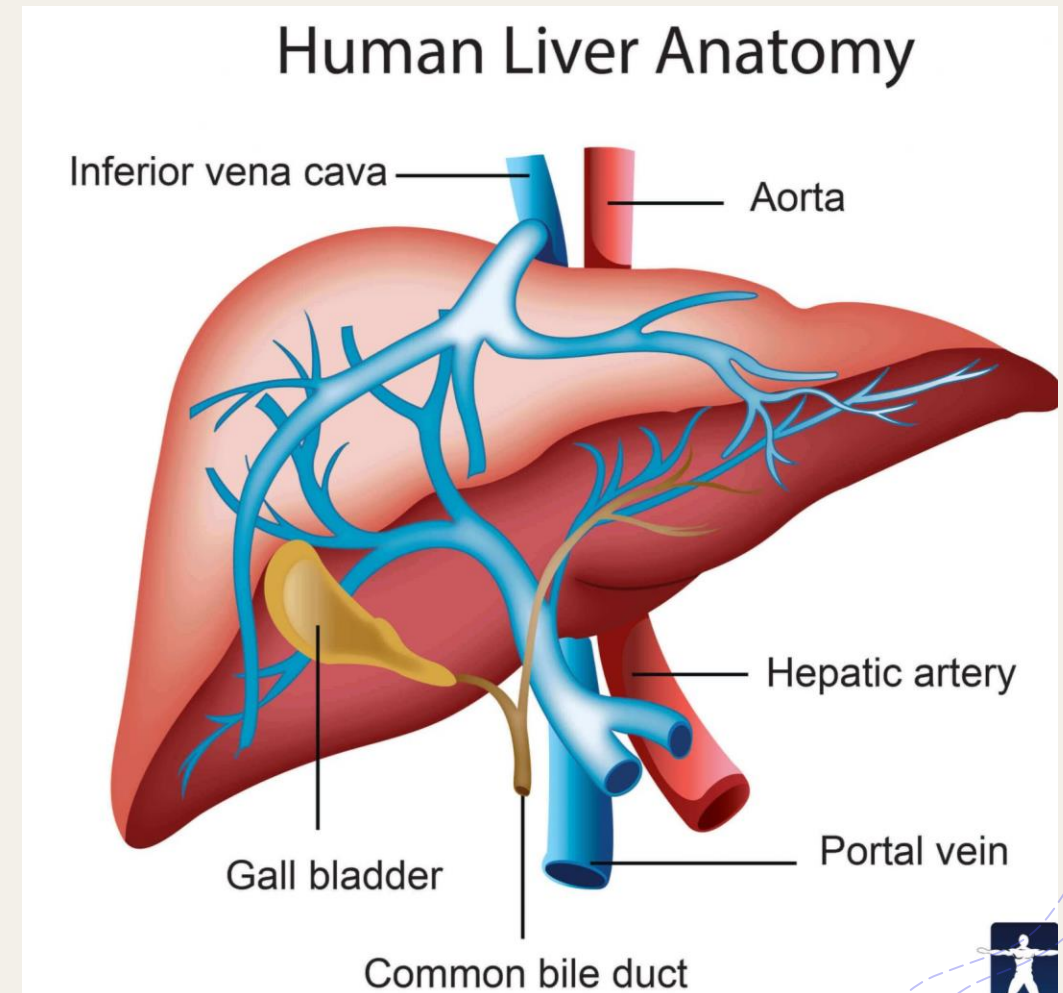
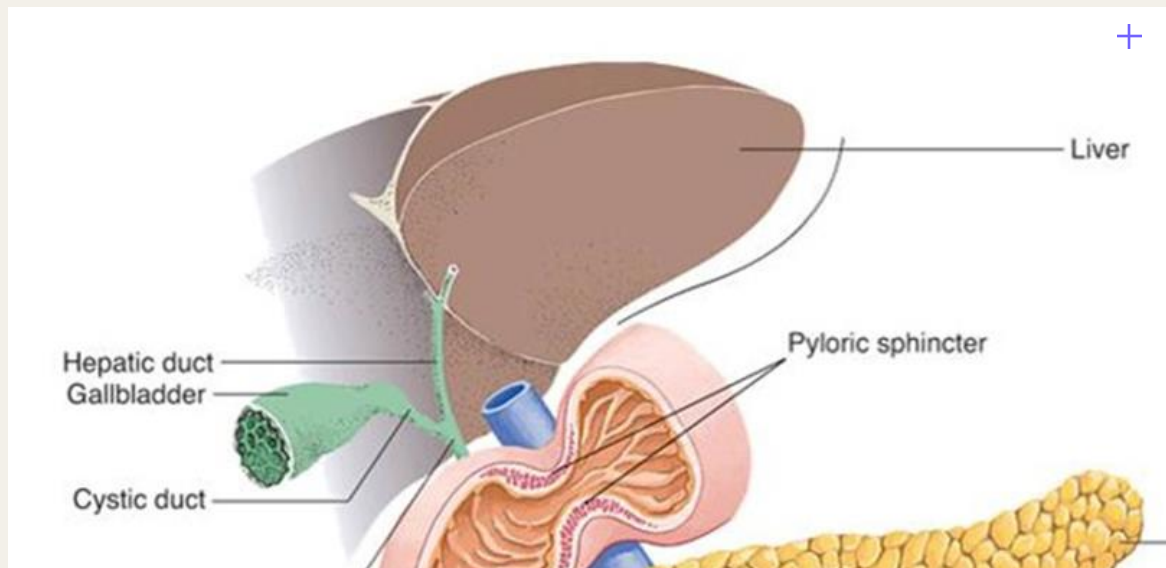
Accessory
organs of
digestion

Produce or
store digestive
secretions



Liver

- Hepatic portal circulation
- Bile



Liver Function

Carbohydrate
metabolism

Amino acid
metabolism

Lipid
metabolism

Synthesis of
plasma
proteins

Phagocytosis
by Kupffer
cells

Formation of
bilirubin

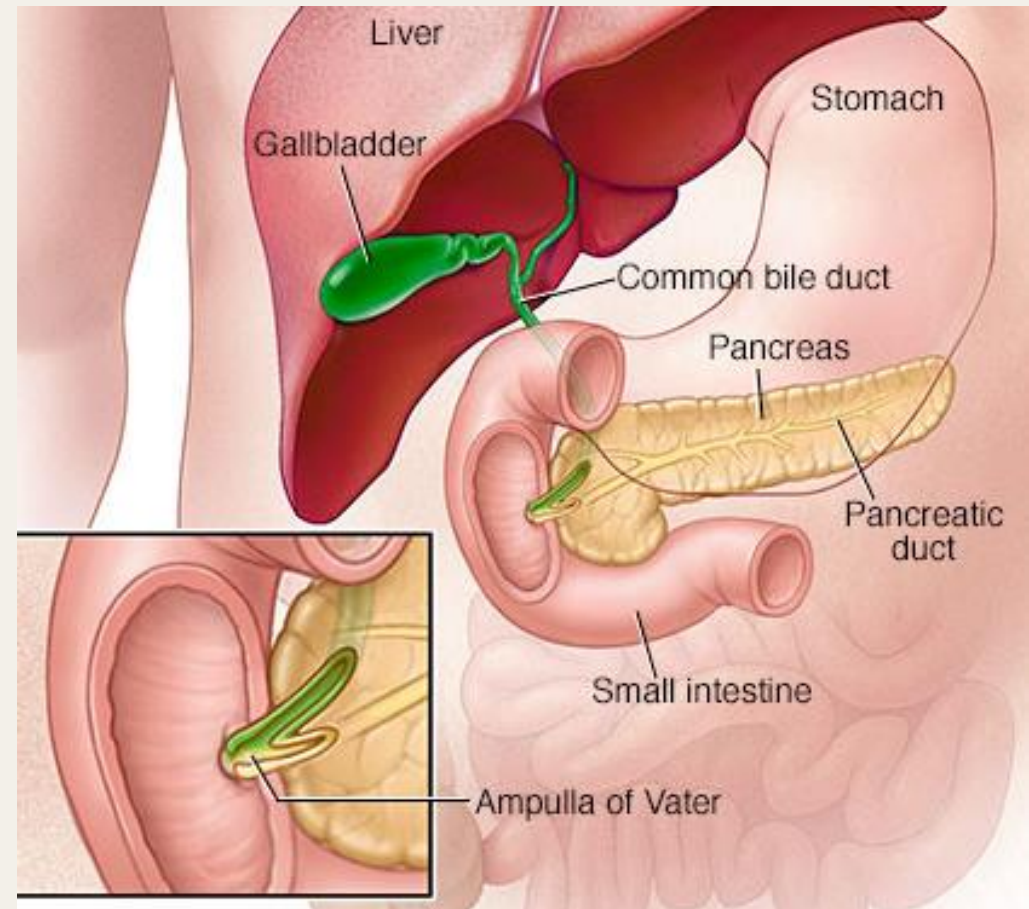
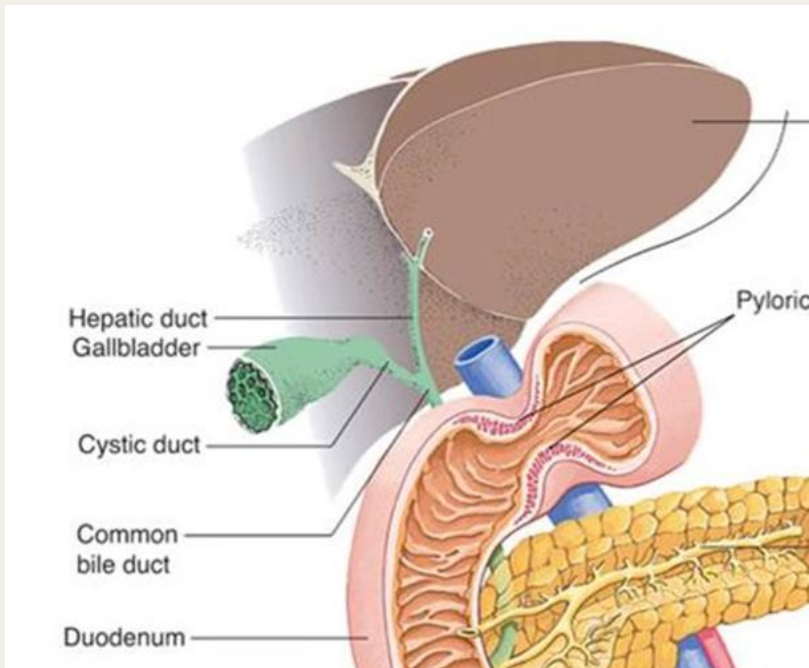
Storage

Detoxification

Activation of
vitamin D

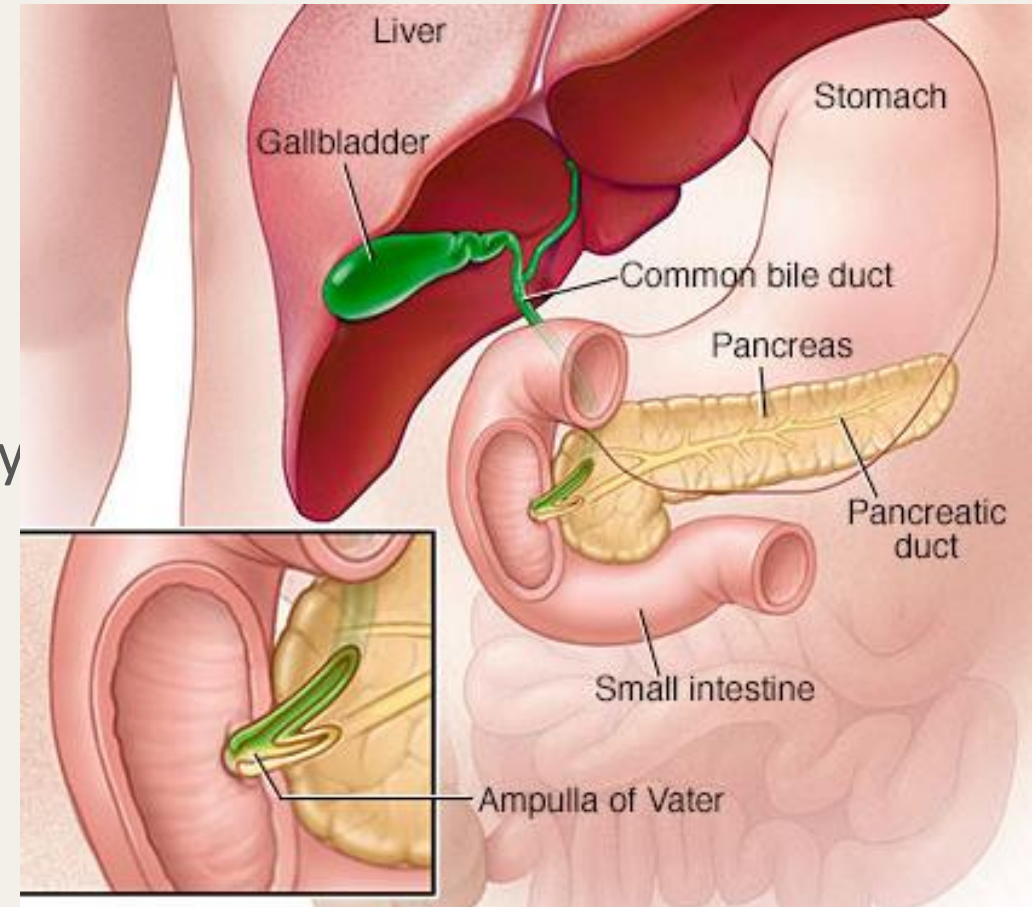
Gallbladder Function

- Stores Bile



Pancreas Function

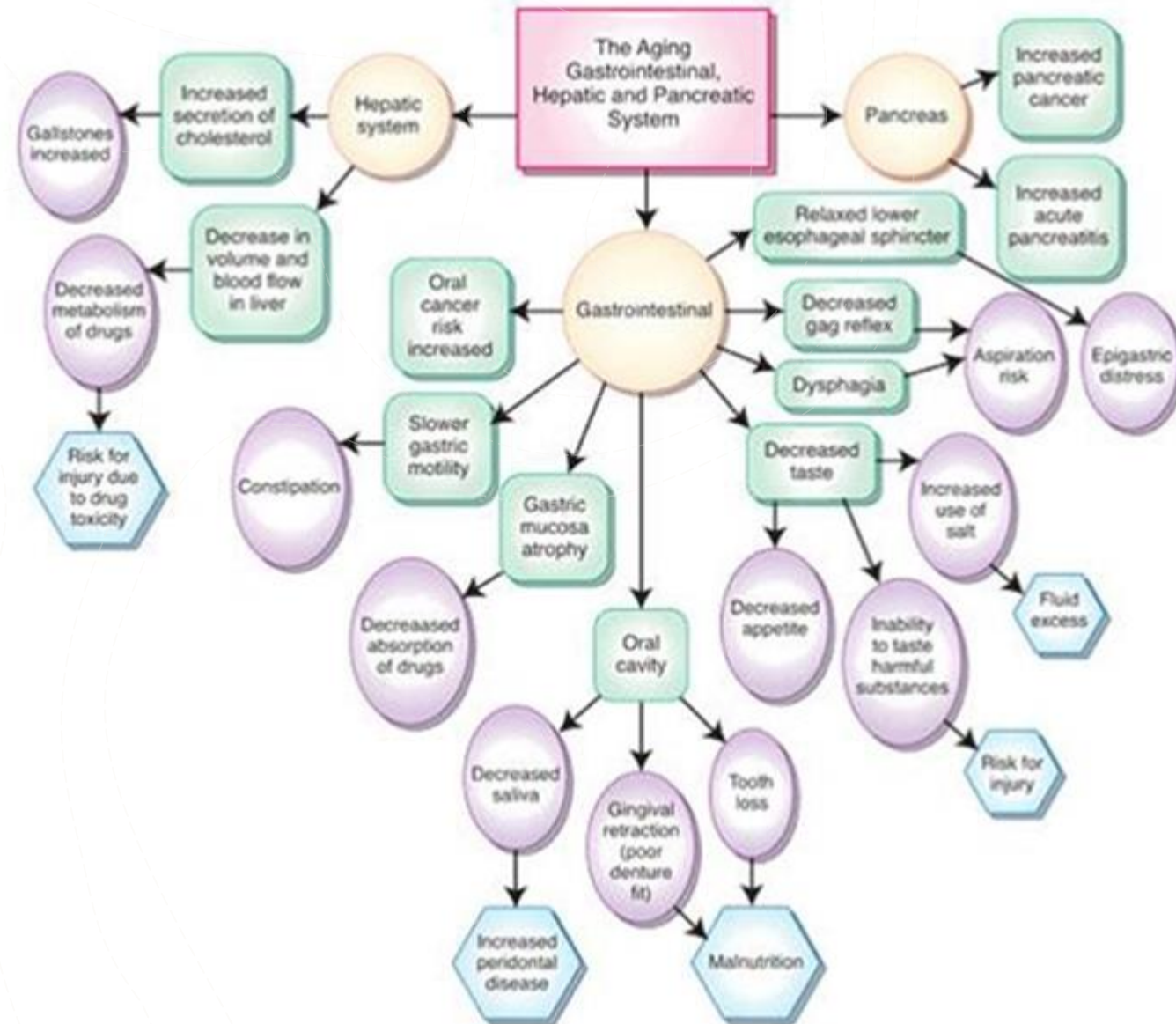
- Amylase
 - Starch to maltose
- Lipase
 - Emulsified fats to fatty acids/monoglycerides
- Trypsin
 - Polypeptides to peptides



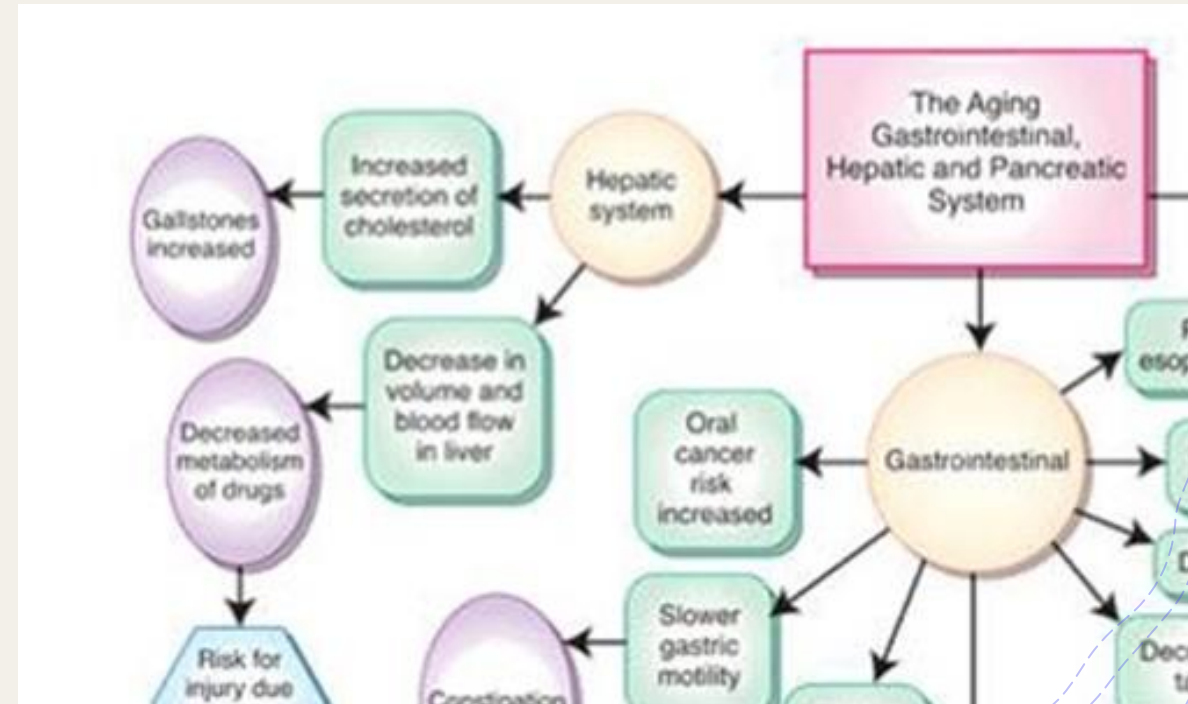


Discuss how age
affects the GI tract of
the accessory glands.

+



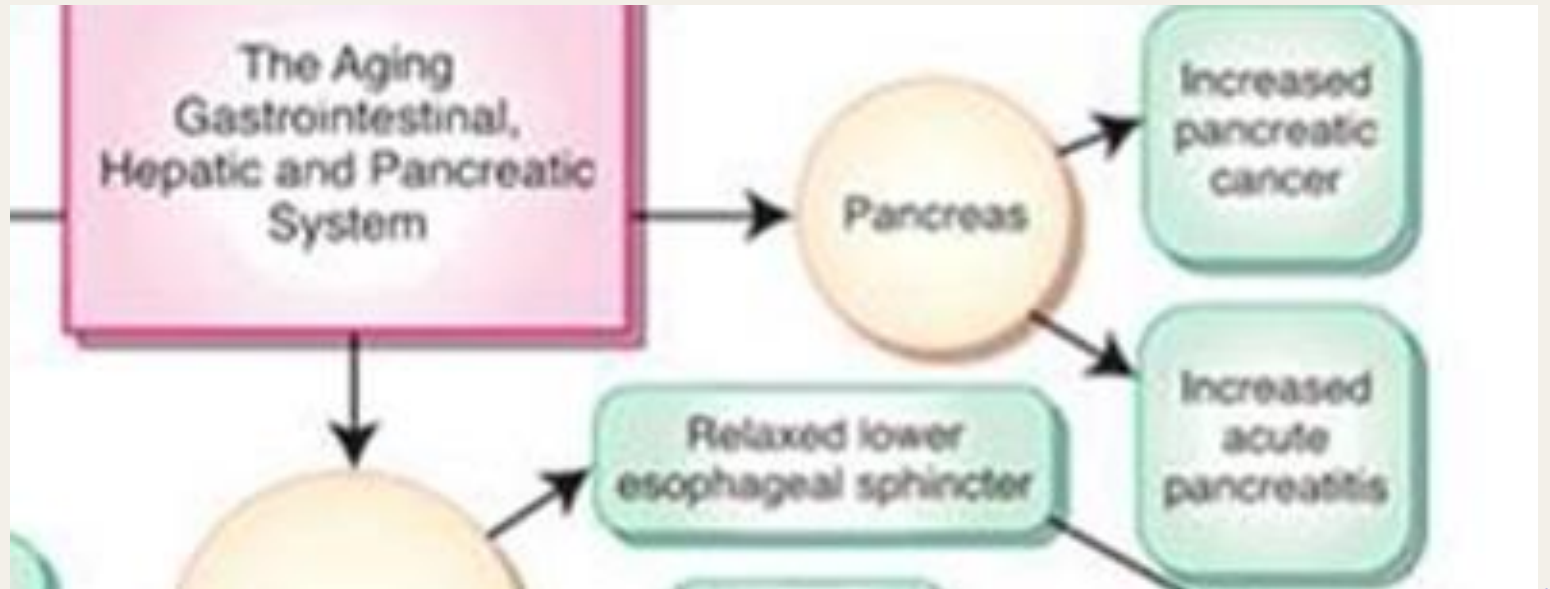
- + Increased Cholesterol-increases gallstones
- + Decrease blood volume and flow to liver-decreased ability to metabolism of drugs

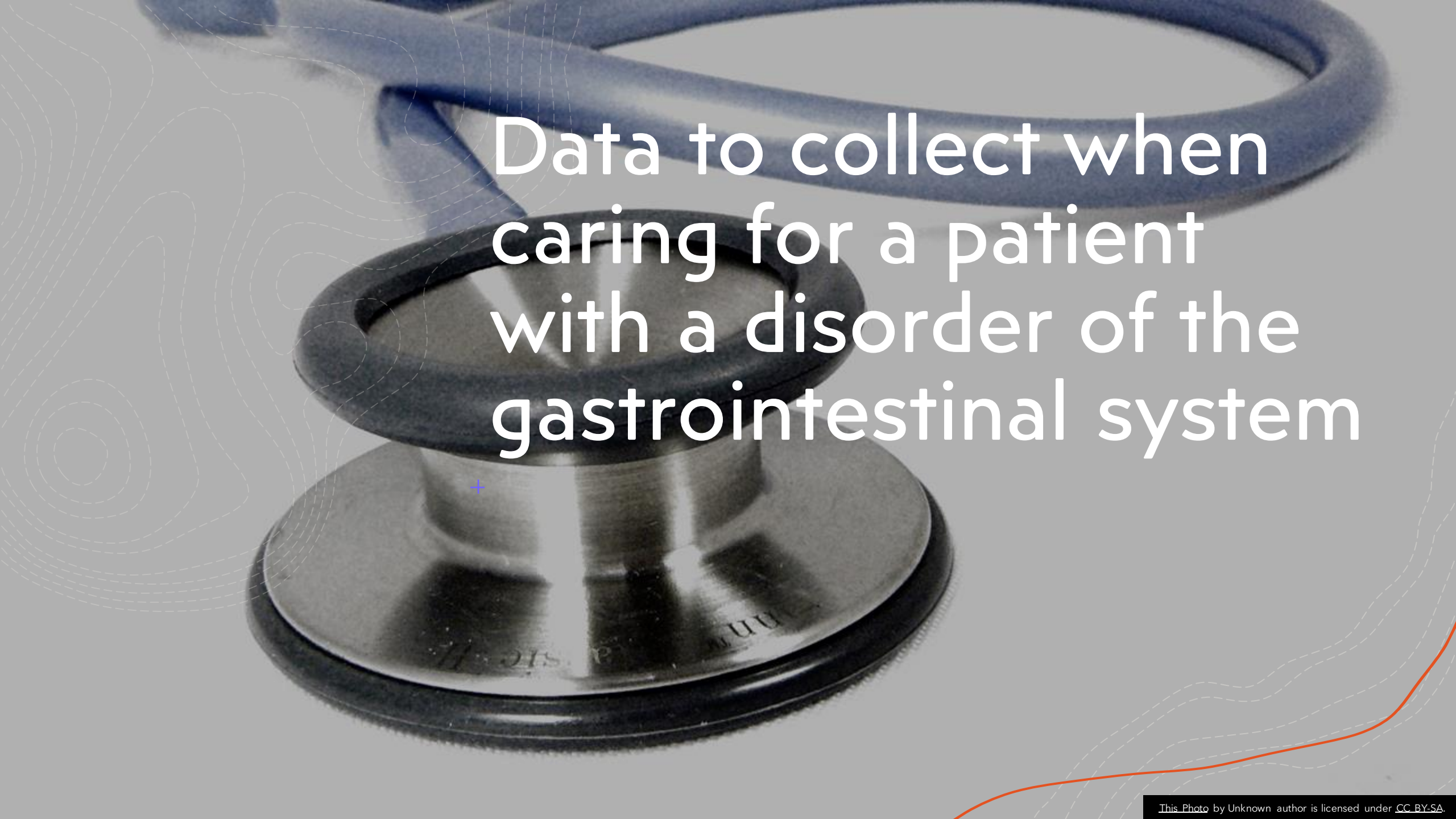


- + Slower gastric mobility-constipation
- + Decreased gastric mucosa- decreased ability absorb drugs
- + Decreased saliva-periodontal disease
- + Tooth loss-malnutrition
- + Decreased gag reflex-risk choking
- + Decreased taste-decreased appetite



- + Increased pancreatic cancer
- + Increased acute pancreatitis





Data to collect when caring for a patient with a disorder of the gastrointestinal system

Data Collection

Health History

- Medications
- Illnesses
- Surgeries
- Smoking
- Patterns
- Pain

Data Collection

Nutritional

- Diet
- Allergies
- Weight

Data Collection

Family

- Disease
- Hereditary
- Cultural

Diagnostic Tests- Laboratory

+**Stool tests:**

- + Occult blood
- + Culture
- + Ova or parasites
- + Steatorrhea
- + Recommendation screening-
begin at age 45 years of age

Table 32.5

SHADES OF POOP



Brown:

You're fine. Poop is naturally brown due to the bile produced in your liver.



Green:

Food may be moving through your large intestine too quickly. Or you could have eaten lots of green leafy veggies, or green food coloring.



Yellow:

Greasy, foul-smelling yellow poop indicates excess fat, which could be due to a malabsorption disorder like celiac disease.



Black:

It could mean that you're bleeding internally due to ulcer or cancer. Some vitamins containing iron or bismuth subsalicylate could cause black poop too. Pay attention if it's stinky, and see a doc if you're worried.



Light-colored, white, or clay-colored:

If it's not what you're normally seeing. It could mean a bile duct obstruction. Some meds could cause this too. See a doc.



Blood-stained or Red:

Blood in your poop could be a symptom of cancer. Always see a doc right away if you find blood in your stool.

Performing Fecal Occult Blood Testing



<https://www.youtube.com/watch?v=KQNaB37x8-A>

Diagnostic Tests- Laboratory

Blood tests

- + CBC
- + Alanine Aminotransferase (ALT)
- + Albumin
- + Ammonia
- + Amylase
- + Carcinoembryonic Antigen (CEA)
- + Aspartate Aminotransferase (AST)
- + Bilirubin
 - + Total
 - + Direct
 - + Indirect

Table 32.5

Diagnostic Tests- Laboratory

+ **Electrolytes, Cholesterol, Enzymes, Protein**

- + Calcium Total
- + Cholesterol
- + Lactic dehydrogenase (LDH) (Enzyme)
- + Lipase (Enzyme)
- + Prothrombin (Protein)

Table 32.5

Diagnostic Tests-Radiographic Test

Barium swallow

- Xray of the Esophagus, Stomach, Duodenum, and Jejunum using the contrast of Barium **using X-Ray**
 - Pre-op
 - NPO
 - No smoking
 - Post-op
 - Laxative
 - Increase fluids
 - Deter Barium impaction-Constipation



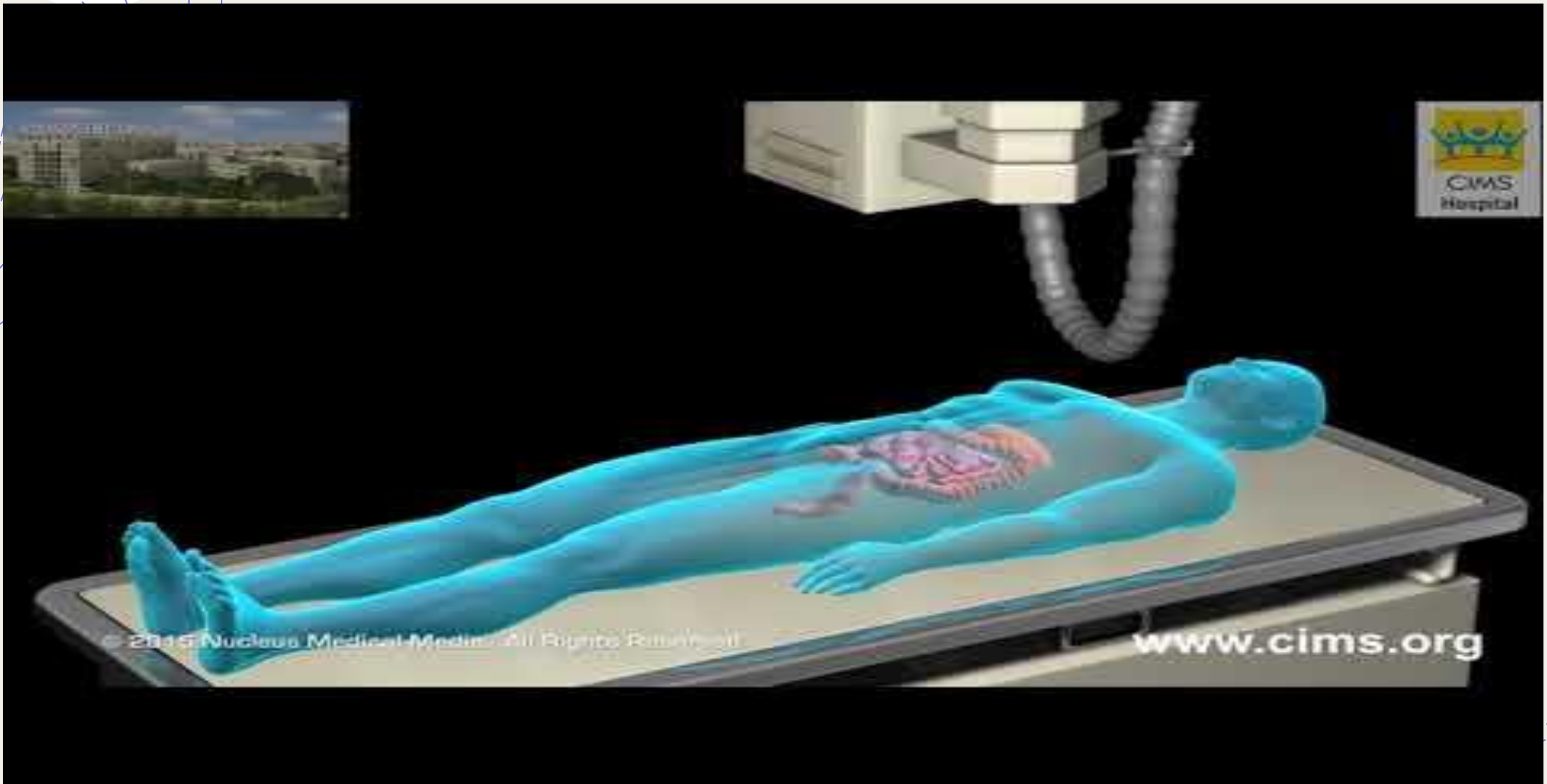
Barium Swallow test

<https://www.youtube.com/watch?v=xILnOSLoME4>

Diagnostic Tests-Radiographic Test

Barium enema

- Visualize position, movements, and filling of the colon using Barium via the rectum
 - Contraindications
- Diet
 - Low-residue diet
 - Clear liquid diet
 - NPO
- Laxatives and bowel cleansing
- Procedure-rectal tube
- Reporting post-procedure



Barium Enema

<https://www.youtube.com/watch?v=lyfL-V2C9Uw>

Diagnostic Tests-Nuclear

+Scans

- + Cholescintigraphy scan
- + Hepatobiliaryscintigraphy scan
- + Hepatobiliary Iminodiacetic acid (HIDA) scan
- + Iminodiacetic acid (IDA) scan

+Pretest:

- + NPO 4-6 hours; stop opiate medication 2-6 hours before

+Posttest:

- + Flushing urine in first 24 hours

+Teach:

- + increase fluids to flush 24-48 hours after

Diagnostic Tests- Endoscopy

Esophagastroduodenoscopy (EGD)

- Visualization through scope
 - Esophagus, stomach, upper duodenum
- Pretest
 - Diet
 - Laxatives
 - NPO
- Posttest
 - Vital signs
 - Check for gag reflex
 - NPO until able to swallow
 - Monitor pain, bleeding, fever, dysphagia





EGD

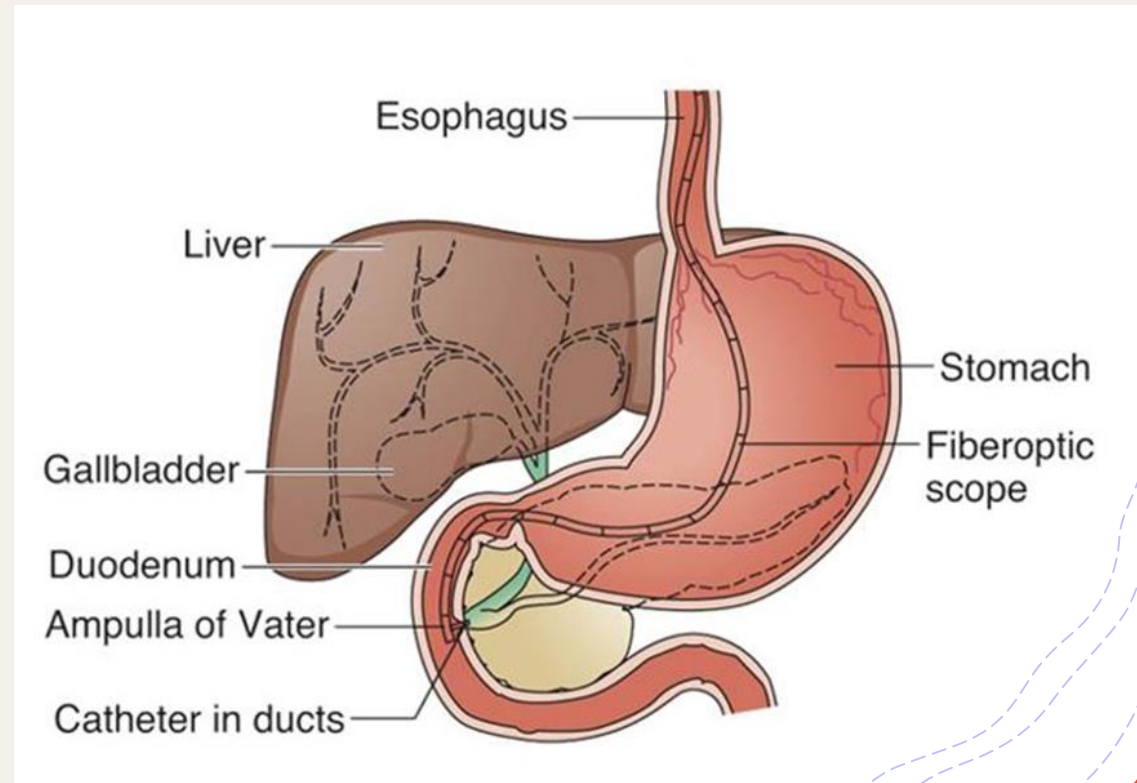
<https://www.youtube.com/watch?v=WPPEGHaOPWA>

Diagnostic Tests- Endoscopy

Endoscopic retrograde cholangiopancreatography (ERCP)

- Visualization of pancreas and common bile ducts
- Xray with contrast
- Pretest:
 - Diet, laxative, NPO
 - Avoid anticoagulants
- Post test:
 - NPO until swallow
 - Monitor Vital signs
 - Intake and output
 - Monitor contrast

Post Test: Check for Gag Reflex!

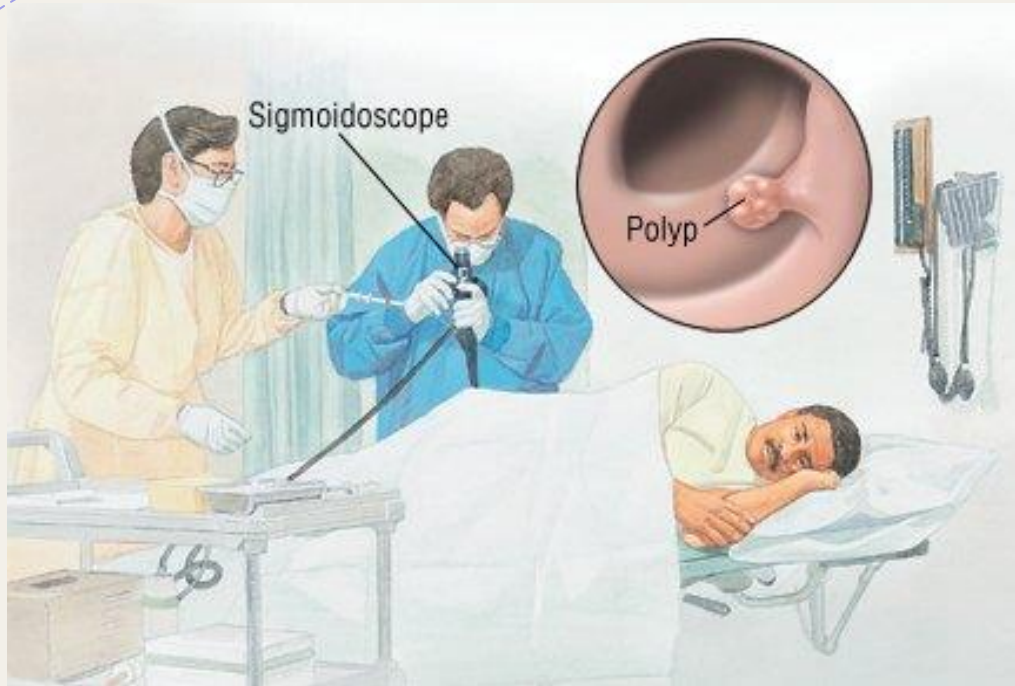




<https://www.youtube.com/watch?v=0KIfgmEmTCA>

ERCP (endoscopic retrograde cholangiopancreatography) - Procedure 3D Animation

Diagnostic Tests- Endoscopy



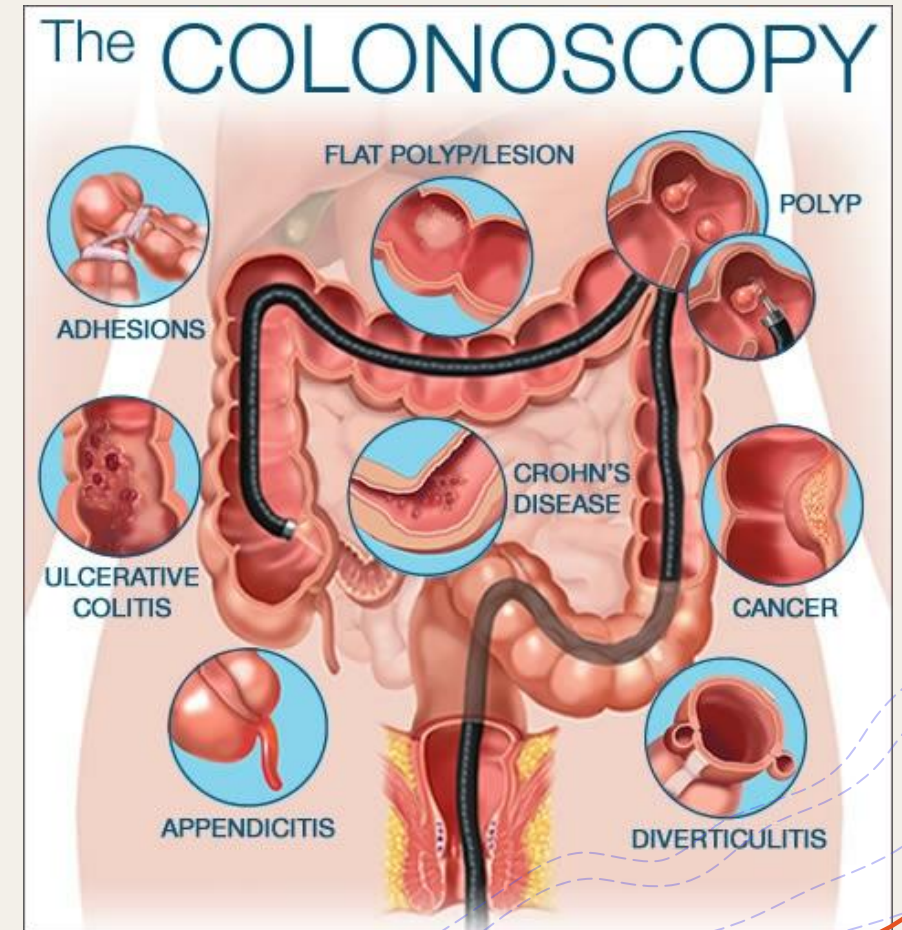
Lower gastrointestinal endoscopy

- Proctosigmoidoscopy
 - Visualization of distal colon, rectum, anus
 - Every 5 yrs after 45 age
 - Findings
 - Polyps
 - Fissures
 - Tumors
 - Hemorrhoids
 - Cancer
- Pretest
 - Diet
 - NPO
 - laxative
- During
 - Left lateral knee to chest position
 - May feel pressure
 - Specimens and electrocoagulation current
- Posttest
 - Monitor vital signs
 - Supine position-orthostatic hypotension
 - Pain and flatus
 - Rectal bleeding

Diagnostic Tests- Endoscopy

Lower gastrointestinal endoscopy

- Colonoscopy
 - Visualization of entire lower colon
 - Recommended 45 years every 10 years
 - Biopsy specimen
 - Polyps removed
 - Findings
 - Pretest
 - Diet
 - NPO
 - Laxative/enema
 - **Teach client may have diarrhea following bowel prep solution**
 - During
 - Sedation and analgesia
 - Left side
 - Vasovagal response
 - Posttest
 - Monitor vital signs
 - Rectal bleeding
 - Severe pain
 - Flatus and cramping
 - Blood may be present is specimen-report to MD





Colonoscopy Patient
Education for Pre and
Post op Care

<https://www.youtube.com/watch?v=0i2nWmeUbqA>



<https://www.youtube.com/watch?v=dZA25BzSpmY>

Gastric Analysis-Measuring Secretions in Stomach-

Basal Cell Secretion Test

- Detects duodenal ulcer, gastric carcinoma, pyloric or duodenal obstruction, and pernicious anemia

Two gastric analysis tests – Basal cell secretion test and Gastric acid stimulation test

Basal cell secretion test

- Prep before test
- Avoid cholinergic and antacid drugs- interfere with gastric acid secretion
- NPO after midnight

□ Procedure

- NG tube inserted - contents of the stomach are suctioned out through the tube using a syringe
- NG tube connected to wall suction
- Stomach contents are collected every 15 minutes for 1 hour
- Specimens are labeled according to time and order in which they were obtained.
- Gastric acid is tested for pH and amount of gastric acid

Too much hydrochloric acid may indicate a peptic ulcer
Too little could be a sign of cancer or pernicious anemia

Gastric Analysis-Measuring Secretions in Stomach-Gastric Acid Stimulation Test

Measures the amount of gastric acid for 1 hour after subcutaneous injection of a histamine drug

- + Prep before test
Histamine subcutaneous injection given
- + Procedure
Measures the amount of gastric acid for 1 hour after Histamine is given
- + Abnormal results
radiographic tests or endoscopy can be done to determine the cause

Diagnostic Tests-Percutaneous Liver Biopsy

Incision over liver

- Findings
 - Liver cancer, cirrhosis, hepatitis
- Needle placed into liver for specimen
- **Risk for bleeding!!!**

Pre-procedure

- Consent
 - CBC
 - Coagulation studies

During procedure

- Back or left side
 - Hold breath while needle inserted
 - Pressure to site

Post procedure

- Vital signs
 - Site for bleeding
 - Avoid coughing, straining, exercise, lifting-1 week
 - Analgesics
- Patient lies on right side for 1-2 hours, then supine for 2-3 hours to prevent bleeding!



Liver biopsy

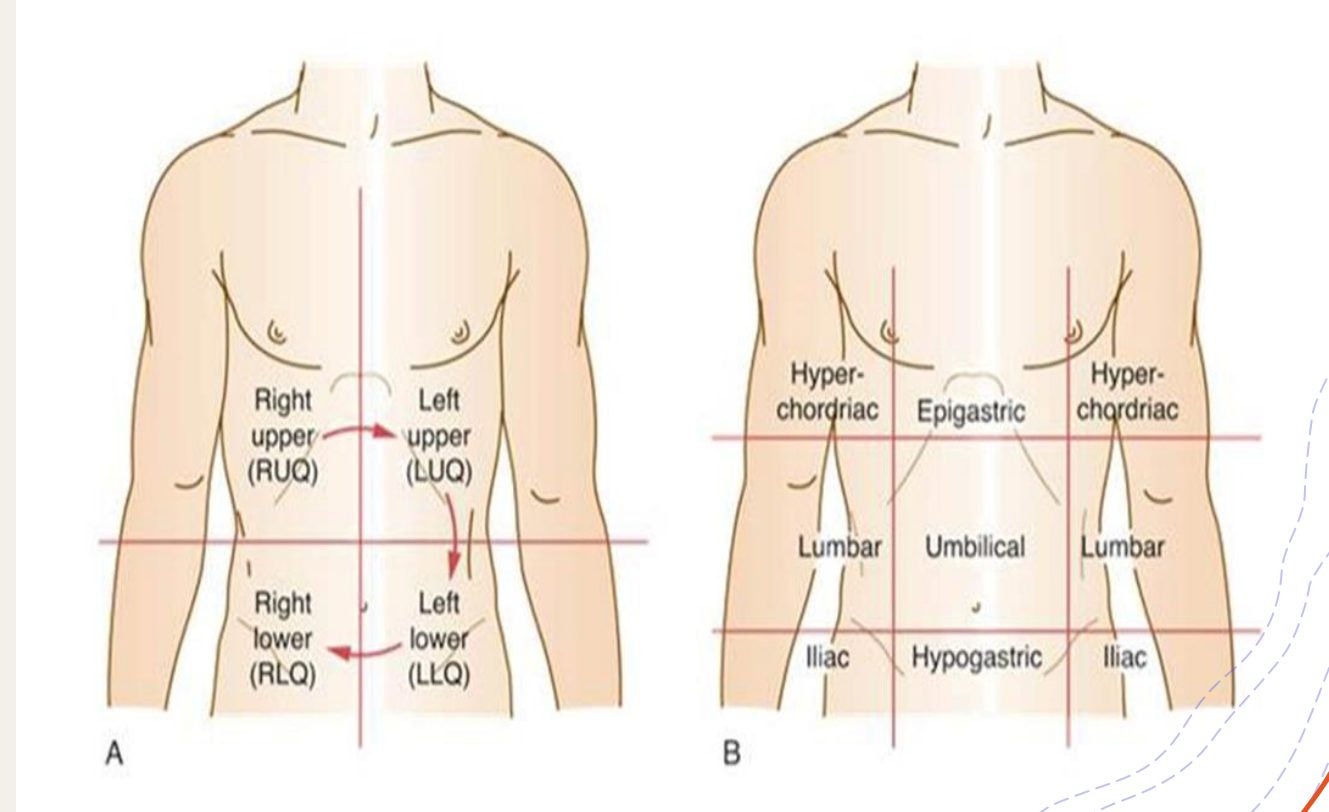
<https://www.youtube.com/watch?v=y2kXIH2y5Vo>

Physical Examination of the Abdomen



Physical Assessment

- Height and weight
- Body mass index
- Oral cavity
- Abdomen
 - Inspection
 - Jaundice
 - Auscultation
 - Percussion
 - Palpation
 - Abdominal girth



Gastrointestinal Intubation-Nasogastric Tubes



Gastrointestinal Intubation

Rationales-NG Tube

Placement of a tube within the GI tract for therapeutic or diagnostic purposes

Decompression - remove gas and fluids from the stomach

Diagnose GI motility and obtain gastric secretions for analysis

Relieve and treat obstructions or bleeding within the GI tract

Provide a means for nutrition, hydration, and medication when oral route is not possible or is contraindicated

Promote healing after esophageal, gastric, or intestinal surgery

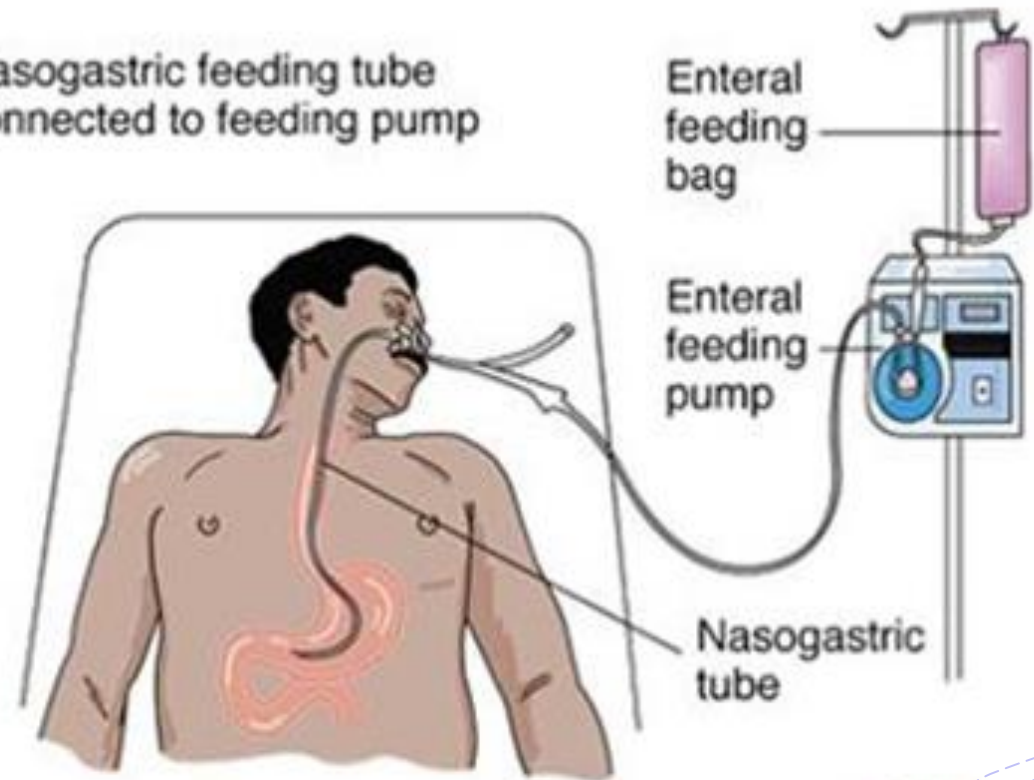
Preventing distention of the GI tract and strain on the suture lines

Remove toxic substances ingested either accidentally or intentionally

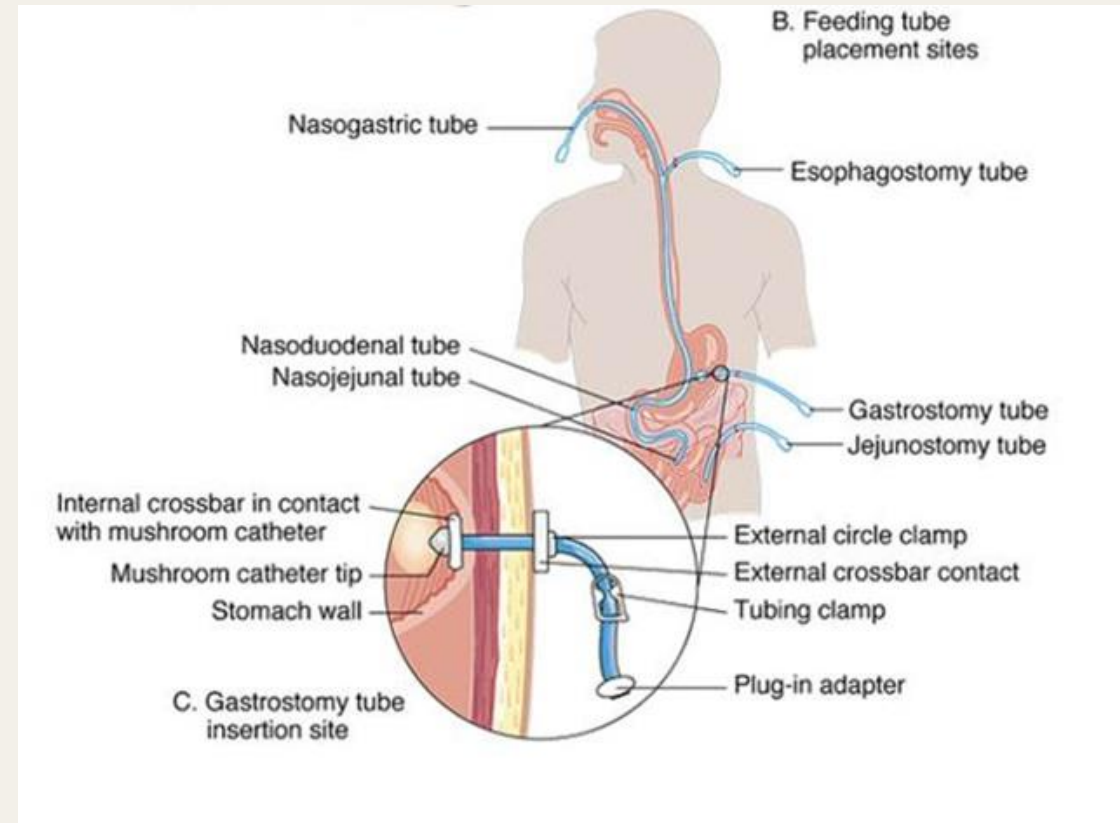
Provide for irrigation

Nasogastric Tubes

A. Nasogastric feeding tube connected to feeding pump



Nasogastric Tubes



Nasogastric Tubes-Nursing Care

Emotional
support to patient
and family

Verify placement
with Chest X-Ray



Checking placement

<https://www.youtube.com/watch?v=qPBoNwyAqLk>

Enteral Nutrition



Provides partial or full nutrition

Delivered directly to stomach, duodenum, or jejunum

Prescribed formula

Water needs

Flushing tube

Head of Bed-
Semi-Fowler's or
Higher

Monitor Fluid and
Electrolytes!

Therapeutic Measures- Gastrointestinal Intubation

Tube feedings

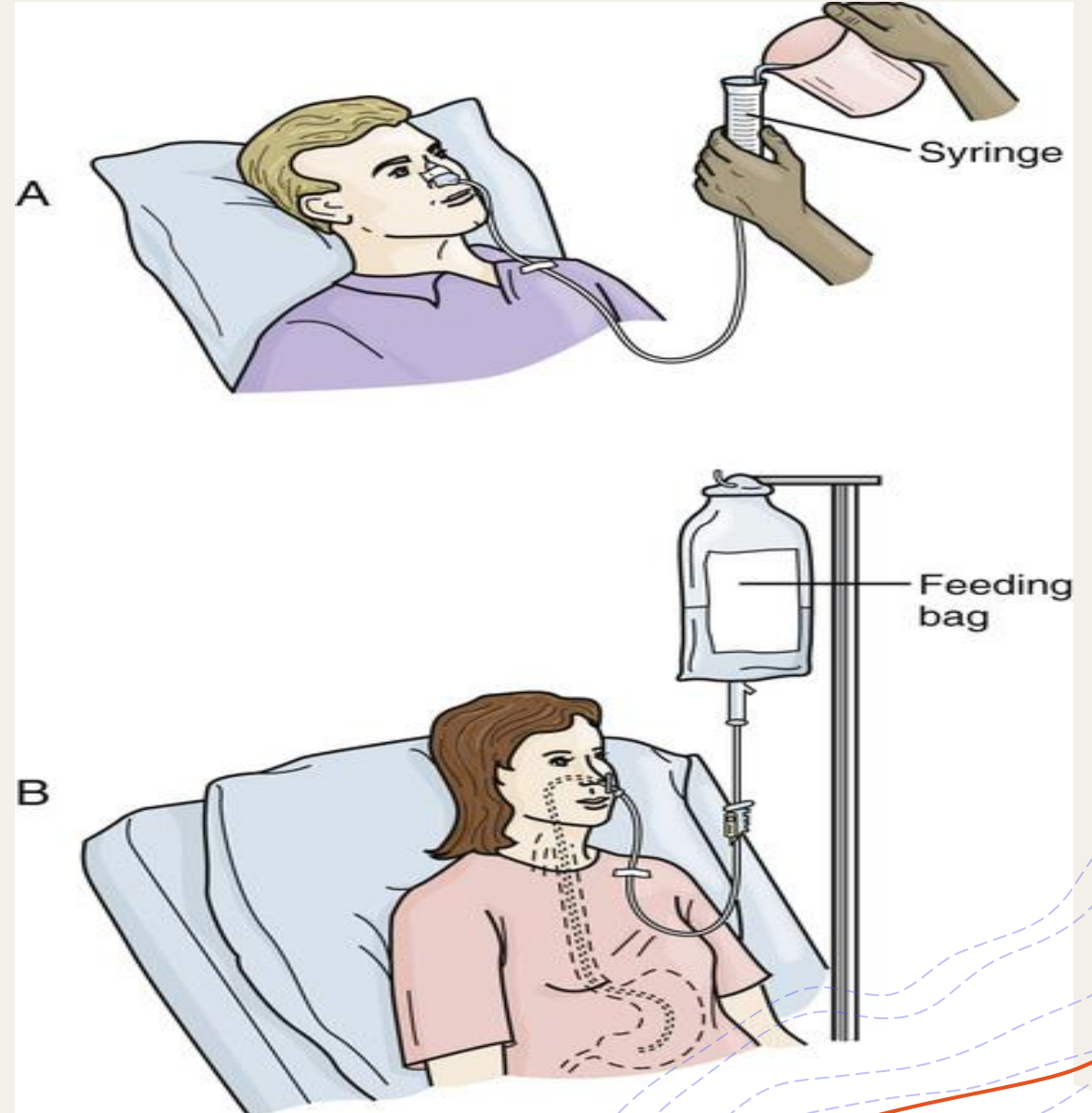
- Gravity
- Pump
- Intermittent
- Continuous

- Nursing care
- Placement check
- Head of bed elevation 30 to 45 degrees
- Monitor for tolerance
- Monitor electrolytes and fluid adequacy

Nursing Actions-Safety with Enteral Feedings

- +Adequate lighting
- +Trace all lines
- +Check connections
- +Route tubes in same direction
- +Use equipment safety features

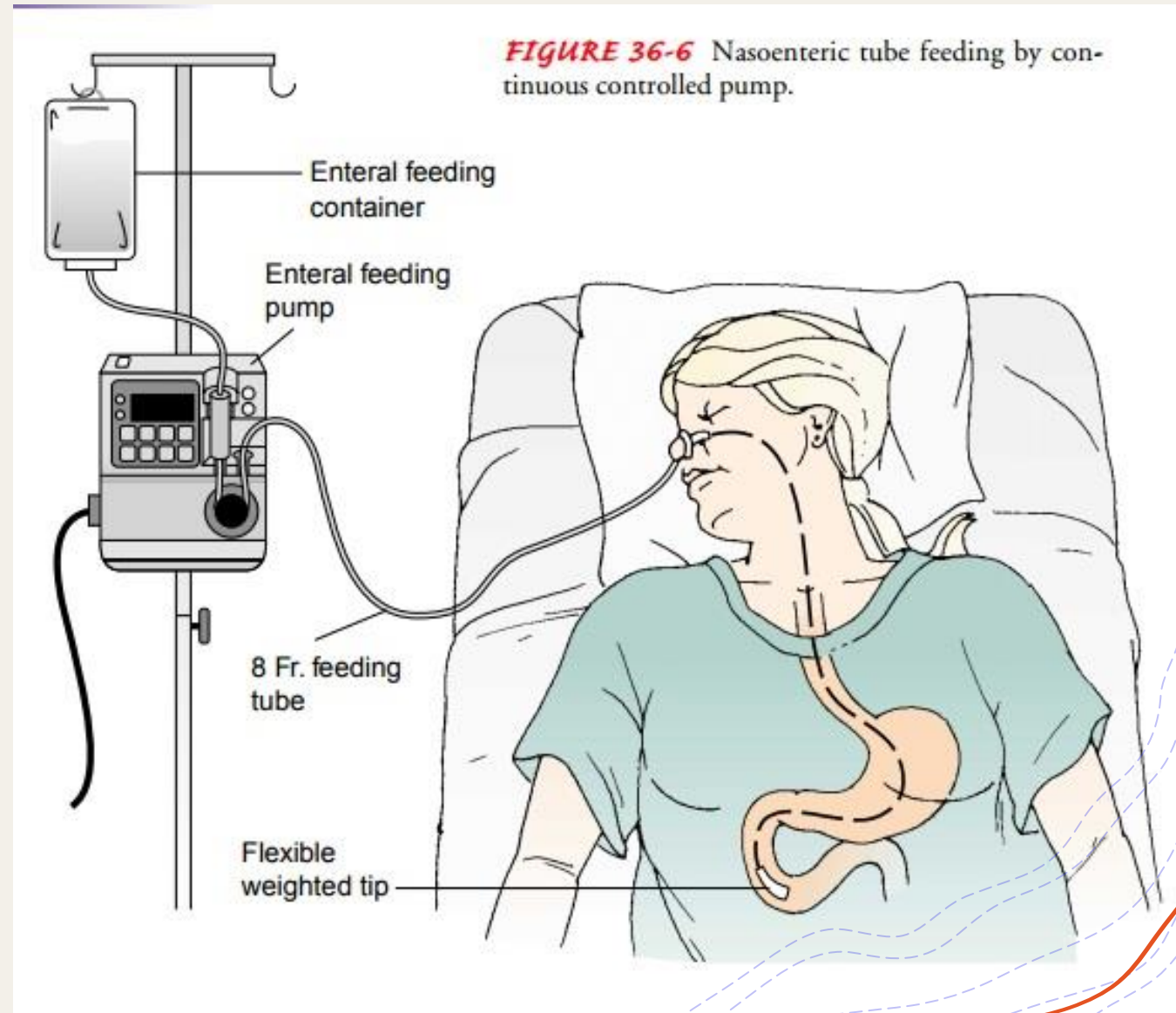
Tube Feeding- Gravity





<https://www.youtube.com/watch?v=ReptcWRP8po>

Tube Feeding- Controlled Pump





Complications of Tube Feedings



Mechanical

- Tube irritations
- Tube obstruction
- Aspiration and regurgitation
- Tube displacement



Gastrointestinal

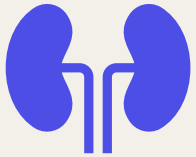
- Cramping
- Distention
- Bloating
- Gas pains
- Nausea
- Vomiting
- Diarrhea



Metabolic

- Dehydration
- Overhydration
- Hyperglycemia
- hypernatremia

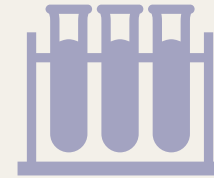
Nursing Care for Tube Feedings



Patient must be in sitting (HOB at least 30 degrees) or high Fowler's position during **feeding- Reduce risk of aspiration**



Monitor for signs feeding not being absorbed- abdominal distention, c/o feeling of fullness nausea/vomiting- **Feeding should be stopped!**



Placement Check-Assess tube placement by noting length of tube, aspirating stomach contents, and, or checking the pH of aspirate



Residual-Greater than 100 mL or amount specified by the agency or HCP-**Stop** feeding and notify HCP! **Prevent vomiting or aspiration**