Gastrointestinal, Hepatic, Pancreatic & Biliary Systems Chapter 32

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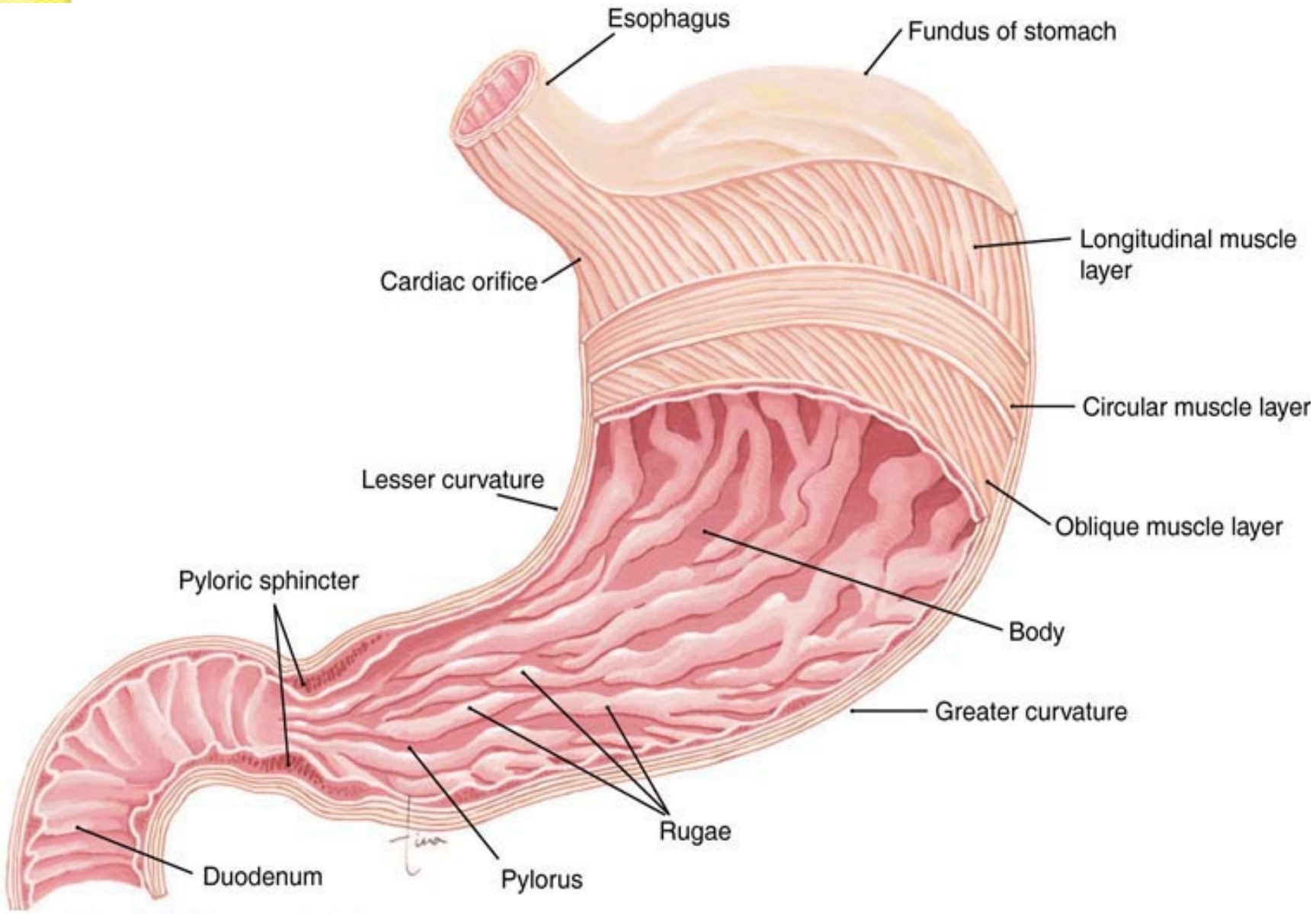
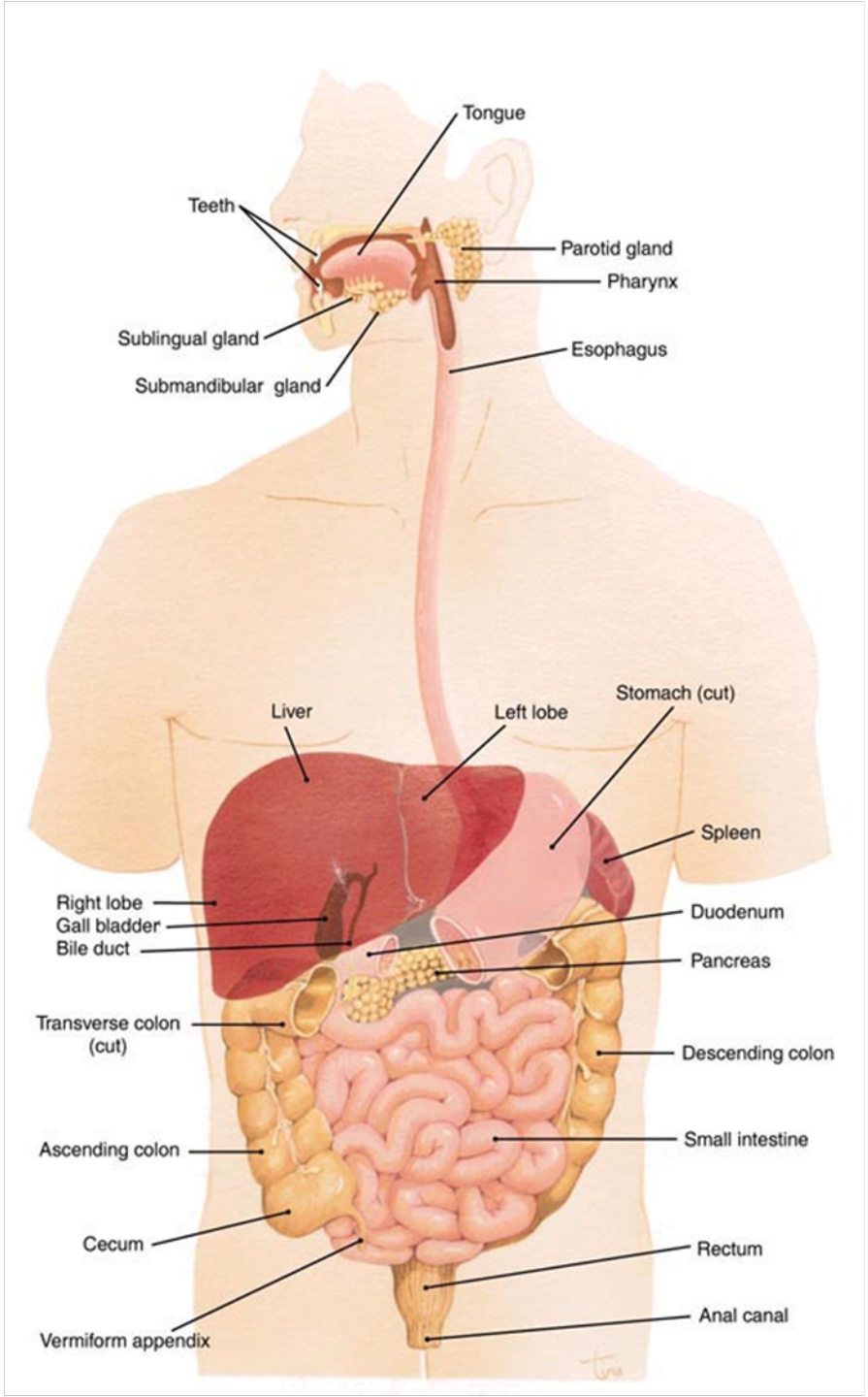
Gastrointestinal Anatomy and Physiology

- Oral cavity and pharynx
- Esophagus
- Stomach
- Small intestine
- Large intestine (Colon)




Tongue
Teeth
Parotid gland
Pharynx
Sublingual gland
Esophagus
Submandibular gland
Liver
Left lobe
Stomach (cut)
Spleen
Right lobe
Gall bladder
Bile duct
Duodenum
Pancreas
Transverse colon (cut)
Descending colon
Small intestine
Ascending colon
Cecum
Rectum
Anal canal
Vermiform appendix

Review of Liver

- Located in RUQ below diaphragm
- 2 Lobes Right > Left
- Receives oxygenated blood thru hepatic artery
- Produces bile in hepatocytes (liver cells)
- Portal circulation
  - Blood from abdominal digestive organs/spleen
    - Enters portal vein before return to heart
  - Regulates blood levels of nutrients
  - Removes potentially toxic substances (alcohol/drugs)
    - Before blood circulates to rest of body

Liver function

1. Carbohydrate metabolism
2. Amino acid metabolism
3. Lipid metabolism
4. Synthesis of plasma proteins
5. Phagocytosis of RBC's
6. Phagocytosis of pathogens
7. Formation of Bilirubin
8. Storage
9. Detoxification
10. Activates Vitamin D

Review of Gallbladder

- Muscular sac, 3-4 inches long located under liver
  - Bile enters via cystic duct
- Stores and concentrates bile until needed
- Secretes bile into duodenum:
  - Duodenal mucosa excretes cholecystokinin, a hormone, that stimulates gallbladder to contract and release bile
  - Aids in digestion

Review of Pancreas

- ~ 6 inches long
- Between the duodenum and spleen
- Endocrine & exocrine gland
- Secrete digestive enzymes - exocrine
  - Amylase
  - Lipase
  - Trypsinogen
- Islets of Langerhans - Endocrine
- Produces bicarbonate juice

Aging and Gastrointestinal System

- Tooth enamel harder/more brittle
  - ?loss of teeth or difficulty chewing
- Tongue atrophy: Acute taste sensations ↓'ed
- Sweet taste sensation lost
- Decreased production of saliva by 33%
- Esophagus motility decreases, dilates, emptying slower, peristalsis decreases
- Weaker gag reflex
- Decreased motility of stomach

Nursing Assessment

- Subjective data
  - Health history
  - Medications (Rx & OTC)
  - Nutritional assessment (Usual diet/Allergies)
  - Family history
  - Cultural considerations

Nursing Assessment

- Objective data
  - Height, weight and BMI
  - Oral cavity
  - Abdomen
    - Inspection
    - Auscultation
    - Palpation
    - Percussion – usually done by a MD or CRNP

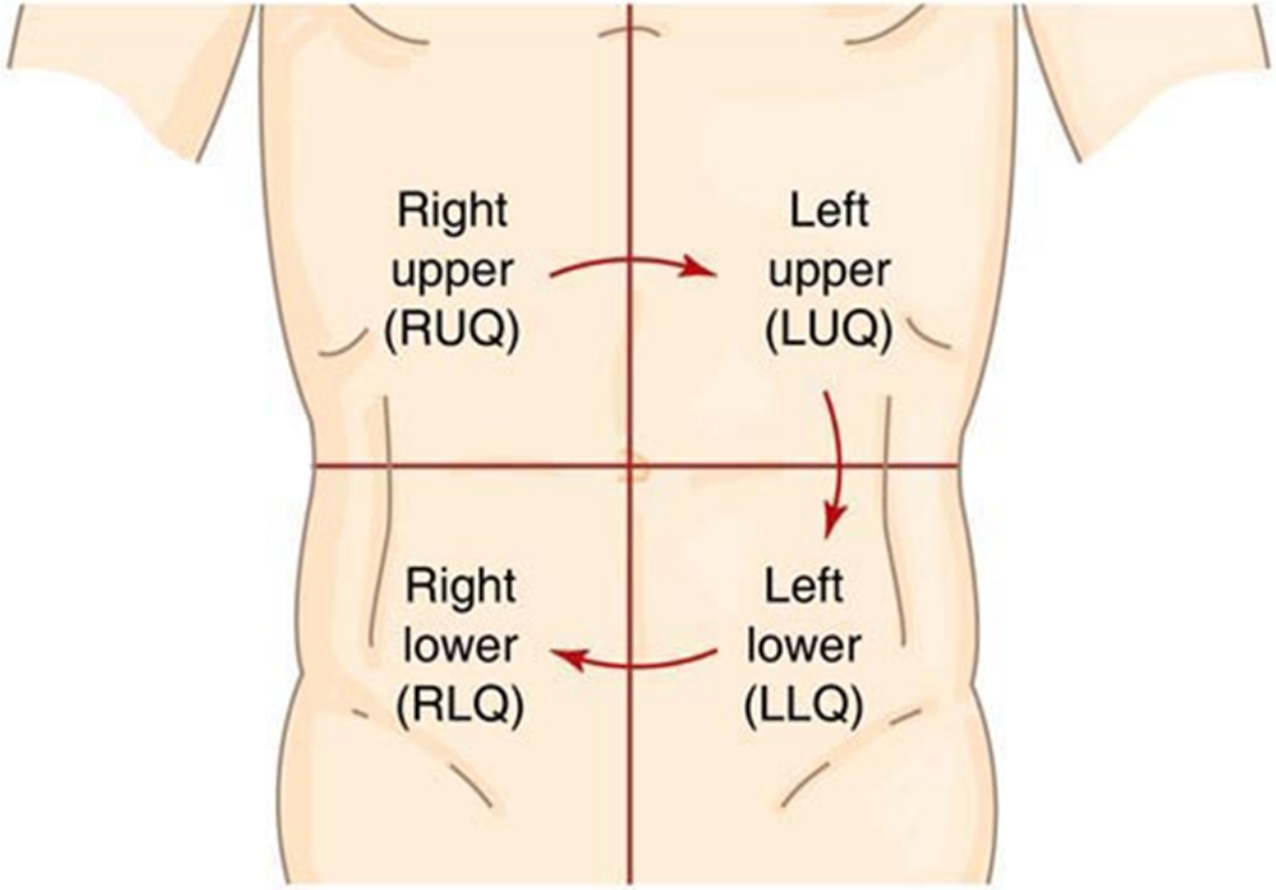
Conditions before Examination

- Patient conditions:
  - Empty bladder
  - Relaxed patient
  - Arms at side
  - Proper exposure
- Examiner conditions:
  - Warm hands
  - Slow and purposeful movements
  - Assess for any areas of pain
  - Monitor your examination by watching the patient's face

Inspection

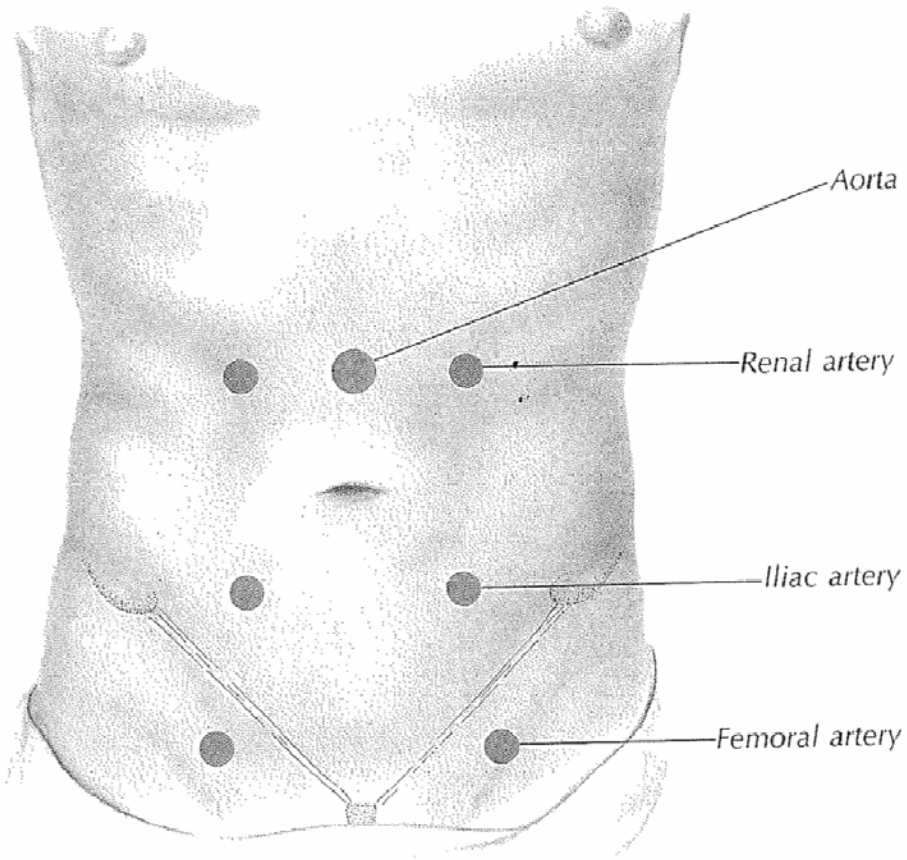
- Skin
- Umbilicus
- Contour of the abdomen
- Symmetry
- Enlarged organs
- Masses
- Peristalsis & Pulsations

Quadrants of the abdomen



Auscultation

- Bowel sounds
- Bruits
  - Epigastrium
  - Aorta
  - Iliac arteries
  - Femoral arteries
- Friction rubs


Aorta
Renal artery
Iliac artery
Femoral artery

Palpation

- Light palpation
  - Muscular resistance
  - Abdominal tenderness
  - Superficial organs & masses
  - Relaxes patient
- Deep palpation
  - Done by MD or CRNP

Diagnostic Studies

- Stool collection procedure
  - Observe universal precautions
  - Sterile technique for cultures
    - Tongue blade
    - Sterile container
    - 2.5 cm long or 1oz liquid sample
    - Send to lab

Stool for Ova & Parasites

- Detects intestinal infections
- Series of 3 specimens (collected q2nd or3rd Day)
- Preservative in container
- Send immediately to lab
- False negatives
  - Urine
  - Old specimen

Stool for occult blood

- Detects blood not visible w/ naked eye
- 2 methods
  - Microscopic exam – sent to lab
  - Chemical reaction using guiac
  - Series of 3 tests
- False positives
  - Bleeding gums, ingestion of red meat, fish, turnips or horseradish. Vitamin C.
  - Drugs – ex. Anticoags, ASA, colchicine, iron, etc.

Radiographic Tests
Barium Swallow (Upper GI Series)

- X-ray of esophagus, stomach, duodenum & jejunum
  - Oral liquid radiopaque contrast (barium)
  - Fluoroscope
- Detects strictures, ulcers, tumors, polyps, hiatal hernias, motility problems (i.e. reflux)

Barium Swallow (Upper GI Series)

- Procedure
  - NPO 6-8 hrs
  - Clear liquid dinner previous evening
  - No smoking
  - Ingestion of barium while x-rayed
  - ↑ fluids after procedure
  - Abdominal assessment post-procedure
    - √ stool for return normal color (3 days max)

Barium Enema (Lower GI Series)

- Visualizes the position, movements & filling of the colon
- Detects
  - Tumors
  - Diverticula
  - Narrowing (Stenosis)
  - Obstructions
  - Inflammation
  - Ulcerative colitis
  - Polyps

Barium Enema (Lower GI Series)

- Procedure
  - Low residue or clear diet 2 days prior
  - Cathartics, laxatives or enemas
  - NPO after MN, clear liquids may be allowed in AM
  - Barium instilled rectally
  - X-rays taken
  - Lasts ~ 15 mins

Barium Enema (Lower GI Series)

- Contraindications
  - Inflammatory disease
  - Suspected perforation
  - Obstruction
  - Active GI bleed
- Post procedure
  - ↑ fluids
  - Report abd pain, bloating, no stool, blood

CT Scan

- 3-D look at abdominal organs
- Dilute barium/oral contrast/IV contrast
- NPO 2-4 hours prior to test, can have clear liquids am of test if later in day
- Note allergies to iodine/contrast

Nuclear Scanning (Cholecystogram, PIPIDA)

- Injected with sm. amt. radioactive isotope
- 60 min after injection pictures taken
- Traces path of isotope through bile ducts, gallbladder, intestines
- Fatty meal/cholecystokinin to stimulate gallbladder
- Dx ejection problems, obstruction, disease
- Takes 2 hours

Angiography

- Useful for s/s arterial occlusion disease of hepatic biliary pancreatic vessels
- IV contrast given 1 hour before
- NPO 2-8 hours before
- Xrays taken q 20 min for 1 hour
- √ Allergies to Iodine
- √ bleeding at puncture site post procedure
- √ pulses distal to puncture site

Endoscopy

- Inspection of body organs or cavities
- Also can remove polyps, take biopsies, and coagulate bleeding sites.
- Endoscope
  - Tube with an fiberoptic system

EGD (Upper GI Endoscopy)

- ESOPHAGOGASTRODUODENOSCOPY
- Views esophagus, stomach, and duodenum.
- NPO 8-12 hours before
- Usually requires sedation(Versed/Valium)
- Post-procedure – must check gag reflex before giving anything "po"

Endoscopic Retrograde Cholangiopancreatography

- AKA ERCP
- Visualizes
  - Liver
  - Gallbladder
  - Pancreas
- Contrast medium
  - Ampulla of Vater
  - Check iodine allergy

Endoscopic Retrograde Cholangiopancreatography

- Flexible fiberoptic endoscope
- Evaluates
  - Jaundice
  - Pancreatitis
  - Stones
  - Persistent abd pain
  - Biliary tract disease
  - F/U pancreatic disease

Endoscopic Retrograde Cholangiopancreatography

- Procedure
  - Topical anesthetic
  - IV sedation
  - Left lateral position
  - Biopsies may be done or obstructions relieved
- Monitor
  - Vital signs
  - √ RUQ pain
  - N/V

Sigmoidoscopy (Proctosigmoidoscopy)

- Visualizes distal sigmoid colon, rectum and anus
- Sigmoidoscope
  - Flexible (most common)
  - Rigid (rare) – used to visualize the rectum
- Biopsies may be taken
- Detects
  - Ulcers, tumors, hemorrhoids, polyps, fissures, fistulas, abscesses
  - Main use – detection of cancers

Clear Liquids 24 hours before

NPO night before

Bowel Prep necessary

Sigmoidoscopy (cont.)

- May have strong urge to defecate during procedure
- Position
  - Knee to chest – rigid
  - Left lateral - flexible

Sigmoidoscopy (cont.)

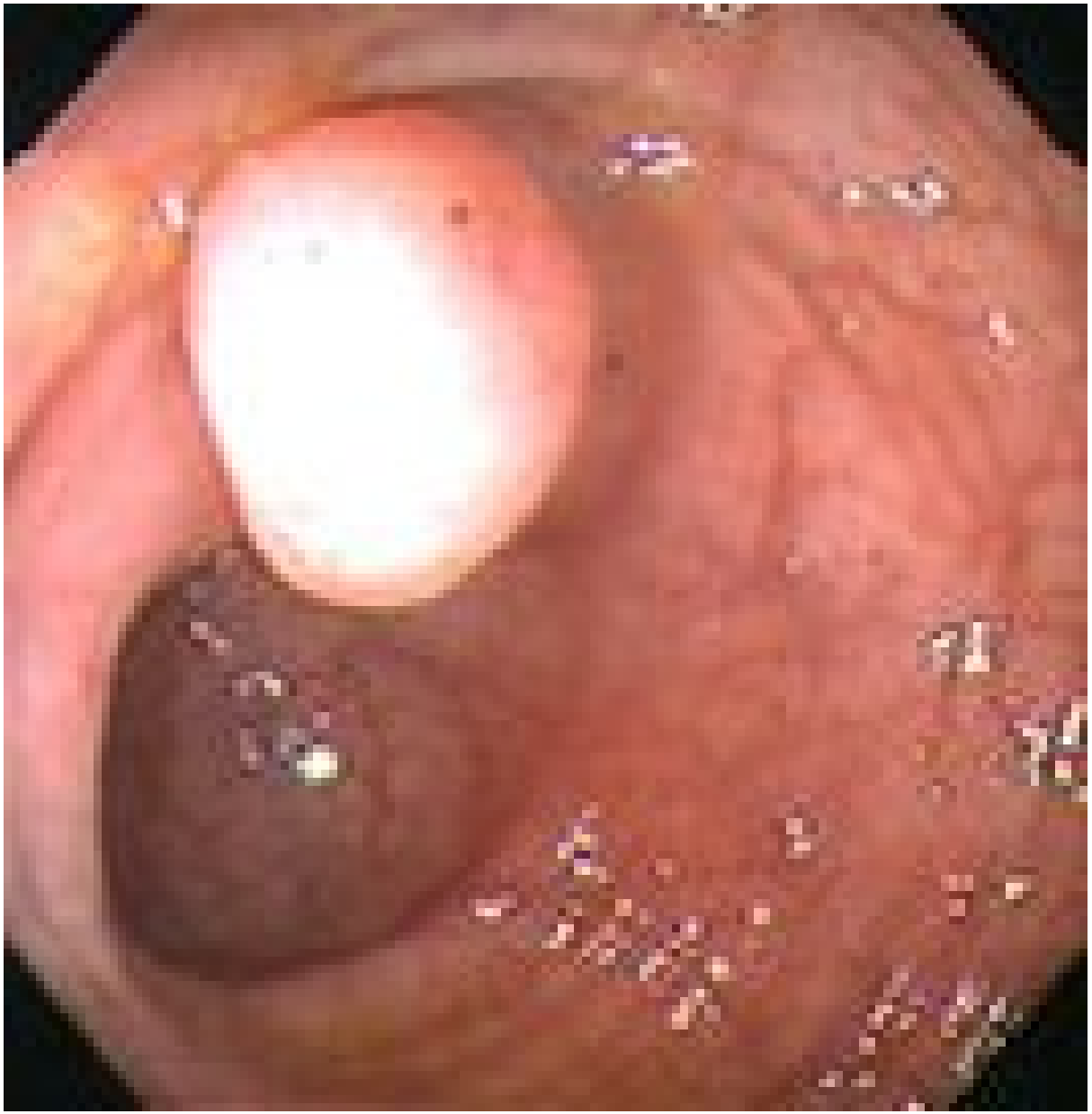
- Complications
  - Perforation
    - √ bleeding
    - Vital signs
- Sitz baths

Colonoscopy

- Visualized lining of ***large intestine***
- Detects
  - Ulcers, lacerations
  - Early malignancy
  - Tumors
  - Hemorrhoids
  - Polyps
  - Fissures, fistulas
  - Early GI bleed

Colonoscopy (cont.)

- Procedure
  - Sedation(Versed)
  - Position on left
  - Colonoscope lubricated, inserted rectally
  - Air instilled
  - Photos are taken
  - Monitor VS
    - Vasovagal response - ↓ BP, bradycardia



Gastric Analysis

- Measures stomach secretions
- Detects/aids in diagnosis of
  - Duodenal ulcer
  - Gastric ca
  - Pyloric or duodenal obstruction
  - Pernicious anemia
- Two tests performed
  - Basal cell secretion test
  - Gastric acid stimulation test

Abdominal Ultrasound (US)

- Non invasive
- High frequency sound waves
- Visualizes
  - Liver, gallbladder, bile ducts
  - Pancreas
  - Kidneys, adrenal glands
  - Spleen
  - Large abdominal blood vessels

Abdominal Ultrasound (US)

- Procedure (~30 -60 mins)
  - NPO 8hrs prior
  - Covered with gel
  - Controlled breathing
  - Transducer moved over abdomen
  - Images recorded

Abdominal Ultrasound (US)

- Detects
  - Fluid collections
  - Masses
  - Infections
  - obstructions

Liver Biopsy

- Done if less invasive procedures non-diagnostic
- Detects
  - Cancer
  - Cirrhosis
  - Hepatitis
  - Other causes of liver dx

Liver Biopsy

- Pre-procedure
  - Consent – teaching
  - Baseline labs
  - NPO X 6-8 hrs
  - Baseline VS
  - Sedation if ordered

Liver Biopsy

- Procedure
  - Position on back or left side
    - No movement
  - Instruct breathing
    - Exhale and hold
    - MD inserts needle and withdraws liver tissue

Liver Biopsy

- Post-procedure
  - **CBR X 24 hrs**
  - Frequent VS and site √
  - Avoid coughing or straining
  - Analgesics
- Complications
  - ↑ risk for bleeding

Abdominal Paracentesis

- Uses
  - Diagnostically
    - Abnormal cells
  - Therapeutically
    - Drain fluid
- Rarely done
  - Removes serous fluid
    - Contains large amts of albumin
    - Not easily replaced by liver

Abdominal Paracentesis

- Procedure
  - Baseline VS, Sedation
  - Void pre-procedure
  - Fowler's position
  - Local anesthetic
  - #20 gauge needle inserted into abd
  - Fluid removed
    - 50cc at a time – 300 -1000cc withdrawn

Abdominal Paracentesis

- Post procedure
  - Post – op v.s.
  - Position unaffected side X 1hr – then comfort
  - Band-Aid to puncture site
  - Pain management
  - Record

Gastric Intubation

- Placement of tube in GI tract
- Therapeutic or diagnostic
- Types
  - Nasogastric
    - Nares to stomach
  - Nasoenteric
    - Nares to intestine

Gastric Intubation

- Purposes
  - Decompression
  - Diagnosis
  - Obstruction treatment
  - Gavage
  - GI tract rest
  - Lavage
  - Irrigation

Gastric Intubation

- Feeding tubes
  - Long term use
    - Esophagostomy
    - Gastrostomy
    - Jejunostomy
  - Temporary use
    - Nasogastric
- Insertion
- ***Always √ placement prior to instillation of anything***

Tube Feedings

- When oral feeding not possible as a supplement
- Placement is checked q shift or before each feeding or med administration
- Residual checked q 4 hours or before each feeding
  - > 100cc stop for 1 hour and recheck , after 1 hour still > 100cc contact physician

Types of GI tubes

- Levine tube
  - Single lumen
  - Uses
    - Gastric decompression
    - Irrigations
    - Lavages
    - Feedings
  - Not vented
    - Low suction

Types of GI tubes

- Sump tube (Salem Sump)
  - Double lumen
  - Uses
    - Decompression
    - Irrigation
    - lavages

Types of GI tubes

- Weighted, flexible feeding tubes w/stylets (i.e. Dobbhoff, Keofeed)
  - Small bore
  - Tube feeding only
  - Long term
  - Suction collapses tubes

Types of GI tubes

- Miller-Abbott Tube
  - Double lumen
  - Drain and decompress
    - Small intestine
  - Inserted by MD or trained nurse
  - Tube advanced 1-2 inches q 2hrs

Total Parenteral Nutrition
IV Nutrition

- Contains: dextrose,aminoacids, vitamins, minerals, fats
- Designed to:
  - Increase nutritional status
  - Increase weight gain
  - Aid in healing process
- Monitor for S/S of hypoglycemia
- PPN-Peripheral Parenteral Nutrition
  - Dextrose <12%
  - Less than 10 days
  - Same mixture as TPN