Abdomen and Gastrointestinal

Gallbladder and Biliary Tract

Cholelithiasis

- Classic presentation: obese, female, age 20-40
- Clinical: RUQ pain after a meal (not always postprandial), nausea
    - Radiation of pain (often to the back)
- Dx: with ultrasound (+GS, no GBW thickening)
- Tx: analgesics (NSAIDS b/c it is PG mediated pain), antiemetics, surgery referral

Choledocolithiasis

- GS in the common bile duct (CBD)
- Similar presentation to acute cholecystitis
- Jaundice possible
- Diagnosis: elevated alk phos, conjugated hyperbilirubinemia, lipase/amylase elevation possible; US shows dilation of the CBD, +GS

Cholecystitis

- Clinical: pain of cholelithiasis, lasts longer; F/C/N/V
    - May be toxic
    - Murphy sign 65-70% sensitive
- Tougher to diagnose in the elderly
- Workup
    - Elevated WBC, AST, ALT, lipase
    - **Ultrasound diagnostic**: wall thickening, pericholecystic fluid, sonographic murphy's sign
- Complications
    - GB empyema
    - Perforation
    - Emphysematous cholecystitis (gas in the GB wall) → very sick patients
- Tx: abx, resuscitation, surgery consult
- Beware of the elderly: subtle presentations, little to no RUQ ttp, and normal labs

Acalculous Cholecystitis

- Generally, a disorder of sick, dying, elderly patients

- An inflamed GB with NO stone

Cholangitis

- Biliary obstruction with underlying bacterial infection
- CBD most commonly involved
- **Charcot's Triad: fever, RUQ pain, and jaundice**
- Presentations can be subtle
- Dx and TX: ultrasound, volume resuscitation, abx, decompression (ERCP, surgical)

TUMORS

GB Carcinoma

- Older females
- Chronic RUQ pain
- **Porcelain GB:** 25% risk of cancer

Cholangiocarcinoma

- High mortality
- Acute/chronic pain
- Jaundice a common finding, biliary obstruction

Pancreatic Disease

Acute Pancreatitis

- Inflammation of the pancreas
- Multiple etiologies
    - Most common in US: **idiopathic**, **gallstones and alcohol**
    - Drugs, toxins, and infections
    - Trauma (kids)
    - Scorpion bites
- Presentation: mid-epigastric pain, LUQ pain, N/V, TTP epigastrium, diffuse pain possible
    - Can present with shock
- **Hemorrhagic pancreatitis**: grey turner sign, Cullen sign
- Diagnosis
    - Elevated lipase: higher sensitivity and specificity; elevation does NOT correlate with disease severity
    - CT/US to determine etiology (CT scan in sick patients to help define potential complications)
- Treatment
    - Aggressive hydration
    - Analgesics, antiemetics

    - Antibiotics if necrosis on CT
    - Endoscopic sphincterotomy for biliary pancreatitis
- Complications: ARDS, pleural effusions, hypocalcemia, hypoglycemia, hemorrhage, renal failure, pseudocyst

Ranson's Criteria

At admission

- Age >55
- WBC >16,000
- Glucose >200
- AST >250
- LDH>350

At 48 hours

- Ca <8
- HCT fall >10%
- PO2 <60
- BUN increase >5
- Negative base excess >4
- Fluid sequestration >6L

Necrotizing Pancreatitis

- Severe illness
- Patient usually toxic
- Operative management
- Antibiotics
- Can develop ARDS and sepsis

Chronic Pancreatitis

- Etiology
    - Most cases due to alcohol abuse
    - Trauma, anatomic variants, lipids
- Malabsorption when 90% pancreas affected
- Chronic abdominal pain
- May not have elevated enzymes
- Dx and TX: pancreatic enzymes replacement, history, supportive care

Pancreatic Tumors

- Common cause of GI cancer
- High mortality rate
- Adenocarcinoma: common, head of pancreas, high mortality
- Clinical: weight loss, dull epigastric pain, **painless jaundice**
    - Classic finding: **Courvoisier sign** (enlarged palpable GB with painless jaundice)
- Dx: US, biopsy, CT scan
- Complete resection only cure

HERNIAS

- Incarcerated vs strangulated
    - Incarcerated: like you are in jail. That is bad. You are stuck.
    - Strangulated: when you lose your arterial blood supply and need surgery
- Ventral hernia (separation of rectus abdominis muscles)
- Umbilical/paraumbilical hernia (can incarcerate/strangulate)
- Incisional
- Inguinal
- Spigelian (between muscles layers, can incarcerate/strangulate)

Esophageal Disease

Achalasia

- The most common motility disorder
- **Impaired relaxation of the LES** and absence of peristalsis
- Clinical: chest pain, odynophagia, esophageal spasm, vomiting
- Scleroderma can produce a disorder that looks just like this

Diffuse Esophageal Spasm

- Simultaneous contractions of the esophageal body
- Clinical: intense chest pain
- Differentiate from angina/ACS

Boerhaave's Syndrome

- Full-thickness perforation of the esophagus after severe vomiting
    - Develop mediastinitis
- Sudden increase in esophageal pressure
- Commonly misdiagnosed
- *Examiner favorite *
- Clinical: forceful vomiting, chest pain after excessive vomiting, ill appearing, chest/neck pain, ***air in the neck**, ***hamman's crunch** (crunching sound around the heart as air dissects around the heart)
    - vomiting → blood → fever = esophageal rupture
- Rupture common on the **left side**
- CXR usually abnormal
    - Pleural effusion
    - Pneumomediastinum, pneumothorax
- Usually when you suspect this you get a CT scan for better eval
- Tx: abx, operative repair
- **HIV and esophageal candidiasis = can present with spontaneous rupture of the esophagus

Diverticula

- Anywhere in the esophagus (and anywhere in bowel)
- Transfer dysfunction
- Clinical: regurgitation, recurrent aspiration, recurrent pneumonia, halitosis
    - Neck pain / “mass”
- CT or endoscopy
- Surgical repair

Zenker’s Diverticulum

- Diverticulum of pharyngeal mucosa (above the UES)
- Presents as recurrent aspiration or regurgitation, recurrent pneumonia
- Partial wall diverticula (not full thickness)

Foreign Body

- Majority in kids
    - Peds: proximal
    - Most common: coin ingestion
- Adults: distal
- Clinical
    - History: usually a **witnessed choking episode**
    - Chest pain, vomiting, dysphagia, gagging, choking
- Workup: plain films, endoscopy, CT scan, esophogram with contrast
- **High risk (in esophagus): button batteries (double rim often visible) or sharp objects → consult for removal

Food impaction

- Treatment
    - Treat airway emergency
    - **Glucagon 1mg IV** relaxes the LES (makes you vomit)
    - Soda (usually coke on the test)
    - Esophagoscopy
    - **Always follow up after removal** (many people have an underlying structural abnormality that needs eval with ENT)

Mallory-Weiss Syndrome

- Partial thickness esophageal tear (differentiate from Boerhaave with full thickness tear)
- At the GE junction
- Vomiting classic (1/3 no vomiting)
    - vomit → pain →blood
- Upper GI bleeding (often diagnosed during scope)

Stricture/Stenosis

- Secondary from scarring from GERD
- Presentation: solid food dysphagia
- Endoscopy

Tracheoesophageal Fistula

- Defect between trachea and esophagus
- Peds and adults
- Aspiration
- Respiratory distress with recurrent PN

Esophageal CA

- Most squamous cell cancer
- Men, EtOH, smoking, Barrett's esophagus – chronic GERD
- Clinical: dysphagia, chest pain, GI bleed presentation
- Poor prognosis

Candida Esophagitis

- HIV + patient with a low CD4 count; any immunosuppressed patient
- Presents with pain and dysphagia; can perforate

Esophagitis

- Inflammation of the esophagus
- Multiple etiologies
    - **Antibiotics (doxycycline) – "pill esophagitis"
    - GERD (most common form of esophagitis that can lead to barrets and then esophageal CA)
    - NSAIDS, other meds, candida
- Clinical: chest pain/odynophagia
- Endoscopic diagnosis
- Tx: PPI or H2 blocker
- Chronically can lead to Barrett's esophagus → esophageal CA

GERD

- Associated with: EtOH, caffeine, meds, high fat foods, obesity
- Clinical
    - Classic symptom: "heartburn"
    - Odynophagia, dysphagia
    - Can be confused with cardiac chest pain
    - May present as asthma/cough
- Barrett's esophagus

    - Pre-malignant condition
    - Endoscopy
    - PPI, H2 blocker

Caustic Ingestion

- Classic for the boards: BLEACH ingestion
    - Household bleach (3-6% Na hypochlorite): not that harmful to esophagus
- **ALKALI worse (liquefactive necrosis)**
- **Acid = coagulation necrosis = blocks further damage**
- Clinical
    - Severe odynophagia, dysphonia, burns
    - Severe abdominal pain
- Clinical diagnosis
- Gastric perforation possible (get an upright CXR to eval for free air)
- Endoscopy may be required
- Surgery may be required
- **Do NOT induce emesis (no diluents)**

Liver Disease

Hepatic Failure

- Types: hepatocellular, cholestatic, infiltrative
- Etiologies: Tylenol, EtOH, acute severe hepatitis, toxins, meds
- Sequelae: coagulopathy, hypoalbuminemia, hepatorenal syndrome, encephalopathy

Cirrhosis

- Results from scarring of the liver
- Etiology
    - Hepatitis C (most common outside the US)
    - Etoh (most common cause in the US)
- Complications

Portal Hypertension

- Acute variceal hemorrhage, spontaneous bacterial peritonitis, hepatic encephalopathy, hepatorenal syndrome

Esophageal Varices

- Occur secondary to the increased portal pressure (**portal HTN**)
- High re-bleed rate and high mortality
- Massive upper GI Bleed
- Hematemesis or “coffee-ground” emesis
- Tx: Assuming true, massive esophageal bleed…

    - Intubate
    - Blood products
    - Linten tube
    - GI consult
    - Octreotide and Abx
    - IR: TIPS may be lifesaving

Hepatorenal Syndrome

- Development of acute renal failure
- No reversible causes
- High mortality
- The thought: massive ascites in the ER → ER paracentesis → oncotic pressure causes ascites to re-accumulate → intravascular pressure drops→ low flow to kidneys → kidneys fail

Hepatic Encephalopathy

- Accumulation of nitrogenous waste products
- Precipitants: narcotics, constipation, infection (SBP)
- AMS, +Asterixis
- Search for infection!
- Lactulose

Spontaneous Bacterial Peritonitis (SBP)

- Acute bacterial infection of ascitic fluid
    - **Gram-negative rods (E.coli)**
- Translocation of bacteria from gut/bowel flora
- Clinical
    - Fever, abdominal pain
    - Hepatic encephalopathy
    - May not have much abdominal pain
- Diagnosis: paracentesis
    - **Neutrophil count >250**
    - Total SBC >500
    - Gram stain and culture
- Treatment: abx therapy (Cefotaxime, ceftriaxone)

Liver Abscess

- Two main types
    - **Pyogenic**: 80% of US cases; mixed bacteria (staph, strep) → bad/sick/septic → CT scan, broad spec abx, surgical drainage
    - **Amoebic**: entamoeba histolytica; 10% of cases; may be well-appearing → CT or ultrasound → metronidazole, watch them, ELISA (medical management, surgery usually not needed)
    - Fungal rare
- Commonly associated with biliary obstruction

- Fever/chills, RUQ pain

Acute Hepatitis

- Acute inflammation of the liver
- Diagnostics
    - Elevated transaminases (AST, ALT) in the 1000s
    - Elevated bilirubin (conj and unconj)
    - Elevated alk phos
    - Coagulopathy
- Viral hepatitis: Hep A, B, C
    - Hep B chronic 10-15%
    - Hep C chronic 85%
- Signs/symptoms: fever, anorexia, abd pain, “flu-like” illness, many not have jaundice, hepatomegaly, RUQ tenderness
- Diagnosis
    - ALT > AST acute viral hep
    - AST > ALT alcoholic liver dz
    - Elevated bilirubin
    - Acute HAV: IgM HAV antibody
    - Acute HBV: Hep B surface antigen, IgM anti-core antibody
- Tx: not your job. :) Make sure you make the diagnosis

Mesenteric Ischemia

- More common in older patients
- History of A-fib/cardiac diseases
- High mortality rate, must be aggressive with dx and consultation
- Clinical
    - Severe abdominal **pain out of proportion** to exam
    - Abdomen relatively soft
- Workup
    - Xray to rule out free air
    - CT scan, angiography, Surgery consult
    - Lactate frequently elevated

Mesenteric Embolism

- Most common etiology of mesenteric ischemia
- More common in women
- Afib or mural thrombus

Mesenteric Venous Thrombosis

- Thrombus also a common cause of mesenteric ischemia
- Patients with severe atherosclerosis
- Low flow state; ICU diagnosis; sick patients
    - Hypercoagulable states, pancreatitis, diverticulitis

The Stomach

Gastric Volvulus

- Stomach rotates 180 degrees
- Closed loop obstruction
- Risk factor: paraesophageal hernia
- Sudden, severe abd pain/emesis
    - strangulation → perforation → death
- Inability to pass NGT

Bezoar

- **Phytobezoar: most common (food, fiber)**
- Trichobezoar: hair
- Pharmacobezoar: antacids, ASA

Gastric Adenocarcinoma

- Most common gastric tumor
- Older age: 65-75 yo
- H.pylori common cause
- Pain, vomiting, weight loss, early satiety

Classic Lymph Nodes

- Left supraclavicular node
- Periumbilical node: metastatic spread (sister mary joseph node)

Small Bowel

Crohns Disease

- Can involve **ANY part of the GI tract**
- **"Skip Lesions":** normal bowel between diseased bowel
- Terminal ileitis (classic)
    - Can look like appendicitis
- Clinical
    - Abd pain, bloody diarrhea
    - Fever
    - Extraintestinal manifestations: arthritis, uveitis, erythema nodosum
    - Hepatobiliary complications
- Diagnosis
    - Colonoscopy

    - Abdominal CT: rule out abscess, etc
    - Labs: fluid and electrolyte abnormalities
- Tx: steroids, immunosuppressive agents (GI)
- Complications: abscess, fistula development, intestinal stricture, toxic megacolon

Small Bowel Obstruction (SBO)

- Most common cause: **adhesions**
- Second most common cause: **hernia** (incarcerated)
- Women: consider femoral hernia
- Other: cancer, GS, ileus, inflammatory bowel disease
- Presentation: crampy, intermittent abd pain with vomiting
- Distended loops of bowel on xray; CT more sensitive
- Tx: IVF, bowel decompression (NGT), abx in select cases, surgery consult

Adynamic Ileus

- "Paralytic ileus"
- **No mechanical obstruction present**
- Seen commonly after surgery
- **Motility** problem

Aortoenteric Fistula

- Classic exam question/scenario:
    - **Patient with a history of AAA repair presents with massive upper GI bleed**
    - May have a "**herald bleed**"
- Not common but very fatal
- Key is considering the diagnosis
- Call surgery

Short Bowel Syndrome

- **Malabsorption** syndrome after small bowel resection
- Severity dictated by length removed
- **Watery diarrhea**, hypovolemia, weight loss
- Vitamin deficiencies

Meckel's Diverticulum

- Incomplete closure/obliteration of the vitelline duct
- Near the ileocecal junction
- Bleeding detected by Meckel scan
- Presents with bleeding, anemia; intussusception

Rule of 2s

- 2% of the population
- 2 feet form the terminal ileum

- 2 years of age most common
- 2x more common in boys

Small Bowel Tumors

- Many are malignant
- Rare cause of GI malignancy
- Men and elderly
- Obstruction symptoms, surgical resection required

Large Bowel

Pseudomembranous Colitis

- **I**nfectious disease: **C. difficile**
- Anaerobic, gram-positive bacillus
- Associated with antibiotic use
- Spontaneous, “community acquired” cases
- Clinical: fever, abd pain, diarrhea
- Diagnosis: stool test for C. diff toxin
- **Metronidazole or vancomycin** (with severe cases give IV and PO)
- With severe cases: **stool transplant**! To recolonize your gut!

Viral Enteritis

- Viruses: most common cause of gastroenteritis
- Norwalk: cruise ships
- Rotavirus: young children
- Self limited, supportive care
- Hand washing

Bacterial Enteritis

- Invasive vs enterotoxin mediated
- **Invasive**: colonic cells damaged, invasion (**+blood**)
- **Enterotoxin**: alteration of water and electrolyte absorption (**no blood**)

Diarrhea Buzz Words

- Yersinia
    - May mimic **appendicitis** (p/w RLQ pain and diarrhea)
- E coli O157:H7
    - HUS in kids
    - Undercooked hamburger meat
    - **BLOODY stool, HUS in kids**, TTP in adults
- Salmonella

    - High fever
    - Relative bradycardia
    - **Osteomyelitis** in sickle cell patients
- Shigella
    - **Seizures** in children
- Vibrio parahaemolyticus
    - **Raw seafood**
    - Alcoholics get very sick
    - Summer months
- Campylobacter
    - Association with **Guillain-Barre**

Appendicitis

- Acute obstruction of the lumen of the appendix
- Retrocecal appendicitis: right flank pain
- Pregnancy: RUQ pain
- Classic periumbilical pain that radiated to RLQ
- Anorexia, nausea/emesis
- Rovsing sign: palpate LLQ and hurts RLQ
- Psoas sign: passive extension of thigh = pain
- Obturator sign: rotate hip = pain
- WBC commonly elevated (may be normal)
- **UA: may show sterile pyuria** (+wbc in urine with no symptoms)
- Surgery consult

Radiation Colitis

- Side effect of radiation
- Pelvis radiation
- Abd pain, diarrhea, tenesmus
- Lower GI bleed
- Reduction of rad dose, steroid enemas, supportive care

Ulcerative Colitis

- **Disease of rectum and colon only**
- Does NOT involve entire bowel wall (like Crohn's)
- No skip lesions
- Diarrhea, abd pain, fever, tachy
- Extraintestinal manifestations: arthritis, uveitis, erythema nodosum (inflamm of fat)
- Complications: toxic megacolon, increased risk of CA
- Diagnosis: colonoscopy
- Treatment: prednisone, Sulfasalazine, other agents
    - In severe cases: IV steroids, antibiotics

Large Bowel Obstruction (LBO)

- Less common than SBO
- Etiology
    - Colorectal CA most common cause
    - Diverticular disease
    - Volvulus – rare cause
- Abd pain, n/v
- Diagnosis
    - Plain films
    - CT
- Treatment: NPO, IVF, Surgery consult

Irritable Bowel (IBS)

- A diagnosis of exclusion
- Twice as common in women
- May be related to stress, alcohol, caffeine
- Abd pain, bloating, constipation, diarrhea, pencil stools, tenesmus
- Fever, bleeding NOT seen in IBS

Diverticular Disease

- Middle age, elderly patients
- Young also develop disease
- Low fiber diets
- Left colon/sigmoid disease most common
    - Diverticula from increased intraluminal pressure

Diverticulitis

- Diverticula become blocked → inflamed → pain → risk for perforation
- Acute pain and tenderness, N/V, fever
- CT scan, IVF, Abx, surgery in some cases

Diverticulosis

- Asymptomatic
- Bleeding possible (often large volume)

Volvulus

- Loop of bowel twists and obstructs
- Vascular supply can be compromised → intestinal ischemia
- Sigmoid or Cecal
    - Sigmoid: elderly patient, chronic constipation, from nursing home
- Abd pain, vomiting
- Treatment
    - Sigmoid: may attempt decompression by rectal tube

- Cecal: surgery

Intussusception

- Rare in adults (more common in kids post-viral)
- Small bowel predominantly
- Acute obstructive (partial) picture
- Usually found on CT abd
- Surgery

Colon CA

- Common cause of cancer in men and women
- Abd pain, bleeding
- Obstruction presentation
- Fatigue, dyspnea, anemia
- Colonoscopy, CT scan
- Chemo, surgery

Anus and Rectum

Perianal/Perirectal Abscess

- Obstruction of anal crypt leads to abscess
- Chronic infection can lead to fistula formation
- Clinical diagnosis
- Pain, may have fever
- Deeper abscesses may need CT to diagnose and surgical consult

Pilonidal Cyst/Abscess

- Can drain in the ED usually, may require surgery
- Above the gluteal cleft, midline

Proctitis

- Inflammation of lining of the rectal mucosa
- Causes: STDs, radiation, Crohn's disease
- Rectal fullness, tenesmus, LLQ pain
- Sigmoidoscopy
- Treat infectious etiologies

Anal Fissure

- Skin tear of anoderm
- Hard stools
- Midline-posteriorly

- Pain with defecation
- Tx: Sitz baths, stool softeners, analgesia

Anal Fistula

- Tract connecting skin to anal canal
- Abscess: most common cause
- Classically Crohn's disease
- Tx: Surgical excision
- May also develop with drainage of a perirectal abscess

Rectal Foreign Body

- Seen in kids and adults
- Many asymptomatic
- Eval based on history
- May require procedural sedation

Hemorrhoids

- External vs internal
- Bleeding, pruritus
- Supportive care, stool softeners, analgesics
- Surgical referral

Thrombosed Hemorrhoids

- External, purplish
- Require I&D, pain alleviated a TON after drainage

Rectal Prolapse

- Seen in the young and elderly (bimodal)
- Red, protruding mass from the rectum
- Fecal incontinence
- Bloody discharge
- Manual reduction, surgical consultation

Pearls

RUQ pain:

- **Cholelithiasis**: fat, female, fertile, 40s (postprandial RUQ pain)
- **Choledocolithiasis**: GS in the common bile duct, elevated alkphos/bili
- **Cholecystitis**: RUQ pain, dx with US: +GS, GBW thickening, +perichole fluid
- **Acalculous cholecystitis**: inflamed GB with NO stones (older, very sick pts)

Cholangitis:

- Think **Charcot's Triad: fever, RUQ pain, jaundice**

- Biliary obstruction with underlying bacterial infection

Acute pancreatitis:

- Most common 2/2 **GS or EtOH**
- Eval with **Ranson's** criteria on admission and at 48 hours
- **Necrotizing Pancreatitis**: severe, toxic patients, req abx and surgery
- **Chronic pancreatitis**: most 2/2 chronic EtOH abuse, tx: supportive

Pancreatitic Tumors: **PAINLESS JAUNDICE**, Courvoisier sign, most common GI tumor

Esophageal Disease

- **Achalasia**: impaired relaxation of the LES, most common motility disorder
- **Boerhaave's Syndrome:** full thickness perforation of the esophagus post vomiting (**Air in the neck**, **Hamman's crunch)**
- Diverticula: anywhere in the esophagus, halitosis, recurrent regurg
- Foreign bodies in children: usually a WITNESSED choking episode, coins common
- Food Impaction: tx: **glucagon**, need a follow up study to confirm removal
- Caustic ingestion:
    - **ALKALI worse = Liquefactive necrosis**
    - **Acid = coagulation necrosis = blocks further damage**
    - **Do NOT induce emesis**

Liver Disease

- Complications: portal HTN → esophageal varices, heptorenal syndrome, hepatic encephalopathy, SBP (neutrophils >250, dx with paracentesis)

Mesenteric ischemia: abd **pain out of proportion** with exam, 2/2 **Embolism: most common form**

Small Bowel:

- **CROHN'S dz:** Can involve **ANY part of the GI tract, "skip lesions"**
- **SBO:** think 2/2 **Adhesions & Hernias**
- **Adynamic Ileus: No mechanical obstruction present,** common post surgery