GI INFECTIONS

ABDOMINAL PAIN

VISCERAL: pain from visceral peritoneum → lines organs
- sensitive to stretch and chemical irritation
- autonomic innervation → diffuse pain

PARIETAL: pain from parietal peritoneum → lines abdominal wall
- sensitive to pressure, pain, temp, laceration
- somatic innervation → localized pain

REFERRED: manifestation of visceral pain at location away from affected organ
- foregut → epigastrum • stomach, pancreas, liver, gallbladder, proximal duodenal
- midgut → periumbilical • distal duodenum, small bowel, proximal large bowel
- hindgut → pubic • distal transverse colon to anal canal
- dermatomal lines → sensory ganglia from same level of spinal cord

DIARRHEA

NON-INVASIVE

Watery, SB involvement, enterotoxin

Viral: most common

Rotavirus: 2d incubation. Low grade fever, emesis, diarrhea x4-8d. Outbreaks in kids.

Norovirus: adolescents/adults. Acute N/V/D, cramps, fever, HA, malaise → self-limiting

Bacterial:

Staph aureus (eggs, mayo, dairy) / bacillus cereus (fried rice)
- heat-stable enterotoxin w/ Sx onset within 6hr

Sx: N/V/D tx: supportive

e. coli (enterotoxigenic) AKA "traveler's diarrhea"
- source: contaminated food/drinking water
- less heat-stable. 1-3d incubation.

Sx: watery diarrhea, cramping abdominal pain
tx: supportive ± fluoroquinolone

Vibrio cholerae from contaminated drinking water
- Enterotoxin inhibits Na/Cl channels causing watery diarrhea and electrolyte depletion → self limiting

tx: fluid/electrolyte repletion. May need abx → tetracyclines, quinolones, macrolides

INVASIVE

Mucus/pus/blood. Colon involved. Cytotoxin.

Campylobacter jejuni: MC bacterial enteritis
- source: undercooked poultry, milk, water, pets
- Sx: fever, periumbilical pain. 3day incubation
- tx: supportive. If severe → fluoroquinolone, doxy

Shigella produces Shiga toxin.
- source: fecal-oral. 3day incubation
- Sx: lower abd pain, blood/mucus in stool, ↑WBC
- tx: supportive. If severe → quinolone, azithro, ceph

e.coli O157:H7 produces verotoxin
- source: undercooked beef, milk, cont. water
- Sx: watery THEN bloody diarrhea w/ abd pain
- tx: supportive. Can cause HUS

Salmonella typhi: rare in US
- Common in areas w/ poor water sanitation
- Sx: HA, fever, bradycardia, hepatosplenomegaly, Rose spots on skin
- tx: supportive w/ fluoroquinolone, ceftriaxone

non-typhoid: common in US
- eggs, poultry, dairy, contact w/ reptiles
- Sx: N/V, fever, cramping → supportive tx

Clostridium difficile - pseudomembranous colitis

Spore forming and produces toxin. Disruption of normal flora leads to overgrowth.
- Abx, Tage, PPI → severe diarrheal infection. If severe → toxic megacolon.

+Stool PCR → oral vanc (metro w/ ↑resistance). If severe → fecal microbiota transplant

HEPATOBILIARY INFECTIONS

ACUTE CHOLECYSTITIS

gallbladder inflammation

risk factors: obesity, pregnancy

patho: formation of stones in gallbladder → occlude cystic duct → inflammatory/infectious

clinical: RUQ pain, fever, N/V, ↓appetite. Worse w/ food.
PE → +Murphy's Sign

diagnosis: labs → CBC (neut. leukocytosis), normal CMP/lipase
RUQ US → thick wall, peri-cholecystic fluid, NO dilation
CT A/P → ↑sensitivity
HIDA → no GB visualized
MCRP/ECRP → if high suspicion

treatment: abx and surgery
mild → Unasyn (or cefazolin + metronidazole)
mod (WBC >18K and >72hr) → ZOSYN
- ceftriaxone (or quinolone) + metro

last resort: ertapenem
severe → ZOSYN or cefepime ± metro (or carbapenem)

CHOLANGITIS

bile duct inflammation

risk factors: cholelithiasis, sclerosing cholangitis

patho: biliary tree acutely obstructed - choledocholithiasis, mass or stricture

clinical: charcot's triad - fever, RUQ pain, jaundice.
- Pale stool, dark urine

PE → RUQ pain, ± Murphy's
- hyperbilirubinemia - scleral icterus, jaundice

diagnosis: labs → CBC (neutrophilic leukocytosis), CMP (↑ALKP and billi)
RUQ US or CT A/P → dilated CBD and/or dilated intrahepatic duct
MRI w and w/o contrast + MCRP → dilated bile ducts w/ obstruction

treatment: abx → ZOSYN
alt: quinolone + metro. Carbapenem
Procedural - ECRP or PTC drain

LIVER ABCESS

pyogenic fluid collection

risk factors: infection, procedural interventions, immunocompromised

patho: biliary obstruction or injury causes biliary flora to proliferate within liver tissue
other - GI translocation from gut to portal vein → disseminates

clinical: fever, RUQ pain, nausea, weight loss, ↓appetite, malaise
PE → hepatomegaly, palpable mass, ± jaundice, RUQ tenderness

diagnosis: gram stain/culture
CBC → neutrophilic leukocytosis
CMP → elevated liver enzymes
CT A/P → pyogenic liver abscess

treatment: IV antibiotics
pathogens - E. Coli, Klebsiella, strep, S. aureus
abx - ZOSYN + metro or ceph + metro or carbapenem
surgery → I/D if >5cm

hep A

epi: under-developed

patho: fecal-oral from contaminated water/food
- Shellfish, farm animals
- Incubation: 6 hr

clinical: jaundice, dark urine, N/V/D, flu-like sx

diagnosis: hep A IgM+
+IgG → prior exposure/vaccine

treatment: supportive → fluids, anti-emetics, anti-diarrheals
Does NOT cause chronic

prevention: vaccine

hep B

epi: highest rate Africa, SE Asia

patho vertical, sexual, or IVDU transmission
- major cause of cirrhosis worldwide

clinical: flu-like, jaundice, N/V → >20% go on to cirrhosis, 5% chronic

diagnosis
+HBsAg → acute or chronic
HBcAg + IgM → acute
+IgG → chronic or resolved
early → +HBsAg, HBcAg IgM, HBeAg, DNA
window → +HBcAb IgG and IgM, HBeAb
resolution → +HBsAb, HBc IgG, HBeAb

treatment: tenofovir or entecavir
usually for life. Can reactivate if pts go on immunosuppression

prevention: vaccine (+HBsAb)

hep C

epi: leads to chronic hep in 80-85% pts

patho: blood transmission
- Single-stranded RNA virus w/ 6 major genotypes

clinical: fatigue but usually asymptomatic

diagnosis: serology
① HCV ab → ⊕ → exposed
② HCV RNA VL → ⊖ → cleared
↳ ⊕ → acute/chronic

treatment: based on genotype
Harvoni = Ledipasvir + Sofosbuvir
Epclusa = Velpatasvir + Sofosbuvir
Mavyret = Pibrentasvir + glecaprevir
↳ not for decompensated cirrosis

If SVR at 12wks → cure

ESOPHAGITIS

epi: erosive more common → hx of GERD
infectious → immunocompromised

patho: inflammation of esophageal mucosa
erosive - reflux of acidic gastric secretions
infectious - fungal > viral > bacterial
etiology: Candida albicans most common
viral - HSV, CMV

clinical: retrosternal, burning chest pain, dysphagia, odynophagia, cough, nausea
PE → thrush may indicate candida

diagnosis: EGD w/ biopsy AND culture

treatment: identify pathogen
Candida → fluconazole
If HSV → acyclovir. If CMV → IV ganciclovir

GASTRITIS

epi: childhood. ↑risk in developing countries
• infectious most common

patho: inflammation of gastric mucosa
etiology: h. pylori most common
others - viral, enterococcus
May progress to chronic, PUD, or perforation

clinical: "upset stomach", N/V, ↓appetite, weight loss, bloating
PE → epigastric tenderness

diagnosis: EGD w/ biopsy gold standard
Labs: CBC → megaloblastic anemia
Procedures: urea breath test

treatment: h. pylori eradication
• PPI + amox + clarithromycin (↑resistance)
• PPI + bismuth + metro + tetracycline

DIVERTICULITIS

epi: 25% of people w/ diverticulosis

patho: ↑luminal pressure leads to dilation of diverticula and microscopic perforations in diverticular wall
etiology: gram⁻ rods

clinical: left-sided abdominal pain, change in bowel habits, N/V, fever
PE → tenderness to palpation over area of disease.

diagnosis: Labs → CBC (neutrophilic leukocytosis)
CT A/P IV+PO contrast → wall thickening, pericolic fat stranding, microperf, contrast extravasation

treatment: medical or surgical
abx - cover gram⁻ rods and anaerobes
• non-perf and healthy → oral outpatient
quinolone + metro, amox/clav
• perf w/ abscess OR high risk → IV inpatient
Zosyn, ceftriaxone/quinolone + metro
Surgical → elective if ≥2 episode.
If perf/complicated → colon resection w/ ostomy

APPENDICITIS

epi: age 5-45

patho: obstruction of appendix leads to dilation of appendix, inflammation, infection, and ↑ intra-appendiceal pressure
• obstruction by fecalith
• can rupture and cause abscess → peritonitis, sepsis

etiology: pseudomonas, e. coli, bacteroides

clinical: 24-48 hr periumbilical then RLQ pain w/ associated malaise, fever, anorexia, N/V
PE → +rovsing's, psoas, obturator signs
tenderness at McBurney's point

diagnosis: Labs → CBC (neutrophilic leukocytosis) and elevated CRP
Abd US (peds) → thick wall, dilated >1cm
CT A/P IV+PO contrast → thick wall w/ peri-appendiceal stranding, dilated >1cm

treatment: antibiotics
1. Zosyn
2. ceftriaxone + metronidazole
3. fluoroquinolone + metronidazole
+surgery → laparoscopic vs. open appendectomy