GI Study Guide

Relevant Evidence-Based Guidelines: https://www.hcvguidelines.org/ (from IDSA and AASLD)

GERD:

- General Treatment Approach
  - Physician Referral
    - Alarm symptoms: dysphagia, odynophagia, unexplained weight loss, GI bleeding
    - Infant or child <12 yo
    - Continuous symptoms despite adequate 14 day course of OTC therapy
  - Mild, Intermittent Symptoms
    - Lifestyle modifications + antacid and/or OTC doses of H2RA prn
  - Mild, Symptoms ≥ 2 Days/Week
    - Lifestyle modifications + OTC doses of either H2RA or PPI x14 days
  - Moderate/Severe Symptoms
    - Lifestyle modifications + PPI x8 weeks
  - Healing of Erosive Esophagitis
    - Lifestyle modifications + PPI x8 weeks
- Medications Used in Acute Care
  - Antacids: sodium bicarbonate, aluminum salt, calcium carbonate, magnesium salt
  - H2RAs: cimetidine, famotidine, nizatidine, ranitidine
  - PPIs: esomeprazole, lansoprazole, omeprazole, pantoprazole, rabeprazole
- Medications Used in Chronic Care (if applicable)
  - PPIs – if symptoms are refractory after d/c PPI or if complications present
- Important Monitoring Parameters
  - Enteric infections, CAP with PPIs
  - Vitamin B12 and iron malabsorption, hypomagnesemia with PPIs
  - Vitamin B12 with H2RAs
  - Endoscopy if persistent symptoms despite treatment (gold standard)

Diarrhea:

- General Treatment Approach
  - Acute
    - No fever or systemic symptoms → use symptomatic therapy (fluids/electrolytes, diet, anti-motility agents, anti-secretory agents, adsorbents)
    - Fever/systemic symptoms → check feces for infectious source
  - Chronic → diagnose and treat underlying cause, plus symptomatic therapy
- Medications Used
  - Symptomatic therapy: fluids, diet (BRAT), anti-motility agents, antisecretory agents, adsorbents
    - Oral rehydration therapy (Pedialyte):
      - 6 months – 5 years = 50-100 mL/kg over 3-4 hours
      - >5 years and adults = 2-4 L over 3-4 hours
      - Maintenance: ~ 10 mL/kg for each loose stool or emesis
  - Loperamide, diphenoxylate (schedule V), difenoxin (schedule IV)
  - Bismuth subsalicylate (useful for traveler's diarrhea)
  - Polycarbophil
  - Lactase enzyme (Lactaid)
  - *Lactobacillus acidophilus*
- Important Monitoring Parameters: hydration status

Constipation:

- General Treatment Approach
  - Rome III criteria for diagnosis: at least 2 of the following (for 25% of BMs)
    - Infrequent bowel movements (<3 per week)
    - Stools that are hard, small, or dry
    - Difficulty or pain of defecation
    - Feeling of abdominal discomfort or bloating, incomplete evacuation, etc
  - Alarm symptoms: severe abdominal pain, fever, N/V, blood in stool, significant weight loss/anorexia
- Medications Used in Acute Care
  - First line: glycerin suppository, saline enema
  - Second line: Bisacodyl, senna, oral saline laxatives (MOM)
- Medications Used in Chronic Care
  - First line: dietary fiber, methylcellulose, polycarbophil, psyllium
  - Second line: PEG 3350, sorbitol, lactulose
  - If opioid-induced: alvimopan, methylnaltrexone, naloxegol
  - Lubiprostone (Amitiza) or linaclotide trial (Linzess)
- Important Monitoring Parameters: alarm symptoms, number of BMs

Irritable Bowel Syndrome (IBS):

- General Treatment Approach
  - Rome III Criteria
    - Recurrent abdominal pain or discomfort at least 3 days/month in the last 3 months associated with 2 or more of the following:
      - Relieved with defecation
      - Onset associated with change in frequency of stool
      - Onset associated with change in form (appearance) of stool
- Medications Used in Constipation-Predominant IBS
  - Dietary fiber, Bulk-forming laxative or PEG laxative
  - Lubiprostone (used in women only for IBS-C), linaclotide
- Medications Used in Diarrhea-Predominant IBS
  - Polycarbophil; loperamide prn
  - Alosetron (Lotrenex) (requires prescribing program due to risk of ischemic colitis)
  - Rifaximin (Xifaxin)
  - Eluxadoline (Viberzi) (mu-opioid receptor agonist)
  - Treatment of pain: low dose TCAs
- Important Monitoring Parameters: constipation associated with alosetron or eluxadoline

N/V:

- General Treatment Approach → select pharmacologic therapy based on symptoms and source of N/V
- Medications Used in Acute Care
  - Motion sickness
    - H1RA: *dimenhydrinate, *diphenhydramine, meclizine, *cyclizine (*can be used in children, cyclizine only age 6+)
    - Rx antihistamine/anticholinergics: hydroxyzine, scopolamine, trimethobenzamide
  - Overindulgence, simple N/V: H2RAs, bismuth subsalicylate, antacids, phosphorated carbohydrate solution (Emetrol)
  - Pregnancy-induced: pyridoxine, doxylamine
  - Herbals: chamomile, ginger, peppermint oil

- Important Monitoring Parameters: fluid/electrolyte status, fever, weight loss, abdominal pain
    - Anticholinergics: drowsiness, tinnitus, blurred vision, dry mouth, urinary retention, constipation, paradoxical stimulation
    - Pyridoxine: may cause rare peripheral sensory neuropathic disturbances at high doses
    - Herbals: heartburn, bleed risk, drug interactions

Peptic Ulcer Disease

- General Treatment Approach
    - H2RAs and PPIs used to relieve symptoms, do not cure
    - Endoscopy + biopsy to determine cause/presence of *H. pylori*
- Medications Used in Acute Care
    - H. pylori induced: (14 days)
        - Three drug regimen: PPI + clarithromycin + amoxicillin or metronidazole
        - Four drug regimen: PPI or H2RA + bismuth subsalicylate + metronidazole + tetracycline or clarithromycin
    - NSAID induced:
        - d/c NSAID → 4 weeks of healing dose of PPI or 6-8 weeks of healing dose of H2R
        - If NSAID can't be d/c → PPI for 8-12 weeks
- Medications Used in Chronic Care
    - H. pylori induced:
        - If uncomplicated and asymptomatic after eradication → no need to continue PPI/H2RA
        - If complicated/large ulcer → continue PPI for 4 weeks; consider maintenance dose of PPI, H2RA, or sucralfate
    - NSAID induced:
        - Avoid long term NSAID use or use with PPI or misoprostol
        - Consider partial selective COX-2 inhibitor if no CV risk factors (with PPI or misoprostol)
- Important Monitoring Parameters
    - Misoprostol: pregnancy category X
    - Alarm symptoms: dysphagia, odynophagia, weight loss, anorexia/early satiety, anemia, abdominal mass
    - Follow-up testing >4 weeks after eradication if *H. pylori* induced

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Celiac Disease:

- General Treatment Approach
    - Life-long gluten free diet: avoid wheat, barley, rye
    - Supplementation: iron, calcium, fat soluble vitamins deficiency (ADEK), fiber, B12
    - Evaluate if medications have gluten, further investigation required:
        - Wheat, starch, pregelatinized starch, dextrates, dextrin, dextrimaltose, caramel coloring
    - Dextrans and Dextrose are safe!
- http://glutenfreedrugs.com/
- http://www.celiaccentral.org/gluteninmeds/

Pancreatitis:

- General Treatment Approach
    - Mild AP → supportive care, adequate nutrition, pain relief, d/c drugs that may cause pancreatitis
    - Severe AP → supportive care, nasojejunal tube for nutrition, pain relief, antibiotics if infected necrosis, management of systemic complications (organ failure)

    - Chronic → d/c alcohol, small meals, pancreatic enzyme supplement, d/c smoking, manage blood glucose, analgesics, endoscopy/surgery
- Medications Used in Acute Care
    - Fluid replacement: NSS or Lactated Ringers 5-10 mL/kg/hr
    - IV opioids with PCA: meperidine, morphine, hydromorphone, fentanyl
- Medications Used in Chronic Care
    - Pancreatic enzyme supplement: pancrelipase (Creon, Pancreaze)
    - Analgesics: NSAIDs, opiates if necessary
- Important Monitoring Parameters
    - Fluid replacement: vital signs, urine output, serum glucose, BUN, SCr, Hct, electrolytes
    - Chronic: malnutrition (fat malabsorption and fat-soluble vitamins), weight loss
    - Blood glucose (development of diabetes)

<u>HBV:</u>

- General Treatment Approach
    - Pre-exposure → immunization
    - Post-exposure → HBIg and HBV vaccine (can use IgG in adults only)
    - Prevention of reactivation → tenofovir, entecavir in high risk and moderate risk groups (rituximab)
    - Chronic → treat immune active phase (+ consolidation for at least 12 months after seroconversion)
        - Seroconversion = anti-HBe +
        - Indefinite antiviral therapy for patient that continues to be HBeAg +
        - Treat in pregnancy if HBVDNA > 200,000 IU/ml
- Medications Used in Acute Care
    - HBIg, HBV vaccine, IgG
- Medications Used in Chronic Care
    - Nucleoside/nucleotide analogues: Lamivudine, telbivudine, adefovir, tenofovir, entecavir
        - Tenofovir and entecavir are the primary therapies in most patients
    - Interferons: Pegylated interferon alfa 2a, interferon alfa 2a
    - Pregnancy: lamivudine, telbivudine, tenofovir
        - Infant still receives perinatal prophylaxis (within 12 hours of birth)
    - Children: tenofovir, adefovir, entecavir, lamivudine, IFN-alfa 2b
- Important Monitoring Parameters
    - Be aware of which tenofovir formulation is being used (TDF has more renal toxicity)
    - Depression, anxiety, neutropenia, thrombocytopenia, flu like symptoms with interferon
    - Peginterferon: CBC, TSH, LFTs, ischemia, neuropsychiatric, infectious, autoimmune
    - Entecavir: lactic acid, SCr
    - Tenofovir AF: lactic acid
    - Tenofovir DF: SCr, phosphate, urine glucose, urine protein, bone density, lactic acid
    - HBV DNA, HBeAg, ALT, HBsAg

<u>HCV:</u>

- General Treatment Approach
    - Determine genotype → use www.hcvguidelines.org to select most appropriate patient-specific treatment
    - Check for drug interactions!
- Medications Used in Acute Care
    - NS5A inhibitor: ledipasvir, ombitasvir, elbasvir, velpatasvir, pibrentasvir
    - NS5A replication complex inhibitor: daclatasvir
    - NS5B polymerase inhibitor: sofosbuvir, dasabuvir
    - NS3/4A protease inhibitor: simeprevir, paritaprevir-r, grazoprevir, glecaprevir
    - Trade names

        - Daklinza = daclatasvir
        - Olysio = simeprevir
        - Sovaldi = sofosbuvir
        - Harvoni = sofosbuvir/ledipasvir
        - Viekira Pak or Viekira XR = ombitasvir, dasabuvir, paritaprevir-r
        - Technivie = ombitasvir, paritaprevir-r
        - Zepatier = elbasvir, grazoprevir
        - Epclusa = velpatasvir, sofosbuvir
        - Mavyret = glecaprevir, pibrentasvir (*New!* Not covered in our class, pangenotypic)
    - Non-specific HCV therapy: ribavirin, peginterferon alfa
- Important Monitoring Parameters: side effects of different regimens, HBV reactivation, CrCl

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<u>Complications of Chronic Liver Disease:</u>

- General Treatment Approach
    - Varices → screen all patients with cirrhosis
        - Small varices + risk factor for hemorrhage = non-selective beta-blockers
        - Large/medium varices = non-selective beta-blocker OR endoscopic variceal ligation
    - Variceal bleed → medical emergency
        - IV fluids
        - Blood transfusion if Hgb <8
        - Vasoconstricting agent + endoscopy banding or sclerotherapy
        - 7 day antibiotic regimen
        - Secondary prevention of beta-blocker + endoscopic variceal ligation
    - Ascites → d/c alcohol, sodium restriction, diuretics, paracentesis, albumin
        - Fluid restriction only in severe hyponatremia (<125)
        - If ascitic fluid protein <1.5 WITH renal or liver dysfunction →indefinite SBP prophylaxis
    - Spontaneous Bacterial Peritonitis (SBP) → calculate ANC of ascitic fluid, empiric antibiotics, indefinite prophylaxis
        - If SCr >1, BUN >30, or total bilirubin >4 → albumin 25% IV infusion on day 1 and 3
    - Encephalopathy→non-absorbable disaccharides, antibiotics, supplements
        - Antibiotics used in combo if lactulose unresponsive or as an alternative if intolerant to lactulose
- Medications Used in Acute Care
    - IV fluids: NSS or LRs
    - Vasoconstricting agents: octreotide or vasopressin
    - Antibiotics for active bleed: ceftriaxone, cefotaxime (7 days) (fluoroquinolones as alternative)
    - Diuretics: spironolactone + furosemide in 100:40/5:2 ratio
    - 6-8 grams of 25% albumin per liter of ascites removed if >5 L removed in paracentesis
    - SBP empiric therapy: cefotaxime or ceftriaxone (5 days); ciprofloxacin or ofloxacin (8 days, alternative)
    - Non-absorbable disaccharides: lactulose (PEG 3350 is an alternative)
    - HE antibiotics: rifaximin, neomycin, metronidazole, oral vancomycin
    - Supplements: limit protein while maintaining total caloric intake
        - Branched chain amino acids, L-ornithine L-aspartate (LOLA)
        - Zinc
- Medications Used in Chronic Care
    - Non-selective beta-blockers: nadolol, propranolol, carvedilol
    - Maintenance diuretic therapy
    - Non-absorbable disaccharides: lactulose titrated to 2-3 soft stools daily
    - HE abx: rifaximin, neomycin (metronidazole and vancomycin not recommended long term)
    - SBP prophylaxis: Bactrim DS daily, Cipro daily

- Important Monitoring Parameters
    - Spironolactone: hyperkalemia, gynecomastia, SCr, BUN
    - Furosemide: electrolytes, weight loss (0.5 kg per day)
    - Lactulose: severe diarrhea, electrolyte disturbances, hypovolemia
    - Neomycin: nephrotoxicity and irreversible ototoxicity
    - West Haven Criteria (severity grading of hepatic encephalopathy)