Diarrhea*	
PowerPlans	GI Chronic Diarrhea Labs Plan, SSYCE Plan, Stool Studies plan
Differential	• **Acute**: Gastroenteritis (viral or bacterial), food poisoning, antibiotic-associated, toxic ingestion, hyperthyroidism, disaccharidase deficiency (infants) • **Chronic**: Postinfectious lactase deficiency, IBS/IBD, Celiac, milk protein allergy (infants), lactose intolerance, laxative abuse, giardiasis, secretory tumor, lymphangiectasia, familial villous atrophy
Workup	• Consider FOBT, ESR/CRP, fecal calprotectin or lactoferrin, infectious stool studies (SSYCE esp. If febrile, bloody stools, immunocomp.), C. diff, stool for O&P, viral antigens including rotavirus), fecal elastase, fecal reducing substances • To differentiate osmotic vs. secretory diarrhea: • Stool Osmolar Gap = Stool Osm - (2 x [stool Na + stool K]) ▪ **Osmotic Diarrhea (osmolar gap > 100)**: Maldigested nutrients draw water into the intestinal lumen (e.g., celiac, pancreatic disease, lactose intolerance). Stool volume **decreased with fasting**. ▪ **Secretory Diarrhea (osmolar gap < 100 mOsm/kg)**: Secretion of water into intestine exceeds absorption (e.g., cholera, hyperthyroidism, nonosmotic laxative use). Large volumes, **does not decrease with fasting.**
Management	• Hydration • Generally avoid anti-diarrheals

GER/GERD*	
PowerPlans	GI AMB Gastroesophageal Reflux Plan
Presentation	• **GER**: Reflux of gastric constants through LES into esophagus. **Normal** in infants. LES tone improves by 6m • **GERD** = GER + "troublesome symptoms" (back arching/Sandifer syndrome, **excessive crying** (>3h/day), **feeding difficulties, slow weight gain, parental concern**
Treatment	**Approach to GERD in the older child (JPGN 2018;66: 516-554)** • H&P, diet and lifestyle changes and if no improvement, brief trial of acid suppression with H2RA or PPI (4-8 weeks only) • Consider GI referral if no improvement on PPI or if unable to wean → upper endoscopy +/- pH impedance testing

Approach to infant GERD (JPGN 2018;66: 516–554)	
1	**Reflux precautions:** Elevate the head of the bed, avoiding overfeeding, keep infants upright after feeds, thicken feeds (Similac SpitUp/Enfamil AR, or with rice/oatmeal cereal [1 teaspoon of cereal per ounce of formula))
2	2-4w trial of **hydrolyzed or amino acid formula** or eliminate cow's milk in maternal diet if BFing
3	Consider GI referral **4w** trial of **Ranitidine or PPI** (limited evidence of efficacy; ↑ risk of CAP PNA, GI infections, vitamin deficiencies and fractures)
Refractory	Referral to GI (will consider Nissen fundoplication)

Inflammatory Bowel Disease*	
PowerPlan	GI Inflammatory Bowel Disease Admit Orderset/Workup Plan/Medications Plan

Inflammatory Bowel Disease*		
	Crohn's	**Ulcerative Colitis**
Epi	• More common in whites, Ashkenazi Jews • Onset in teens-20s and 50s-60s. Unusual in <5y	• Onset in teens and young adults
RFs	NOD2/CARD15 mutations. >200 risk loci associated with IBD; Turner's Syndrome	• **Familial inheritance with less strong genetics** • Wiskott Aldrich Syndrome
Presentation	• **Systemic**: poor weight gain, anorexia, delayed puberty, anemia, fatigue • **GI** ▪ **Early**: abd. pain, RLQ mass (ileal involvement), bloody stools, perianal skin tags, fistulas, and abscesses. Primary sclerosing cholangitis. ▪ **Late**: stricture formation, intraabdominal abscesses, colon cancer (8-10y after onset) • **Extraintestinal**: erythema nodosum, pyoderma gangrenosum, arthritis, uveitis/episcleritis, nephrolithiasis, osteoporosis, thrombosis	• Frequent, **bloody diarrhea**, tenesmus, abdominal pain similar to infectious colitis. • Similar sx as CD, but less likely to have systemic symptoms. • **Extraintestinal**: erythema nodosum, arthritis, thrombosis, PSC
	Toxic Megacolon: fever, tachycardia, dehydration, electrolyte disturbance, hypoTN/shock, abd distention, vomiting, severe pain. ↑ risk w/antimotility agents (loperamide or opiates) → **SAT Abd XR + Surgery c/s**	
Workup	• High **ESR/CRP**, low albumin, low Hct, low B12, +fecal leukocytes, high fecal calprotectin/lactoferrin. • p-ANCA -, **ANCA +** (80% of patients) • Upper GI/SBFT/MRI/low dose CTE/ WCE: **skip lesions**, "cobblestoning," narrowing or obstruction • **Endoscopy**: Inflammation can occur anywhere in the gut but most commonly is ileocecal, patchy involvement, colonic aphthous lesions, linear fissures, **rectal sparing, perianal findings (skin tags, fissures fistulae)** • **Biopsy**: chronic inflammation, noncaseating granulomatous, **transmural inflammation**	• High **ESR/CRP**, low albumin, low Hct, +fecal leukocytes, high fecal calprotectin/lactoferrin. • **p-ANCA + (60% of patients)** • **Endoscopy**: friable colonic mucosa with **continuous extension from rectum up to prox colon**, pseudopolyps, "backwash" ileitis, +/- gastritis • **Biopsy**: chronic mucosal inflammation in lamina propria, crypt abscesses
Treatment	• **Corticosteroids**: systemic or topical (enteric-coated or rectal) • **Aminosalicylates (5-ASA):** timed release, enteric-coated, pH-release, rectal suppository or enema (only in mild disease) • **Immunomodulators**: thiopurines (azathioprine, 6-MP – check TPMT activity before starting), methotrexate, tacrolimus take 2-3 mon to work so require a steroid bridge to manage acute inflammation • **Biologics**: infliximab(IV) , adalimumab (SC) (anti- TNF alpha antibody medications) [need anti-Hep B sAg, VZV titer or 2 vaccines, TB within 6m to initiate] • **Vedolizumab**: anti-integrin used mainly for maintenance of Crohns colitis • **Ustekinumab**: anti- IL12/23 used mainly for maintenance.Antibiotics - ciprofloxacin+metronidazole also useful in mild active CD. • **EEN**: A formula based diet that can be used in place of steroids which is as effective as steroids at inducing remission, particularly good in growth failure and SI disease • **Surgery**: for complications such as stricture, fistula, abscess formation and to remove isolated areas of bowel involvement • **Specific Carbohydrate or anti-inflammatory diets**: as adjuvant • Use PCDAI index to measure Trx response	• **Corticosteroids** and **oral and rectally administered 5-ASA formulations** as with CD • **Immunomodulators**: 6-MP (check TPMT activity before starting), tacrolimus, cyclosporine • **Biologic agents**: infliximab (anti- TNF alpha antibody) -IV medication used for induction and maintenance. • **Vedolizumab**: anti-integrin used mainly for maintenance (UC >Crohns). • **Tofacitinib (Xelganz)**: approved for adult UC • **Surgery**: colectomy can be curative, but require either ileostomy (undesirable) or ileal-rectal/ileal-anal anastamoses (complicated surgeries, prone to recurrence with any residual rectal mucosa) • **Specific Carbohydrate or anti-inflammatory diets**: as adjuvant • **Probiotics (VSL#3)**: may be complimentary • Use Pediatric Ulcerative Colitis Activity Index (PUCAI) to measure trx response (Gastroenterology 2007;133:423-432)