Pediatric Most Commons

- MC Upper GI bleed (0-1y): Gastritis, Esophagitis
- MC Upper GI in 1y-adults: Esophageal varices, esophagitis
- Double bubble: Malrotation, Duodenal Atresia, Anullar Pancreas

- Foregut - lungs, esophagus, stomach, pancreas, liver, gallbladder, bile duct, duodenum proximal to ampulla
- Midgut - duodenum distal to ampulla, small bowel, large bowel to distal 1/3 of transverse colon
- Hindgut - distal 1/3 of transverse colon to anal canal
- Midgut rotates *270 degrees counterclockwise* normally

- Malrotation
  - Any kid(<2yo) with bilious vomiting needs an emergent upper GI series to Rule out malrotation.
  - Failure of 270 counterclockwise rotation.
  - Ladd’s bands cause duodenal obstruction, most common cause of duodenal obstruction in kids. Can have duodenal webs even after ladd’s.
  - Can volvulize resulting in and knock out SMA resulting in loss of entire small bowel.

- Resect Ladd’s bands
- Fix Cecum to LLQ
- Duodenum to RUQ
- Perform Appendectomy

Choledochal Cysts

- I – Fusiform,
- II – Diverticulum,
- III – Periduodenal,
- IV – Intra and extrahepatic(Type B is extrahepatic only),
- V – Intrahepatic
- I and IV are by far the most common
- 15% cholangiocarcinoma rate.
Choledochal Cysts

• I – Resect Roux-en-Y Hepaticojejunostomy
• II – Resect, Roux-en-Y hepaticojejunostomy. Some do diverticulectomy and ligate at base, but you leave behind some abnormal mucosa.
• III – ERCP Biopsy, if Duodenal Mucosal Sphincterotomy, if Biliary mucosa. Resect and reimplant pancreatic duct and CBD.
• IV – Resect Roux-en-Y Hepaticojejunostomy, if intrahepatic involvement – Lobectomy
• V – Liver Transplant(unless unilateral)

Biliary atresia

• Persistent jaundice (direct bili)
• Can involve intra/extrahepatic ducts
• Dx with liver biopsy
• Tx- Kasai procedure(hepaticoportojejunostomy) before 3 mo, may need transplant

Trauma

• Fluid bolus- 20ml/kg
• Blood bolus- 10ml/kg
• UOP- 2-4 ml/kg/hr
• Don’t use atropine in children, use epi

VACTERL

• Vertebral anomalies
• Anorectal (imperforate)
• Cardiac anomalies
• TE fistula
• Renal anomalies
• Limb deformities (radius)

Pulm sequestration

• Separate normal lung tissue
• No communication with trachea/bronchioles
• All have systemic blood supply from aorta
• Difference in venous flow
  – Intralobar- pulm venous drainage
  – Extralobar- systemic venous drainage usually through azygous
• Can cause Failure to thrive, respiratory distress, CHF, infection, hemorrhage.
• Usually in the Left Lower Lobe
• Tx- lobectomy or mass if extralobar.

Congenital Cystic Adenoid Malformation (CCAM)

• Abnormal lung tissue that communicates with airway system, comes from overgrowth of bronchioles without cartilage
• Causes respiratory distress in newborns, Infections in older children
• Can worsen when placed on the vent.
• Most common in lower lobes, and connected to airway bronchus.
• Can have malignant generation.
• Tx- Lobectomy
Bronchogenic cyst
- Extrapulmonary cyst formed by abnormal lung tissue. Not connected to the airway
- Middle mediastinal mass
- Usually filled w/ milky fluid
- Can cause respiratory distress or infection
- Tx: resection

Congenital Lobar Emphysema
- Respiratory Distress or Hypotension occurs secondary to overdistention of this portion of lung(similar to tension physiology).
- Bronchus cartilage failure to develop
- Most commonly occurs in LUL
- CXR: hyperinflation of lobe With compression of other structures
- Treatment is lobectomy

Congenital Diaphragmatic Hernias
- High mortality (50%)
- More common on left(80%)
- 80% have associated anomalies: cardiac, Neuro, malrotation
- Both lungs are compromised, and usually have respiratory distress
- Usually picked up on Prenatal U/S. CXR- bowel or gastric tube in chest
- Tx: with HFOV, Inhaled nitric, ECMO, and repair through a variety of approaches.

TF fistula
- Type C most common
  - Spits up undigested food
  - Can't place NGT
  - Gas-filled stomach
- Type A 2nd most common
  - Spits up undigested food
  - Can't place NGT
  - Gasless abdomen
- Tx: R extrapleural thoracotomy, mobilization and anastomosis

Hemangioma
- Indications to Treat:
  - Uncontrolled growth
  - Impaired function of airway, eyelid, ear canal
  - Persistent after age 8
  - Ulceration and recurrent bleeding
- Treat with:
  - Steroids
  - Pulse Dye Laser
  - Resection if the other two fail

Meckel's Diverticulum
- Persistent vitelline duct
- 1# cause of painless GI bleeding in kids
- Rule of 2’s
  - 2ft from ileocecal valve
  - 2% of population
  - 2% symptomatic
  - 2 tissue types (pancreatic, gastric)
- Get Meckel’s pertechnate scan
- Tx: resection
Hydrocele
- Persistent Tunica vaginalis
- Communicating if has patent processus vaginalis
- Will transilluminate, bowel will note.
- Indications for surgery:
  - At 1 year of age if not resolved,
  - Communicating
- Ligate processus vaginalis, resect hydrocele through inginal approach

Inguinal Hernia
- More common in males, more common on the Right
- High ligation up to about age 16.
- If incarcerated and reduced put do within the next 24-48
- If non-incarcerated do within the next week
- Umbilical Hernia
  - Repair by age 5 if not closed, if patient has VP shunt or has incarceration.

Undescended testicle
- Most commonly in inguinal canal 90%
- Sx Cancer risk(10x for bilateral)
- Wait till at least 4-6 months
- You can try Hcg injections
- Perform orchiopexy through inguinal incision.

Neuroblastoma
- #1 solid abd malignancy in children (most less than 2 yo)
  - Usually presents as asymptomatic mass.
  - From neural crest cells
  - Associated with N-MYC
  - Diagnosis with CT Chest/ABD/PEL, MIBG if needed.
  - Most common from adrenal
  - 90% have increased metanephrines, catecholemines, VMA, &HVA
  - Mets in 50%
  - Tx- resection, except S-type which is treated with chemo

Wilm's tumor(Nephroblastoma)
- Usually asymptomatic renal mass (may have hematuria or HTN)
- 10% bilateral
- Prognosis by tumor grade
- Frequent mets (bone/lung)
  - Lung mets treated with XRT, resection for failure
  - Tumor can extend into IVC and still be resected
  - Tx-Resection with chemo +/- XRT
  - Chemo: VAD: Vincristine, Actinomycin, Doxorubicin

Thyroglossal duct cyst
- Midline neck mass
- Moves up w/ extension of tongue
- Can extend up to the foramen cecum on base of tongue
- Excise cyst, tract, and hyoid bone(sistrunk procedure)
### Meckel’s Diverticulum
- Persistent *vitelline duct*
- 1# cause of painless GI bleeding in kids
- True Diverticulum
- Rule of 2’s
  - 2ft from ileocecal valve
  - 2% of population
  - 2% symptomatic
  - 2 tissue types (pancreatic, gastric)
- Get Meckel's 99TC Pertechnate scan
- Tx - resection
- Incidental: Leave alone unless narrow neck or suspected gastric mucosa

### NEC
- Bloody stools in premies especially after first feeds.
- Risk Factors:
  - Prematurity, hypoxia, hypotension, Anemia or polycythemia, Sepsis
- Tx- TPN, NPO, ABX, serial exams, and radiographs
- Surgery for pneumoperitoneum, peritonitis, or failed medical management/detioration
- Can tx with peritoneal drainage if won’t tolerate operation

### Gastroschisis v. omphaloceole
- **Gastroschisis**
  - No sac
  - R of midline
  - Less congenital defects
  - Better prognosis
- **Omphaloceole**
  - Sac
  - Midline
  - More congenital defects
  - Cantrell’s pentad
  - Worse prognosis

### Intussusception
- 3wk to 3yr olds
- **Current jelly stools**
- Sausage mass in RUQ, Abd Pain, Distention
- Reduce with barium or air contrast enema
  - Air contrast- max 120mmHg
  - Barium- max 3 ft column
  - 90% effective
- 15% recurrence rate after reduction
- OR if unable to reduce, peritonitis, or 3rd occurrence

### Hirschsprung’s Disease
- #1 cause of colonic obstruction
- Don’t pass *meconium* in 1st 24hrs, explosive diarrhea with rectal exam.
- Dx w/ rectal biopsy
- **No ganglion cells** in myenteric plexus
- Incomplete migration of *neural crest cell* from throat to anus
- Tx- Resect to point where ganglion cells appear. Suave or Duhamel pull through

### Meconium ileus
- Newborns failing to pass meconium in 24hrs
- Distended abd
- Abd X-ray- gas-filled bowel
- Tx- gastrografin enema or mucomyst enema
- Assoc w/Cystic Fibrosis so get sweat Cl test
### Imperforate anus

- Associated with VACTERL
- High- above levators  
  - Fistula to bladder, vagina or prostatic urethra  
  - Treat with colostomy and later repair
- Low- below levators  
  - Posterior sagital anoplasty, no colostomy necessary.

### Pyloric stenosis

- 3 wks old
- 1st born male
- **Projectile vomiting**  
  - Give hypochloremic, hypokalemic, met alkalosis
- Epigastric **olive mass**
- Resuscitation with NS bolus then D5 ½ NS at 1.5 maintenance
- US >4mm thick and >14mm long
- Tx- pyloromyotomy,

### Duodenal Atresia

- Failure of recanalization of the duodenum
- Most common atresia
- Double Bubble  
  - Usually(80%) distal to ampulla of vater
  - 20% have down’s syndrome, 1/3 have cardiac defects
- Can have duodenal webs as well.
- Resuscitate then perform duodenoduodenostomy or duodenojejunostomy

### Intestinal Atresia

- Intrauterine vascular accident
- Usually show polyhydramnios on prenatal ultrasound.
- 10% of atresias are multiple.
- Resection with primary anastomosis or possibly bilateral ostomies if necessary.

### Extras

- **Testicular torsion:** acute, severe onset of testicular pain assoc. With N/V without a cremasteric reflex; must operate within 6 hours or risk testicular necrosis