**Surgery**

- **Toradol (NSAID)** → check SCr, Hgb (15mg IV q6hrs)
- **Tylenol** → check LFTs
- **Surgery Progress Notes**
  - 24hr interval → fever, chills, SOB, chest pain, eating, NGT output, BMs, foley
  - Plan → pain management, I&Os, DVT ppx, pulm toilet, labs, functional status, PO status, diet, etc.
- **Post Op Infx**
  - PNA, UTI, wound infx (cellulitis, central line infx)
  - 5-7 days out → abscess
- **Fever**
  - Wind - atelectasis, pneumonia (esp POD1-2)
  - Water - UTI esp if foley (POD 2-3)
  - Wound - incision site, cellulitis, abscess (after 72hrs, esp POD 5-7)
  - Walking - DVT, PE, thrombophlebitis (after 72hrs)
  - Wonder drug - drug rxn
  - Whole blood - transfusion rxn
  - Work up
    - <48 post op no need to work up
    - >48hr post op → CXR, blood cx x2, urine cx
    - Fever >1wk is a serious complication unless caused by drug allergies
- **Fluids**
  - Resuscitative fluid (postop) → lactated ringers
  - Maintenance → D51/2NS + KCl (k pulls insulin into cells)
  - IV fluids + TPN + lipids = 100cc/hr
- **Electrolytes goals for surgery**
  - K+ 5
    - TABLET KCl is CONTRAINDICATED in SBO
    - If dumping, liquid > tablet
  - Phos 3
  - Mg goal of 2 → if 1.5+ give 2mg mag sulfate, if 1.2+ give 4mg mag sulfate
- **Preop abx = Flagyl & neomycin**
- **SIRS - dohle bodies**
- **Pancreatitis etiology → “I GET SMASHED”**
  - Idiopathic, Gallstones*, EtOH*, Triglycerides/Trauma, Steroids, Mumps, Autoimmune, Scorpion bite, Hyperlipidemia/Hypercalcemia/HyperPTH, ERCP, Drugs
- **Trial to void:** give 8hrs to void after removing foley, bladder scan if no void → if > 600cc need to straight cath
- **TNF-alpha inhibitors (Crohn’s Disease):** Infliximab* (Remicade), Adalimumab* (Humira), Golimumab* (Simponi), Certolizumab pegol (Cimzia), Etanercept (Enbrel)
  - *monoclonal antibody
- Diagnostic imaging first lines
  - Appendicitis → abd CT (US in kids & pregnancy)
  - Chronic Pancreatitis → ERCP
  - Gallbladder → US
  - Diverticulosis → barium enema
  - Diverticulitis → CT scan
  - Achalasia → barium swallow
  - Zenker's diverticulum (esophageal) → barium swallow
  - UGIB → endoscopy
  - PE → pulmonary angiogram
- Courvisier’s sign = palpable, nontender gallbladder → indicates compression/obstruction of distal CBD d/t mass → pancreatic cancer
- Trosseau’s sign = hypercoagulable state created by the malignancy → migratory thrombophlebitis throughout body
- Whipple = pancreateoduodenectomy (for pancreatic cancer)
- Most common kinds of cancer:
  - Colon = adenocarcinoma
  - Gallbladder = adenocarcinoma
  - Pancreas = adenocarcinoma (ductal) → CA-19-9 trending
  - Prostate = adenocarcinoma (m/c cancer in men in US)
  - Liver = hepatocellular carcinoma (increased AFP indicates malignancy)
  - Renal = renal cell carcinoma
  - Small bowel = carcinoid tumors (usually in ileum)
  - Esophageal = SCC (alcohol x tobacco use)
  - Anal cancer = SCC
  - Vulvar = SCC (risk = lichen sclerosus)
  - Bladder cancer = transitional cell carcinoma (smoking) aka invasive urothelial cell carcinoma
  - Breast = IDC
  - Carcinoid tumors tend to be in appendix
  - Thyroid = papillary carcinoma (radiation = risk)
- Vit K dependent factors = II, VII, IX, X
- Common pathway: II, V, X
- PT = extrinsic & common pathways (VII) → monitors coumadin
- PTT → intrinsic pathway (VIII, IX, XI, XII) → monitors heparin
- Common causes of bowel obstruction = adhesions (m/c in western nations), hernias (m/c worldwide), malignancy
- Ogilive's syndrome = idiopathic pseudo-obstruction → enormous dilation of r-side of colon without obstruction → bowel rest, IVF, rectal decompression tube via scope
- m/c vascular procedure = carotic endarterectomy
- Classic triad for renal cell carcinoma (m/c solid renal tumor) = flank pain, hematuria, palpable mass
- Vicryl = absorbable, nylon = non-absorbable
- Malignant hyperthermia → IV dantrolene
- Gastric ulcers should undergo bx → risk of carcinoma
- Causes of ileus → laparotomy, hypokalemia, narcotics, intraperitoneal infx
- Virchow's node = L supraclavicular
- Sister mary joseph node = umbilical
- Nec fac - renal impairment is a major hallmark
  - Triad: WBC >14, BUN >15, hyponatremia <135
- Pressure ulcers
  - Stage I = intact skin with blanching erythema
  - Stage II = partial-thickness skin loss - breakdown of dermis (abrasion, blister, shallow ulcer crater)
  - Stage III = full thickness skin loss, extending to subQ tissue but not beyond fascia
  - Stage IV = full thickness & subQ loss, extending to muscle, tendon, bones, joint

<table>
<thead>
<tr>
<th>CROHNS</th>
<th>UC</th>
</tr>
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<tbody>
<tr>
<td>Transmural</td>
<td>Mucosal inflammation (superficial penetration of mucosal wall)</td>
</tr>
<tr>
<td>Commonly involves terminal ileum (spares rectum)</td>
<td>Commonly begins in rectum &amp; spreads proximally</td>
</tr>
<tr>
<td>“Skip lesions”</td>
<td>Continuous</td>
</tr>
<tr>
<td>Can involve entire GI tract (mouth to anus)</td>
<td>Limited to colon</td>
</tr>
<tr>
<td>s/sx: aggravated by smoking, fistulas, abscesses, perianal dz, obstruction, prolonged diarrhea &amp; abd pain, fatigue, weight loss</td>
<td>S/sx: proctitis, tenesmus, lower abd or pelvic cramping, bloody diarrhea, mucus/pus per rectum, fever</td>
</tr>
<tr>
<td>Imaging: upper GI series w/ SBFT</td>
<td>Sigmoidoscopy w/ bx show crypt abscesses</td>
</tr>
<tr>
<td>Colonoscopy → cobblestoning w/ varying degrees of mucosal ulceration</td>
<td>Barium enema may show “stovepipe” colon d/t loss of haustra</td>
</tr>
<tr>
<td>Steroids for flares (budesonide)</td>
<td>Mesalamine, hydrocortisone suppositories (1st line)</td>
</tr>
<tr>
<td>Infliximab, Azathioprine, MTX, mercaptopurine</td>
<td>Sulfasalazine (2nd line), Oral 5-ASA</td>
</tr>
<tr>
<td>Complications: strictures, fistulas, stones</td>
<td>Complications: toxic megacolon, perf, stricture</td>
</tr>
</tbody>
</table>
Factors affecting perioperative mortality (Goldman’s Index)

- #1 - CHF (EF <35% no surgery)
- #2 - MI w/in 6mo (check EKG → stress test → cath → reperfusion)
- #3 - Arrhythmia
- #4 - Age (>70)
- #5 - emergent surgery
- #6 - AS, poor medical condition, surgery in chest/abd
  - Always check for murmur of AS (late systolic, crescendo-decrescendo murmur that radiates to carotids, increased with squatting)

Meds to stop before surgery:

- Aspirin, NSAIDs, Vit E (2 weeks prior)
- Warfarin (5 days prior) - drop INR to <1.5 (can use vit K)
- Take ½ the morning dose of insulin if diabetic (risk of lactic acidosis w/ metformin)
- If CKD on dialysis - dialyze 24hrs pre-op
- If BUN >100 there is an increased risk of post-op bleeding 2/2 uremic plt dysfunction (see normal plts but prolonged bleeding time)

Ventilation

- Settings:
  - Assist Control setting → set TV and rate but if pt take a breath, vent gives the volume
  - Pressure support → pt rules rate but a boost of pressure is given (important for weaning)
  - CPAP → pt must breath on own but pos pressure given all the time
  - PEEP → pressure given at the end of cycle to keep alveoli open (used in ARDS and CHF)
- Best tests to evaluate management = ABG
  - If PaO2 is low → increase FiO2
  - If PaO2 is high → decrease FiO2
  - If PaCO2 is low (high pH) → decrease rate or TV
  - If PaCO2 is high (low pH) → increase rate or TV
  - Which is more efficient?  TV is more efficient to change (more air goes into function space vs. increasing rate is getting more air to dead space)

Fluids & Nutrition

- Maintenance IVF = D51/2NS + 20KCl (if peeing)
- 4:2:1 rule when calculating cc/hr
- Daily requirements:  100ml/kg/d for first 10kg, 50ml/kg/d for next 10kg, 20ml/kg/d for all kg above 20
- Enteral feeds are best - keep gut mucosa intact and prevent bacterial translocation
- TPN is indicated if gut can’t absorb nutrients 2/2 physical or functional loss
- Risks - acalculus cholecystitis, zinc def, hyperglycemia, liver dysfxn, lyte probs
- HIT (post-op, decreased plts, clots) → tx with leparudin or agatroban (synthetic heparin)
- DIC (low plts, increased PT/PTT/BT, low fibrinogen, high d-dimer, schistocytes)
- Lung cancer:
  - Low PTH → hypercalcemia → squamous cell carcinoma
  - SIADH from small cell carcinoma
  - Peripheral - adenocarcinoma, large cell
  - Central - squamous, small cell
  - *Small cell (no surgery) - chemo & radio-sensitive
  - *Non-small cell (surgery) - adeno, squamous, large cell
- Right-sided heart murmurs get louder with inspiration