High Yield Internal Medicine

Shelf Exam Review

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Cardiology
A patient comes in with chest pain...

- **Best 1st test = EKG**
- If 2mm ST elevation or new LBBB (wide, flat QRS) → STEMI
- ST elevation immediately, T wave inversion 6hrs- years, Q waves last forever

<table>
<thead>
<tr>
<th>Location</th>
<th>Artery</th>
<th>Leads</th>
</tr>
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<tbody>
<tr>
<td>Anterior</td>
<td>LAD</td>
<td>V1-V4</td>
</tr>
<tr>
<td>Lateral</td>
<td>Circumflex</td>
<td>I, avL, V4-V6</td>
</tr>
<tr>
<td>Inferior</td>
<td>RCA</td>
<td>II, III and aVF</td>
</tr>
<tr>
<td>Right ventricular</td>
<td>RCA</td>
<td>V4 on R-sided EKG is 100% specific</td>
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</tbody>
</table>

- Emergency reperfusion- go to cath lab or *thrombolytics if no contraindications
- Right ventricular infarct- Sxs are hypotension, tachycardia, clear lungs, JVD, and NO pulsus paradoxus. DON’T give nitro. Tx w/vigorous fluid resuscitation.
Next best test = cardiac enzymes

If elevated → NSTEMI. Check enzymes q8hrs x 3.

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>Rise</th>
<th>Peaks</th>
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<tbody>
<tr>
<td>Myoglobin</td>
<td>1st</td>
<td>in 2hrs, nl by 24</td>
</tr>
<tr>
<td>CKMB</td>
<td>4-8hrs</td>
<td>24 hrs, nl by 72hs</td>
</tr>
<tr>
<td>Troponin I</td>
<td>3-5hrs</td>
<td>24-48hrs, nl by 7-10days</td>
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</table>

Tx w/ morphine, oxygen, nitrates, aspirin/clopidogrel, and b-blocker

Do CORONARY ANGIOGRAPHY w/in 48hrs to determine need for intervention.

PCI w/ stenting is standard.

CABG if: L main dz, 3 vessel dz (2 vessel dz + DM), >70% occlusion, pain despite maximum medical tx, or post-infarction angina

Discharge meds = aspirin (+ clopidogrel for 9-12mo if stent placed)

B-blocker

ACE-inhibitor if CHF or LV-dysfxn

Statin

Short acting nitrates
• If no ST-elevation and normal cardiac enzymes x3...
• Diagnosis is unstable angina.

• Work up-
  – Exercise EKG: avoid b-blockers and CCB before.
  – Can’t do EKG stress test if old LBBB or baseline ST elevation or on Digoxin. Do Exercise Echo instead.
  – If pt can’t exercise- do chemical stress test w/ dobutamine or adenosine.
  – MUGA is nuclear medicine test that shows perfusion of areas of the heart. Avoid caffeine or theophylline before
  – Positive if chest pain is reproduced, ST depression, or hypotension → on to coronary angiography
Post-MI complications

- MC cause of death?
- New systolic murmur 5-7 days s/p?
- Acute severe hypotension?
- “step up” in O2 conc from RA → RV?
- Persistent ST elevation ~1mo later + systolic MR murmur?
- “Cannon A-waves”?
- 5-10wks later pleuritic CP, low grade temp?

Arrhythmias. V-fib
Papillary muscle rupture
Ventricular free wall rupture
Ventricular septal rupture
Ventricular wall aneurysm
AV-dissociation. Either V-fib or 3rd degree heart block
Dressler’s syndrome. (probably) autoimmune pericarditis. Tx w/ NSAIDs and aspirin.
A young, healthy patient comes in with chest pain...

- If worse w/ inspiration, better w/ leaning forwards, friction rub & diffuse ST elevation → **pericarditis**

- If worse w/ palpation → **costochondritis**

- If vague w/ hx of viral infxn and murmur → **myocarditis**

- If occurs at rest, worse at night, few CAD risk factors and migraine headaches, w/ transient ST elevation during episodes → **Prinzmetal’s angina**
  - Dx w/ ergonovine stim test. Tx w/ CCB or nitrates
EKG Buzzwords

“Progressive, prolongation of the PR interval followed by a dropped beat”

Cannon-a waves on physical exam.
“regular P-P interval and regular R-R interval”

“varying PR interval with 3 or more morphologically distinct P waves in the same lead”.
Seen in an old person w/ chronic lung dz in pending respiratory failure
“Three or more consecutive beats w/ QRS <120ms @ a rate of >120bpm”

“Short PR interval followed by QRS >120ms with a slurred initial deflection representing early ventricular activation via the bundle of Kent”.

“Regular rhythm with a ventricular rate of 125-150 bpm and atrial rate of 250-300 bpm”

“prolonged QT interval leading to undulating rotation of the QRS complex around the EKG baseline” In a pt w/ low Mg and low K. Li or TCA OD
“Regular rhythm w/ a rate btwn 150-220bpm.” Sudden onset of palpitations/dizziness.

Renal failure patient/crush injury/burn victim w/ “peaked T-waves, widened QRS, short QT and prolonged PR.”

“Alternate beat variation in direction, amplitude and duration of the QRS complex” in a patient w/ pulsus paradoxus, hypotension, distant heart sounds, JVD

“Undulating baseline, no p-waves appreciated, irregular R-R interval” in a hyperthyroid pt, old pt w/ SOB/dizziness/palpitations w/ CHF or valve dz
Murmur Buzzwords

- SEM cresc/decresc, louder w/ squatting, softer w/ valsalva. + parvus et tardus
  - Aortic Stenosis
- SEM louder w/ valsalva, softer w/ squatting or handgrip.
  - HOCM
- Late systolic murmur w/ click louder w/ valsalva and handgrip, softer w/ squatting
  - Mitral Valve Prolapse
- Holosystolic murmur radiates to axilla w/ LAE
  - Mitral Regurgitation
More Murmurs

- Holosystolic murmur w/ late diastolic rumble in kiddos
- Continuous machine like murmur
- Wide fixed and split S2
- Rumbling diastolic murmur with an opening snap, LAE and A-fib
- Blowing diastolic murmur with widened pulse pressure and eponym parade.

VSD  PDA  ASD  Mitral Stenosis  Aortic Regurgitation
A patient comes in with shortness of breath... cardiac or pulmonary?

- If you suspect PE (history of cancer, surgery or lots of butt sitting) → heparin!
- Check O2 sats → give O2 if <90%
- If signs/sxs of pneumonia → get a CXR
- If murmur present or history of CHF → get echo to check ejection fraction
- For acute pulmonary edema → give nitrates, lasix and morphine
- If young w/ sxs of CHF w/ prior hx of viral infx → consider myocarditis (Coxsackie B).
- If pt is young and no cardiomegaly on CXR → consider primary pHTN
  – Right heart cath can tell CHF from pulmonary HTN (how?)
Right Heart Cath

PCWP ~ LAP

PAP
CHF

• Systolic- decreased EF (<55%)
  – Ischemic, dilated
    • Viral, ETOH, cocaine, Chagas, Idiopathic
    • Alcoholic dilated cardiomyopathy is reversible if you stop the booze.
  – Alcoholic dilated cardiomyopathy is reversible if you stop the booze.
• Diastolic- normal EF, heart can’t fill
  – HTN, amyloidosis, hemachromatosis
    • Hemachromatosis restrictive cardiomyopathy is reversible w/ phlebotomy.
• Tx-
  – ACE-I improve survival- prevent remodeling by aldo.
  – B-blocker (metoprolol and carveldilol) improve survival- prevent remodeling by epi/norepi
  – Spironolactone- improves survival in NYHA class III and IV
  – Furosemide- improves sxs (SOB, crackles, edema)
  – Digoxin- decreases sxs and hospitalizations. NOT survival
Pulmonology
CXR Buzzwords

“Opacification, consolidation, air bronchograms”

“hyperlucent lung fields with flattened diaphragms”

“heart > 50% AP diameter, cephalization, Kerly B lines & interstitial edema”

“Cavity containing an air-fluid level”

“Upper lobe cavitation, consolidation +/- hilar adenopathy”

“Thickened peritracheal stripe and splayed carina bifurcation”
Pleural Effusions

- Pleural Effusions ➔ see fluid >1cm on lat decu ➔ thoracentesis!
  - If transudative, likely CHF, nephrotic, cirrhotic
    - If low pleural glucose? Rheumatoid Arthritis
    - If high lymphocytes? Tuberculosis
    - If bloody? Malignant or Pulmonary Embolus
  - If exudative, likely parapneumonic, cancer, etc.
  - If complicated (+ gram or cx, pH < 7.2, glc < 60):
    - Insert chest tube for drainage.
  - Light’s Criteria ➔ *transudative* if:
    
    - LDH < 200
    - LDH eff/serum < 0.6
    - Protein eff/serum < 0.5
Pulmonary Embolism

- High risk after surgery, long car ride, hypercoagulable state (cancer, nephrotic)
  - Sxs = pleuritic chest pain, hemoptysis, tachypnea, Decr pO2, tachycardia.
  - Random signs = right heart strain on EKG, sinus tach, decr vascular markings on CXR, wedge infarct, ABG w/ low CO2 and O2.
  - If suspected, **give heparin 1st!** Then work up w/ V/Q scan, then spiral CT. Pulmonary angiography is gold standard.
  - Tx w/ heparin warfarin overlap. Use thrombolytics if severe but NOT if s/p surgery or hemorrhagic stroke. Surgical thrombectomy if life threatening. IVC filter if contraindications to chronic coagulation.
ARDS

• Pathophys: inflammation → impaired gas exchange, inflam mediator release, hypoxemia

• Causes:
  – Sepsis, gastric aspiration, trauma, low perfusion, pancreatitis.

• Diagnosis:
  1.) PaO2/FiO2 < 200 (<300 means acute lung injury)
  2.) Bilateral alveolar infiltrates on CXR
  3.) PCWP is <18 (means pulmonary edema is non cardiogenic)

• Treatment:  mechanical ventilation w/ PEEP
# PFTs

<table>
<thead>
<tr>
<th></th>
<th>Obstructive</th>
<th>Restrictive</th>
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<tbody>
<tr>
<td><strong>Examples</strong></td>
<td>Asthma</td>
<td>Interstitial lung dz (sarcoid, silicosis, asbestosis. Structural- super obese, MG/ALS, phrenic nerve paralysis, scoliosis</td>
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<tr>
<td></td>
<td>COPD</td>
<td></td>
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<tr>
<td></td>
<td>Emphysema</td>
<td></td>
</tr>
<tr>
<td><strong>FVC</strong></td>
<td>$\downarrow &lt;80%$ predicted</td>
<td>$\downarrow &lt;80%$ predicted</td>
</tr>
<tr>
<td><strong>FEV1</strong></td>
<td>$\downarrow &lt;80%$ predicted</td>
<td>$\downarrow &lt;80%$ predicted</td>
</tr>
<tr>
<td><strong>FEV1/FVC</strong></td>
<td>$\downarrow &lt;80%$ predicted</td>
<td>Normal</td>
</tr>
<tr>
<td><strong>TLC</strong></td>
<td>$\uparrow &gt;120%$ predicted</td>
<td>$\downarrow &lt;80%$ predicted</td>
</tr>
<tr>
<td><strong>RV</strong></td>
<td>$\uparrow &gt;120%$ predicted</td>
<td>$\downarrow &lt;80%$ predicted</td>
</tr>
<tr>
<td>Improves &gt;12% with bronchodilator</td>
<td>Asthma does COPD and Emphysema don’t.</td>
<td>Nope</td>
</tr>
<tr>
<td>DLCO reduced</td>
<td>Reduced in Emphysema 2/2 alveolar destruction.</td>
<td>Reduced in ILD due to fibrosis thickening distance</td>
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COPD

- **Criteria for diagnosis?**  
  Productive cough >3mo for >2 consecutive yrs

- **Treatment?**  
  1st line = ipratropium, tiotropium. 2nd Beta agonists. 3rd Theophylline

- **Indications to start O2?**  
  PaO2 <55 or SpO2<88%. If cor pulmonale, <59

- **Criteria for exacerbation?**  
  Change in sputum, increasing dyspnea

- **Treatment for exacerbation?**  
  O2 to 90%, albuterol/ipratropium nebs, PO or IV corticosteroids, FQ or macrolide ABX,

- **Best prognostic indicator?**  
  FEV1

- **Shown to improve mortality?**  
  1.) Quitting smoking (can decr rate of FEV1 decline
  2.) Continuous O2 therapy >18hrs/day

- **Why is our goal for SpO2 94-95% instead of 100%?**  
  COPDers are chronic CO2 retainers. Hypoxia is the only drive for respiration.

- **Important vaccinations?**  
  Pneumococcus w/ a 5yr booster and yearly influenza vaccine
Your COPD patient comes with a 6 week history of this...

New Clubbing in a COPDer = Hypertrophic Osteoarthropathy
Next best step... get a CXR
Most likely cause is underlying lung malignancy
Asthma

- If pt has sxs twice a week and PFTs are normal?  
  - **Albuterol only**

- If pt has sxs 4x a week, night cough 2x a month and PFTs are normal?  
  - **Albuterol + inhaled CS**

- If pt has sxs daily, night cough 2x a week and FEV1 is 60-80%?  
  - **Albuterol + inhaled CS + long-acting beta-ag (salmeterol)**

- If pt has sxs daily, night cough 4x a week and FEV1 is <60%?  
  - **Albuterol + inhaled CS + salmeterol + montelukast and oral steroids**

- Exacerbation → tx w/ inhaled albuterol and PO/IV steroids. *Watch peak flow rates and blood gas.* PCO2 should be low. Normalizing PCO2 means impending respiratory failure → INTUBATE.

- Complications → **Allergic Brochopulmonary Aspergillus**
Random Restrictive Lung Dz

• 1cm nodules in *upper lobes* w/ eggshell calcifications. **Silicosis.** Get yearly TB test!. Give INH for 9mo if >10mm

• Reticulonodular process in *lower lobes* w/ pleural plaques. **Asbestosis.** Most common cancer is broncogenic carcinoma, but incr risk for mesothelioma

• Patchy *lower lobe* infiltrates, thermophilic actinomyces. **Hypersensitivity Pneumonitis** = “farmer’s lung”

• Hilar lymphadenopathy, ↑ACE erythema nodosum. **Sarcoidosis.**
  – Hypercalcemia? 2/2 ↑ macrophages making vitD
  – Important referral? Ophthalmology → uveitis conjunctivitis in 25%
  – Dx/Treatment? Dx by biopsy. Tx w/ steroids
So you found a pulmonary nodule...

- 1st step = look for an old CXR to compare!
- Characteristics of benign nodules:
  - Popcorn calcification = hamartoma (most common)
  - Concentric calcification = old granuloma
  - Pt < 40, <3cm, well circumscribed
    - Tx w/ CXR or CT scans q2mo to look for growth
- Characteristics of malignant nodules:
  - If pt has risk factors (smoker, old), If >3cm, if eccentric calcification
    - Do open lung bx and remove the nodule

http://emedicine.medscape.com/article/356271-media

A patient presents with weight loss, cough, dyspnea, hemoptysis, repeated pneumonia or lung collapse.

- Characteristics of effusion? Exudative with high hyaluronidase.
- Patient with kidney stones, constipation and malaise low PTH + central lung mass? Squamous cell carcinoma. Paraneoplastic syndrome 2/2 secretion of PTH-rP. Low PO4, High Ca.
- Patient with shoulder pain, ptosis, constricted pupil, and facial edema? Superior Sulcus Syndrome from Small cell carcinoma. Also a central cancer.
- Patient with ptosis better after 1 minute of upward gaze? Lambert Eaton Syndrome from small cell carcinoma. Ab to pre-syn Ca channel.
- Old smoker presenting w/ Na = 125, moist mucus membranes, no JVD? SIADH from small cell carcinoma. Produces Euvolemic hyponatremia. Fluid restrict +/- 3% saline in <112.
- CXR showing *peripheral* cavitation and CT showing distant mets? Large Cell Carcinoma.
Gastroenterology
Inflammatory Bowel Disease

- Continuous involving rectum? UC. Rarely ileal backwash but never higher.
- Incr risk for Primary Sclerosing Cholangitis? UC. PSC leads to higher risk of cholangioCA.
- Granulomas on biopsy? Crohn’s.
- Transmural inflammation? Crohn’s.
- Cured by colectomy? UC.
- Smokers have lower risk? UC. Smokers have higher risk for Crohn’s.
- Highest risk of colon cancer? UC. Another reason for colectomy.
- Associated w/ p-ANCA? UC.

Treatment = ASA, sulfasalzine to maintain remission. Corticosteroids to induce remission. For CD, give metranidazole for ANY ulcer or abscess. Azathioprine, 6MP and methotrexate for severe dz.
IBD Images & Complications

http://www.ajronline.org/cgi/content-nw/full/188/6/1604/FIG20

medinfo.ufl.edu/~bms5191/gi/images/fig1a.jpg

commons.wikimedia.org

studenthealth.co.uk
<table>
<thead>
<tr>
<th>LFT/Lab Buzzwords</th>
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<tbody>
<tr>
<td>AST&gt;ALT (2x) + high GGT</td>
<td>Alcoholic Hepatitis</td>
</tr>
<tr>
<td>ALT&gt;AST &amp; in the 1000s</td>
<td>Viral Hepatitis</td>
</tr>
<tr>
<td>AST and ALT in the 1000s after surgery or hemorrhage</td>
<td>Ischemic Hepatitis (&quot;shock liver&quot;)</td>
</tr>
<tr>
<td>Elevated D-bili</td>
<td>Obstructive (stone/cancer) or Dubin’s Johnsons, Rotor</td>
</tr>
<tr>
<td>Elevated I-bili</td>
<td>Hemolysis or Gilbert’s, Crigler Najjar</td>
</tr>
<tr>
<td>Elevated alk phos and GGT</td>
<td>Bile duct obstruction, if IBD → PSC</td>
</tr>
<tr>
<td>Elevated alk phos, normal GGT, normal Ca</td>
<td>Paget’s disease (incr hat size, hearing loss, HA. Tx w/ bisphosphonates.</td>
</tr>
<tr>
<td>Antimitochondrial Ab</td>
<td>Primary Biliary Cirrhosis – tx w/ bile resins</td>
</tr>
<tr>
<td>ANA + antismooth muscle Ab</td>
<td>Autoimmune Hepatitis – tx w/ ‘roids</td>
</tr>
<tr>
<td>High Fe, low ferritin, low Fe binding capacity</td>
<td>Hemachromatosis- hepatitis, DM, golden skin</td>
</tr>
<tr>
<td>Low ceruloplasmin, high urinary Cu</td>
<td>Wilson’s- hepatitis, psychiatric sxs (BG), corneal deposits</td>
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Infectious Disease
Meningitis

• **Most Common bugs?**
  - Strep Pneumo, H. Influenza, N. meningitidis (tx w/ Ceftriaxone and Vanco)
  - Add Lysteria. (tx w/ Ampicillin)
  - Add Staph (tx w/ Vanco)

• **In old and young?**

• **In ppl w/ brain surg?**

• **Randoms?**
  - TB (RIPE + ‘roids) and Lyme (IV ceftriazone)

• **Best 1\textsuperscript{st} step?**
  - Start empiric treatment (+ steroids if you think it is bacterial), Exam for elevated ICP/CT, then LP +Gram stain, >1000WBC is diagnostic.
  - High protein and low glucose support bacterial

• **Roommate of the kid in the dorms who has bacterial meningitis and petechial rash?**
  - Rifampin!!
Pneumonia

- Classic sx’s... best 1st step? **CXR!**
- Most common bug all comers? **Strep Pneumo. Tx w/ M, FQ, 3rd ceph**
- Most common bug, healthy young people? **Mycoplasma. Assoc w/ cold agglutinins. Tx w/ M, FQ or doxy**
- Hospitalized w/in 3mo or in the hospital >5-7d **Pseudomona, Klebsiella, E. Coli, MRSA. Tx w/ pip/tazo or imipenem+ Vanc**
- Old smokers w/ COPD? **H. influenzae. Tx w/ 2nd-3rd ceph**
- Alcoholics w/ current jelly sputum? **Klebsiella. Tx w/ 3rd ceph**
- Old men w/ HA, confusion, diarrhea and abd pain? **Legionella. Dx w/ urine antigen. Tx w/ M, FQ, doxy**
- Just had the flu? **MRSA. Tx w/ vanc**
- Just delivered a baby cow and have vomiting and diarrhea? **Q-fever. Coxiella burnetti. Tx w/ doxy**
- Just skinned a rabbit? **Franciella tularensis. Tx w/ streptamycin, gentamycin**
Tuberculosis

• If a patient is symptomatic → best test is CXR
• For screening →
  – >15mm, >10mm if prison, healthcare, nursing home, DM, ETOH, chronically ill, >5mm for AIDS, immune suppressed
  – If + PPD → do CXR.
  – If +CXR → do acid fast stain of sputum.
  – If CXR negative, or +CXR & 3 negative sputums →
  – If positive → tx w/ 4 drug RIPE Regimen for 6mo (12 for meningitis and 9 if pregnant)

*Chemoprophylaxis (INH for 9mo) for kiddos <4 exposed to known TB.

• Drug Side Effects:
  – Rifampin- body fluids turn orange/red, induces CYP450
  – INH- peripheral neuropathy and sideroblastic anemia (prevent by giving B6. Hepatitis w/ mild bump in LFTs
  – Pyrazinamide- Benign hyperuricemia
  – Ethambutol- optic neuritis, other color vision abnormalities.
Endocarditis

Acute endocarditis-
• most common bug? Staph aureus seeds native valves from bacteremia

Subacute Native valve endocarditis-
• Most common valve? Mitral Valve (MVP is MC predisposition)
• Most common bug? Viridens group strep

IVDU
• Most common valve? Tricuspid Valve (murmur worse w/ inspiration)
• Most common bug? Staph Aureus
• Diagnosis? Blood cx, TTE then TEE. Major and Minor Criteria
• Complications? CHF #1 cause of death, septic emboli to lungs or brain
• Treatment? Strep Viridens = 4-6 wks PCN. Staph = Naf + gent or vanco
• Prophylaxis? if prosthetic valve, hx of EC, or uncorrected congenital lesion
• *What if you find strep bovis bacteremia? Next step is colonoscopy!!
When to suspect HIV...

- If a patient “travels a lot for work” → that means they have sex with lots of strangers and are at risk for HIV
- Acute retroviral syndrome = 2-3 wks s/p exposure but 3wks before seroconversion. → ie, ELISA neg
  - Fever, fatigue, lymphadenopathy, headache, pharyngitis, n/v/d +/- aseptic meningitis
- A young patient with new/bilateral Bell’s Palsy.
- A young patient with unexplained thrombocytopenia and fatigue.
- A young patient with unexplained weight loss >10%
- A young patient with thrush, Zoster, or Kaposi sarcoma
When to start Tx/Post exposure Prophylaxis

• Start HAART when CD4 < 350 or viral load >55,000 (except preggos get tx >1,000 copies)
  – GI, leukopenia, macrocytic anemia  Zidovudine-
  – Pancreatitis, peripheral neuropathy  Didanosine-
  – HS rash, fever, n/v, muscle aches, SOB in 1st 6wks. D/C and never use again!  Abacavir-
  – Nephrolithiasis and hyperbilirubinemia  Indinavir-
  – Sleepy, confused, psycho  Efavirenz-

• Post-exposure prophylaxis-
  – If stuck w/ known HIV pt  →  AZT, lamivudine and nelfinavir for 4wks
HIV+ patient with DOE, dry cough, fever, chest pain

- Think PCP. CD4 prob <200.
- CXR shows “bilat diffuse symmetric interstitial infiltrates”
- Can see elevated LDH.
- Best test? After CXR, do Bronchoscopy w/ BAL to visualize bug
- 1st line Treatment? Trim-sulfa
- 2nd line Treatment? Trim-dapsone or primaquine-clinda, or pentamidine
- When to add Steroids? When PaO2 < 70, A-a gradient >35
- Prophylaxis? Start when CD4 is <200. Can d/c is >200 for >6mo
  1st- Trim-sulfa
  2nd- Dapsone
  3rd- Atovaquone
  4th- Aerosolized pentamidine (causes pancreatitis!)
HIV+ patient with diarrhea

• CMV- (<50)
  – Dx w/ colonoscopy/biopsy. Diarrhea can be bloody
  – Tx w/ ganciclovir (neutropenia) or foscarnet (renal tox)
• MAC- (<50)
  – Diarrhea, wasting, fevers, night sweats.
  – Tx w/ clarithromycin and ethambutol +/- rifampin
  – Prophylax w/ azithromycin weekly
• Cryptosporidium- (<50)
  – Transmitted via dog poo, swimming pools
  – Watery diarrhea w/ mucus, Oocysts are acid fast
HIV+ patient with neurologic signs

- If multiple ring enhancing lesions?
  Think Toxo. Do empiric pyramethamine sulfadiazine (+ folic acid) for 6wks. If no improvement in 1wk, consider biopsy for CNS lymphoma. Assoc w/ EBV infxn of B-cells. Tx w/ HAART.

- If one ring enhancing lesion?
  Think HSV encephalitis. (predisposed for temporal lobe). Give acyclovir as SOON as suspected.

- If seizure w/ de ja vu aura and 500 RBCs in CSF?
  Think Crypto. +India ink. Tx w/ ampho IV for 2wks then fluconazole maintenance.

- If s/s of meningitis?
  Think PML. JC polyomavirus demyelinates at grey-white jxn. Brain bx is gold standard dx.

- If hemisensory loss, visual impairment, Babinski?

- If memory problems or gait disturbance?
  Think AIDS-Dementia complex. Check serum, CSF and MRI to r/o treatable causes.
Neutropenic Fever

• Medical Emergency!
• NEVER do a DRE on a neutropenic patient!
• Defined by a single temp > 101.3 or sustained temp >100.4 for 1hr. ANC < 500.
• Mucositis 2/2 chemo causes bacteremia (usually from gut)
• MC bugs are pseudomonas or MRSA (if port present).
• Work up → 1st get blood cx, then start 3rd or 4th gen cephalosporin (ceftazidime or cefipime)
  – Add vanc if line infxn suspected or if septic shock develops.
  – Add amphoB if no improvement and no source found in 5 days.
Random Infection Buzzwords

- Target rash, fever, VII palsy, meningitis, AV block
- Rash @ wrists & ankles (palms & soles), fever and HA.
- Tick bite, no rash, myalgia, fever, HA, ↓plts and WBC, ↑ALT
- Immune suppressed, cavitary lung dz (purulent sputum)+ weight loss, fever. Gram + aerobic branching partially acid fast
- Neck or face infection w/ draining yellow material (+sulfur granules). Gram + anaerobic branching

Lyme! Tx w/ doxy (amox for <8). Heart or CNS dz needs IV ceftriaxone

Rickettsia! Tx w/ doxy.

Ehrlichiosis! Can dx w/ morulae intracell inclusion. Tx w/ doxy

Nocardia! Tx w/ trim-sulfa

Actinomyces! Tx w/ high dose PCN for 6-12wks
Nephrology
Electrolyte Abnormalities

• ↓Na = gain of water.
  – Check osm, then check volume status.
    • Hypervolemic hypoNa: CHF, nephrotic, cirrhotic
    • Hypovolemic hypoNa: diuretics or vomiting + free water
    • Euvolemic hypoNa: SIADH (check CXR if smoker), addisons, hypothyroidism.
    • Correct w/ NS if hypovolemic, 3% saline only if seizures or [Na] < 120. Otherwise fluid restrict + diuretics.
    • Don’t correct faster than 12-24mEq/day or else Central Pontine Myelinolysis.

• ↑Na = loss of water.
  – Replace water w/ D5W or other hypotonic fluid
    • Don’t correct faster than 12-24mEq/day or else cerebral edema.
Other Electrolyte Abnormalities

- numbness, Chvostek or Troussaeu, prolonged QT interval. ↓Ca
- bones, stones, groans, psycho. Shortened QT interval. ↑Ca
- paralysis, ileus, ST depression, U waves. ↓K
  - Tx w/ K (make sure pt can pee), max 40mEq/hr
- peaked T waves, prolonged PR and QRS, sine waves. ↑K
  - Tx w/ Ca-gluconate then insulin + glc, kayexalate, albuterol and sodium bicarb. Last resort = dialysis
Acid Base Disorders

• Check pH → if <7.4 = acidotic. If >7.4 = alkalotic
  – Check HCO3 and pCO2:
    • If HCO3 is high and pCO2 is high → metabolic alkalosis
    • Check urine chloride-
      » If [Cl] > 20 + hypertension → think hyperaldo (Conns). If normotensive think Barter’s or Gittlemans.
      » If [Cl] < 20 → think vomiting/NG suction, antacids, diuretics
    • If pCO2 is low and HCO3 is low → respiratory alkalosis
    • Hyperventillation from anxiety, incr ICP, fever, pain, salicylates
    • If HCO3 is low and pCO2 is low → metabolic acidosis
      – Check anion gap (Na – [Cl + HCO3]), normal is 8-12
        » Gap acidosis = MUDPILES
        » Non-gap acidosis = diarrhea, diuretic, RTAs (I, II and IV)
    • If pCO2 is high and HCO3 is high → respiratory acidosis
    • Hypoventillation from opiate OD, brainstem injury, vent prob
## Renal Tubular Acidoses

**Cause NAGMA**

<table>
<thead>
<tr>
<th>Type</th>
<th>Cause</th>
<th>Presentation/Dx</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td><strong>Lithium</strong>/Ampho B analgesics SLE, Sjogrens, sickle cell, hepatitis</td>
<td>Urine pH &gt; 5.4, <strong>HypoK</strong>, Kidney stones Problem? Cannot excrete H+</td>
<td>Replete K <strong>Oral bicarb</strong></td>
</tr>
<tr>
<td>Distal</td>
<td></td>
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<tr>
<td>Type II</td>
<td><em>Fanconi’s syndrome</em>* Myeloma**, amyloid, vitD def, autoimmune dz</td>
<td><strong>HypoK</strong>, Osteomalacia Problem? Cannot reabsorb HCO3.</td>
<td>Replete K Mild diuretic <strong>Bicarb won’t help</strong></td>
</tr>
<tr>
<td>Proximal</td>
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</tr>
<tr>
<td>Type IV</td>
<td>&gt;50% caused by <strong>diabetes</strong>! Addisons, sickle cell, any cause of aldo def.</td>
<td><strong>HyperK</strong> HyperCl High urine [Na] even w/ salt restriction</td>
<td><strong>Fludrocortisone</strong></td>
</tr>
<tr>
<td>Hyperrenin Hypoaldo</td>
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</tbody>
</table>

*Fanconi’s anemia = hereditary or acquired prox tubule dysfxn where there is defective transport of glc, AA, Na, K, PO4, uric acid and bicarb.*
Acute Renal Failure

- >25% or 0.5 rise in creatinine over baseline.

Work up-
- BUN/Cr ratio $\rightarrow$ if >20/1 = prerenal
- Check urine Na and Cr $\rightarrow$ if FENA < 1% = prerenal
- If pt on diuretic measure FENurea $\rightarrow$ is <35% = prerenal

Treatment-
- Prerenal causes = anything keeping the kidney from being perfused.
- If prerenal, tx w/ fluids (& tx CHF, GN, cirhosis, renal artery stenosis, etc)
Intrinsic Causes

• Muddy brown casts in a pt w/ampho, AG, cisplatin or prolonged ischemia?
• Protein, blood and Eos in the urine + fever and rash who took Trim-sulfa 1-2wks ago?
• Army recruit or crush victim w/ CPK of 50K, +blood on dip but no RBCs?
• Enveloped shaped crystals on UA?
• Bump in creatinine 48-72hrs s/p cardiac cath or CT scan?

ATN. Tx w/ fluids, avoid nephrotox and dialysis if indicated.

AIN. Stop offending agent. Add steroids if no improvement.

Rhabdomyolysis. 1st test is check [K+] or EKG. Tx w/ bicarb to alkalinize urine to prevent precipitation

Ethylene glycol intox. (AGMA). Tx w/ dialysis or NaHCO3 if pH<7.2

Contrast nephropathy. Prevent by hydrating before or giving bicarb or NAC
Indications for Emergent Dialysis

- **A-** Acidosis
- **E-** Electrolyte imbalance $\rightarrow$ particularly high K > 6.5
- **I-** Intoxication $\rightarrow$ particularly antifreeze, Li
- **O-** Overload of volume $\rightarrow$ sx of CHF or pulmonary edema
- **U-** Uremia $\rightarrow$ pericarditis, altered mental status

- NOT for high creatinine or oliguria alone!
Chronic Kidney Disease

• #1 cause is DM, next is HTN
• #1 cause of death in CKD pt is cardiovascular dz → so target LDL < 100.
• Complications =
  – HTN (2/2 ↑aldo), fluid retention → CHF
  – Normochromic normocytic anemia → loss of EPO
  – ↑K, ↑PO4, ↓Ca (leads to 2ndary hyperPTH)
  – ↑PO4 leads to precip of Ca into tissues → renal osteodystrophy and calciphylaxis (skin necrosis)
  – Uremia → confusion, pericarditis, itchiness, increased bleeding 2/2 platelet dysfxn
So your patient is peeing blood...

- **Best 1st test?**  Urinalysis
- **Painless hematuria?**  Bladder/Kidney cancer until proven otherwise
- **“terminal hematuria” + tiny clots?**  Bladder cancer or hemorrhagic cystitis (cyclophosphamide!)
- **Dysmorphic RBCs or RBC casts?**  Glomerular source
- **Definition of nephritic syndrome?**  Proteinuria (but <2g/24hrs), hematuria, edema and azotemia
- **1-2 days after runny nose, sore throat & cough?**  Berger’s Dz (IgA nephropathy). MC cause.
- **1-2 weeks after sore throat or skin infxn?**  Post-strep GN- smoky/cola urine, best 1st test is ASO titer. Subepithelial IgG humps
- **Hematuria + Hemoptysis?**  Goodpasture’s Syndrome. Abs to collagen IV
- **Hematuria + Deafness?**  Alport Syndrome. XLR mutation in collagen IV
• Kiddo s/p viral URI w/ Renal failure + abd pain, arthralgia and purpura.
• Kiddo s/p hamburger and diarrhea w/ renal failure, MAHA and petechiae.
• Cardiac patient s/p ticlopidine w/ renal failure, MAHA, ↓ plts, fever and AMS.
• c-ANCA, kidney, lung and sinus involvement.
• p-ANCA, renal failure, asthma and eosinophilia.
• p-ANCA, NO lung involvement, Hep B.

Henoch-Schonlein Purpura. IgA. Supportive tx +/- steroids
HUS. E.Coli O157H7 or shigella. Don’t tx w/ ABX (releases more toxin)
TTP. Tx w/ plasmapheresis. DON’T give platelets. Can tell from DIC b/c PT and PTT are normal in HUS/TTP.

Wegener’s Granulomatosis. Most accurate test is bx. Tx w/ steroids or cyclophosphamide.
Churg Strauss. Best test is lung bx. Tx w/ cyclophosphamide.

Polyarteritis Nodosa. Affects small/med arteries of every organ except the lung! Tx w/ cyclophosphamide.
Kidney Stones

• Flank pain radiating to groin + hematuria.
• Best test? **CT.**
• Types-
  – Most common type? **Calcium Oxalate. Tx w/ HCTZ**
  – Kid w/ family hx of stones? **Cysteine. Can’t resorb certain AA.**
  – Chronic indwelling foley and alkaline pee? **Mg/Al/PO4 = struvite. proteus, staph, pseudomonas, klebsiella**
  – If leukemia being treated w/ chemo? **Uric Acid**
  – If s/p bowel resection for volvulus? **Pure oxylate stone. Ca not reabsorbed by gut (pooped out)**
• Treatment
  – Stones <5mm **Will pass spontaneously. Just hydrate**
  – Stones >2cm **Open or endoscopic surgical removal**
  – Stones 5mm-2cm **Extracorporal shock wave lithotropsy**
So your patient is peeing protein...

- Best 1st test? Repeat test in 2 weeks, then quantify w/ 24hr urine
- Definition of nephrotic syndrome? >3.5g protein/24hrs, hypoalbuminemia, edema, hyperlipidemia (fatty/waxy casts)
- MC in kiddos? Minimal change dz- fusion of foot processes, tx w/ ‘roids
- MC in adults? Membranous- thick cap walls w/ subepi spikes
- Assoc w/ heroin use and HIV? Focal-Segmental- mesangial IgM deposits. Limited response to ‘roids.
- Assoc w/ chronic hepatitis and low complement? Membranoprolif- tram-track BM w/ subendo deposits
- If nephrotic patient suddenly develops flank pain? Suspect renal vein thrombosis! 2/2 peeing out ATIII, protein C and S. Do CT or U/S stat!
- Other random causes? Orthostatic, bence jones in MM, UTI, preggos, fever, CHF
Hematology/Oncology
A patient walks in with microcytic anemia...

1.) MCV = 70, ↓Fe, ↑TIBC, ↓retic, ↑RDW, ↓ferritin.
2.) MCV = 70, ↓Fe, ↓TIBC, ↓retic, nl ferritin.
3.) MCV = 60, ↓RDW
4.) MCV = 70, ↑Fe, ↑ferritin, ↓TIBC
A patient walks in with macrocytic anemia...

1.) MVC = 100, ↓retics, ↑homocysteine, nl methylmelonic acid.

2.) MVC = 100, ↓retics, ↑homocysteine, ↑methylmelonic acid.

3.) MVC = 100
Normal MCV, ↑LDH, ↑indirect bilirubin, ↓haptoglobin

- Sickle cell kid w/ sudden drop in Hct?
- Cyanosis of fingers, ears, nose + recent Mycoplasma infx.
- Sudden onset after PCN, ceph, sulfas, rifampin or Cancer.
- Splenomegaly, +FH, bilirubin gallstones, ↑MCHC.
- Dark urine in AM, Budd-Chiari syndrome.
- Sudden onset after primiquine, sulfas, fava beans

Aplastic Crisis.
Sickle Crisis from hypoxia, dehydration or acidosis

Cold Agglutinins. Destruction occurs in the liver. IgM mediated.

Warm Agglutinins. Destruction in spleen. IgG. Tx w/ steroids 1st, then splenectomy.

Hereditary spherocytosis (AD loss of spectrin). Tx w/ splenectomy.

Paroxysmal Nocturnal Hemoglobinuria. Defect in PIG-A. Lysis by complement. Incr risk for aplastic anemia

G6PDH def. Heinz bodies, Bite cells. Avoid oxidant stress.
A patient walks in with thrombocytopenia

- **30 y/o F** recurrent epistaxis, heavy periods & petechiae. ↓ plt only.
- **20 y/o F** recurrent epistaxis, heavy periods, petechiae, normal plt, ↑ bleeding time and PTT.
- **20 y/o M** recurrent bruising, hematuria, & hemarthroses, ↑ PTT that corrected w/ mixing studies.
- **50y/o M** “meat-a-tarian” just finished 2wks of clinda has hemarthroses & oozing at venipuncture sites.
- **50y/o M** “beer-a-tarian” w/ severe cirrhosis.
  - 1st factor depleted? VII, so PT increases 1st
  - 2 factors not depleted? VIII and vWF b/c they are made by endothelial cells.
A patient walks in with thrombocytopenia and this smear...

- If PT and PTT are ↑, fibrinogen ↓, D-dimer and fibrin split products ↑? **DIC!**
  - Causes? Sepsis, rhabdo, adenocarcinoma, heatstroke, pancreatitis, snake bites, OB stuff, *Tx of M3 AML*
  - Treatment? FFP, platelet transfusion, correct underlying d/o

- If PT and PTT are nl? **HUS or TTP**
  - Causes? O157H7, ticlopidine, quinine, cyclosporine, HIV, cancer,
  - Treatment? Plasmapheresis. NO PLATELETS!
• 7 days post-op, a patient develops an arterial clot. Her platelets are found to be 50% less than pre-op.
  – Mechanism? IgG to heparin bound to PF4
  – Treatment? Stop heparin, reverse warfarin w/ vitK, start lepirudin

• What to look for in someone w/ unprovoked thrombus?
  – CANCER
  – Lupus Anticoagulant ↑PTT, multiple SABs, false + VDRL
  – Protein C/S deficiency Skin necrosis after warfarin is started
  – Factor V Leiden MC inheritable pro-coag state. V is resistant to C
  – AT III Deficiency Heparin won’t work. Clots on heparin.
  – OCPs/HRT No Go for women >35 who smoke
  – Nephrotic syndrome Pee out ATIII protein C and S preferentially. Puts at risk for Renal Vein Thrombosis
Rheumatology/Dermatology
A patient comes in with arthritis...

Knee pain, DIP involvement no swelling or warmth, worse at the end of the day, crepitation.

OA.

PIP and wrists bilaterally, worse in the AM, low grade fever.

RA.

DIP joint involvement, rash with silvery scale on elbows and knees, pitting nails and swollen fingers.

Psoriatic Arthritis.

Symmetric, bilateral arthritis, malar rash, oral ulcers, proteinuria, thrombocytopenia. Arthritis is not erosive or have lasting sequellae.

SLE.
A patient comes in w/ acute swollen painful joint...

- **1st best test?**  
  Tap it!

- **WBCs >50K**  
  Septic arthritis
  - 30 yr old who “travels a lot for work”  
  Gonococcal. Cx may be negative. Look also for tenosynovitis and arm pustules. Tx w/ ceftriaxone.

- **70 yr old nun**  
  Staph aureus. Tx w/ nafcillin or vanco.

- **WBCs 5-50K**  
  Inflammatory. If no crystals, think RA, ank spon, SLE, Reiter’s
  - Needle shaped, negatively birefringent crystals.  
  Gout. Monosodium Urate.
  - Acute TX? Indomethacin + colchicine (steroids if kidneys suck).
  - Chronic TX? Probencid if undersecreter. Allopurinol if overproduc.

- **Rhomboid shaped, positively birefringent crystals.**

- **WBCs 200-5K**  
  OA, hypertrophic osteoarthropathy, trauma

- **WBCs <200**  
  Normal.
Antibodies to Know!

- If negative, rules out SLE? ANA – peripheral/rim staining.
- Most sensitive for SLE? Anti-dsDNA or Anti-Smith
- Drug induced lupus? Anti-histone (hydralazine).
- Sjogren’s Syndrome? Anti-Ro (SSA) or Anti-La (SSB)
- CREST Syndrome? Anti-centromere
- Systemic Sclerosis? Anti-Scl-70, Anti-topoisomerase
- Mixed connective tissue disease? Anti-RNP
- 2 tests for RA? RF (against Fc of IgG)
  Anti-CCP (cyclic citrullinated peptide)
Skin signs of systemic diseases:

- Sign of Leser Trelat
- Dermatomyositis
- Seborrheic Dermatitis
- Erythema Multiforme
- Acanthosis Nigricans
- Dermatitis Herpetiformis
Skin signs of systemic diseases part deaux:

- Porphyria Cutanea Tarda
- Erythema Nodosum
- Necrolytic migratory erythema
- Bullous Pemphigoid
- Pemphigus Vulgaris
- Behcet’s Syndrome
Other Skin Randoms

Acrodermatitis enteropathica (Zn deficiency)

Dermatitis of Pellagra

Tinea Capitis

Actinic Keratosis

Kaposi Sarcoma

Bacillary Angiomatosis
Skin Cancer

• Basal Cell Carcinoma-
  – Shave or punch bx then surgical removal (Mohs)

• Squamous Cell Carcinoma-
  – AK is precursor lesion (tx w/ 5FU or excision) or keratoacanthoma.
  – Excisional bx at edge of lesion, then wide local excision.
  – Can use rads for tough locations.

• Melanoma-
  – Superficial spreading (best prog, most common)
  – Nodular (poor prog)
  – Acrolintiginous (palms, soles, mucous membranes in darker complected races).
  – Lentigo Maligna (head and neck, good prog)
  – Need full thickness biopsy b/c depth is #1 prog
  – Tx w/ excision-1cm margin if <1mm thick,
    2cm margin if 1-4mm thick, 3cm margin if >4mm
  – High dose IFN or IL2 may help

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Endocrinology
Common Endo Diseases

• MC pituitary adenoma?  Prolactinoma. Consider in amenorrhea/hypoT
  – Tx?  Bromocriptine or cabergoline... even if macro (>10mm)

• Order of hormones lost in hypopituitarism?
  #1 FSH and LH  #2 GR  #3 TSH  #4 ACTH

• Polyuria, polydipsia, hyperNa, hyperOsm, dilute urine.
  – Central-  urine Osm still ↓ s/p water depriv. Urine Osm ↑ w/ ddAVP
  – Nephrogenic-  Urine Osm still ↓ s/p ddAVP. Tx w/ HCTZ/amiloride.

• See low TSH, high free T3/T4.
  Next best step?  I\textsuperscript{123} RAIU scan. If ↑ = Graves. If ↓ = factitious or thyroiditis
  – Tx?  1\textsuperscript{st} = propranolol + PTU/MTZ. I\textsuperscript{131} ablation or surgery (preggos & kiddos)
  – Tx of thyroid storm?  PTU + Iodine (Lugol’s sol’n) + propranolol.
Work up of a Thyroid Nodule

• 1st step? Check TSH
• If low? Do RAIU to find the “hot nodule”. Excise or radioactive I\textsuperscript{131}
• If normal? FNA
• If benign? Leave it alone.
• If malignant? Surgically excise and check pathology
• If indeterminate? Re-biopsy or check RAIU
• If cold? Surgically excise and check pathology
  – Papillary MC type, spreads via lymph, psammoma bodies
  – Follicular Spreads via blood, must surgically excise whole thyroid!
  – Medullary Assoc w/ MENII (look for pheo, hyperCa). Amyloid/calci
  – Anaplastic 80% mortality in 1st year.
  – Thyroid Lymphoma Hashimoto’s predisposes to it.
Adrenal Issues

• Osteoporosis, central fat, DM, hirsutism  
  – Best screening tests? 1mg ON dexa suppression test or 24hr urine cortisol

• If abnormal? Diagnoses Cushing’s Syndrome
  – Next best test? 8mg ON dexa suppression test

• Suppression to <50% of control? Pituitary adenoma (Cushing’s dz)

• No suppression? Either adrenal neoplasia or ectopic ACTH
  – Next best test? Plasma ACTH. Chest CT if smoker. Abdominal CT/DHEAS

• Weakness, hypotension, weight loss, hyperpigmentation, ↑K, ↓Na, ↓pH  
  – Best screening test? Cosyntropin stimulation test (60min after 250mcg)

• MC cause? Autoimmune (Addison’s dz)
Work up of an Adrenal Nodule

- **Best 1\(^{st}\) step?** Check functional status

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Features</th>
<th>Biochemical Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pheochromocytoma</td>
<td>High blood pressure, catechol symptoms</td>
<td>Urine- and plasma-free metanephrines</td>
</tr>
<tr>
<td>Primary aldosteronism</td>
<td>High blood pressure, low K(^+), low PRA*</td>
<td>Plasma aldosterone-to-renin ratio</td>
</tr>
<tr>
<td>Adrenocortical carcinoma</td>
<td>Virilization or feminization</td>
<td>Urine 17-ketosteroids</td>
</tr>
<tr>
<td>Cushing or &quot;silent&quot; Cushing syndrome</td>
<td>Cushing symptoms or normal examination results</td>
<td>Overnight 1-mg dexamethasone test</td>
</tr>
</tbody>
</table>

- **#2- if <5cm and non-function →**
  - Observe w/ CT scans q6mo
  - If >6cm or functional →
    - Surgical excision

Parathyroid Disease

Hypoparathyroidism
- Perioral numbness, Chvortek, Trousseau s/p Thyroidectomy
- ↓[Ca], ↑[PO4], ↓[PTH]

Hyperparathyroidism
- Kidney stones, constipation/abd pain or psychiatric sxes
- ↑[Ca], ↓[PO4], ↑vitD, ↑[PTH]

Dx w/ FNA of suspicious nodules. Can use Sestamibi scan.

Tx w/ surgical removal of adenoma. If hyperplasia, remove all 4 glands and implant 1 in forearm.

• MEN-
  - MEN1- pituitary adenoma, parathyroid hyperplasia, pancreatic islet cell tumor.
  - MEN2a- parathyroid hyperplasia, medullary thyroid cancer, pheochromocytoma
  - MEN2b- medullary thyroid cancer, pheochromocytoma, Marfanoid
Diabetes

- **Diagnosis of Diabetes?**
  - FBGL > 126 x 2, 2hr OGTT > 200, random glc > 200 + sx (polyuria, polydipsia, blurred vision)

- **Nausea, vomiting, abdominal pain, Kussmaul respirations, coma w/ BGL = 400?** \(\text{DKA}\)
  - **Dx?** Ketones in blood (&urine), AGMA, hyperkalemia
  - **Tx?** High volume NS + insulin bolus & drip. Add K once peeing. Add glc < 200

- **Polyuria, polydipsia, profound dehydration, confusion and coma w/ BGL = 1000?** \(\text{HHS}\)
  - **Tx?** High volume fluid & electrolytes. May require insulin.

- **MC cause of death?** Cardiovascular disease

- **Important screening?**
  - **Heart?** LDL < 100, BP < 130/80,
  - **Kidney?** Check for microalbuminemia (30-300 in 24hrs). Start ACE-I
  - **Eye?** Annual screening for prolife retinopathy \(\rightarrow\) Vitreous hemor/neovasc
  - **Nerves?** Podiatric exam annually. Tx gastroparesis w/ metoclopramide or erythromycin. May get ED. 3\(^{\text{rd}}, 4^{\text{th}}, 6^{\text{th}}\) CN palsy.
Neurology
A 47 year old IVDU comes in requesting hydromorphone for back pain. His pain is worse w/ valsalva, and his L4 vertebra is TTP. His LE have 4-/5 strength bilaterally, his has flaccid rectal tone, and plantar response is upgoing.

- Next best step? MRI of the spine. 2nd choice is CT myelogram
- If same clinical picture in a patient w/ hx of prostate ca... next best step? IV dexamethasone then MRI then radiation therapy.
- Pt s/p MVC w/ “whiplash” has loss of pain/temp on neck and arms & intact sensation. Syringomyelia. MRI to dx, surgery to tx
- Pt w/ high cholesterol presents w/ acute onset flaccid paralysis below the waist, loss of pain/temp w/ preserved vibration of position. Anterior spinal artery occlusion. Tx is supportive.
Stroke!

- **Most common cause?** 80% ischemic, 20% hemorrhagic
- **Best 1st step?** Non-contrast CT to r/o hemorrhage
- **Most accurate test?** Diffusion-weighted MRI best for ischemic. CT can be neg 1st 48hrs.
- **Treatment?**
  - If w/in 3 (4.5) hours? TPA
  - If later than that? Aspirin. Heparin only for those in a-fib, basilar clot
- **Contraindications to TPA?** Stroke w/in 3mo, surg w/in 2wks, LP w/in 1wk
- **When to clip an aneurysm?** Nimodipine to reduce ischemic stroke from vc (MC cause of M&M)
- **When to do endarterectomy?** W/in days or rupture or when <10mm
- **When occlusion >70% and is symptomatic. (>60% if <60y/o)**
Where’s the lesion?

- L hemiplegia/hemisensory loss, L homononomous hemianopsia w/ eyes deviated twoards the R + apraxia.
- L hemiplegia/hemisensory loss in the leg>arm. Confusion, behavioral disturbance.
- L hemiplegia + R ptosis & eye deviated to the right and down.
- Falling to the L + R ptosis & eye deviated to the right and down.
- L hemisensory loss + Horners + R facial sensory loss.
- Vertigo, vomiting, nystagmus and clumsiness with the right arm.
- Total paralysis except for vertical eye movements.
Seizures

• Medical causes include hypoglycemia, hyponatremia, hypocalcemia, structural (tumor, bleed, stroke), infection, ETOH or benzo w/drawal.

• Status Epilepticus.
  – Tx? Lorazepam + LD of phenytoin. Then phenobarbitol. Then anesthesia.

• Partial seizures begin focally. (Arm twitch, de-ja-vu, burning rubber smell).
  – They are simple if no LOC and complex if LOC (may have lip smacking). Both can generalize.
  – Tx? 1st line = carbamazepine or phenytoin. Then valproate or lamotrigine

• Generalized seizures begin from both hemispheres @ once.
  – Either grand mal or absence (5-10sec unresponsiveness in kiddos), myoclonic, atonic. Tx absence w/ ethosuximide
  – Tx? 1st line = valproic acid, then lamotrigine, carbamezepine, phenytoin
EEG Buzzwords

• 3 Hz spike-and-wave.  
  Absence Seizure. Tx w/ ethosuxamide

• Triphasic bursts  
  Creutzfeldt Jakob. Dementia + myoclonus

• Diffuse background slowing.  
  Delirium. Contrast w/ psychosis that has no EEG changes

• Hypsarrhythmia  
  Infantile spasms. Tx w/ ACTH. Most are associated w/ mental retardation.
New Onset Severe Headache

Things to consider:

• “Worse headache of my life” Subarachnoid hemorrhage. Noncon CT 1st!
• + Fever and Nuchal rigidity Meningitis. Abx then CT then LP.
• Deep pain that wakes them up at night. Worse w/ coughing or bending forward.
• Unilateral pounding headache w/ changes in vision and jaw claudication.
• Fat lady on minocycline or who takes isotreintoin w/ abduccens nerve palsy/diplopia.

Consider brain tumor. Most important prognostic factor is grade (degree of anaplasia).

Temporal arteritis. Check ESR, then give steroids, then do temporal artery biopsy. Can lead to blindness.

Pseudotumor cerebri. Also assoc w/ OCPs. Normal CT, elevated pressure on LP. Tx w/ weight loss, then acetazolamide, then shunt or optic nerve sheath fenestration.
Neuro reasons to go to the hospital...

• Diarrhea 3wks ago, now areflexia and ascending paralysis.
  – Most likely bug? Campylobacter, HHV, CMV, EBV
  – Best tx? IVIG or plasmapheresis. Monitor VC for intubation req.

• Nasal voice, ptosis, dysphagia, **Myasthenia Gravis**. 1st test is Ach-ab. Most respiratory acidosis. Most accurate is EMG, decrease in muscle fiber contraction.
  – Acute tx? IVIG or plasmapheresis. Monitor VC for intubation req.
  – Chronic tx? Pyridostigmine, GCs/azathioprine, thymectomy (<60)
  – Meds to avoid? Aminoglycosides & beta-blockers

• Urinary retention, Babinski on R. Episode of double vision 6mo ago.
  – Best dx test? MRI of the brain. Incr T2 @ periventricular white matter
  – Acute tx? Steroids. (3 days IV then 4wks oral). Plasma xchng is 2nd line
  – Chronic tx? IFN-beta1a, beta1b, glatiramer reduce exacerbations

**Guillain-Barre**. CSF shows albumino-cytologic dissociation

**Multiple Sclerosis**. Neuro-deficits separated by time and space
Gastroenterology Extra Slides
A patient comes in with dysphagia...

- Best 1st test is a barium swallow
- Next best test is endoscopy (can be dx and allow for bx of suspicious masses or tx in dilation of peptic strictures or injecting botox for achalasia).
- Manometry is the test of choice for achalasia.
- 24 pH monitoring is the test of choice for GERD.
- If HIV+ (CD <100) or otherwise immunocompromised- remember candida, CMV and HSV esophagitis
• Bad breath & snacks in the AM.
  Zenker’s diverticulum.  
  Tx w/ surgery

• True or false? False. Only contains mucosa

• Dysphagia to liquids & solids.
  Dysphagia worse w/ hot & cold liquids + chest pain that feels like MI w/ NO regurg
  Achalasia.  
  Tx w/ CCB, nitrates, botox, or heller myotomy  
  Assoc w/ Chagas dz and esophageal cancer.

• Epigastric pain worse after eating or when laying down cough, wheeze, hoarse.
  GERD. Most sensitive test is 24-hr pH monitoring. Do endoscopy if “danger signs” present. Tx w/ behav mod 1st, then antacids, H2 block, PPI.

• Indications for surgery?
  bleeding, stricture, Barrett’s, incompetent LES, max dose PPI w/ still sxs, or no want meds.
If hematemesis (blood occurs after vomiting, w/ subQ emphysema). Can see pleural effusion w/ ↑amylase

**Boerhaave’s**
Esophageal Rupture

Next best test?
CXR, gastrograffin esophagram. NO endoscopy

Tx?
surgical repair if full thickness

If gross hematemesis unprovoked in a cirrhotic w/ pHTN.

**Gastric Varices**
If in hypovolemic shock?
do ABCs, NG lavage, medical tx w/ octreotide or SS. Balloon tamponade only if you need to stabilize for transport

Tx of choice?
Endoscopic sclerotherapy or banding

*Don’t prophylactically band asymptomatic varices. Give BB.

If progressive dysphagia/wgt loss.

**Esophageal Carcinoma**
Squamous cell in smoker/drinkers in the middle 1/3.
Adeno in ppl with long standing GERD in the distal 1/3.

Best 1st test?
barium swallow, then endoscopy w/ bx, then staging CT.
A patient comes in with MEG pain...

• #1 cause is non-ulcerative dyspepsia. Dx of exclusion. Tx w/ H2 blocker and antacid.
• If GERD sxs predominate- tx empirically w/ PPI for 4 wks then re-evaluate.
• If biliary colic sxs predominate → RUQ sono
• If hx of stones or drinking, check amylase and lipase and CT scan is best imaging for pancreas.
• Danger sxs warrant endoscopic work up-
  – >50 y/o, hx of smoking and drinking, recent unprovoked weight loss, odynophagia, Fe-def anemia or melena.
• **Gastric Ulcers**- MEG pain worse w/ eating. H.pylori, NSAIDs, ‘roids
  – Double-contrast barium swallow shows punched out lesion w/ regular margins. EGD w/ bx can tell H. pylori, malign, benign.
  – Tx w/ sucralfate, H2-block, PPI. Surgery if ulcer remains s/p 12wks treatment.
• **Duodenal Ulcers**- MEG pain better w/ eating
  – 95% assoc w/ H. pylori
  – Healthy pts < 45y/o can do trial of H2 block or PPI
  – Can do blood, stool or breath test for H. pylori but endoscopy w/ biopsy (CLO test) is best b/c it can also exclude cancer.
  – Tx H. pylori w/ PPI, clarithromycin & amoxicillin for 2wks. Breath or stool test can be test of cure.
• **Zollinger-Ellison Syndrome**-
  – Suspect it if MEG pain/ulcers don’t improve w/ eradication of H. pylori, large, multiple or atypically located ulcers.
  – Best test is secretin stim test (finding high gastrin)
  – Tx w/ resection if localized, long term PPI if metastatic.
  – Look for pituitary and parathyroid problems (MEN1)
• **Acute Cholecystitis**-
  – RUQ pain → back, n/v, fever (diff than sx-atic gall-stones) worse after fatty food, +Murphy’s.
  – Best 1st test is U/S → thickened wall. HIDA shows non-visualization of GB.
  – Tx with cholecystectomy. If too unstable for surg, can place a percutaneous cholecystostomy.

• **Choledocothithiasis**-
  – Same sx + obstructive jaundice, high bili, alk phos
  – U/S will show stones. Do cholecystectomy or ERCP to remove stone.

• **Ascending Cholangitis**-
  – RUQ pain, fever, jaundice (+hypotension and AMS)
  – Tx w/ fluids & broad spec abx. ERCP and stone removal.

• **Cholangiocarcinoma** - rare. RF are primary sclerosing cholangitis (UC), liver flukes and thorothrast exposure. Tx w/ surgery.
• **Acute Pancreatitis**-
  – Gallstones & ETOH most common etiologies
  – MEG pain → back + n/v, Turner’s and Cullens signs
  – Labs show incr amylase (>1000 means stone) lipase. Best imaging is CT scan. Tx w/ NG, NPO, IV. Observe.
  – Prognosis- worse if old, WBC>16K, Glc>200, LDH>350, AST>250... drop in HCT, decr calcium, acidosis, hypox
  – Complications- pseudocyst (no cells!), hemorrhage, abscess, ARDs

• **Chronic Pancreatitis**-
  – Chronic MEG pain, DM, malabsorption (steatorrhea)
  – Can cause splenic vein thrombosis

• **Adenocarcinoma**-
  – Usually don’t have sx until advanced. If in head of pancreas → Courvoisier’s sign (large, nontender GB, itching and jaundice). Trousseau’s sign = migratory thrombophlebitis.
  – Dx w/ EUS and FNA biopsy
  – Tx w/ Whipple if: no mets outside abdomen, no extension into SMA or portal vein, no liver mets, no peritoneal mets.
A patient comes in with diarrhea...

- If hypotensive, tachycardic. Give NS first!
- Vial is #1 cause → rota in daycare kids, Norwalk on cruise ships
- Check fecal leukocytes → tells invasion. Stool cx is best test
- If bloody diarrhea → consider EHEC, shigella, vibrio parahaemolyticus, salmonella, entamoeba histolytica
- If hx of picnic → B. cereus, staph food poisoning. 1-6hrs
- If hx of abx use → check stool for c. diff toxin antigen
- If foul smelling, bulky, malnourished → consider Sprue, chronic pancreatitis, Whipple’s dz, CF if young person.
- If accompanied by flushing, tachycardia/ hypotension → consider carcinoid syndrome (metastatic).
  – *Can cause niacin deficiency!* (2/2 using all the tryptophan to make 5HT) Dementia, Dermatitis, Diarrhea.
Oncology Extra Slides
A patient presents w/ fatigue, petechiae, infection bone pain and HSM...

- If >20% blasts? Defines Acute Leukemia on Biopsy
- CALLA or TdT? ALL. Most common cancer in kids.
- Auer Rods, myeloperoxidase, esterase? AML. More common in adults. RF = rads exposure, Down’s, myeloprolif. *M3 has Auer Rods and causes DIC upon tx.
- Tartate resistant acid phosphatase, ↓monos & CD11 and CD22+? Hairy Cell Leukemia. See enlarged spleen but no adenopathy.
- Hairy Cells have numerous cytoplasmic projections on smear.
- Tx w/ cladribine 5-7day single course
- Tx of ALL? Danorub, vincris, pred. Add intrathecal MTX for CNS recurrence. BM transplant after 1st remission.
- Tx of AML? Danorub + araC. If *M3 → give all trans retinoic acid
CML - 9:22 transloc $\rightarrow$ tyrosine kinase

- A patient presents with fatigue, night sweats, fever, splenomegaly and elevated WBCs with low LAP and basophilia?

- Asymptomatic elevation in WBCs found on routine exam – 80% lymphs.

Tx w/ imatinib (Gleevec), inhibits tyrosine kinase. 2nd line is bone marrow transplant.
Cx = blast crisis.

If Lymphadenopathy
Stage 0 or 1 need no tx - 12 yrs till death
If Splenomegaly
Stage 2 tx w/ fludrabine

If Anemia
If Thrombocytopenia
Stage 3 or 4 tx w/ steroids
• Enlarged, painless, rubbery lymph nodes

• Drenching night sweats, fevers & 10% weight loss.

• Best initial test? *Excisional* lymph node biopsy

• Next best test? Staging Chest/Abdominal CT or MRI. If still unsure, staging laparotomy is done. Bone marrow bx (esp for NHL

• Orderly, centripetal spread + Reed Sternberg cells?

• Type w/ best prognosis? Lymphocyte predominant

• More likely to involve extranodal sites? (spleen, BM)

• Staging? I = 1 node group, II = 2 groups, same side of diaphragm, III = both sides of diaphragm, extension into organ. IV = BM or liver

• Treatment? I/II get rads III/IV get ABVD chemo

Think Lymphoma

“B-symptoms” = poor prognosis along w/ >40, ↑ESR and LDH, large mediastinal LND

Hodgkin’s Lymphoma

Non-hodgkin’s Lymphoma
Other hematologic randoms...

- Bone pain, “punched out lesions” on *x-ray*, hyper Ca
  - Best 1st test- Serum protein elecrophoresis- IgG monoclonal spike
  - Confirmatory test- Bone marrow bx showing >10% plasma cells.
  - Tx- If young, BM transplant. If old, melphalan + prednisone. Hydration and lasix then bisphosphonate for hyperCa

- Dizziness, HA, hearing/vision problems and monoclonal IgM M-spike.
- No sx, immunoglobulin spike found on routine exam
- Older pt w/ generalized pruritis and flushing after hot bath. Hct of 60%.
  - Best 1st test- Check epo, make sure it isn’t secondary. (PSG, carboxy-Hb)
  - Tx- Scheduled phlebotomy. Hydroxyurea can prevent thromboses

Multiple Myeloma
Waldenstrom Macroglobulinemia
MGUS
Polycythemia Vera