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

Anterior	LAD	V1-V4
Lateral	Circumflex	I, avL, V4-V6
Inferior	RCA	II, III and aVF
R ventricular	RCA	V4 on R-sided EKG is 100% specific

- 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.

Myoglobin	Rises 1st	Peaks in 2hrs, nl by 24
CKMB	Rise 4-8hrs	Peaks 24 hrs, nl by 72hs
Troponin I	Rise 3-5hrs	Peaks 24-48hrs, nl by 7-10days

- 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.

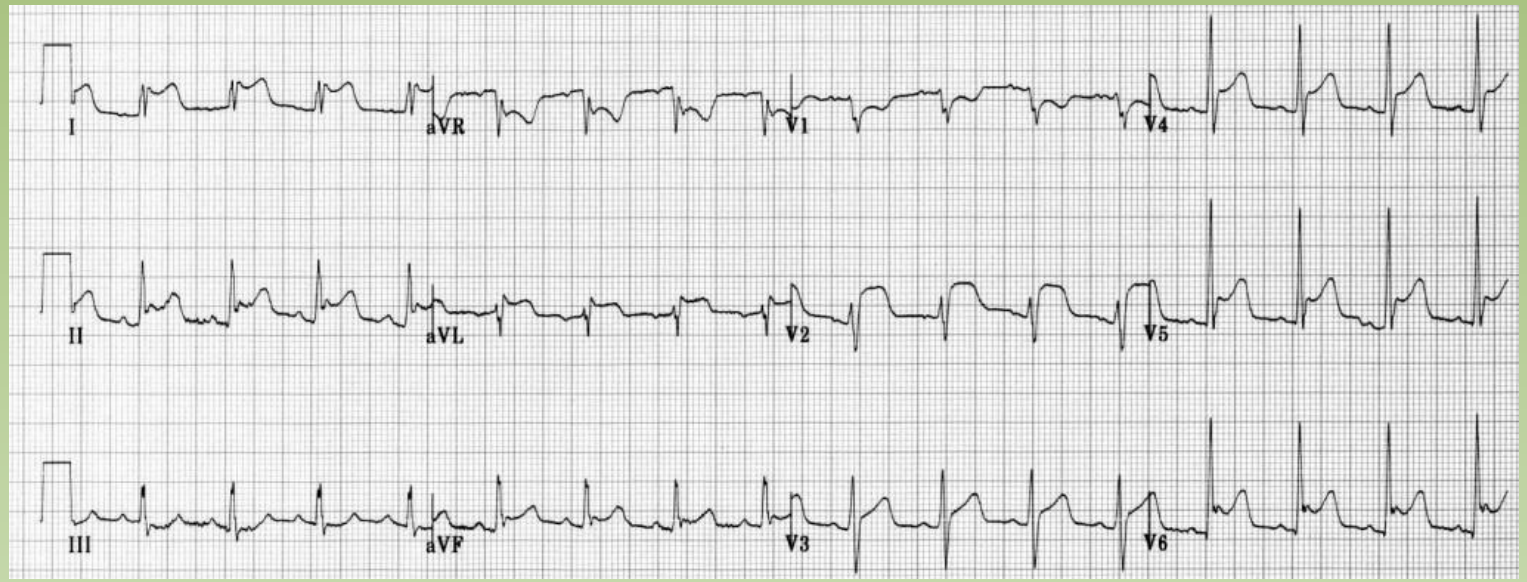
- Work up-
  - Exercise EKG: avoid b-blockers and CCB before.
  - Can't do EKG stress test if old LBBB or baseline ST elevation or on Digoxin. Do Exercise Echo instead.
  - If pt can't exercise- do chemical stress test w/ dobutamine or adenosine.
  - MUGA is nuclear medicine test that shows perfusion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

Post-MI complications

- MC cause of death? — Arrhythmias. V-fib
- New systolic murmur 5-7 days s/p? — Papillary muscle rupture
- Acute severe hypotension? — Ventricular free wall rupture
- "step up" in O2 conc from RA → RV? — Ventricular septal rupture
- Persistent ST elevation ~1mo later + systolic MR murmur? — Ventricular wall aneurysm
- "Cannon A-waves"? — AV-dissociation. Either V-fib or 3rd degree heart block
- 5-10wks later pleuritic CP, low grade temp? — Dressler's syndrome. (probably) autoimmune pericarditis. Tx w/ NSAIDs and aspirin.

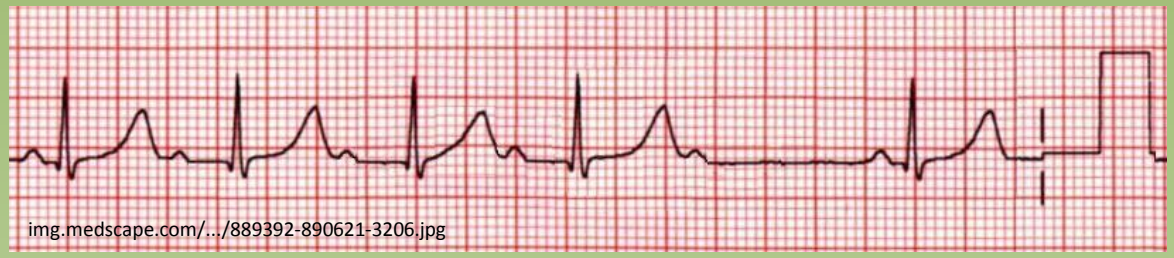
A young, healthy patient comes in with chest pain…

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



- If worse w/ palpation → costochondriasis
- 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



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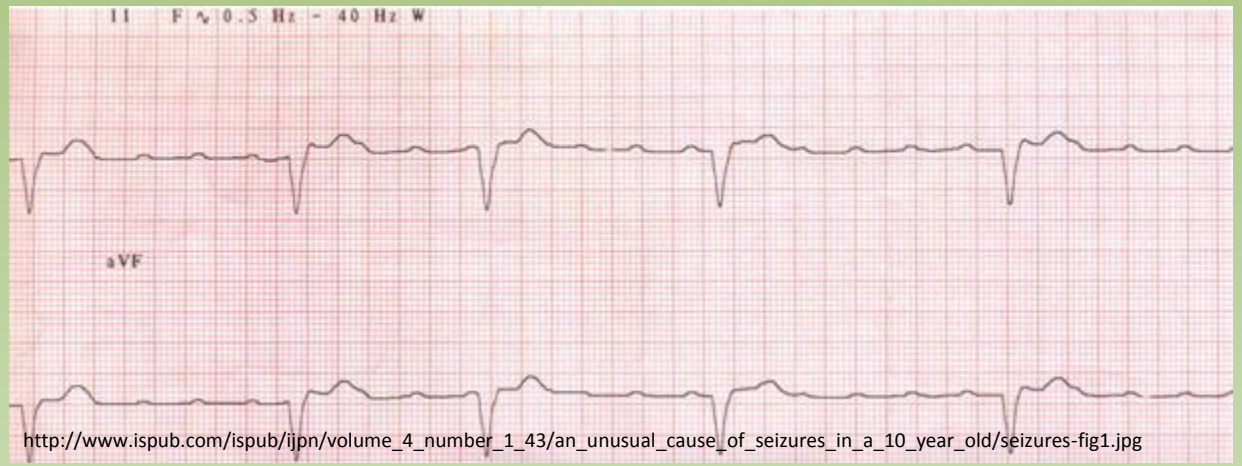
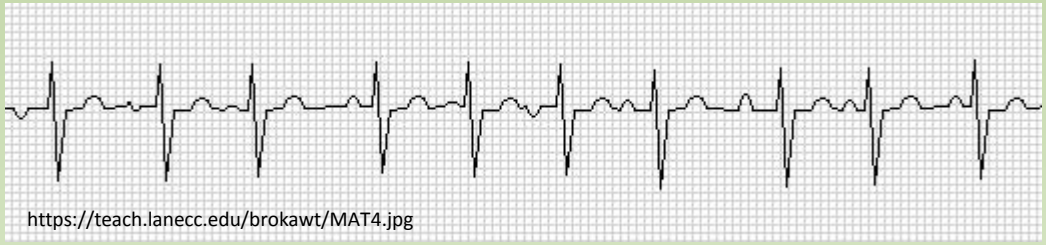
"Progressive, prolongation of the PR interval followed by a dropped beat"



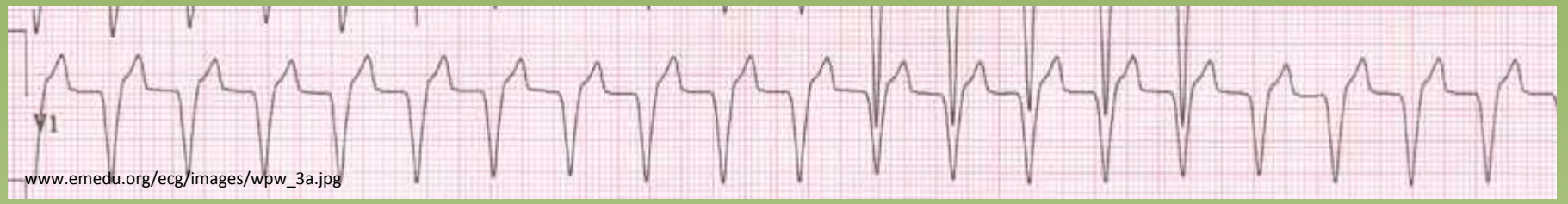
http://www.ispub.com/ispub/ijpn/volume_4_number_1_43/an_unusual_cause_of_seizures_in_a_10_year_old/seizures-fig1.jpg

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

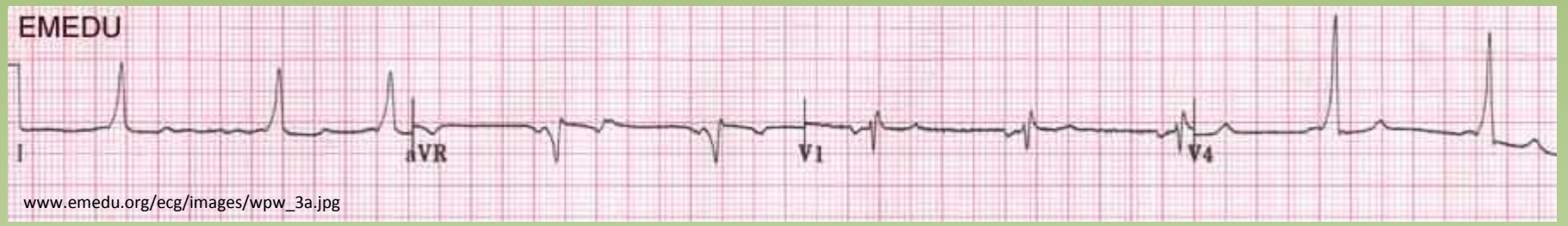


https://teach.lanecc.edu/brokawt/MAT4.jpg

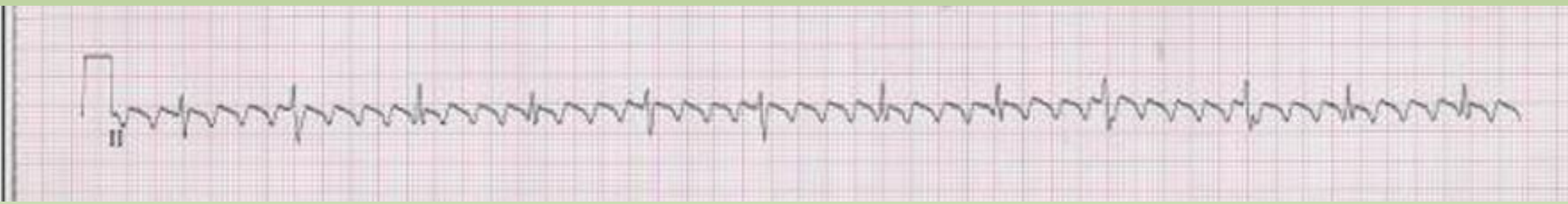
"varrying PR interval with 3 or more morphologically distinct P waves in the same lead". Seen in an old person w/ chronic lung dz in pending respiratory failure



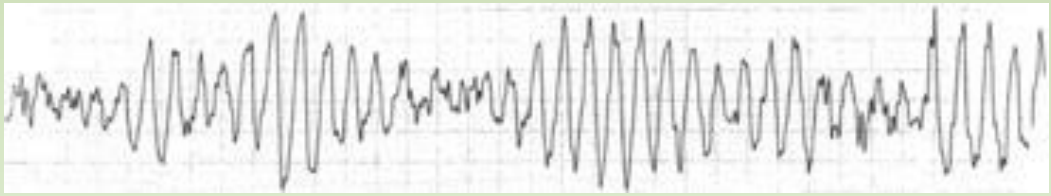
"Three or more consecutive beats w/ QRS <120ms @ a rate of >120bpm"



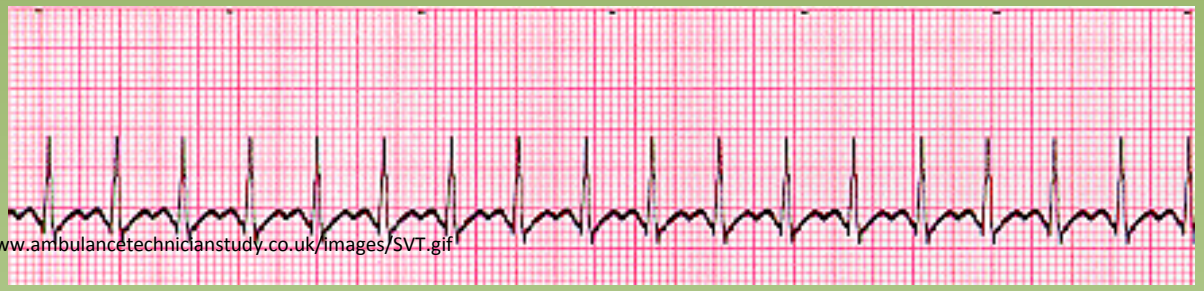
"Short PR interval followed by QRS >120ms with a slurred initial deflection representing early ventricular activation via the bundle of Kent".



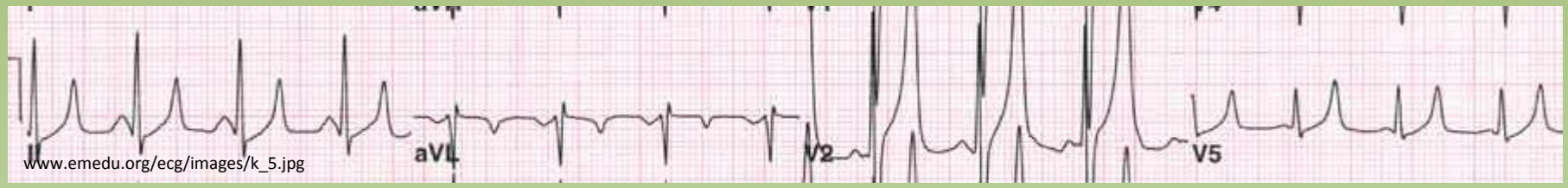
"Regular rhythm with a ventricular rate of 125-150 bpm and atrial rate of 250-300 bpm"



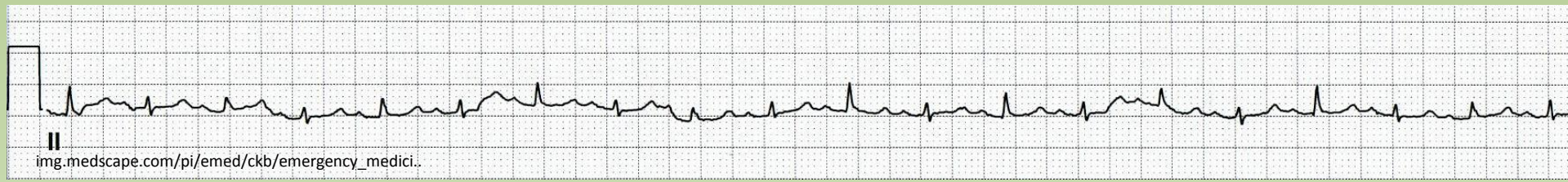
"prolonged QT interval leading to undulating rotation of the QRS complex around the EKG baseline" In a pt w/ low Mg and low K. Li or TCA OD



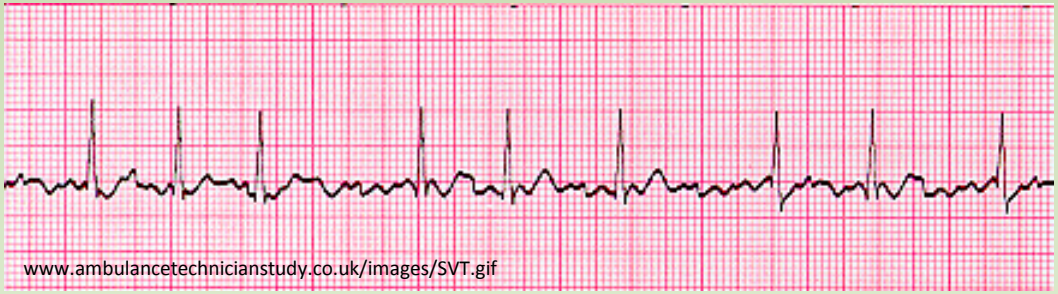
"Regular rhythm w/ a rate btwn 150-220bpm." Sudden onset of palpitations/dizziness.



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

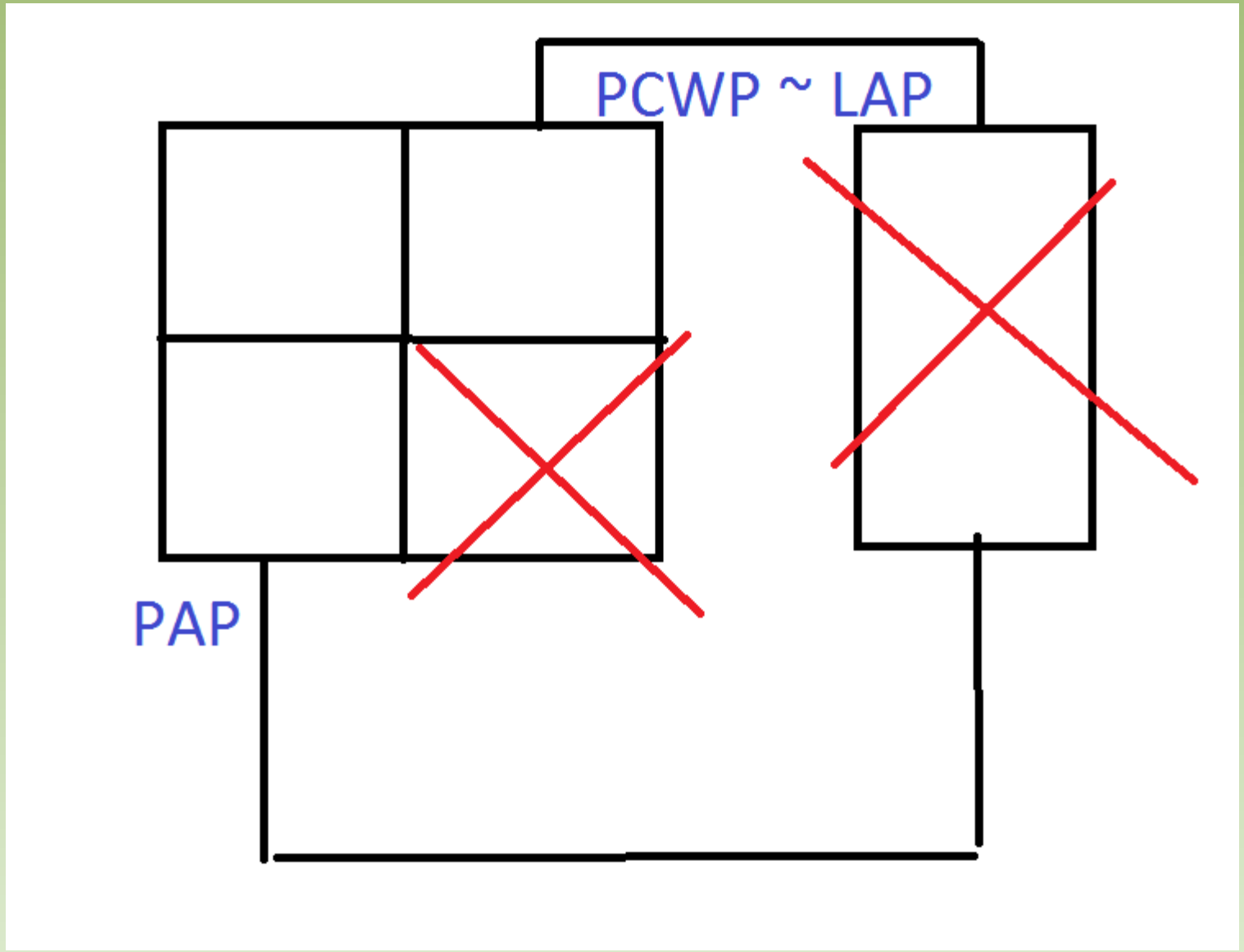
More Murmurs

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



CHF

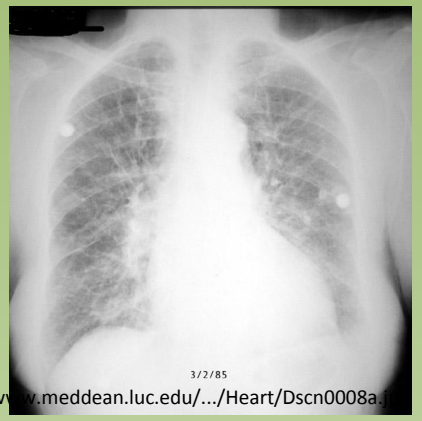
- Systolic- decreased EF (<55%)
  - Ischemic, dilated
    - Viral, ETOH, cocaine, Chagas, Idiopathic
    - Alcoholic dilated cardiomyopathy is reversible if you stop the booze.
- Diastolic- normal EF, heart can't fill
  - HTN, amyloidosis, hemachromatosis
    - Hemachromatosis restrictive cardiomyopathy 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

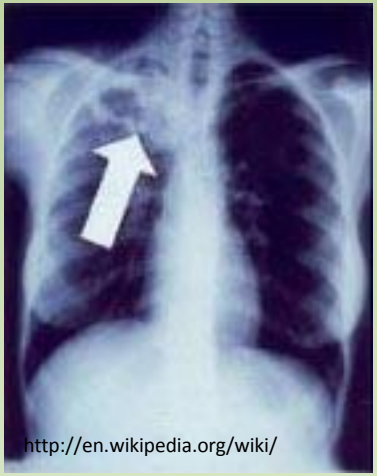
"Opacification, consolidation, air bronchograms"

"hyperlucent lung fields with flattened diaphragms"



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

"Cavity containing an air-fluid level"



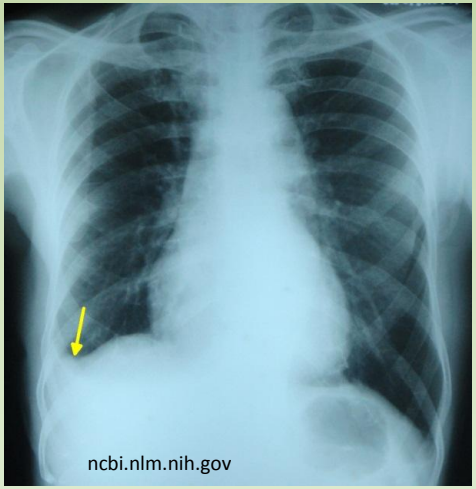
"Upper lobe cavitation, consolidation +/- hilar adenopathy"

"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? Tuburculosis
    - 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, hyper coagulable 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 xchange, inflam mediator release, hypoxemia
- Causes:
  - Sepsis, gastric aspiration, trauma, low perfusion, pancreatitis.
- Diagnosis:

  1.) $PaO_2/FiO_2 < 200$ (<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

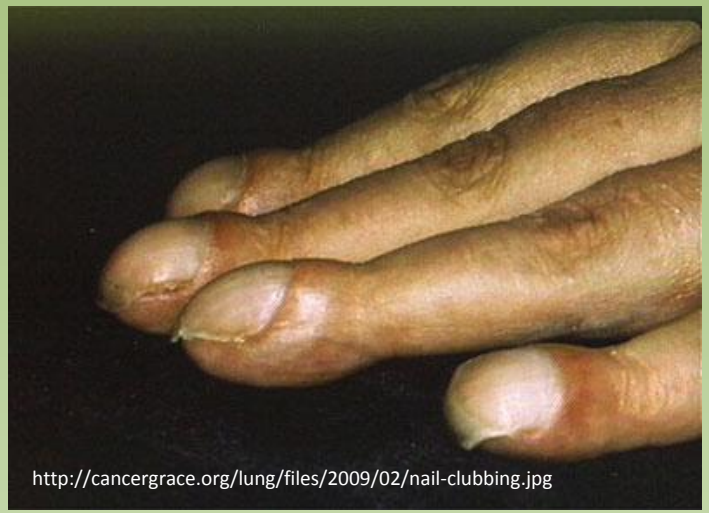
PFTs

	Obstructive	Restrictive
Examples	Asthma COPD Emphysema	Interstitial lung dz (sarcoid, silicosis, asbestosis. Structural- super obese, MG/ALS, phrenic nerve paralysis, scoliosis
FVC	↓ <80% predicted	↓ <80% predicted
FEV1	↓ <80% predicted	↓ <80% predicted
FEV1/FVC	↓ <80% predicted	Normal
TLC	↑ >120% predicted	↓ <80% predicted
RV	↑ >120% predicted	↓ <80% predicted
Improves >12% with bronchodilator	Asthma does COPD and Emphysema don't.	Nope
DLCO reduced	Reduced in Emphysema 2/2 alveolar destruction.	Reduced in ILD due to fibrosis thickening distance

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 nodues 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

http://emedicine.medscape.com/article/358433-media

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

- MC cancer in non-smokers? **Adenocarcinoma**. Occurs in scars of old pnia
- Location and mets? Peripheral cancer. Mets to liver, bone, brain and adrenals
- 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 chan
- 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**

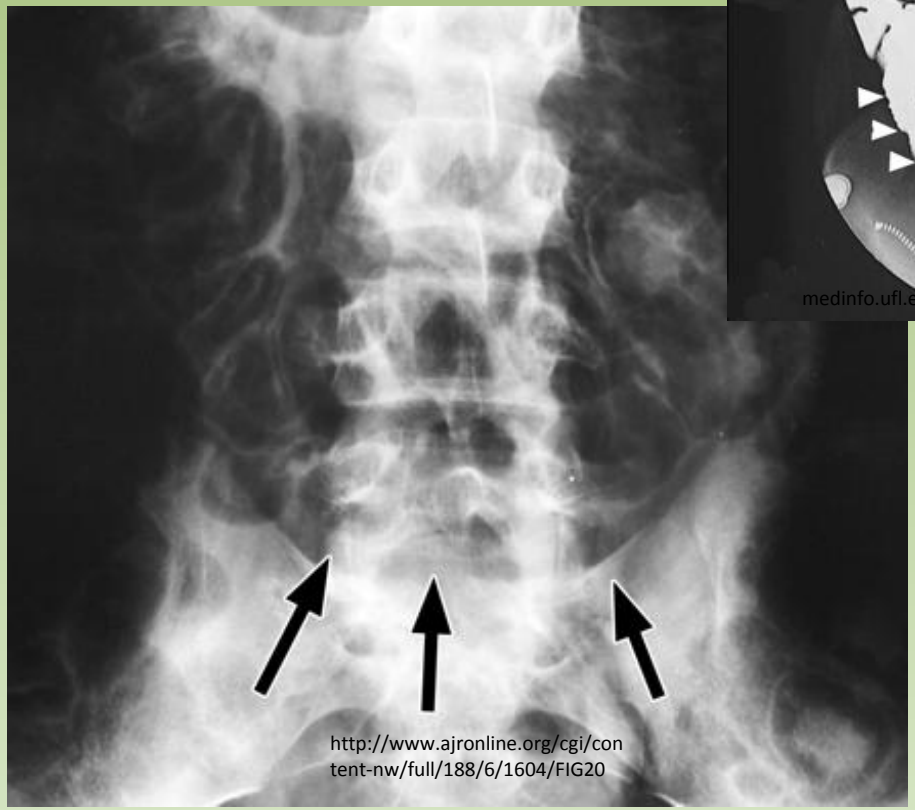
Gastroenterology

Inflammatory Bowel Disease

- Involves terminal ileum? Crohn's. Mimics appendicitis. Fe deficiency.
- Continuous involving rectum? UC. Rarely ileal backwash but never higher
- Incr risk for Primary Sclerosing Cholangitis? UC. PSC leads to higher risk of cholangioCA
- Fistulae likely? Crohn's. Give metronidazole.
- 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



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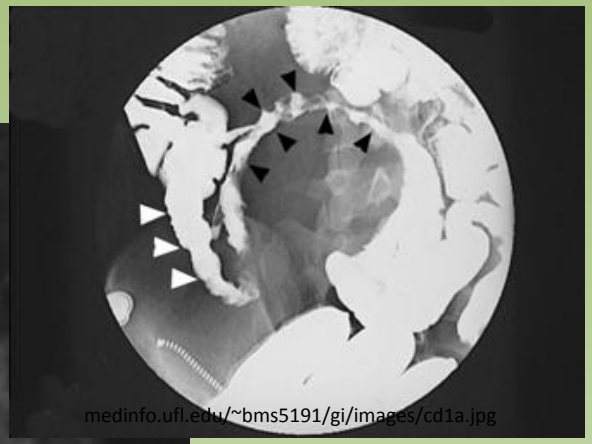

medinfo.ufl.edu/~bms5191/gi/images/cd1a.jpg

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studenthealth.co.uk

LFT/Lab Buzzwords

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

Infectious Disease

Meningitis

- Most Common bugs? Strep Pneumo, H. Influenza, N. meningitidis (tx w/ Ceftriaxone and Vanco)
- In old and young? Add Lysteria. (tx w/ Ampicillin)
- In ppl w/ brain surg? Add Staph (tx w/ Vanco)
- Randoms? TB (RIPE + 'roids) and Lyme (IV ceftriazone)
- Best 1st step? Start empiric treatment (+ steroids if you think it is bacterial), Exam for elevated ICP/CT, then LP +Gram stain, >1000WBC is diagnostic.
- Diagnostic test? High protein and low glucose support bacterial
- Roommate of the kid in the dorms who has bacterial meningitis and petechial rash? Rifampin!!

Pneumonia

- Classic sxs… 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 aggutinins. Tx w/ M, FQ or doxy
- Hospitalized w/in 3mo or in the hospital >5-7d Pseudomonas, 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!!

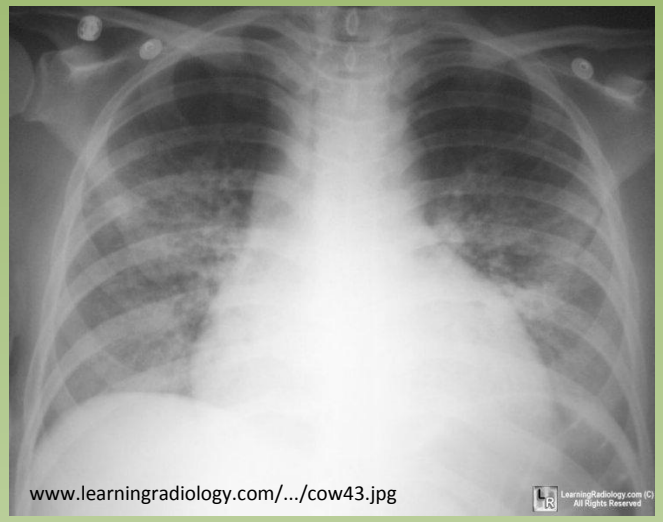
When to suspect HIV…

- 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/ gancicylovir (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?
- If seizure w/ de ja vu aura and 500 RBCs in CSF?
  - Think HSV encephalitis. (predisposed for temporal lobe). Give acyclovir as SOON as suspected.
- If s/s of meningitis?
  - Think Crypto. +India ink. Tx w/ ampho IV for 2wks then fluconazole maintenance
- If hemisensory loss, visual impairment, Babinski?
  - Think PML. JC polyomavirus demyelinates at grey-white jxn. Brain bx is gold standard dx
- If memory problems or gait disturbanc?
  - 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
  Lyme! Tx w/ doxy (amox for <8). Heart or CNS dz needs IV ceftriaxone
- Rash @ wrists & ankles (palms & soles), fever and HA.
  Rickettsia! Tx w/ doxy.
- Tick bite, no rash, myalgia, fever, HA, ↓plts and WBC, ↑ALT
  Ehrlichiosis! Can dx w/ morulae intracell inclusion. Tx w/ doxy
- Immune suppressed, cavitary lung dz (purulent sputum)+ weight loss, fever. Gram + aerobic branching partially acid fast
  Nocardia! Tx w/ trim-sulfa
- Neck or face infection w/ draining yellow material (+sulfur granules). Gram + anaerobic branching
  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, cirrotic
    - 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

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

*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 → if >20/1 = prerenal
  - Check urine Na and Cr → if FENA < 1% = prerenal
  - If pt on diuretic measure FENurea → 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 $NaHCO_3$ if pH<7.2

Contrast nephropathy. Prevent by hydrating before or giving bicarb or NAC

Indications for Emergent Dialysis

- A- Acidosis
- E- Electrolyte imbalance → particularly high K > 6.5
- I- Intoxication → particularly antifreeze, Li
- O- Overload of volume → sxs of CHF or pulmonary edema
- U- Uremia → 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? Urinanalysis
- 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.

Henoch-Schonlein Purpura. IgA. Supportive tx +/- steroids

- Kiddo s/p hamburger and diarrhea w/ renal failure, MAHA and petechiae.

HUS. E.Coli O157H7 or shigella. Don't tx w/ ABX (releases more toxin)

- Cardiac patient s/p ticlopidine w/ renal failure, MAHA, ↓plts, fever and AMS.

TTP. Tx w/ plasmapheresis. DON'T give platelets. Can tell from DIC b/c PT and PTT are normal in HUS/TTP.

- c-ANCA, kidney, lung and sinus involvement.

Wegener's Granuolmatosis. Most accurate test is bx. Tx w/ steroids or cyclophosphamide.

- p-ANCA, renal failure, asthma and eosinophilia.

Churg Strauss. Best test is lung bx. Tx w/ cyclophosphamide.

- p-ANCA, NO lung involvment, Hep B.

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

Kidney Stones

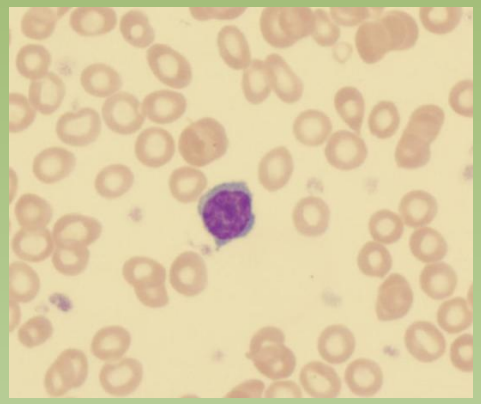
- Flank pain radiating to groin + hematuria.
- Best test? CT.
- Types-
  - Most common type? Calcium Oxalate. Tx w/ HCTZ
  - Kid w/ family hx of stones? Cysteine. Can't resorb certain AA.
  - Chronic indwelling foley and alkaline pee? Mg/Al/PO4 = struvite. proteus, staph, pseudomonas, klebsiella
  - If leukemia being treated w/ chemo? Uric Acid
    Tx by alkalinizing the urine + hydration
  - 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

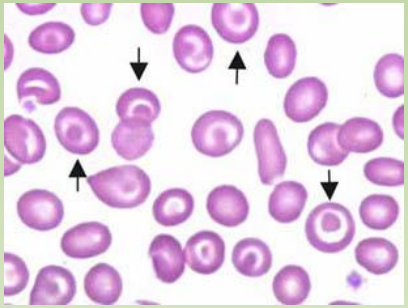
Hematology/Oncology

A patient walks in with microcytic anemia…



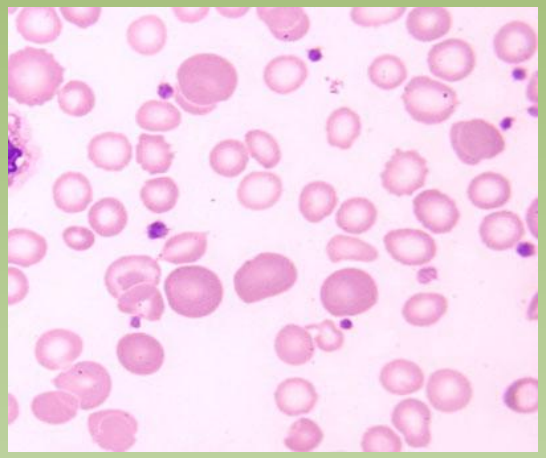
1.) MCV = 70, ↓Fe, ↑TIBC, ↓retic, ↑RDW, ↓ferritin.

2.) MCV = 70, ↓Fe, ↓TIBC, ↓retic, nl ferritin.



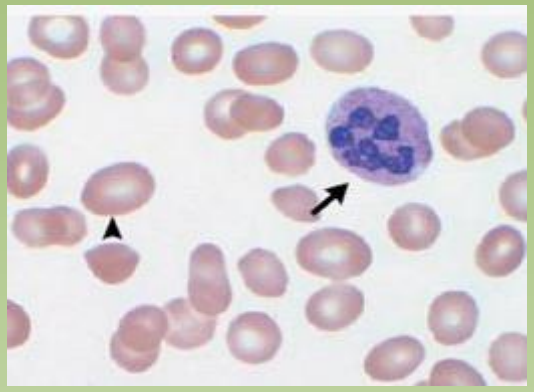
3.) MCV = 60, ↓RDW

www.ezhemeonc.com/wp-content/uploads/2009/02



4.) MCV = 70, ↑Fe, ↑ferritin, ↓TIBC

A patient walks in with macrocytic anemia…



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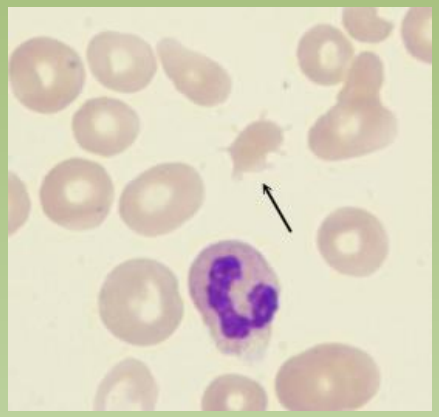


1.) MVC = 100, ↓retics,
↑homocysteine,
nl methylmelonic acid.

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

3.) MVC = 100

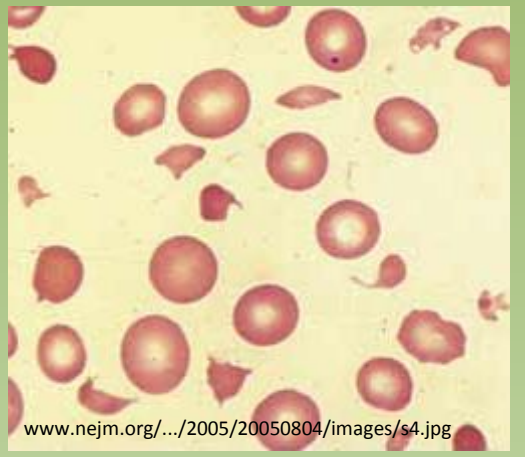
Normal MCV, ↑LDH, ↑indirect bilirubin, ↓haptoglobin

- Sickle cell kid w/ sudden drop in Hct?
  - Aplastic Crisis.
  - Sickle Crisis from hypoxia, dehydration or acidosis
- Cyanosis of fingers, ears, nose + recent Mycoplasma infx.
  - Cold Agglutinins. Destruction occurs in the liver. IgM mediated.
- Sudden onset after PCN, ceph, sulfas, rifampin or Cancer.
  - Warm Agglutinins. Destruction in spleen. IgG. Tx w/ steroids 1st, then splenectomy.
- Splenomegaly, +FH, bilirubin gallstones, ↑MCHC.
  - Hereditary spherocytosis (AD loss of spectrin). Tx w/ splenectomy.
- Dark urine in AM, Budd-Chiari syndrome.
  - Paroxysmal Nocturnal Hemoglobinuria. Defect in PIG-A. Lysis by complement. Incr risk for aplastic anemia
- Sudden onset after primiquine, sulfas, fava beans
  - G6PDH def. Heinz bodies, Bite cells. Avoid oxidant stress.

A patient walks in with thrombocytopenia

- 30 y/o F recurrent epistaxis, heavy menses & petechiae. ↓plts only.
  ITP. Tx w/ prednisone 1st. Then splenectomy. IVIG if <10K. Rituximab
- 20 y/o F recurrent epistaxis, heavy menses, petechiae, normal plts, ↑ bleeding time and PTT.
  VWD. DDAVP for bleeding or pre-op. Replace factor VIII (contains vWF) if bleeding continues.
- 20 y/o M recurrent bruising, hematuria, & hemarthroses, ↑ PTT that corrected w/ mixing studies.
  Hemophilia. If mild, tx w/ DDAVP, otherwise, replace factors.
- 50y/o M "meat-a-tarian" just finished 2wks of clinda has hemarthroses & oozing at venipuncture sites.
  VitK def. ↓ II, VII, IX and X. Same for warfarin toxicity.
  Tx w/ FFP acutely + vitK shot
- 50y/o M "beer-a-tarian" w/ severe cirrhosis.
  Liver Disease. GI bleeding is MC
  - 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!

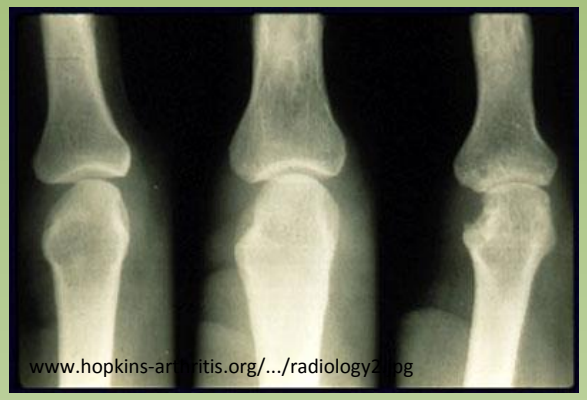
- 7 days post-op, a patient develops an arterial clot. Her platelets are found to be 50% less than pre-op. HIT!
  - Mechanism? IgG to heparin bound to PF4
  - Treatment? Stop heparin, reverse warfarin w/ vitK, start lepirudin
- What to look for in someone w/ unprovoked thrombus?
  - CANCER
  - Lupus 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 w/ arthritis…

OA.

Knee pain, DIP involvement no swelling or warmth, worse @ the end of the day, crepetence.



RA.

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

Psoriatic Arthritis.

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

- 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…

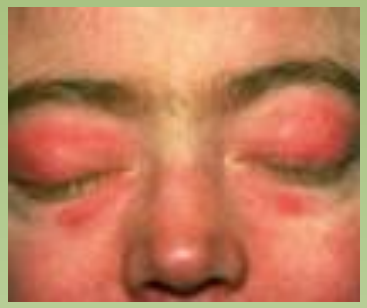
- 1st best test? Tap it!
- WBCs >50K Septic arthritis
  - 30 yr old who "travels a lot for work" Gonococcal. Cx may be negative. Look also for tenosynovitis and arm pustules. Tx w/ ceftriaxone.
  - 70 yr old nun Staph aureus. Tx w/ nafcillin or vanco.
- WBCs 5-50K Inflammatory. If no crystals, think RA, ank spon, SLE, Reiter's
  - Needle shaped, negatively birefringent crystals. Gout. Monosodium Urate.
    - Acute TX? Indomethacin + colchicine (steroids if kidneys suck).
    - Chronic TX? Probenecid if undersecreter. Allopurinol if overproduc.
  - Rhomboid shaped, positively birefringent crystals. Pseudogout. Calcium pyrophosphate.
- WBCs 200-5K OA, hypertrophic osteoarthropathy, trauma
- WBCs <200 Normal.

Antibodies to Know!

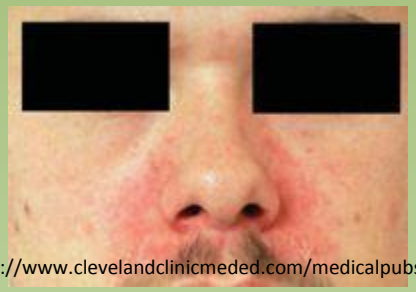
- If negative, rules out SLE? ANA – peripheral/rim staining.
- Most sensitive for SLE? Anti-dsDNA or Anti-Smith
- Drug induced lupus? (hydralazine). Anti-histone
- Sjogren's Syndrome? Anti-Ro (SSA) or Anti-La (SSB)
- CREST Syndrome? Anti-centromere
- Systemic Sclerosis? Anti-Scl-70, Anti-topoisomerase
- 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

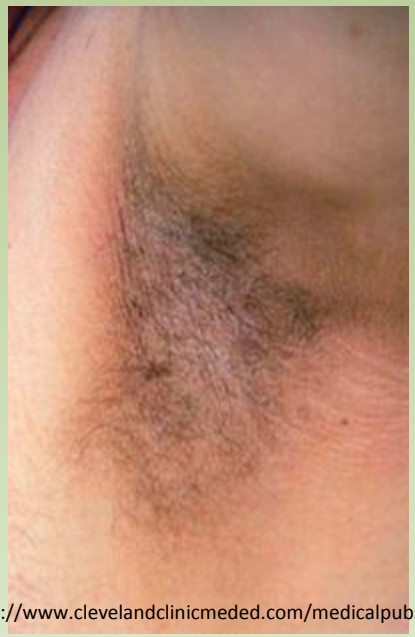


Dermatomyositis

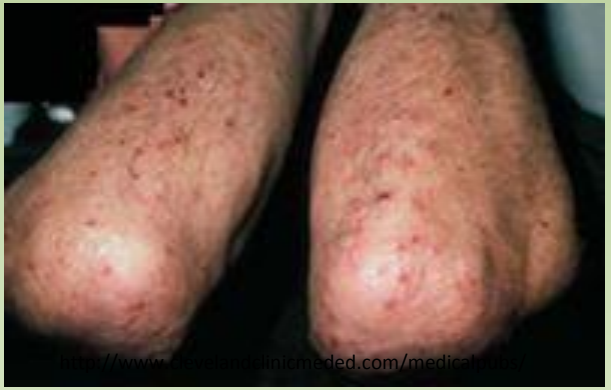


Seborrheic Dermatitis

Erythema Multiforme

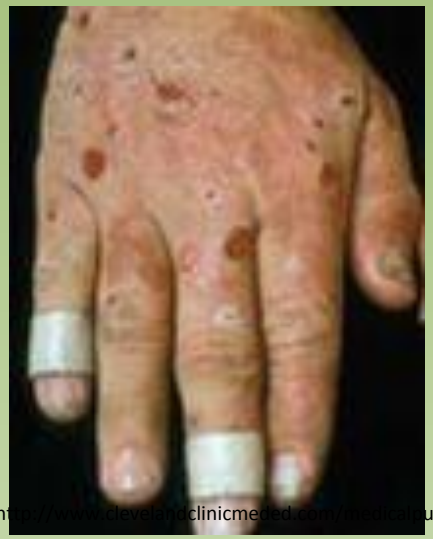


Acanthosis Nigricans



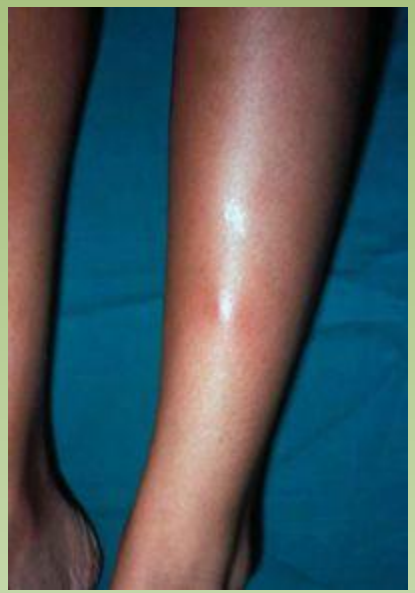
Dermatitis Herpetiformis

Skin signs of systemic diseases part deaux:



http://www.clevelandclinicmeded.com/medicalpubs/

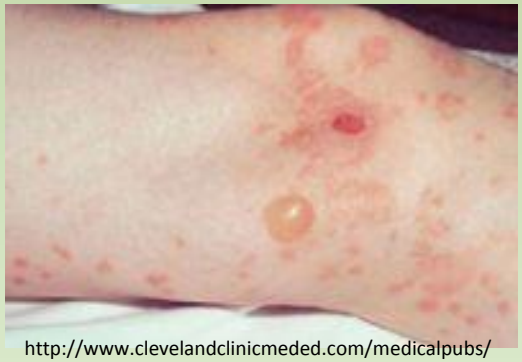
Porphyria Cutanea Tarda



Erythema Nodosum

http://dermnetnz.org/systemic/necrolytic-erythema.html

Necrolytic migratory erythema



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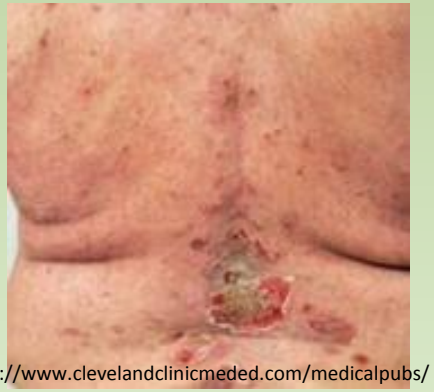
Bullous Pemphigoid



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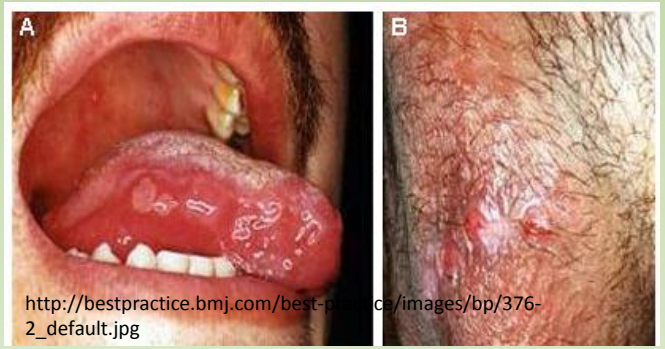
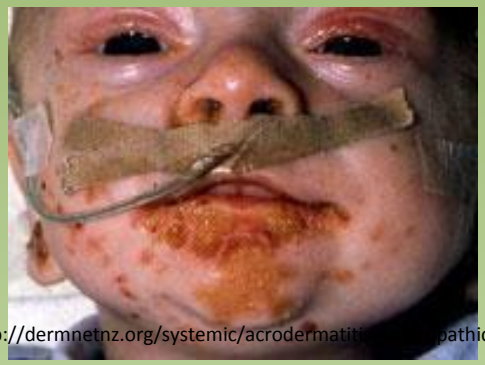
Pemphigus Vulgaris



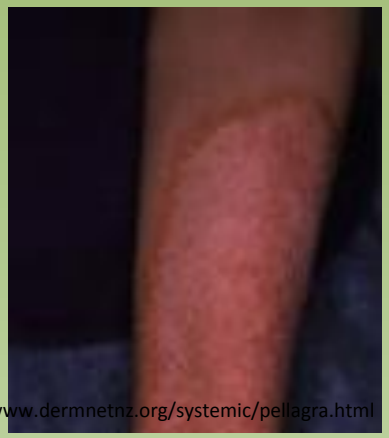
http://bestpractice.bmj.com/best-p ce/images/bp/376-2_default.jpg

Behcet's Syndrome

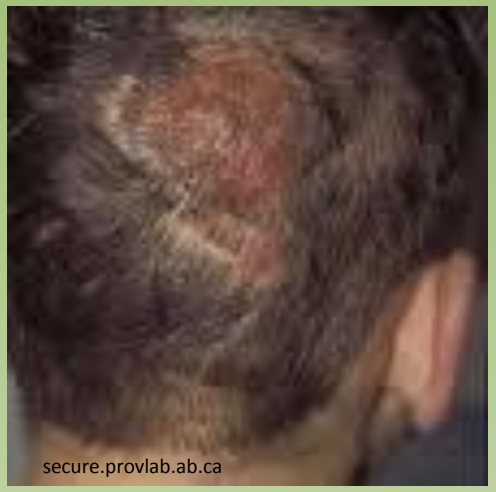
Other Skin Randoms



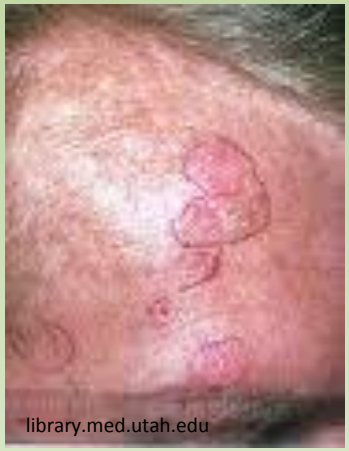
Acrodermatitis enteropathica (Zn deficiency)



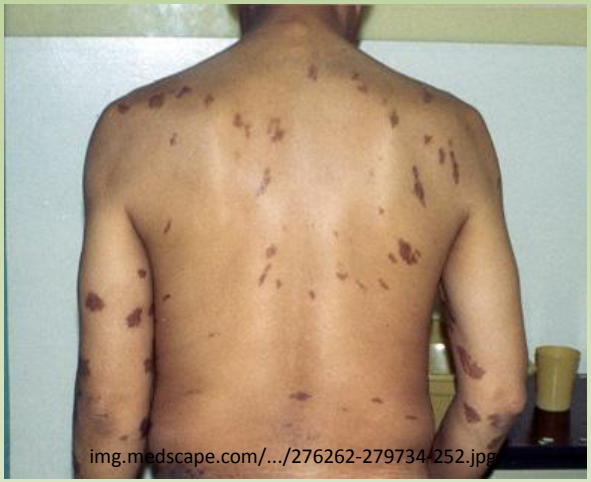
Dermatitis of Pellagra



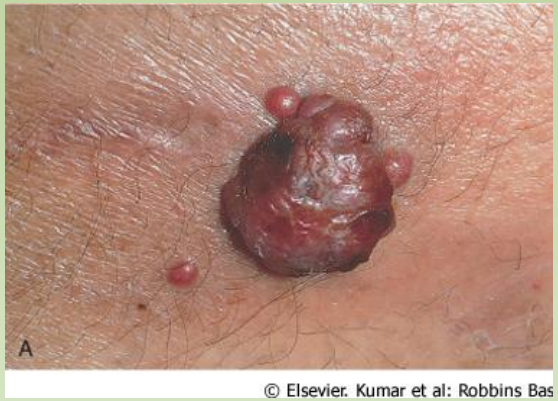
Tinea Capitis



Actinic Keratosis



Kaposi Sarcoma

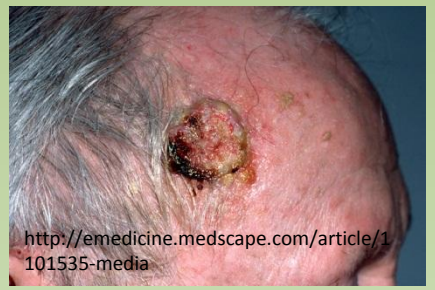


Bacillary Angiomatosis

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


http://emedicine.medscape.com/article/276624-media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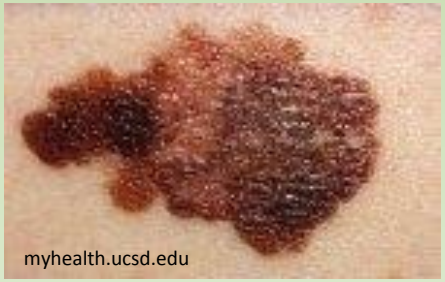

myhealth.ucsd.edu

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. DI- lack of ADH (or non-fxnal)
  Do water deprivation test to tell if crazy
  - 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^{123} RAIU scan. If ↑ = Graves. If ↓ = factitious or thyroiditis
  - Tx? 1^{st} = propranolol + PTU/MTZ. I^{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^{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

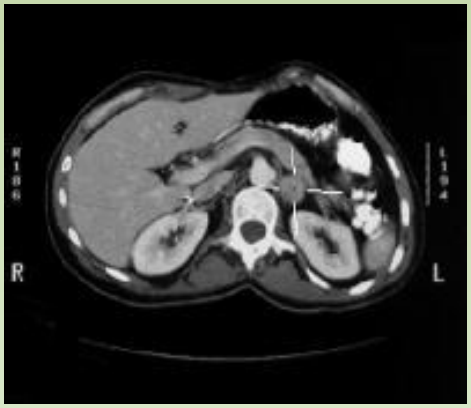
- Osteoporosis, central fat, DM, hirsutism — Suspect Cushing's.
  - Best screening tests? 1mg ON dexa suppression test or 24hr urine cortisol
- If abnormal? Diagnoses Cushing's Syndrome
  - Next best test? 8mg ON dexa suppression test
- Suppression to <50% of control? Pituitary adenoma (Cushing's dz)
- 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 — Suspect Adrenal Insufficiency
  - Best screening test? Cosyntropin stimulation test (60min after 250mcg)
- MC cause? Autoimmune (Addison's dz)
  - Treatment? NaCl resuc. Long term replacement of dexamethasone and fludrocortisone.

Work up of an Adrenal Nodule

- Best 1st step? Check functional status

Diagnosis	Features	Biochemical Tests
Pheochromocytoma	High blood pressure, catechol symptoms	Urine- and plasma-free metanephrines
Primary aldosteronism	High blood pressure, low K^+, low PRA*	Plasma aldosterone-to-renin ratio
Adrenocortical carcinoma	Virilization or feminization	Urine 17-ketosteroids
Cushing or "silent" Cushing syndrome	Cushing symptoms or normal examination results	Overnight 1-mg dexamethasone test

- #2- if <5cm and non-function →



Observe w/ CT scans q6mo

If >6cm or functional →

Surgical excision

http://emedicine.medscape.com/article/116587-treatment

Parathyroid Disease

Hypoparathryoidism

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

Hyperparathyroidism

- Kidney stones, constipation/abd pain or psychiatric sxs
- ↑[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- parathryoid 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 + sxs (polyuria, polydipsia, blurred vision)
- Nausea, vomiting, abdominal pain, Kussmaul respirations, coma w/ BGL = 400? 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? 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 prolif retinopathy → Vitreous hemor/neovasc
  - Nerves? Podiatric exam annually. Tx gastroparesis w/ metoclopramide or erythromycin. May get ED. 3rd, 4th, 6th 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
- If they had the stroke on aspirin? Add dipyridamole or switch to clopidogrel. Don't use ticlopidine! (why?)
- If they had a subarachnoid hemorrhage? Nimodipine to reduce ischemic stroke from vc (MC cause of M&M)
- When to clip an aneurysm? W/in days or rupture or when <10mm
- When to do endarterectomy? When occlusion >70% and is symptomatic. (>60% if <60y/o)

Where's the lesion?

- L hemiplegia/hemisensory loss, L homonomous hemianopsia w/ eyes deviated twoards the R + apraxia. — R MCA stroke
- L hemiplegia/hemisensory loss in the leg>arm. Confusion, behavioral disturbance. — R ACA stroke
- L hemiplegia + R ptosis & eye deviated to the right and down. — R Webber's
- Falling to the L + R ptosis & eye deviated to the right and down. — R Benedikt's
- L hemisensory loss + Horners + R facial sensory loss. — R Wallenburg (PICA)
- Vertigo, vomiting, nystagmus and clumsiness with the right arm. — Major R cerebellar arteries
- Total paralysis except for vertical eye movements. — Paramedial branches of the basilar artery.

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. Consider brain tumor. Most important prognostic factor is grade (degree of anaplasia).
- Unilateral pounding headache w/ changes in vision and jaw claudication. Temporal arteritis. Check ESR, then give steroids, then do temporal artery biopsy. Can lead to blindness.
- Fat lady on minocycline or who takes isotreintoin w/ abducens nerve palsy/diplopia. 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. **Guillain-Barre**. CSF shows albumino-cytologic dissociation
  - Most likely bug? Campylobacter, HHV, CMV, EBV
  - Best tx? IVIG or plasmapheresis. Monitor VC for intubation req.
- Nasal voice, ptosis, dysphagia, respiratory acidosis. **Myasthenia Gravis**. 1st test is Ach-ab. 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. **Multiple Sclerosis**. Neuro-deficits separated by time and space
  - 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

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

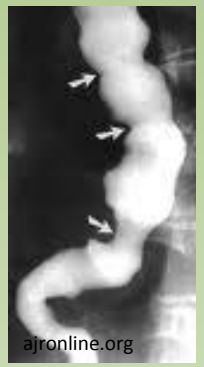
- True or false?

False. Only contains mucosa

- Dysphagia to liquids & solids.

Achalasia.
Tx w/ CCB, nitrates, botox, or heller myotomy
Assoc w/ Chagas dz and esophageal cancer.

Dysphagia worse w/ hot & cold liquids + chest pain that feels like MI w/ NO regurg



Diffuse esphogeal spasm.
Tx w/ CCB or nitrates

- 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 edoscopy

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 stablize for transport

Tx of choice?

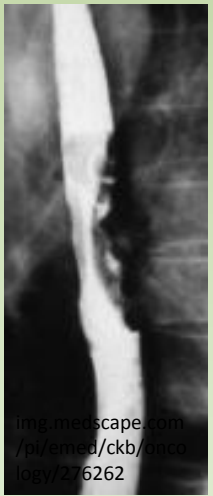
Endoscopic sclerotherapy or banding
*Don't prophylactically band asymptomatic varices. Give BB.

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.



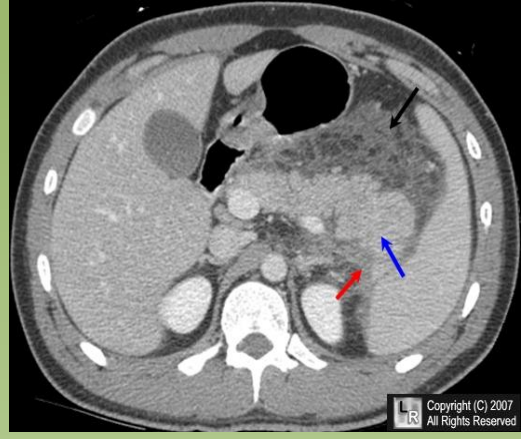
A patient comes in with MEG pain…

- #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 sxs + 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 sxs 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 peritoineal 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. ceres, 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.

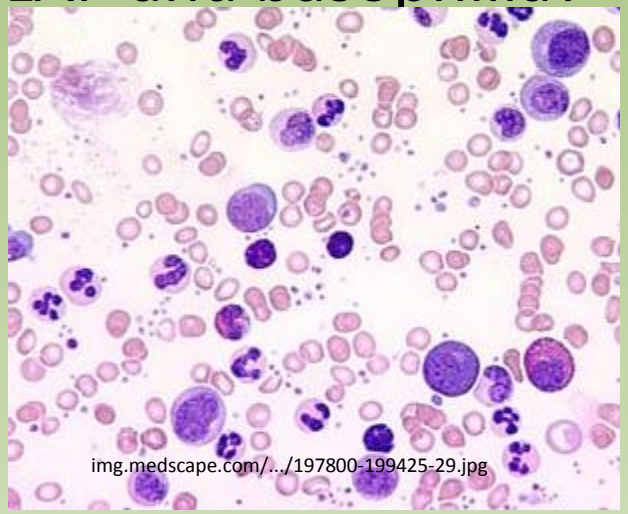
Oncology Extra Slides

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 → tyrosine kinase

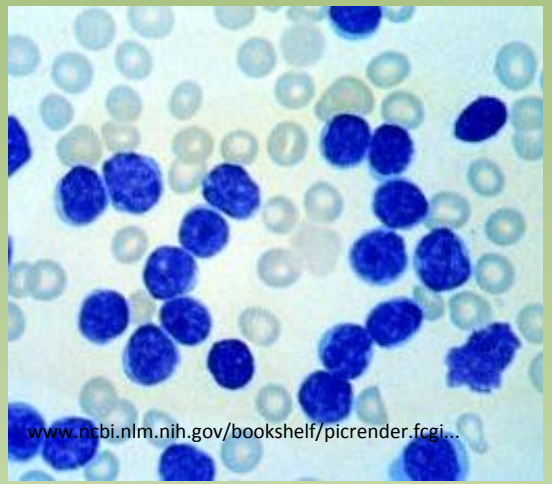
- A patient presents w/ fatigue, night sweats, fever, splenomegaly and elevated WBCs w/ low LAP and basophilia?



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

CLL

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



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

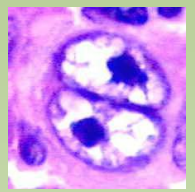
Think Lymphoma

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

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

- 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?



Hodgkin's Lymphoma

- Type w/ best prognosis? Lymphocyte predominant
- More likely to involve extranodal sites? (spleen, BM) Non-hodgkin's Lymphoma
- 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

Other hematologic randoms…

- Bone pain, "punched out lesions" on *x-ray*, hyper Ca — Multiple Myeloma
  - 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. — Waldenstrom Macroglobulinemia
- No sxs, immunoglobulin spike found on routine exam — MGUS
- Older pt w/ generalized pruritis and flushing after hot bath. Hct of 60%. — Polycythemia Vera
  - Best 1st test- Check epo, make sure it isn't secondary. (PSG, carboxy-Hb)
  - Tx- Scheduled phlebotomy. Hydroxyurea can prevent thromboses