SCREENING FOR ADRENAL INSUFFICIENCY

Symptoms of Adenal Insufficiency **Fatigue, weight loss, low BP, eosinophelia, hyponatremia, brown bigmentation (especially in skin creases/oral mucous membranes)**		**Diagnostic Screening Tests for Adrenal Insufficiency**			
		Basal Cortisol Level (early morning)	**ACTH**	**Cortisol Response to cosyntropic**	**Origin of disease**
Result of screening test	**Primary Adrenal Insufficiency**	LOW (<5ug/dL)	HIGH	Minimal Response	Adrenal gland disease/ Addison's Disease
	Secondary or tertiary adrenal insufficiency	LOW (<5ug/dL)	LOW	Minimal or suboptimal response	Pituitary or hypothalamic disease
	Unlikely to be adrenal insufficiency	>15ug/dL		Normal response >20 ug/dL	
	Indeterminate	5-15 ug/dL			

What is cosyntropic?	Cosyntropin is an ACTH synthetic analogue.
What does this test show?	Cortisol level is measured 30-60 min to help distinguish primary AI (adrenal disease/Addison's Disease) vs. central AI (pituitary/ hypothalamic)
Why do this test?	Could make the diagnosis with cortisol and ACTH but the results of ACTH take

AMENORRHEA

1° = woman who has never menstruated. Normal up to age 16 if has secondary sexual characteristics. If absent secondary sexual characteristics, evaluate at age 14.
2° = menstrual-age woman who has not menstruated in 6 mo

(absent breast development indicates estrogen deficiency)
Most common cause = pregnancy. Exclude before further workup.
Most common anatomic cause of 2°amenorrhea = Asherman's Syndrome: scarring of **uterine** cavity after D&C

Uterus present: Check Serum FSH		Uterus absent: Check Karyotype and Serum testosterone	
↑FSH	↓FSH	46, XX Normal **female** testosterone levels	46XY Normal **male** testosterone levels

	Peripheral	**Central**	**Abnormal Mullerian Development**	**Androgen insensitivity syndrome**
Workup:	Karyotype	Pituitary MRI		
Causes:	• **Ovarian** dysfunction: Turner's syndrome, premature menopause. Sx of estrogen deficiency **(hot flashes,** mood swings, vaginal dryness, dyspareunia, sleep disturbances, skin thinning)	• **Pituitary** dysfunction: either ↓ hypothalmic pulsatile release of GnRH or ↓ pituitary release of FSH or LH • **Hypothalamic** deficiency 2/2weight loss, excessive exercise, obesity, prolactinoma/ craniopharyngiom a, anorexia	Genital outflow tract alteration: imperforate hymen or agenesis of uterus/vagina	

ANTICOAGULATION

can start as soon as 48-72 hrs after surgery w/out increased risk of bleeding
When treating DVT, use unfractionated or LMWH, bridge to warfarin ≥3 mo w goal INR 2-3. heparin prevents extension of the clot and devpt of future clots, does not lyse current clot.

	mechanism	labs	complications
unfractionated heparin		**Platelet count ↓≥ 50%** from baseline (nadir of 30,000-60,000) follow aPTT: goal aPTT > 1.5-2 times normal, at which point warfarin is initiated ('heparin bridge')	Type 1 HIT — • Nonimmune direct effect of heparin on platelet activation • usually presents within first 2 days of heparin exposure. Then platelet count normalizes with ocntinued heaprin therapy. • No clinical consequences. Type 2 HIT — • Immune-mediated disorderdue to antibodies to platelet factor 4 (PF4) complexed with heparin -> platelet aggreagtion, thrombocytopenia, thrombosis *artierial and venous) • Presents 5-10 days after initiation of heparin therapy • Severe, may lead to life-threatning consequences *limb ischemia, stroke)
low molecular weight heparin (LMWH) = enoxaparin		normal aPTT	cannot be used in patients with severe renal insufficiency (estGFR < 30 mL/min/1.73m^2 — reduced renal clearance increases anti-Xa activity levels and bleeding risk —> use unfx heparin
Factor Xa inhibitors (fondaparinux(injection), rivaroxaban (oral))	immediate onset of action		cannot be used in patients with severe renal insufficiency (estGFR < 30 mL/min/1.73m^2 — reduced renal clearance increases anti-Xa activity levels and bleeding risk —> use unfx heparin
Warfarin	Co-administered with IV unfractionated or LMWH. Do not use alone due to **initial hypercoagulable state from transient protein C depletion** and risk of thrombosis and skin necrosis	takes up to 5-7 days to reach therapeutic levels can stop heparin bridge when INR is therapeutic	

COAGULATION DISORDERS

Warfarin mechanism:
Inhibits production of vitamin K-**dependent** clotting factors II, VII, IX, and X.
& Inhibits production of natural anticoagulants protein C and S

Prothrombotic					Bleeding
Warfarin-induced skin necrosis	Heparin-induced thrombocytopenia (HIT)	Antithrombin III deficiency	Factor V Leiden mutation	Antiphospholipid antibody syndrome (APS)	Factor VII deficiency
Protein C production decreases faster (50% within first day) while levels of procoagulant factors (II, IX and X) decline more slowly = transient hypercoagulable state Increase the risk for **venous** thromboembolism and skin necrosis, esp in patients with underlying heriditary protein C deficiency Typically within first few days of warfarin therapy, esp at large loading doses	Caused by autoantibodies to platelet factor 4 (PF4) complexed with heparin Thrombocytopenia**, arterial or venous** thrombosis, and necrotic skin lesions at heparin injection sites within 5-10 days of therapy.	Antithrombin III = vitamin K-**independent** inhibitor of the clotting cascade Predisposes to thrombus formation	Increases risk for venous thromboembolis (DVT or PE) Inc risk for cerebral mesenteric portal vein thrombosis	False positive VDRL Prolonged PTT Thrombocytopenia Inc risk for recurrent pregnancy losses/ spontaneous abortions, arterial and venous thrombosis Dx: • VDRL (false positive) • Prolonged PTT • Trombocytopenia	Bleeding diabthesis characterized by bruising and hemorrhage
			Anticoagulants Initiation of warfarin should not cause unusual hypercoagulability	Low dose aspirin and LMWH to avoid pregnancy loss	

BACK PAIN

vertebral osteomyelitis	Tenderness to gentle percussion on spinal processes pain not relieved with rest	IVDU, sickle cell anemia, immunosuppressed are at highest risk	Dx by MRI (most sensitive) ESR sig elevated > 100mm/hg Platelet count high as marker of inflammation/stress Rx = longterm IV abx +/- surgery
Ankylosing spondylitis	Pain and progressive limitation of back motion Sx worst in the morning, improve as day progresses		
Lumbar disk herniation	Acute onset pain +/- radiation down a leg Usually 2/2 an inciting event Pain worse with activity and improves with rest		
Lumbar spinal stenosis = arrowing of spinal canal with compression of 1 or more spinal roots	Pain radiating to buttocks and thighs Sx worsen with walking and lumbar extension (walking down hill), better w lumbar flexion (shopping cart) +/- Numbness and paresthesias	Usually patients > 60yo	Dx by MRI
Vertebral compression fracture	Local tenderness to palpation	Elderly patients with history of osteoporosis	

ACUTE BACTERIAL RHINOSINUSITIS

Pathogen

- Usually preceded by viral URI
- Streptococcus pneumoniae
- Haemophilus influenzae

Sx

- Purulent nasal discharge
- Facial pain
- Fever

Complicated:

- Periorbital edema
- Vision abnormalities
- Altered mental status

Dx

A clinical diagnosis

- Persistent symptoms ≥ 10 days without improvement
- Severe symptoms, fever ≥ 39 C, purulent nasal discharge, or face pain ≥ 3 days,
- Worsening symptoms ≥ 5 days after initially improving viral URI

Rx

Oral amoxicillin-clavulanic acid

+ intranasal corticosteroids if hx of allergic rhinitis

CF (VERSUS)

	CF	**primary ciliary dyskinesia (immotile cilia syndrome)**	**acute lymphoblastic leukemia**	
	autosomal recessive	autosomal recessive d/o of mucociliary clearance		
dx	gold std = quantitative pilocarpine iontophoresis + measurement of **sweat chloride** concentration	much more rare than CF		
etiology of recurrent pulm infxn	accumulation of inspissated mucus allow bacteria to proliferate -> rec rhinosinusitis	same <-		
clinical features by organ system	respiratory: • obxt lung dz - bronchiectasis • recurrent pna • chronic rhinosinusitis GI: • obxtn - meconium ileus, distal obxtn • pancreatic - exocrine insuff, CF-related diabetes repro: • infertility msk: • osteopenia - fractures • kyphoscoliosis • digital clubbing			
sx, PhyEx	nasal polyps - further obstruct and exacerbate sinusitis bilat diffuse rales digital clubbing	also has nasal polyps also digital clubbing	wt loss, recurr infections hepatosplenomeg lyphandenopathy petechiae	

rx	intranasal glucocorticoids can provide sx relief +/- surgical resetion of polypcs			

IMMUNODEF SYNDROMES

			dx	risk of:
humoral immunity deficiency	igA		all - quantitative measurement of serum immunoglobulin levels	encapsulated bacteria (recurrent, severe, upper and lower resp tract infections)
	igG igG3 alone	adult females, assd with recurrent sinopulm and GI infections		
	CVID	suppressed cell immunity and inc risk of malignancy		
cell-mediated				infections from viruses, pathogens, fungi (intracellular replication)

Alveolar O2 pressure derived from = PAO2 = (FiO2 x [Patm - PH2O]) - (PaCO2 + R)
Arterial O2 measured directly by blood gas

A-a gradient is elevated by anything that results in impaired gas exchange
interstitial dz, processes that cause V/Q mismatch (ex PE)

<u>Other causes of recurrent sinopulm infections:</u>

+GI obstruction/panc dz, + infertility, +msk -> CF

+ dependent/lower lobes 2/2 aspiration while upright, or posterior segment of upper lobes-> aspiration pna
- altered consciousness - sz, alcoholism, drug OD
- neuro dysphagia - dementia, parkinsonian, cva, myasthenia),
- GEjunction - esoph dz, gerd),
- diruption of glottic closure - endotracheal intub, bronchoscopy, endocsopy),
- sedation for procedures

BREAST CANCER (V INFECTIOUS

Nipple discharge in a non-lactating woman – esp if spontaneous, unilateral, localized to a single duct, pt is >40yo, bloody, or assd with mass

	Breast cancer		Infectious	
	inflammatory breast carcinoma		Cellulitis/abscess	mastitis
appearance	Peau d'orange = brawny edematous cutaneous plaque, overlying a breast mass.		Erythematous and edematous cutaneous plaque	
Prognosis				
Dx	Most present with axillary lymphadenopathy,			
Rx	¼ are found to have subsequent metastatic dz			Abx that covers Staphylococci Should be encouraged to continue breastfeeding or breas pumping from the affected breast

CARDIAC

cardiac tamponade = Beck's triad = jugular venous distention, muffled/distant heart sounds, hypotension
+/- pulsus paradoxus >10mm Hg drop in systolic bp during inspiration
positive hepatojugular reflux
clear lungs (not vol o/l)
compensatory tachycardia and inc contractility 2/2 sympathetic stimulation to maintain cardiac output

(etiology: fluid accumulation (eg from viral pericarditis/pericardial effusion) in pericardial cavity so intrapericardial pressure > diastolic vent pressure —> dec venous return to heart/both ventricles —> dec preload, stroke volume, cardiac output.
etiology of pulsus paradoxus: inspiration —> filling of right ventricle —> interventricular septum shifts towards left ventricle cavity —> further dec left vent filling).

rx - pericardiocentesis, pericardiectomy

NOTE:
inspiration = lowers intrathoracic pressure and increase venous return to right ventricle

HEART FAILURE

COR PULMONALE

Common etiologies	COPD (most common) PE (also common) Interstitial lung disease Pulmonary vascular disease (thromboembolic) OSA
Symptoms	Dyspnea on exertion, fatigue, lethargy Exertional syncope (due to â†“ cardiac output) Exertional angina (due to â†‘ myocardial demand)
Examination	Peripheral edema inc JVP with prominent a wave Widely split and loud (pulmonic component of) S2 Right sided heave Pulsatile liver from congestion Tricuspid regurgitation murmur
Imaging	ECG: partial or complete RBBB, right axis deviation, RVH, right atrial enlargement ECHO: pulmonary HTN, dilated right ventricle, tricuspid regurg R heart catheterization: right ventricular dysfunction, pulmonary HTN, no left heart disease

Etiology	Systemic hypertension is the classic cause (chronic high left ventricular diastolic pressures -> atrial dilatation, can -> afib)
Symptoms	Can lead to decompensated heart failure
Examination	
Imaging	
Treatment	Diuretics Blood pressure control

DIURETICS/ANTIHYPERTENSIVES

Non pharmacologic:

Treatment of hypertension		
Modification	**Recommended plan**	**Approximate ↓systolic BP (mm Hg)**
Weight loss	Reduce BMI <25 kg/m^2	5-20 per 10-kg loss
DASH diet	Diet high in fruits & vegetables & low in saturated fat & total fat	8-14
Exercise	30 min/day for 5-6 days/week	4-9
Dietary sodium	<3 g/day	2-8
Alcohol intake	2 drinks/day in men & 1 drink/day in women	2-4

Class of Drug	**Examples**	**How it works?**	**Mortality Benefit?**
ACE/ARB	Ie. Captopril, losartan	Limits ventricular remodeling	**Improves mortality**
B-blockers	Ie. Metoprolol, carvedilol, bisoprolol	Blocks the neurohormonal cascade that leads to disease progression	**Improves mortality**
COX inhibitors	Aspirin	Prevents platelet aggregation	**Improves mortality in patient w/ underlying CAD**
Loop Diuretics	Furosemide	Diuretic	Symptomatic relief
Aldosterone antagonist	Spironolactone, eplerenone	K+ sparing diuretic	**Improves mortality**
Cardiac Glycoside	Digoxin	Increases heartâ€™s contractility	Symptomatic relief

Renin is produced in the juxtaglomerular cells of the kidney in response to hypoperfusion. Renin cleaves angiotensinogen into angiotensin I, which is converted into angiotensin II by angiotensin-concerting enzyme (ACE) in the lung. Aldosterone acts on the collecting ducts to increased renal sodium and water reabsorption. The net result of RAAS activation is increased blood pressure, total body sodium and water, and blood volume. As a result, any drug that blocks the effect of angiotensin II or aldosterone enhances natriuresis.

HEART FAILURE MEDICATIONS

	Mechanism	Affect on RAAS (renin, angiotensin Ii, aldo)
Loop diuretics		Decreased blood volume stimulates renin release that in turn increases angiotensin II and aldosterone concentrations hRenin hAng-II hAldosterone
Hydrochlorothiazide		
K-Sparing		
ACE inhibitors	Prevent conversion of angiotensin I to angiotensin II	
Direct renin inhibitors (eg, aliskiren)		iAng-II iAldosterone
Angiotensin receptor blockers	Prevent angiotensin II from acting on angiotensin receptors. Unlike ACE inhibitors, angiotensin receptor blockers **do not decrease angiotensin II** levels but decrease aldosterone production.	-- Ang-II iAldosterone
Aldosterone receptor antagonists		-- Ang-II hAldosterone (by blocking the mineralocorticoid receptors)

Cardiorenal syndrome - ex in heart failure patients with volume overload but low cardiac ouput —> poor renal perfusion. Rx with IV loop diuretics to improve renal perfusion

DYSPHAGIA - ENT

		organism	Signs/sx	Rx
Pts without HIV	Ludwig anginaÂ (rapidly progressive bilateral cellulitis of submandibular and sublingual spacs)	Classically streptococcus and anaerobes **from infected second or third mandibular molar**.	Fever Dysphagia Odynophagia Drooling (from swelling of submandibular space and posterior displacement of tongue) Induration of submandibular space, +/- crepitus from anaerobes. **Can die of asphyxiation**	Intubation if necessary. Abx and removal of infected tooth.
	[diffl dx — Cervical actinomycosis	Actinomyces -- anaerobic, gram +, filemtnous branching bacteria colonizes the oral cavity	Risk factors: malnutrition, poor oral hygiene, diabetes mellitus, immunosuppression, local tissue damage (eg irradiation) Prseentation: Chornic slowly progressive, nontender indurated mass Extends through tissue planes to form abscess, fistula, and draining sinus tract Mandible isth emost commonly involved site	Penicillin for prolonged (12 hrs) + surgical excision for more severe cases (extensive abscesses, persistent sinus tracts)

Patients with HIV	+ Oral thrush, mild sx	Candida likely		Empiric treatment (eg, fluconazole) Endoscopy if no improvement with treatment
	- Oral thrust, severe sx	Dx: endoscopy for likely viral (eg HSV, CMV) etiology:		
		White plaques = candida		Fluconazole Resistant voriconazole, echinocandin (caspofungin), or amphotericin
		Large linear ulcers = CMV likely,		Ganciclovir Acyclovir — not useful bc the virus does not encode the thymidine kinase enzyme to convert acyclovir to its active form
		Vesicles & round/ ovoid ulcers (usually multiple, small, well circumscribed) = HSV likely	Cells w ballooning degeneration and esoiniohpilic intanuclear inclusions	Acyclovir
		Aphthous ulcers (noninfectious)		Symptomatic therapy -- topical corticosteroids. Recurrent - prednisone

ENDOCARDITIS

	in IVDU (++ risk in HIV) Tricuspid/Right-sided > aortic valve	left-sided/mitral
Signs/Sx	Fevers, chills Septic emboli common (occur in up to 75% of pts): Lung -- pleuritic chest pain, dyspnea, and/or cough Fewer peripheral manifestations splinter hemorrhages Janeway lesions Often lacks audible tricuspid valve murmur (due to relatively low pressure gradient across the valve) [tricuspid regurg - holosystolic murmur of lower sternum, increases in intensity with inspiration)	Intermittent fever fatigue new holosystolic murmur
Dx	Requires high degree of suspicion CT may show pulm septic emboli, usually at periphery: Pulmonary infiltrates Abscesses Infarction Gangrene Cavities	+ bl cx
Organism	Most common -- Staph aureus in IVDU >=50% cases	• staph aureus - prosthetic valves, intravascular catheters, implanted devices (pacemakers, defibrillators), IV drug users. most common hosp-assd • streptococci - most common community acqd • viridans group strep (strep sanguinis, mitis, oralis, mutans, sobrinus, milleri)- dental procedures, bx/incision of resp tract. • coag neg staph - IV catheters, prosthetic valves, pacemakers or debrillators • enterococci - nosocomial UTI • strep bovis - colon ca, IBD • fungi - immunocomp host, chronic indwelling catheters, prolonged abx
Complications	Septic emboli - to lungs	splenic abscess 2/2 hematogenous spread or septic emboli — presents with classic triad: fever/chills, leurokocytosis, & LUQ pain. left-sided pleural effusion with left-sided pleuritic chest pain, splenomegaly. 2/2 staph, strep, salmonella. dx by abd CT Rx abx & splenectomy, +/- percutaneous drainage if poor surg candidate
Rx (empiric)	Native valve: Cover methicillin-susceptible and resistant staphylococci, streptococci, and enterococci Ex: Vanc	vancomycin to cover: staphylococci (methicillin-susceptible and -resistant) stretococci enterococci
Post-culture sensitivity results	• Amp-sulbactam for penicillin-resistant enterococcus and HACEK organisms • Penicillin G for penicillin-susceptible viridans streptococci. • Aminoglycosides (gentamcin) • Clindamycin for ppx for high risk patients undergoing invasive dental procedures.	viridans group streptococci (ex strep mutans) - very susceptible to pcn with MIC of <0.12 ug/ml • = IV aqueous penicillin G q4-6 hrs of 24hrs continuous infusion or IV ceftriaxone once daily for 4 wks (easier for home administration) • if pcn allergy, IV vanc

PULMONARY- DYSPNEA AND LUNG CAVITIES

	H.Flu is a colonizer of URtract	Legionella penumophila	Primary TB	Pnemocystis pnemonia (CD4 <200 /uL)	Pnemococcus -- community acquired pneumonia (streptococcus pneumoniae)	Embolization 2/2 tricustpid endocarditis
	Typically causes upper respiratory tract infections, bronchitis (primarily in pts with COPD), and PNA Usually presents with noncavitating infiltrates	Via contaminated aerosolized water (cooling systems) Pts with chronic lung disease, cigarette smokers, and immunospressed pts are more predisposed	**Slowly** progressive sx of malaise, anorexia, wt loss, fever, and night sweats along with pulmonary findings. Chronic cough, not dyspnea, usually the most common pulm sx	**Subacute** respiratory sx	lobar	Fragments of vegetation embolies to the lungs
Dx				Increased alveolar-arterial gradient		
Organism						Staphylococcus aureus
CXR		Cavities more often found in immunosuppressed patients receiving corticosteroids		Diffuse infiltrates	Rarely causes cavitation	Characteristic nodular infiltrate w cavitation
Complications						

PNEUMONIA

Curb65 for CAP empiric treatment based on what level treatment they need =

- confusion
- Uremia – bun>20
- Tachypnea (rr >30/min)
- Hypotension (BP <90/60)
- Age > 65

2+ = inpatient

4+ = icu

2ndary bacterial superinfection/pna common in elderly most common strep pnemo, staph aureus, or hflu

- Staph aureus can cause necrotizing broncopna with multiple nodular infiltrates
  - “pnematocoeles” (cavitate to make small abscesses)

	Hx	Sx	Phys Exam/imaging	Dx	Rx
Community acquired pnemonias					
Strep pnemo (most common - adults)	**Nursing home**				Preventative -- vaccination with pnemovax Risk assessment using CURB65 -> outpatient, inpatient, icu: Eimpiic therapy: Outpt = macrolide/doxy Fluoroquin or beta lactam +macrolide if comorbid condition, inpatient, or icu Icu could also do beta lactam + macrolide
Staph aureus (relatively uncommon cause of CAP)	most often affects hospitalized patients, nursing home residents, IVDU, CF patients, or recent influenza infection		Can be assd wÂ necrotizing bronchopna resulting in pnematocoeles (small abscness cavities)	Gram + cocci in clusters on gram stain	
H flu					
Legionella 2-10% (gram -- rod, primarily intracellular)	Travel associated, linked to cruise ship and hotel water supplies	• **High-grade fever >39.0 C** • **GI** • **Neuro**	Rales CXR = focal lobar consolidation Sputum gram stain shows many neutrophils but no organisms (stains poorly bc primarily intracellular)	Bacterial Cx on charcoal agar +/- urinary antigen testing	Macrolides (azithromycin) Or Newer generation fluoroquinolones (levofloxacin)
mycoplasma pneumoniae (leading cause of 'atypical' pna)		nonproducti ve cough Headache rash	CXR = may have interstitial pattern	no organism on gram stain. +/-2 cold agglutinins present in blood	
Nosocomial pneumonia					
MRSA very likely					Vancomycin
klebsiella pneumoniae	diabetics, alcoholics	currant jelly sputum	cavitation empyema	gram - encapsulat ed rods	
pseudamonas aeruginosa	CF patients, bronchiectasis			gram - rod	
Aspiration pneumonia					
Anaerobic organisms	Neuro disorders (advanced dementia, parkinsons dz, stroke), poor dentition	subacute	leading cause of abscesses -> CXR fluid filled cavity		Clindamycin
Cryptococcal infection					Fluconazole

TB - PPD

PPD/TST Induration	Patients to treat
>= 5 mm	HIV-positive patients Recent contacts of known TB case Nodular or fibrotic changes on chest x-ray consistent with previously healed TB Organ transplant recipients and other immunosuppressed patients
>= 10 mm	Recent immigrants (<5 years) from TB-endemic areas Injection drug user Residents and employees of high-risk settings (eg prisons, nursing homes, hospitals, homeless shelters) Mycobacteriology lab personnel Higher risk for reactivation TB (eg, diabetes, prolonged corticosteroid therapy, leukemia, end-stage renal disease, chronic malabsorption syndromes) Children <4 years of age, or those exposed to adults in high-risk categories
>= 15 mm	All of the above plus **healthy individuals**
If -- PPD: Does not have latent TB, no rx.	
If +PPD: Hx, PhysEx, CXR to rule out active TB Ã	
If CXR is neg, treat for latent TB: 9 mo isoniazid (INH) + pyridoxine to prevent possible neuropathy or 3 mo once weekly INH and rifapentine by direct observed therapy	**If CXR is pos, treat for active TB:** Isoniazid, rifampin, ethambutol, pyrazinamide for 8 weeks (2 mo). Then (continuation phase) INH + rifampin for additional 4 mo.

Tuberculin skin test (TST) is used to identify asymptomatic patients with prior exposure to mycobacterium tuberculosis and latent tuberculosis infection.
= intradermal injection of purified protein derivative PPD from *M. TB*.
= delayed hypersensitivity response measured by **size of induration** not erythema 48-72 hrs after administration

TB/HEMOPTYSIS

pmh:	• endemic area (mexico, philippines, china, vietnam, india, Dominican Republic, Haiti), lived in US <5 yrs, esp first year • immunocompromised (HIV, on immunosuppression) • hx of hematologic malignancy or head/neck cancer • homeless, alcoholism, work in healthcare field
Sx	chronic low grade fever, night sweats, weight loss, cough productive of blood tinged sputum wt loss extrapulmonary sites - liver, spleen, kidney, bone, adrenal gland
labs	acid-fast bacilli smear, cx
Imaging	**reactivation of latent TB = cavitary lesion on cxr** pathy/nodular opacity, multiple nodules, cavity… involving **apical-posterior segments of upper lobes** of the lungs
Rx	if suspicion for tb, respiratory isolation is first step. until dx confirmed or refuted

Causes of hemoptysis (most common - chronic bronchitis, bronchogenic carcinoma, bronchiectasis)

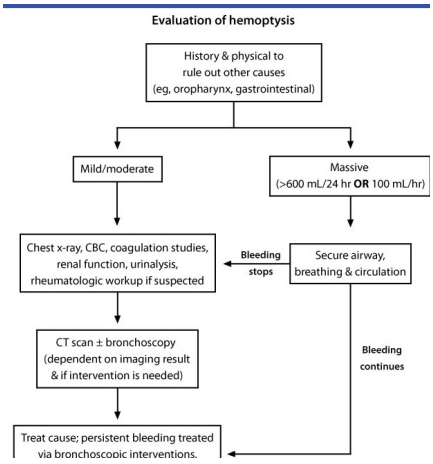
Common causes of hemoptysis	
Pulmonary	• Bronchitis • Pulmonary embolism • Bronchiectasis • Lung cancer
Cardiac	• Mitral stenosis/acute pulmonary edema
Infectious	• Tuberculosis • Lung abscess
Hematologic	• Coagulopathy
Vascular	• Arteriovenous malformations
Systemic diseases	• Wegener's granulomatosis • Goodpasture's syndrome • Systemic lupus erythematosus, vasculitis

+malaise and throat pain and yellow sputum = acute bronchitis
+chronic prod cough for 3 mo in 2 successiv yrs = chronic bronchitis
+fever = pna, lung abscess
+chest pain = pulm infarct
+constitutional signs (wt loss, signifcant hemopt) = malignancy or tb
+ hx recurrent resp tract infections, copious mucopurulent sputum + crackles/rhonchi/wheezing = bronchiectasis

CT indicated if suspect PE, mass lesions, broncietasis, or vascular malformations

if hi res ct doesn't give clear dx, or has recurrent episodes of hemoptysis, or want to assess mass lesions = bronchoscopy

In case of massive hemoptysis, establish adequate patent airway, place bleeding lung in dependent position, and bronchoscopy (can localize site and also intervene)



HIV - IMMUNIZATIONS

Vaccine	Indications
HAV	Chronic liver disease (including hepatitis B and C) Men who have sex with men IV drug users
HBV	All patients without documented immunity to HBV
HPV	Men and woemn age 9-26
Influenza	Annually for all patients
Meningococcus	All patients age 11-18 Large groups living in close proximity (college students, military recruits, incarcerated patients) Asplenia or complement deficiency
Pneumococcus	PCV13 once PPSV23 8 weeks later, then every 5 years
Tetatnus, diptheria & pertussis	Tdap once Repeat Tdap for women during each pregnancy Td every 10 years following Tdap
Live vaccines -- MMR, varicella, zoster, live-attenuated influenza	Contraindicated if CD4+ cell count <200/uL

PCV13 = 13-valent pneumococcal conjugate vaccine
PPSV23 = 23-valent pneumococcal polysaccharide vaccine

PCP

Defn	Fungal organism called pneumocystis jiroveci AIDS defining illness, CD4 count < 200/mL
S/sx	Hypoxia out of proportion to the radiographic findings is suggestive. nonproductive cough, progressive dyspnea, weight loss, tachypnea
Labs/Imaging	CXR = bilateral interstitial infiltrates and/or alveolar infiltrates, or normal Serum LDH levels are frequently elevated.Â Dx confirmed by organism in sputum (induction by hypertonic saline - specific but only 50% sensitive) or **BAL aspirate** (>90% sensitive and specific)

BONE MARROW TRANSPLANT

	CMV
timing	~45 days (2wks-4mo) post BMT
S/sx	fever, dyspnea, dry cough (2/2 pnemonitis) + abd pain, diarrhea (2/2 upper and lower GI ulcers) bone marrow suppression, arthralgias, myalgias, esophagitis
Labs/Imaging	CXR - multifocal diffuse patchy infiltrates HiresCT - parenchymal opacification or multiple small nodules
Dx	Bronchoalveolar lavage dx in most cases.

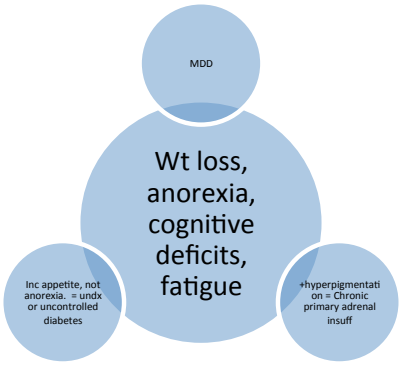
HIV ASSD…ESOPHAGITIS

Common esp when CD4 < 100/uL Painful swallowing and substernal burning.				
Candida albicans (most common) = white plaque, oral thrush	HSV = herpetic vesicles and **round/ ovoid ulcers**, concurrent perioral/ oral HSV	CMV = **linear ulcers**, distal esophagus	Idiopathic/ aphthous = concurrent oral aphthous ulcers	Other causes (medications -- potassium supplements, tetacyclines, bisphosophates) have direct chemical effect on mucosa (pill esophagitis). AR drugs usually do not.
Rx empirically w 3-5 days of oral fluconazole If no thrush or fail to respond to empiric rx: Esophagoscopy w bx, cytology, and culture to determine the specific etiology.	Rx: valacyclovir and acyclovir			

Wt loss, anorexia, cognitive deficits, fatigue

+hyperpigmentation = Chronic primary adrenal insuff

Inc appetite, not anorexia. = undx or uncontrolled diabetes



INFECTIONS IN IMMUNOCOMPROMISED PATIENTS

	Histoplasmosis (disseminated)	Blastomycosis (uncommon in immunocomp hosts)	Coccidiomycosis	Aspergillosis	Sporotrichosis
	Dimorphic fungi Mold in soil, bird and bat droppings -- exploring caves, splunking, cleaning bird cages or coops	Contact with soil or rotting wood..			
Endemic region	Mississippi and Ohio River basins (central and southern)	great lakes, Mississippi and Ohio River basins (wisconsin)	Southwestern US		
Pathophys	Fungus targets histiocytes and reticuloendothelial system.				
Sx	Immunocompromised: Lymphadenopathy, **pancytopenia**, **hepatosplenomegaly** **Palatal ulcers** Disseminated can have fever, fatigue, wt loss	fever, cough, night sweats, wt loss Pulm -- multiple nodules or dense consolidation on CXR Spreads hematogenously to cause **skin ulcerative or verrucous skin** lesions, plaque-like lesions on the mucous membranes, **osteolytic bone lesions** and prostate involvement	fever, cough, night sweats Pulm -- localized pulmonary infiltrate Disseminated disease -- more likely in advanced HIV infection. Presents w fever, maculopapular skin lesions, bone, lesions, and primary lung complaints may be absent	Fever, cough, dyspnea	Subq infection characterized by papule at the site of inoculation followed by development of subsequent papules along route of lymphatic flow Pulmonary sporotrichosis: chronic upper lobe, cavitary lesion.
Labs/ Imaging	CXR: hilar lymphadenopathy with or without areas of pneumonitis Diffuse reticulonodular or cavitary Pancytopenia Elevated serum LDH and ferritin, liver enzymes		CXR: localized pulmonary infiltrate, hilar adenopathy, and/or pleural effusion.	CD4 count < 50/ microL	
Dx	Urine or serum antigen (rapid, very sensitive and specific) Fungal blood cultures are confirmatory but lower sensitivty and teakes days to weeks	broad-based budding yeast from sputum confirms dx			
Rx	Mild/immunocompentent: no rx, or oral itraconazole Severe, or diseeminated, or immunocompromised: Amphotericin B	if symptomatic, itraconazole or amphotericin B			

IMMUNOSUPPRESSANT DRUGS

	Cyclosporine	tacrolimus	Azathioprine	**M**ycophenolate
Mechanism	Inhibits transcription of IL-2 and several other cytokines (mainly T helper lymphocytes) Aka is a calcineurin-inhibitor	Macrolide produced by fungi. Same as cyclosporine also a calcineurin-inhibitor	Purine analog Inhibits purine synthesis	Reversible inhibitor of IMPDH (inosine monophosphate dehydrogenase), the rate-limiting enzyme in de novo purine synthesis
Side effects:	**Nephrotoxicity**: • Reversible acute azotemia or irreversible progressive renal disease • Hyperuricemia with accelerated gout, **hyperK,** hypoP, hypoMg. • Rarerly HUS **Hypertension:** • 2/2 Renal vasoconstriction and Na retention • First few weeks of therarpy • Rx: CaChblockers Neurotoxicity • Reversible • Headaches, visual diturbances, seizure, mild **tremors**, akinetic mutism Glucose intolerance, esp pts taking steroids concurrently Infection Malignancy: • Inc risk of squamous cell carcinoma of skin and lymphoproliferative diseases Gingival hypertrophy and hirsutism GI manifestations: • Anorexia, nausea, vomiting, diarrhea • common but mild	Similar to cyclosporine, but: **NO gingival hypertrophy nor hirsutism.** Higher incidence of neurotoxicity, dirrahea, and glucose intolerance.	**Dose-related diarrhea, leukopenia, and hepatotoxicity**	Bone **m**arrow suppression

DIARRHEA

no diarrhea = mycoplasma, aspergillus, PCP (immediate posttxpt)
+ diarrhea - lung = cryptosporidium

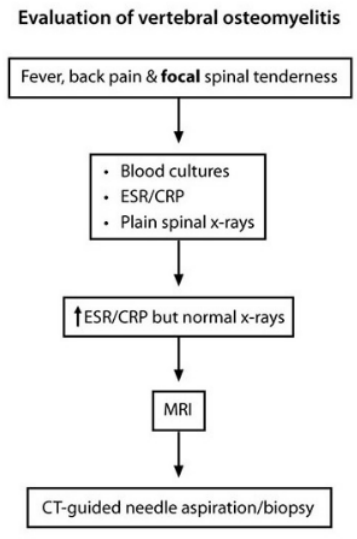
HIV patients			
Non-opportunistic	Opportunistic infections	Non-infectious	
Salmonella Campylobacter Entamoeba Chlamydia Shigella Giardia lamblia	CMV Cryptosporidium Isopora belli Blastocystis MAC HSV Adenovirus HIV	Kaposi sarcoma Lymphoma of GIT tract	
Sx: Hematochezia and lower abdominal cramps usually 2/2 colonic infection with: Cdiff, CMV, Shigella, E.histolytica, or camylobacter	HSV usually assd w painful esophagitis in HIV pts Bloody diarrhea and normal stool exam is highly suspicious for CMV colitis -> colonoscopy w bx	Kaposi is assd w nonbloody diarrhea, no colonic ulcerations.	
Disseminated MAC	**CMV colitis**	**Crypto**	**E histolytica**
Chronic non-bloody diarrhea and weight loss Involves small intestine Bx + culture for dx	Sx: Chronic bloody diarrhea, abdominal pain, CD4 <50 cells/uL, normal stool exam W/u: Colonscopy = mucosal erosions and colonic ulceration. + Bx = large cells with eosinophilic intranuclear and basophilic intracytoplasmic inclusions (“owl’s eye effect”) Rx: Ganciclovir. If failure/ intolerance, Foscarnet.	Profuse, watery nonbloody diarrhea	Bloody diarrhea Trophozoites on stool exam. Colonoscopy = flask-shaped colonic ulcers.

OSTEOMYELITIS

	Vertebral osteomyelitis
S/Sx	Fever, back pain, **focal** spinal tenderness
Organism	Staph aureus >50% of cases of pyogenic spinal osteomyelitis. Gram-neg bacilli -- can be 2/2 to hematogenous spread of UTI
Workup	1.**Blood cultures** Â Inflammatory marker -- **ESR, CRP** markedly elevated. **(leukocyte count may be normal)** Plain spinal xrays -- may be normal in first 2-3 wks **2. MRI** for dx -- can detect abscess and cord compression 3.then CT-guided bone bx

DIABETES PHARMACOLOGY

	Hypoglycemia	Weight gain/ Weight loss	Important Side Effects/ Toxicities
Metformin	No	Loss	GI upset Lactic acidosis
Sulfonylureas	Yes	Gain	
Pioglitazone (TZDs)	No	Gain	Hepatotoxicity CHF Bone Fractures Bladder Cancer
Insulin	Yes	Gain	
DPP-IV inhibitors	No	Neutral	
GLP-1 receptor agonist (exenatide)	No	Loss	Pancreatitis



ENT - PATHOLOGY

		Cause	Sx
Serious otitis media	Most common middle ear pathology in pts w AIDS	Presence of middle ear effusion **without evidence of an acute infection**	Conductive hearing loss Dull tympanic membrane that is hypomobile on pneumatic otoscopy
Otosclerosis		Bony overgrowth of stapes	Conductive hearing loss

BLOOD TRANSFUSION REACTIONS (IMMUNOLOGIC)

Type	
Febrile nonhemolytic (most common reaction)	Fever and chill Within 1-6 hrs of transfusion Caused by cytokine accumulation during blood storage
Acute hemolytic	Fever, flank pain, hemoglobinuria, renal failure and disseminated intravascular coagulation Within 1 hour of transfusion Positive directÂ Coombs test, pink plasma. Caused by ABO incompatibility
Delayed hemolytic	Mild fever and hemolytic anemia Within 2-10 days after transfusion Positive direct Coombs test, positive new antibody screen Caused by anamnesic antibody response
Anaphylactic	Rapid onset of shock, angioedema/urticaria and respiratory distress Within a few seconds to minutes of transfusion Caused by recipient anti-IgA antibodies
Urticarial/allergic	Urticaria, flushing, angioedema and pruritis Within 2-3 hours of transfusion Caused by recipient IgE antibodies and mast cell activation
Transfusion-related acute lung injury	Respiratory distress and signs of noncardiogenic pulmonary edma Within 6 hours of transfusion Caused by donor anti-leukocyte antibodies

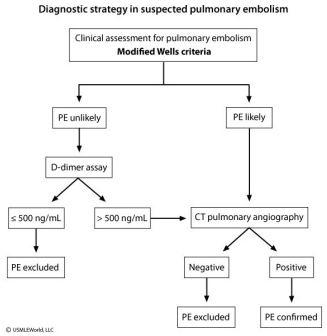
FOOD BORNE DISEASE

By symptom:	
Vomiting predominant	Staph aureus Bacillus cereus Norovirus (eg Norwalk)
Watery diarrhea predominant	Clostridium perfringens Enterotoxic escherichia coli Enteric viruses Cryptosporidium Cyclospora Intestinal tapeworms
Inflammatory diarrhea predominant	Salmonella (both typhi and non0typhi) Campylobacter Siga toxin producing escherichia coli Shigella Enterobacter Vibrio (usually parahaemolyticus) Yersinia
Non-GI symptoms	Botulism (descending paralysis) Ciguatera toxin (paresthesia) Scombroid (flushing, urticaria) Listeria (meningitis) Vibrio vulnificus (cellulitis, sepsis) Hepatitis A (jaundice) Brucellosis (fever, arthralgias)

PE/DYSPNEA

>90% acute PE's from proximal deep veins (above knee) = iliac, femoral, popliteal
10% venous thromboemboli originate in deep veins of upper extremities (inc risk if indwelling catheters)

Diffl dx:
+risk factors DM, fam hx of MI, smoking = MI
same dyspnea/tachypnea/tachycardia +triad (jvd, hypotn,distant heart sounds) = cardiac tamponade
same dyspnea/tachypneatachycardia/lowO2sat +wheezing -pleuritic cp = bronchoconstriction
same acute SOB/pleuritic chest pain, + tracheal dev, hypotn, unilat absence of breath sounds = TensPTX



+3	• Clinical signs • Alternate diagnosis less likely
+1.5	• Previous PE/DVT • HR>100 • Recent surgery/immobilization
+1	• Hemoptysis • Cancer

	PE
dx	modified wells criteria: +3 pts = clinical signs of dvt alternate dx is less likely than PE +1.5pts = previous PE or DVT —- total = likely PE -> [start anticoagulation LMWH or unfrxnated heparin, unless contraindicated] -> CTA to look for filling defect = dx unlikely PE -> Ddimer >500 = ctA <500 exlcuded. if anticoag is contraindicated, if dx testing finds +PE, consider IVC filter
factors making more likely PE	OCP use, sickle cell trait, tachycardia
Sx (non diagnostic)	(from most common): acute onset SOB - 73% pts with PE tachypnea - 70% pleuritic chest pain - 66% tachycardia - 30% leg sx <30% hemoptysis <20% low grade fever 15% calf swelling, virchow's triad (stasis, endothelial injury, hypercoagulable state) not always present
labs/imaging (non dx)	classic: ECG S1Q3T3 (or new onset RBBB) CXR - Hampton's hump, Westermark's sign
Rx/Px	massive PE can lead to right-sided heart failure and hypotension
poor prognostic factors	low O2 sat, afib

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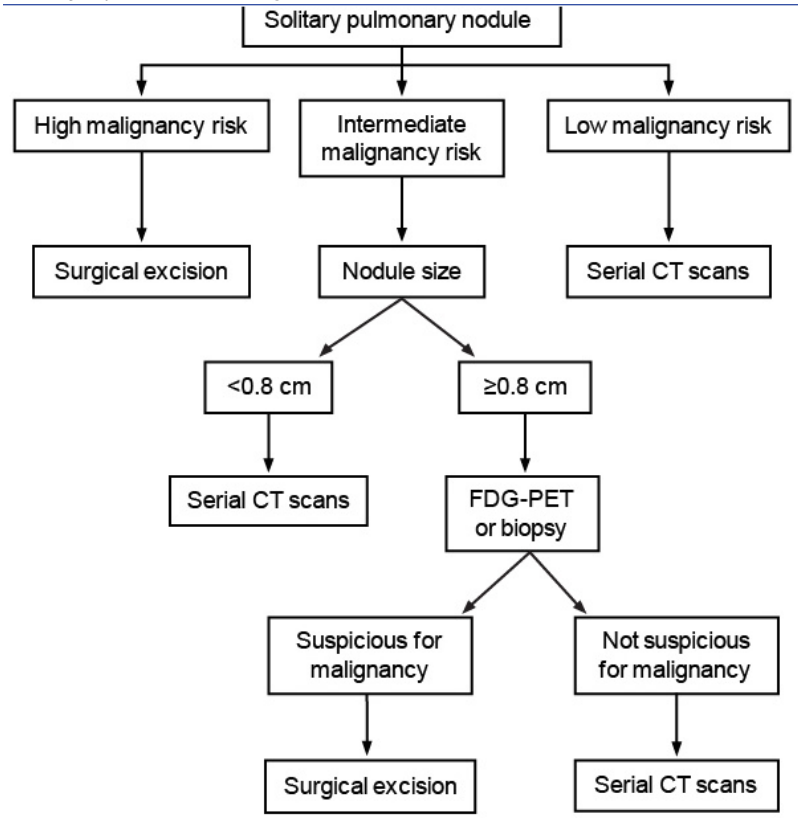
LUNG MASS ON RADIOLOGY

solitary pulm nodule = rounded opacity < 3 cm, completely surrounded by pulm parenchyma, without assd lymph node enlargement



Type of tumor	Incidence	Location	Clinical associations
Adenocarcinoma	40%-50%	• Peripheral	• Clubbing • Hypertrophic osteoarthropathy
Squamous cell carcinoma	20%-25%	• Central • Necrosis & cavitation	• Hypercalcemia
Small cell carcinoma	10%-15%	• Central	• Cushing syndrome • SIADH • Lambert-Eaton syndrome
Large cell carcinoma	5%-10%	• Peripheral	• Gynecomastia • Galactorrhea

Secondary malignancies most commonly in:
lung (esp smokers)
breast
thyroid
bone
GI (colorectal, esophageal, gastric tumors)

primary lung malignancy by distribution:

adenocarcinoma most common in somkers and non smokers

Other tumors/masses:
sarcoid = bilateral hilar adenopathy
aspergilloma = mobile mass that moves w/ position
carcinoid tumors = centrally located
apical lung/SVC syndrome = sm cell lung cancer, NHL

can include sinus imaging, pft's, hi res ct, or empiric sequential therapy for gerd, cough-variant asthma, chronic sinusitis

1st gen antihistamine = chlorpheniramine
combined antihist-decongestant = brompheniramine and pseudoephedrine

	imaging shows:	what it is	sx
fungus ball (aspergilloma)	mobile, intracavitary mass with air crescent in periphery	is fungal hyphae, inflamamtoyr cells, fibrin, tissue debris collecting in preexisting cavity 2/2 cavity (ex from tb, sarcoid, bronchial cysts, neoplasm)	
pulm TB	apical cavitary lesions		prog fever/night sweats, cough, hemoptysis, wt loss
radiation fibrosis	volume loss with coarse opacities	2/2 lung field radiation	dyspnea, nonproductive cough, chest pain 4-24 mo after therapy
secondary malignancy		2/2 radiation/chemo therapy for Hodgkin lymphoma.	

ASTHMA

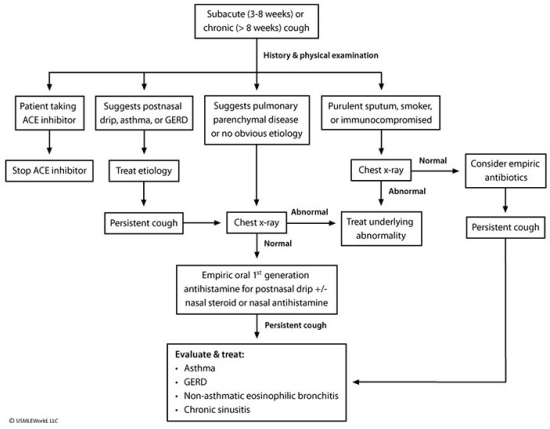
		rx	alternative/adjunctive rx
intermittent	≤ 2 episodes / week ≤ 2 nighttime no limitation on daily activities	short-acting bronchodilator (eg albuterol) PRN	
mild persistent	2+ episodes / week 3-4 nighttime / month minor limitation on activities normal PFTs	+ daily low-dose inhaled corticosteroid (as controller medication	daily oral theophilline
moderate persistent	daily sx weekly nighttime awakenings FEV1 60-80% predicted	+ long-acting inhaled beta 2 agonist	daily oral theophilline
severe persistent	continuous daytime sx frequent nighttime sx extremely limited activity FEV1 <60% predicted	albuterol inhaler PRN high-dose inhaled corticosteroid long-acting inhaled beta 2 agonist +/- daily oral steroids (pred)	daily oral theophilline

bronchoconstriction can be triggered by aspirin or beta blocker therapy in patients with asthma (esp if concurrent chronic rhinitis and nasal polyps). = sudden worsening of asthma and nasal congestion 30m to 3hr after ingestion of nsaid's

SUBACUTE/CHRONIC COUGH

subacute 3-8wks	chronic >8wks
	post nasal drip + gerd + asthma = 90%

Evaluation of subacute & chronic cough



ARDS

	ards	periop MI
defn	1. new/worsening resp sx during past 1 or within 1wk of known clinical insult 2. bilat lung opacities (pulm edema) 3. no cardac failure or fluid overload 4. echo to definitely exclude hydrostatis pulm edema 5. PaO2/FiO2 radio < 300 mmHg with peep >5 cm H2O - mild = 200-300 - moderate = 100-200 - severe <100mm	
etiology	2/2 pancreatitis (leak of pacreatic enzymes from serum across capillaries and damage surfactant in alveoli)	
sx	diffuse crackles, respiratory distress	new S3 gallop, peripheral edema, JVD
dx	dx of exclusion	

CAUSES OF POST-OP FEVER (5W'S)

Wind	Pulmonary embolus PNA Aspiration
Wound	Surgical site infection
Water	UTI
Walk	DVT
Wonder drugs/products	Drug fever Blood products IV lines

SKIN: ERYTHEMA AND SWELLING

	Thrombophlebitis	Toxic shock syndrome	Bacillary angiomatosis	Ludwig angina (rapidly progressive bilateral cellulitis of submandibular and sublingual spacs)
Organisms			Bartonella henselae and bartonella quintana Generally affects immunosuppressed patients (AIDS, hematologic malignancies, undergoing chemotherapy, organ transplant recipients)	Classicallky streptococcus and anaerobes **from infected second or third mandibular molar**.
Pathogenesis				
Signs/sx	Erythema, tenderness, and swelling of distal extremity along with palpable "cord-like" vein.	Diffuse erythematous skin rash that is not localized nor painful. Hypotension followed by multi-organ dysfunction.	Fever, weight loss, malaise, and abdominal pain Classic cutaneous lesion is a large pedunculated exophytic papule with a collarette of scale -- resembles large pyogenic granuloma or cherry angioma	Fever Dysphagia Odynophagia Drooling (from swelling of submandibular space and posterior displacement of tongue) Induration of submandibular space, +/- crepitus from anaerobes. **Can die of asphyxiation.**
Dx			Tisue biopsy and microscopic identificaiton of organisms and the characteristic angiomatous histology -- biopsy with caution, prone to hemorrhage.	
Rx			Abx can lead to involution/regression	Intubation if necessary. Abx and removal of infected tooth.

skin:erythema and swelling continued….

	Necrotizing fasciitis	Abscess	Cellulitis	Pyomyositis (muscle abscess)
Organisms	Streptococcus pyogenes (group A streptococci) Staphylococcus aureus Clostridium perfringens Polymicrobial			
Pathogenesis	Bacteria spreads aggressively and rapidly through subq tissue and deep fascia, undermining the skin	Skin and soft tissue infections that have been successfully limited by immune system and tissue barriers.	Acute skin infection	(usually) limited to one muscle group and does not spread rapidly.
Signs/sx	Pain **out of proportion** to exam Systemic sx (f**ever and hypotension)** **Crepitus** in 50% **Tissue necrosis** Most commonly involves extremities and perineal region	Systemic signs not likely Localized to a tender, fluctuant area and do not spread aggressively.	Warmth, erythema, edema, and tenderness	Fever, erythema, swelling, pain
Dx	CT: air in the tissue planes			
Rx	**Surgical debridement** and broad spectrum abx			

MISC

RESTLESS LEG SYNDROME

Clinical features of restless legs syndrome	
Diagnostic criteria	**Urge to move the legs and** • Unpleasant sensations in the legs (or other body parts [eg, arms]) that begin/worsen during inactivity (eg, lying down, sitting) • Unpleasant sensations in the legs relieved by movement (eg, walking, stretching) • Unpleasant sensations in the legs that worsen or occur only in the evening/night • Symptoms not explained by another disorder
Secondary causes	• Iron-deficiency anemia • Uremia (end-stage renal disease, chronic kidney disease) • Diabetes mellitus • Multiple sclerosis, Parkinson disease • Pregnancy • Drugs (eg, antidepressants, metoclopramide)
Treatment	**Mild/intermittent symptoms** • Iron supplementation for serum ferritin ≤75 µg/L • Supportive measures (eg, leg massage, heating pads, exercise) • Avoid aggravating factors (eg, sleep deprivation, medications) **Persistent/moderate to severe symptoms** • **1st-line:** Dopamine-agonists (eg, pramipexole) • **Alternate:** Alpha-2-delta calcium channel ligands (eg, gabapentin enacarbil)

REPRODUCTIVE/GERM CELL TUMORS

		origin	
leydig cell tumors	most common type of testicular sex cord stromal tumors	principal source of testosterone + capable of estrogen production via aromatase	
seminomas			betaHCG somewhat elevated if contain syncytiotrophoblastic giant cells
yolk sac tumor		endodermal sinus tumor	
choriocarcinoma		germ cell tumor	inc beta-HCG
teratoma			inc serum AFP or beta-hCG (may indicate coexistant germ cell tumor)

Stage	Clinical manifestations of Lyme disease
Early localized (days-1 month after tick bite)	• **Erythema migrans** (80% of patients) • Fatigue, malaise, lethargy • Mild headache & neck stiffness • Myalgias & arthralgias

Early disseminated (weeks-months after tick bite)	• **Carditis** (5% untreated patients)
	  ◦ Atrioventricular block, cardiomyopathy
	• **Neurologic** (15% untreated patients)
	  ◦ Unilateral or bilateral cranial nerve defects (usually VII), meningitis, encephalitis
	• **Muscular** (60% untreated patients): Migratory arthralgias
	• **Conjunctivitis** (10% untreated patients)
	• **Skin**: Multiple erythema migrans
	• Regional or generalized lymphadenopathy

Late or chronic (months-years after tick bite)	• **Muscular** (60% untreated patients): Arthritis • **Neurologic**: Encephalomyelitis, peripheral neuropathy