DIABETES

- Type I = insulin-deficient → autoimmune dz resulting in destruction of pancreatic beta-cells
  - Autoantibodies present: anti-islet cell, antiligutamic acid dehydrogenase (not required)
- Type II = insulin-resistant → resistant to the effects of insulin, eventually results in beta-cell failure
- S/sx: polyuria, polydipsia, unexplained weight loss, blurry vision, fatigue, weakness, pruritus, poor wound healing, increased susceptibility to infections (esp. fungal)
- Diabetes Criteria:

<table>
<thead>
<tr>
<th></th>
<th>Diabetes</th>
<th>Prediabetes</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fasting Blood Glucose (mg/dL)</strong></td>
<td>≥126</td>
<td>100-125 (impaired fasting glucose)</td>
<td>&lt;100</td>
</tr>
<tr>
<td><strong>OGTT (mg/dL)</strong></td>
<td>≥200</td>
<td>140-199 (impaired glucose tolerance)</td>
<td>&lt;140</td>
</tr>
<tr>
<td><strong>Random glucose (mg/dL)</strong></td>
<td>≥200 w/ classic sx</td>
<td>126-199 → perform fu FBG</td>
<td>&lt;125</td>
</tr>
<tr>
<td><strong>HbA1c (%)</strong> Average glucose level over preceding 120d</td>
<td>≥6.5</td>
<td>&lt;6.5</td>
<td></td>
</tr>
</tbody>
</table>

- Exam considerations:
  - Monofilament test (checks for peripheral neuropathy)
  - Check for microalbuminuria (often first sign of diabetic kidney damage)
  - Foot exam → skin breaks, ulcers, decreased pulses, delayed cap refill, bony deformities
- Complications:
  - Microvascular: retinopathy, nephropathy, neuropathy (peripheral, autonomic, mono-)
    - Peripheral - symmetric sensory dysfunction, distal sensory loss, paresthesias
    - Autonomic - gastroparesis, orthostatic hypoTN, impotence, neurogenic bladder
  - Macrovascular: atherosclerosis, cerebrovascular dz, peripheral vascular dz
- Prediabetes management (increased risk for future DM; 50% increased risk for MI or CVA)
  - Address risk factors, manage BP and lipids, rescreen for DM annually
  - Smoking cessation, weight loss (5-10%), diet, exercise (30min/d x 5d/wk)
- Management Goals
  - Check HbA1c q3-4mo until goal, then q6mo
  - Goals (ABC’s)
    - A1c = <7% (=ave. 154mg/dL) (FPG 80-130mg/dL, 2hr post prandial <180)
    - BP in diabetes <140/90 mmHg
    - Cholesterol: LDL in diabetes <100 → consider statin for hyperlipidemia
  - Complication prevention: smoking cessation, aspirin use, kidney health, immunizations, eye exam, foot care, and dental exam
- When to start pharmacologic therapy:
  - A1c >7.5 - start immediately
  - A1c <7.5 and highly motivated pt - 3-6mo trial of lifestyle modifications is reasonable
Initial Therapy (Step 1):
- Lifestyle modifications - decrease weight & increase activity (1-2% ↓ in A1c)
  - Exercise: 30-60 min. of moderate-intensity aerobic activity (40-60% of VO2 max) on most days of the week (>150 min/week) with resistance training 2x/wk
  - Diet: caloric restriction, decrease carbs, eliminate sugars
- Metformin (1-2% ↓ in A1c) = Biguanide
  - ↓ hepatic glucose production & intestinal absorption, ↑ peripheral uptake
  - S/E: GI/N/D (take w/ food!), lactic acidosis (check renal fnx)
  - Contraindicated in renal insufficiency; stop if SCr >1.5 M or >1.4 F
    - Use Glipizide for pts in which metformin is contraindicated
  - Dosing: 1500-2550 mg/d
    - Immediate-release tablet or solution (adults ≥ 17 years):
      - Initial: 500 mg 2xd or 850 mg 1xd; titrate up 500 mg/wk
      - may titrate from 500 mg 2xd to 850 mg 2xd after 2 weeks

Additional Therapy (Step 2):
- Insulin (1.5-3.5% ↓) → initial therapy if A1c far from goal (>8.5)
  - *Initial therapy* = bedtime basal insulin (then add prandial short acting prn)
    - NPH insulin or Detemir @ bedtime, OR Glargine @ bedtime or morning
    - 0.2 units/kg/day (minimum 10 units), then titrated upward
  - Rapid Short-Acting: Aspart (NovoLog), Lispro (Humalog), Glulisine (Apidra)
    - Take 3xd before meals; 30-90 min peak, 3-5 hr duration
  - Regular Short-Acting: Humulin R, Novolin R
    - Take 3xd before meals; 2-4 hr peak, 4-8 hr duration
  - Intermediate-Acting (Basal): NPH (Humulin N, Novolin N)
    - Take 2xd, 6-10 hr peak, 10-18 hr duration
  - Long-acting (Basal): Detemir (Levemir), Glargine (Lantus), Degludec (Tresiba)
    - Take 1-2xd; no peak (mimics natural insulin), 20-24 hr duration
    - Degludec = once daily dosing, lasts longer than 24 hrs
- Sulfonylureas (1-2% ↓) = Glipizide** (Glucotrol), Glimepiride, Glyburide
  - ↑ insulin secretion by pancreatic beta cells (avoid in type I)
  - Disadvantages: high risk of hypoglycemia*, weight gain
- Additional oral hypoglycemics (less well validated)
  - Thiazolidinediones (0.5-1.4% ↓) = Pioglitazone** (Actos) or Rosiglitazone
    - Actos has potential improvement in lipid profile & decrease in MI
    - Disadvantages: fluid retention, weight gain, HF, bone fx, expensive
  - SGLT-2 Inhibitors (0.5-0.7% ↓) = Invokana, Farxiga, Jardiance (-gliflozins)
    - Inhibits NA-gluc co-transporter in prox. renal tubules from reabsorbing glucose
    - Weight loss, reduction in SBP
    - Disadvantages: UTIs, vulvovaginal candidiasis
  - GLP-1 analogs (0.5-1% ↓) = Exenatide (Byetta), Liraglutide (Victoza), Albiglutide (Tanzeum), Dulaglutide (Trulicity)
    - enhances insulin secretion, slows gastric emptying, suppresses glucagon
    - Weight loss
    - Disadvantages: requires injection, GI side effects
  - DDP-IV inhibitors = Sitaagliptin (Januvia), Saxagliptin (Onglyza), Linagliptin (Tradjenta), Alogliptin (Nesina) → same as GLP (DDP IV prolongs GLP by break it down)
  - Alpha-glucosidase inhibitors (0.5-0.8% ↓) = Acarbose, Miglitol
    - ↓ glucose absorption in intestines (causes diarrhea & gas)
○ **Pramlintide** = Symlin
  - Amylin Analogue - can be combined w. Insulin in Type 1 or Type 2
  - slows down gastric transit (= feel full, less glucose absorbed), inhibits gluconeogenesis by inhibiting glucagon secretion → weight loss
  - Rarely used - only fine tunes BG control, doubles # of injections, GI sx, expensive

○ **Meglitinides** = Repaglinide, Nateglinide

○ **Bile Acid Sequestrants: Colesevelam** – ONLY used if pt needs lipid management TOO and can’t take statin

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**Management of type 2 diabetes**

Algorithm for the metabolic management of type 2 diabetes; reinforce lifestyle interventions at every visit and check A1C every three months until A1C is <7% and then at least every six months. The interventions should be changed if A1C is ≥7%.

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**METABOLIC SYNDROME**

- 3 of 5 criteria:
  - Obesity → waist circumference >40 M, >35 F (94cm; 80cm)
  - Triglycerides ≥150 or on meds for high TGs
  - HDL <40 M, <50 F or on meds for low HDL
  - BP ≥130/85 or on meds for HTN
  - FPG ≥100 or on meds for high blood glucose

- Implications: increased risk for DM and CVD
HYPERTENSION

- BP = CO x SVR (goal = to maintain organ perfusion)
- Primary factors determining BP = sympathetic nervous system, the renin-angiotensin-aldosterone system, and plasma volume (largely mediated by the kidneys)
- Risk factors for primary (essential) HTN: age, obesity, FH/genetics, race, high sodium (>3g/d), EtOH, sedentary, DM, dyslipidemia
- Causes of secondary HTN: *primary renal disease, *renovascular dz (atherosclerotic RAS, fibromuscular dysplasia), OCPs, chronic NSAIDs, glucocorticoids, illicit drugs, primary aldosteronism, pheochromocytoma, OSA, Cushing’s, CoA
- Hypertensive Urgency = severe HTN (usually DBP >120) in asymptomatic patients
- Hypertensive Emergency = severe HTN w/ evidence of acute end-organ damage (immediate tx)
- Malignant HTN = associated with end-organ damage (likely d/t duration of HTN)
- Complications of HTN: CVA, MI, aneurysm, LVH, HF, PVD, CM, CKD/ESRD, retinopathy
- Dx requires measurement at 2+ visits, or by repeated home BP readings that average ≥135/85
- Exam: VS & BMI, cardiac & lungs, carotids, thyroids, optic fundi, abd (aneurysm, bruits, organomegaly), extremities (pulses, edema), neuro
- Sx of target organ damage: HA, dizziness/lightheadedness, chest pain, SOB, claudication, loss of visual acuity, transient weakness or blindness, abd pain, oliguria
- Before initiating therapy do: EKG, BG, hematocrit, K and Ca, Cr, lipid profile, UA, Albumin:Cr
- JNC 7 Definitions

<table>
<thead>
<tr>
<th>BLOOD PRESSURE STAGE</th>
<th>SYSTOLIC BLOOD PRESSURE (mm Hg)</th>
<th>DIASTOLIC BLOOD PRESSURE (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>&lt;80</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120-139</td>
<td>80-89</td>
</tr>
<tr>
<td>Stage 1 hypertension</td>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>Stage 2 hypertension</td>
<td>≥160</td>
<td>≥100</td>
</tr>
</tbody>
</table>

- JNC 8 Recommendations for management of HTN
  - ≥60 yo initiate tx at ≥150/≥90, tx to goal of <150/90 (Strong rec, grade A)
  - <60yo initiate tx at ≥140/≥90, tx to goal of <140/90 (Strong rec, grade A)
  - Diabetes initiate tx at ≥140/≥90, tx to goal <140/90 (expert opinion, grade E)
  - CKD initiate tx at ≥140/≥90, tx to goal of <140/90 (expert opinion, grade E)
    - initial tx should include ACEI or ARB, regardless of race or DM (grade B)
  - Nonblack initial tx should include a thiazide-type diuretic, CCB, ACEI, or ARB (mod rec - grade B)
  - Black population initial tx should include CCB or thiazide diuretic (grade B-C)
  - If goal BP is not reached within 1mo of tx, increase the dose of the initial drug or add a second drug (thiazide-type diuretic, CCB, ACEI, or ARB). If goal BP cannot be reached with 2 drugs, add and titrate a third drug from the list provided
  - Do not use an ACEI and an ARB together in the same patient
HYPERLIPIDEMIA

- Increase HDL (goal >40; >60 is neg risk factor): ↑ anaerobic activity, moderate EtOH (1-2/d)
- Determine when to treat based on individual risk: Framingham CV Risk Assessment Calculator
  - A statin can lower risk by 20-30% (weigh benefit vs. cost, burdens, side effects)
- Popular non-med management: fish oil, red yeast rice, pu-erh tea
- **Statins** = first line, mainstay, primary or secondary prevention of atherosclerotic dz
  - MOA: inhibit HMG-CoA reductase (enzyme in pathway that produces cholesterol in liver)
  - Can lower LDL levels by 20-40% and increase HDL levels by 5-15%
  - Monitoring
    - Baseline labs: CPK, creatinine, LFTs, ALT, cholesterol
    - Check LFTs at baseline, 6-12wks, 3 mo, then q6-12 mo (if levels normal)
      - d/c statin if transaminases become 3x greater than baseline if no hx of liver dz, or 2x if there is a hx of liver dz
    - Recheck lipids 6wks after lifestyle modification or medical therapy is started
    - Fasting required for triglycerides and LDL calculation
  - Contraindications: active liver dz, elevated transaminases, pregnancy
  - Side effects: muscle injury, hepatic dysfxn (0.5-3%), DM (<0.3%), cognitive impairment
    - myalgias (up to 11%) → use 100mg daily Coenzyme Q10 / ubiquinone
    - rhabdomyolysis (<0.1%) → alert if muscle weakness & brown urine
  - Types (w/ recommended doses for primary prevention)
    - **Atorvastatin** (Lipitor) 20mg - good for renal impairment
    - **Lovastatin** 40mg
    - **Pravastatin** 20-40mg - good for liver dz; not CYP metabolized, renal metabolism
    - **Simvastatin** 40mg - don't take w/ antifungals or macrolides
    - **Rosuvastatin** 5-10mg - not CYP metabolized

<table>
<thead>
<tr>
<th>LDL Cholesterol</th>
<th>Optimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100</td>
<td></td>
</tr>
<tr>
<td>100-129</td>
<td>Near optimal/above optimal</td>
</tr>
<tr>
<td>130-159</td>
<td>Borderline high</td>
</tr>
<tr>
<td>160-189</td>
<td>High</td>
</tr>
<tr>
<td>≥190</td>
<td>Very high</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Cholesterol</th>
<th>Desirable</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;200</td>
<td></td>
</tr>
<tr>
<td>200-239</td>
<td>Borderline high</td>
</tr>
<tr>
<td>&gt;240</td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HDL Cholesterol</th>
<th>Low (increased risk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td></td>
</tr>
</tbody>
</table>

- **Recommendations:**
  - Clinical ASCVD: high intensity if <75yo, moderate if >75yo
  - LDL >190: high intensity statin
  - Diabetes: moderate intensity statin (high if 10yr risk >7.5%)
  - ≥7.5% 10yr estimated ASCVD risk: moderate to high intensity statin
- Other lipid lowering therapies if intolerant to statins: Omega 3 fatty acids, red yeast rice, PCSK 9 inhibitors, Niacin, Fibric Acid derivatives, Bile acid sequestrants, cholesterol absorption inhibitors
- **Hypertriglyceridemia:** fibrates aka fibric acid derivatives (Fenofibrate, Gemfibrozil), niacin (Vit B3, nicotinic acid), fish oil supplements (>3g/d); CIs to fibrates: renal or hepatic dz, gallstones
## THE “SICK VISIT”

<table>
<thead>
<tr>
<th>COUGH DDx</th>
<th>S/sx</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bronchiolitis</strong></td>
<td>→viral** → RSV</td>
<td>Palivizumab vaccine Ribavirin as antiviral in severe cases</td>
</tr>
<tr>
<td></td>
<td>Seen in infants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Signs of respiratory distress: cough, wheezing, tachypnea, nasal flaring, etc.</td>
<td></td>
</tr>
<tr>
<td><strong>Bronchitis</strong></td>
<td>→viral** → influenza A &amp; B, parainfluenza, coronavirus, rhinovirus, RSV →bacterial → M. pneumo, C. pneu →inhaletional</td>
<td>Cough, sputum, SOB, wheezing, chest pain, malaise</td>
</tr>
<tr>
<td></td>
<td>Often associated with simple URI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suspect if cough persisted &gt;5d</td>
<td>Fever rare → consider influenza or pneumonia</td>
</tr>
<tr>
<td></td>
<td>Usually 20-30d duration</td>
<td></td>
</tr>
<tr>
<td><strong>Croup</strong></td>
<td>→infection of trachea &amp; larynx →viral → parainfluenza virus</td>
<td>Barking cough, hoarseness</td>
</tr>
<tr>
<td></td>
<td>6mo - 12yrs (m/c in 1-3yo)</td>
<td>Steroids (Decadron PO) Nebulizer treatments Cool humidified air Racemic epi</td>
</tr>
<tr>
<td><strong>Pertussis</strong></td>
<td>→Bordetella pertussis = gram neg coccobacillus</td>
<td>Whooping cough spells (paroxysms w/ posttussive emesis)</td>
</tr>
<tr>
<td></td>
<td>Cattarrhal phase = mild URI sx</td>
<td>Usually 12wk duration Abx helpful if in catarrhal phase</td>
</tr>
<tr>
<td></td>
<td>Paroxysmal stage = whooping cough</td>
<td>Azithromycin x5d (500 mg for the first dose, then 250 mg daily for the next 4d) Isolate for 5d</td>
</tr>
<tr>
<td></td>
<td>Convalescent stage =mild cough continues</td>
<td></td>
</tr>
<tr>
<td><strong>Pneumonia (CAP)</strong></td>
<td>→infx of alveoli</td>
<td>Ages 6mo-5yrs = viral → amoxicillin</td>
</tr>
<tr>
<td></td>
<td>→viral*: influenza, RSV, CMV</td>
<td>Influenza A → oseltamavir or zanamivir within 48hrs of sx onset</td>
</tr>
<tr>
<td></td>
<td>→bacterial (10-15%): S. pneumo m/c H. influenza in smokers</td>
<td>RSV → supportive tx CMV → gancyclovir</td>
</tr>
<tr>
<td></td>
<td>→young children: RSV, parainfluenza, adenovirus, enterovirus, S. pneumo, group A strep, GBS (neonates), M. pneumo, chlamydina trachomatis, H. influenza, M. cattarrhalis</td>
<td>Non-complicated, no abx 3mo prior: Augmentin 500mg q8hrs (amox+clav) Azithromycin x5d (zpak OR 500mg x3d) Levaquin good for elderly Alternative: Doxycycline = 100mg BID Comorbidities: FQs (levo/moxi) HCAP = zosyn, carbapenem, cefepime (concern for MRSA, peusodomonas)</td>
</tr>
<tr>
<td></td>
<td>Dx: CXR, CBC, BMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CURB-65 (confusion, uremia = BUN &gt;7, RR &gt;30, BP &lt;90/60, &gt;65yo, pleural effusion) 0-1 → outpatient &gt;2 → consider hospitalization</td>
<td></td>
</tr>
<tr>
<td><strong>Atypical Pneumonia</strong></td>
<td>Fever, HA, myalgias, non-productive cough</td>
<td>Macrolides or FQs Azithromycin x5d (500 mg for the first dose, then 250 mg daily for the next 4d) Levaquin or Doxy x7-14d</td>
</tr>
<tr>
<td></td>
<td>CXR usually looks worse than presentation</td>
<td></td>
</tr>
<tr>
<td><strong>TB</strong></td>
<td>Cough, hemoptysis, weight loss, night sweats Get mask &amp; send to ER!</td>
<td>Active → 2mo of Isoniazid, Rifampin, Pyrazinimide 4-7mo of continued Isoniazid &amp; Rifampin Latent → 9mo INH or 4mo Rifampin</td>
</tr>
<tr>
<td>SORE THROAT DDx</td>
<td>S/sx</td>
<td>Management</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Non-infectious causes:</td>
<td>allergies, GERD, pollutants, smoke inhalation, trauma, STDs</td>
<td></td>
</tr>
<tr>
<td>Strep Pharyngitis</td>
<td>Sore throat (usually &lt;1wk duration) Tonsillitis</td>
<td>Penicillin VK 500 mg TID x7d</td>
</tr>
<tr>
<td>—~15% of pharyngitis cases</td>
<td>Centor clinical criteria: tonsillar exudates, tender anterior cervical lymphadenopathy, fever, NO cough</td>
<td>Amoxicillin 500 mg BID x10d</td>
</tr>
<tr>
<td>—group A beta-hemolytic</td>
<td>2-3 criteria → Rapid Strep Antigen Test 4 criteria → tx empirically</td>
<td>IM Penicillin G (benzathine) 1 dose</td>
</tr>
<tr>
<td>streptococcus (GABHS)</td>
<td>RADT neg but high suspicion → throat cx on blood agar plate</td>
<td>PCN allergy: macrolides or clinda</td>
</tr>
<tr>
<td>Other non-viral causes of</td>
<td></td>
<td>Azithromycin z-pak or multi-day course</td>
</tr>
<tr>
<td>pharyngitis can include</td>
<td></td>
<td>Tx to prevent rheumatic fever, glomerulonephritis, pharyngeal space infx i.e. PTA</td>
</tr>
<tr>
<td>chlamydophila pneumoniae,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mycoplasma, C. diphtheriae,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. gonorrhoeae, Candida</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viral Pharyngitis</td>
<td>Sore throat, cough possible</td>
<td>Salt water gargles</td>
</tr>
<tr>
<td>—adenovirus**, rhinovirus,</td>
<td>Hand-foot-mouth dz: erythematous-based small vesicles/ulcers in pharynx &amp; palms/soles</td>
<td>Lozenges</td>
</tr>
<tr>
<td>coxsackievirus, influenza,</td>
<td></td>
<td>Motrin / NSAIDs</td>
</tr>
<tr>
<td>EBV, HSV, varicella, RSV</td>
<td></td>
<td>Hurricanes mouth spray (benzocaine)</td>
</tr>
<tr>
<td>Mononucleosis</td>
<td>Fever, fatigue, malaise</td>
<td>Avoid contact sports &amp; heavy lifting first 2-3wks</td>
</tr>
<tr>
<td>—Epstein Barr virus</td>
<td>Pharyngitis (for 10-14d)</td>
<td>AVOID AMPICILLIN / AMOXICILLIN</td>
</tr>
<tr>
<td>—other viruses like CMV can</td>
<td>Tonsillar edema, erythema</td>
<td>If provider mistakes this for strep and gives these, mono pt can get RASH</td>
</tr>
<tr>
<td>cause mono-like syndrome</td>
<td>Exudative tonsillitis (shaggy white-purple) LAD, hepatosplenomegaly</td>
<td>Complications: ruptured spleen, hepatitis, low blood cell counts, CNS infx</td>
</tr>
<tr>
<td>Peritonsillar Abscess</td>
<td>Dx: Monospot test (detects heterophile Abs), LFTs, CBC w/ platelets, Coombs test --monospot not pos early in dz</td>
<td>Urgent referral to ENT for I&amp;D</td>
</tr>
<tr>
<td>—may follow tonsillitis</td>
<td>Deviated uvula</td>
<td></td>
</tr>
<tr>
<td>Ludwig's Angina</td>
<td>Unilateral bulging soft palate</td>
<td></td>
</tr>
<tr>
<td>—cellulitis of floor of mouth</td>
<td>Dysphagia, trismus, drooling</td>
<td></td>
</tr>
<tr>
<td>UP: RESPIRATORY DDx</td>
<td>Swollen neck, protruding tongue, trismus</td>
<td></td>
</tr>
<tr>
<td>Common Cold</td>
<td>Slow, insidious onset</td>
<td></td>
</tr>
<tr>
<td>—viral: rhinovirus, coronavirus, adenovirus</td>
<td>Congestion, sneezing, sore throat, cough</td>
<td>Rest, hydration, saline drops, humidifier Antipyrretics / Analgesics</td>
</tr>
<tr>
<td>THE FLU</td>
<td>Usually no HA, fever, chills, myalgias</td>
<td>Decongestants (Sudafed, Afrin) Dextromethorphan, Guaifenesin Antivirals WITHIN 48hrs OF SX ONSET</td>
</tr>
<tr>
<td>—influenza A/B virus</td>
<td>Abrupt onset (worsens over 3-6hrs) Fever, headache, myalgia, malaise</td>
<td>Antipyrretics / Analgesics</td>
</tr>
<tr>
<td></td>
<td>DRY cough, sore throat, rhinitis sometimes</td>
<td>Albuterol SABA Neb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antivirals WITHIN 48hrs OF SX ONSET</td>
</tr>
<tr>
<td></td>
<td></td>
<td>--Tamiflu/Oseltamivir 75mg Bid x5d (PO)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>--Ralamza/Zanamivir 10mg Bid x5d (IH)</td>
</tr>
</tbody>
</table>
| Laryngitis | Hoarseness DDx:  
Acute: viral/URI/postnasal drip, strain, vocal fold paralysis  
→ hydration, humidification, vocal rest  
Chronic: reflux, irritants, vocal misuse/strain, nodules/polyps  
Others: malignancy, neural dysfunction  
*AVOID steroids & antihistamines (mask injury, permanent damage)  
*refer to ENT if >2wks (for laryngoscopy) |
|---|---|
| Allergic Rhinitis (hay fever) | Congestion  
Rhinorrhea (clear)  
Sneezing  
Postnasal drip → throat itchiness  
Itchy, watery eyes  
Pruritis  
Allergic shiners, allergic salute  
Possible cough, epistaxis, HA, bronchospasm, eczematous dermatitis  
*red turbinate mucosa  
Boggy or swollen nasal turbinates  
Associated w/ nasal polyps  
Note: “Allergic Triad” = asthma, polyps, serious Cox-1 inhibitor sensitivity (aspirin, ibuprofen, Advil, alieve) |
|---|---|
| Sinusitis (Rhino-sinusitis) | Congestion  
Rhinorrhea (clear vs. thick yellow)  
Loss of smell (hyposmia)  
Headache, pressure (localized sinus pain)  
Possible cough, fever, malaise, dizziness  
*bacterial clues (vs. viral):  
--purulent yellow-green nasal discharge  
--fever  
--persistence of symptoms >10 days  
--biphasic illness (gets better than worse)  
*Hydration/fluids  
Guaifenesin (thins mucous)  
Nasal irrigation  
Decongestants – Sufadef, Afrin  
Intranasal corticosteroid - Flonase  
Antihistamines - Claritin, Allegra, etc.  
Analgesics prn  
ABX for bacterial if sx last >2wks (sx often self-limiting w/in 2wks)  
Amoxicillin, Augmentin  
PCN allergies: erythro, clinda |
<table>
<thead>
<tr>
<th>EARACHE DDx</th>
<th>S/sx</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Otitis Externa</strong></td>
<td>Otalgia, Painful tragus and outer ear, Tenderness &amp; pain w/ earlobe retraction, Decreased hearing, Painful erythema + edema of ear canal, Often have drainage with purulent exudate, TM may be erythematous (or not visible)</td>
<td>Clean ear canal - remove debris, Flush out with saline syringe, Acidification w/ drying agent → 2% acetic acid +/- hydrocortisone, Acetosol (acetic acid +hydrocortisone), Corticosporin* (cipro + steroid) drops, Ciprofloxacin otic solution, Ofloxacin if TM ruptured, Gentamicin, Tobramycin</td>
</tr>
<tr>
<td><strong>Otalgia</strong> P. aeruginosa*, S. aureus, Proteus, E. coli, Klebsiella, S. epidermidis</td>
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<tr>
<td>Fungal: Aspergillus niger, Candida albicans</td>
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<tr>
<td><strong>Otitis Media</strong></td>
<td>Otalgia (most common cause of ear pain), Decreased hearing, Aural pressure, Fever, N/V, Bulging TM* (inflamed), Erythematous, dull, or opaque TM, Displaced or absent light reflex, Decreased TM mobility, Otorrhea, fluid in middle ear, May be pus-forming (suppurative), Mastoid tenderness, OM with effusion (OME) = presence of fluid in middle ear w/out symptoms of acute infection (very common)</td>
<td>&gt;2yo consider watchful waiting vs. abx: Treat underlying illness, tx pain, AOM in kids &lt;6 mo, always give abx: Amoxicillin 500mg TID x5-7d --liquid: 250mg/5ml (1tsp) TID x7d, PCN allergies: macrolide (-mycin), Worsening/Continuing infx: Augmentin, Recurrent OM = 3+ episodes of AOM in 6mo, or 4+ in 1yr, Prophylactic abx: amox, sulfoxazole, Ciprofloxacin w/ dexamethasone drops, Tymanostomy tubes, Surgical/TM repair (definitive), Perforated TM d/t infx = Amoxicillin PO + Floxin otic drops</td>
</tr>
<tr>
<td>Eustachian tube dysfunction</td>
<td>Aural fullness, hearing impairment, Retraction of TM, decreased TM mobility</td>
<td>Usually transient, Decongestants, steroid sprays, Prolonged - concern for cholesteatoma</td>
</tr>
<tr>
<td><strong>PINK EYE</strong></td>
<td>S/sx</td>
<td>Management</td>
</tr>
<tr>
<td><strong>Viral Conjunctivitis</strong></td>
<td>Redness, pain, discharge, swelling, Photophobia possible, Slight itching, May be bilateral, Watery, serous, or mucoid discharge</td>
<td>Self-limiting, Cold compresses, Antihistamine / decongestant drops</td>
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<tr>
<td>--adenovirus and other common viral pathogens; also consider HSV, VZV, CMV</td>
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<tr>
<td><strong>Bacterial Conjunctivitis</strong></td>
<td>Redness, pain, discharge, swelling, Photophobia possible, Mild-mod itching and pain, Often bilateral, Crusted, purulent, yellow-green discharge</td>
<td>Self-limiting (10-14d), Polymyxin B Sulfate + Trimethoprim ophthalmic drops (4xd for 5-7d), Azithromycin drops, Erythromycin or Bacitracin ointment, Contact lens→ cipro or oflaxacin drops</td>
</tr>
<tr>
<td>--strep. pneumonia, s.aureus, H. influenza, pseudomonas, N. gonorrhea, C. trachomatis</td>
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</table>
LYME DISEASE

- Tick bite → find out how long tick was embedded! how many days since bite found?
  - Within 2d of bite → can give 2 tabs of doxy 100mg for prophylactic tx
  - Check labs in 6 weeks
- Early localized (~1-2wks): erythema migrans, flu-like systemic sx, lyme arthralgia
  - if really high fever ~104 or severe sx, consider co-infection Anaplasmosis/Ehrlichi
- Early Disseminated (~1-2mo): cranial neuropathy (facial n. / CN 7), lyme carditis (heart block / conduction delay), diffuse rash
- Late Disseminated: monoarticular arthritis, cognitive effects
- Dx: serology = ELISA (indirect) for antibodies IgG & IgM, if positive → Western Blot (direct)
  - IgG indicates prior i=or late infections (requires 5 antibodies present)
  - IgM indicates current infection (requires 2 abs present)
- Tx: Doxycycline 100mg BID x10-21d
  - Alternatives: Amoxicillin 500mg TID x14-21d OR Cefuroxime 500 BID x14-21d
  - Lyme meningitis, carditis: IV ceftriaxone x28d

ASTHMA

- Reversible hyperactive airway and inflammation
- Classic triad of symptoms: dyspnea, cough, wheezing (+ feeling of chest tightness)
- Common triggers: allergies, exercise, cold, irritant, infection, medications
- Exam findings: altered mental status, tachycardia (>130), pulsus paradoxus, cyanosis (rare)
- Tests: PFTs, ABG, CXR, ECG
- Step Up Therapy: SABA (prn) → ICS/LTRA → ICS + LABA/ICS + LTRA → ICS + LABA + LTRA → add on anti-IgE monoclonal antibody
- Maintenance therapies (daily) → severe asthma
  - ICS: Fluticasone, Budesonide, Beclomethasone
  - ICS+LABA combos: Advair, Symbicort
  - Mast Cell Stabilizers: Cromolyn
  - Systemic Corticosteroids: Prednisone
  - Leukotriene modifiers: Singulair (Montelukast)
  - Immunomodulators: Xolair (Omalizumab)
  - Long Acting Anticholinergic: Spiriva
- Rescue therapies (prn)
  - SABA: Albuterol, Levalbuterol, etc.
  - Short Acting Anticholinergics: Ipratropium Bromide (Atrovent)
    - Combivent = Ipratropium + Albuterol
  - Systemic Corticosteroids: prednisone, glucocorticoids

STDs / STIs & CERVICITIS

- Cervicitis
  - S/Sx: dysuria, frequency, endocervical discharge, postcoital bleeding, dyspareunia, vulvovaginal irritation, cervical or urethral discharge, friable cervix, erythema
  - Common causes: G/C, HSV, Trichomonas
- STDs vs. UTIs → pyuria & (+)LE, but negative nitrite and urine cx
- G/C → Azithromycin 1g PO once + Ceftriaxone 250mg IM once
- BV and Trich → Metronidazole 500mg PO BID x7d (or intravaginally)
- Candida → Monistat, Fluconazole, Nystatin
- Syphilis → PCN IM (or doxy or ceftriaxone)
- HPV → Aldara cream, cryotherapy, acid treatments
- Herpes → Acyclovir PO
### ARTHRITIS

<table>
<thead>
<tr>
<th>OA</th>
<th>RA</th>
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<tbody>
<tr>
<td>Progressive destruction of articular cartilage by proteolytic enzymes, remodeling of subchondral bone</td>
<td>Autoimmune disorder involving chronic inflammation of synovial lining of joints &amp; destruction of surrounding architecture</td>
</tr>
</tbody>
</table>

#### OA
- Stiffness worse w/ activity, relieved with rest
- Hard, bony swollen joints
- Typical finger joints: DIPs, CMCs of thumbs
  - **Heberden (DIP) & Bouchard (PIP) nodes**
- Osteophytes
- Limited movement, crepitus, joint effusion
- Thinned cartilage, bone ends rub together

#### Labs:
- Typically normal ESR & RF
- Clear viscous synovial fluid w/ WBC <2k

#### Xray:
- Asymmetric narrowing of joint space
- Subchondral sclerosis
- Marginal osteophyte formation

#### Tx:
- Weight loss
- Balancing exercises, PT, joint protection, physiotherapy (heat, cold), orthotics
- NSAIDs, Tramadol
- Intraarticular corticosteroids
- Arthroscopic irrigation or synovectomy, arthroplasty, artificial joints

#### RA
- Morning stiffness significant (lasts >1hr)
- Soft, tender, warm swollen joints
- Typical finger joints: PIPs, MCPs, wrists, MTPs
  - **Swan neck deformity, Boutonniere deformity**
- Typically symmetrical
- Fatigue, pain, morning stiffness
- Swollen inflamed synovial membrane, bone erosions

#### Labs:
- +RF, +ESR, +CRP (trending??)

#### Xray:
- Joint space narrowing
- Bony erosions, cysts

#### Tx:
- Analgesics for pain
- NSAIDs for inflammation and analgesia
- Glucocorticoids for pain & inflammation, possible delay of erosions
- DMARDS (MTX) to decrease disease activity, limited by S/Es
- TNF inhibitor (Infliximab, Etanercept) for anti-inflammation

Consider **polymyalgia rheumatica** if (+) ESR & CRP (though not required) and (-) RF

### GOUT
- Deposition of monosodium urate crystals in tissues or supersaturation of the ECFs
- UA = waste product of purine breakdown
- High purine foods = organ meats, fish
- Meds to be cautious with in gout pts (can increase uric acid levels): diuretics, aspirin
- Dx: aspiration of synovial fluid (or tophaceous material) w/ visualization of monosodium urate crystals under polarized microscopy → needle-shaped **negatively birefringent crystals** that are yellow when parallel to the axis of slow vibration
- Maintenance therapy: urate-lowering meds → goal uric acid level of <5-6mg/dl
  - **Start AFTER** an acute attack, not during
  - **Allopurinol** (xanthine oxidase inhibitor) 100mg daily (reduced if CKD)
    - Decreases production of uric acid
  - **Probenecid** (uricosuric drugs), **Pegloticase** (uricase)
    - Increases excretion of uric acid
  - Colchicine may be given prophylactically (short term) to prevent acute attacks during the initiation of antihyperuricemic therapy because it is potentially toxic
- Acute attack
  - **1st line** = NSAID (stopped 48hrs after attack resolves)
    - Indomethacin 50mg TID x5-7d
    - Naproxen 500mg BID x5-7d
  - **2nd line** = **Colchicine** 1.5 to 1.8 mg in 2-3 divided doses in the first 24 hours, followed by tapering of the dose until resolution of the attack (GI side effects)
HYPOTHYROIDISM

- **Primary:** Hashimoto’s (aka autoimmune/lymphocytic - m/c in US), iodine deficiency (m/c worldwide), congenital, thyroidectomy, meds (lithium, amiodarone, I-131 therapy)
- Central: pituitary/hypothalamic dz, congenital, pituitary necrosis (Sheehan syn)
- S/sx: Weakness, fatigue, lethargy, cold intolerance, dry skin, hair loss, coarse hair, constipation, brittle fingernails, slow HR, leg cramps, depression, heavier menses, ED, weight gain d/t fluid restriction, slower thinking, eyelid & facial edema, hyporeflexia, pretibial myxedema
- Dx:
  - Primary: ↑ TSH, ↓ T3/T4 (normal T3/T4 if subclinical)
  - Secondary: ↓ /N TSH, ↓ T3/T4
  - Antithyroid peroxidase + anti-thyroglobulin Abs (TPO and TG abs) → seen in Hashimoto
- Treatment: **Levothyroxine sodium (LT4)**
- Complications = hyperlipidemia, atherosclerosis, fetal death
  - myxedema coma → high mortality, see in elderly & acute illness
    - AMS/coma, hypotension, hypothermia, hypoventilation, AKI

HYPERTHYROIDISM

- **Primary:** Grave’s dz (80%), goiter, toxic nodule, thyroiditis, post-partum thyroiditis, inflammatory process (meds, amiodarone, radiation), exogenous hormone ingestion
- Secondary: TSH-secreting pituitary adenoma
- S/Sx: Exacerbated sympathetic activity, fine brittle hair, shakiness, tremors, hot, excessive sweating, faster HR, frequent loose BMs, insomnia, anxiety, irritability, lighter periods, ED or loss of libido, enlarged thyroid, bulging eyes, localized edema, increased appetite but no weight gain, muscle cramps, weakness, palpitations, PVCs, hyperreflexia
- Dx:
  - Primary: ↓ TSH, ↑ T3/T4 (normal T3/T4 if subclinical)
  - Secondary: ↑/N TSH, ↑ T3/T4
  - Radioiodide uptake scan to differentiate cause
- Tx: Anti-thyroid drugs → **Thionamides (Methimazole, PTU)**
  - Beta-blockers (sx control), radioactive iodine ablation, thyroidectomy
- Complications: Afib, hypercalcemia, osteoporosis, impotence, decreased libido, gynecomastia, nephrocalcinosis, thyroid storm

ADRENAL INSUFFICIENCY

- Primary = glucocorticoid deficiency (adrenal etiology) → loss of GC + MC, high ACTH levels
  - Autoimmune adrenalitis*, infx (TB), adrenal hemorrhage (shock), metastases (breast/lung), drugs, genetic dz
- Secondary = ACTH deficiency (pituitary etiology) → loss of GC, normal MC, low ACTH
  - Exogenous glucocorticoids, H-P dz (tumors, hemorrhage, infarction, infiltrative dz, TBI)
- S/Sx: Weakness, fatigue, anorexia, GI sx, salt craving, postural dizziness, muscle or joint pains, weight loss, hyperpigmentation, hypotension, vitiligo
  - Primary specifically: Na loss & K retention (MC), hyperpigmentation (↑ ATCH)
- Dx AI: will see a subnormal response to
  - Cosyntropin Stimulation Test (CST), Insulin-induced hypoglycemia test, Metryapone Test
- Dx 1° vs 2° dz: ACTH levels (high in 1° vs. low/n in 2°), CT/MRI, Abs to 21-hydroxylase
- Maintenance therapy: GC replacement (hydrocortisone), MC replacement (fludrocortisone), ↑ salt
- Adrenal crisis = acute presentation → **hypotensive shock unresponsive to fluids & pressors**
CUSHING DISEASE

- ACTH-secreting pituitary adenoma
  - impairment of normal feedback suppression results in continued ACTH secretion despite high cortisol levels
  - ↑ ACTH, cortisol, free plasma glucocorticoids
- S/sx: truncal obesity, thirst, polyuria, abdominal striae, moon faces / facial plethora, hirsutism, easy bruising, proximal muscle weakness, backache, headache, acne, depression, insomnia, menstrual abnormalities, HTN, gonadal dysfunction, thyroid dysfunction, osteoporosis
- Dx: ACTH levels detectable
  - 24-hr urine free cortisol → >4x normal is diagnostic
  - Late night salivary cortisol → expect lack of midnight nadir
  - 1mg Dexamethasone suppression test → expect cortisol >1.8
  - 8mg DST → ectopic vs. cushing’s dz (≥50% suppression of 1mg value)
  - MRI, CT, somatostatin scintigraphy
- Treatment: 1st line = transphenoidal resection of pituitary tumor (cures 75-90%)
  - pituitary irradiation, anti-adrenal agents, bilateral adrenalectomy

SCREENING GUIDELINES

<table>
<thead>
<tr>
<th>Condition</th>
<th>Screening Guidelines</th>
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<tbody>
<tr>
<td>Breast Cancer</td>
<td>Mammogram: q1-2yrs 40-69yo (some guidelines recommend 50yo)</td>
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<tr>
<td>Cervical Cancer</td>
<td>HPV vaccine starting at age 9 (2 shots if get it when 11-12)</td>
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<td>PAP smear: q3yrs 18-65yo (or after starting sexual activity)</td>
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<td>q5yrs if HPV DNA + cytology co-testing negative ?</td>
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<tr>
<td>Colorectal Cancer</td>
<td>Colonoscopy: q10 yrs 50-75yo</td>
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<td></td>
<td>FOBT: annually 50-75yo</td>
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<td></td>
<td>Other option: FOBT + flexible sigmoidoscopy</td>
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<tr>
<td></td>
<td>Increased risk: personal or FHx of CRC or adenomatous polyp, hx of IBS/IBD</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>PSA &amp; DRE: annually 50-75yo (though most places start at 40yo)</td>
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</tbody>
</table>

PPD TEST

- PPD = purified protein derivative (form of tuberculin from M. tuberculosis)
- Tests = TST (tuberculin skin test)
- Reaction = delayed-type hypersensitivity T-cell mediated response
- Inject 0.1mL (=5 units) intradermally in the inner surface of forearm
- Measure the transverse diameter (mm) of induration (not redness) 48-72hrs after injection
  - Serial testing?????
- A previous positive results means every future TST will be positive → CXR indicated
- Positive results (abnormal)
  - 5+ if immunocompromised (chemo, transplant, etc) or close contact w TB infected person
  - 10+ for healthcare & lab workers, foreign born from area w/ high risk, DM, dialysis, etc.
  - 15+ for healthy individuals at low risk