"The Big Three": *S. pneumonia, H. influenza, M. catarrhalis* "The Atypicals": *Mycoplasma*, Viruses "The Others": *P. auruginosa* (DM), *S. aureus, E. coli*, *Klebsiella* spp., *P. mirabilis*
General RFs for Chronic Dz: smoking, anatomic abnormalities, immunodeficiency syndromes (check quantitative immunoglobulins if pt has recurrent/severe infections)

NB any pt w/ sudden sensorineural hearing loss should receive immediate prednisone 60mg PO x10d b/c likely viral infection CN8

Otitis Externa "Swimmer's Ear"	Agent • 1° "The Others" • Rare Fungi (Candida), Viral (Herpes) RFs • prolonged exposure to water (swimming) • damage to epithelium (hearing aids, headphones, cell phone aids, Q-tips) Other • Bullous Myringitis • "The Atypicals" • S/S: inflamed TM w/ large red blebs that occasionally bleed (interestingly hearing is NOT affected even though TM is affected) • Tx: PO Z-Pack	Symptoms • Auricle/Canal Inflammation (esp pain when you move the ear) • Canal Pruritus / Purulent Otorrhea / Debris • Occlusive Hearing Loss Complications • Malignant Otitis Externa "MOE" - seen in elderly especially with poorly controlled DM - granulation tissue on canal floor at bonycartilaginous junction w/ exposed bone - Complications: Sensorineural Hearing Loss, Vertigo, Cellulitis, Osteo, Facial Nerve Palsy, CNS Infection - Dx: CT (bone erosion), Technetium Scan (bone inflammation) - Tx: debridement, control DM, IV Abx	Prophylaxis • Avoid RFs Treatment • Canal Cleaners • Abx/Steroid Ear Drops • Analgesic Ear Drops
Otitis Media	Agent Acute (<6mo) younger pts • "The Big Three" Chronic (>6mo) older pts • " The Others" RFs • Allergies • Preceding Viral URTI which leads to Eustachian Tube Obstruction • Dysfunctional Eustachian Tube (2/2 craniofacial defects like cleft palate) that allow bacterial entry from pharynx • Common in Children b/c Eustachian tube anatomy: horizontal, short, decreased tone	Symptoms • Constitutional Symptoms • Middle Ear Inflammation - Hyperemic TM ± Effusion → Bulging w/ Loss of Bony Landmarks and Light Reflex → Impaired Mobility on Pneumatic Otoscopy or Poor TM Compliance on Tympanometer → Perforation w/ Disappearance of Pain • Conductive Hearing Loss • Infants have unique S/S (Pulling on Ear, Irritability, N/V) hence that is why TM are always checked in infants • 25% of Pts are Asymptomatic Complications • TM Perforation - DDx: Direct Trauma (Q-tip), Indirect Trauma (slap side) - S/Sx: visible tear, otalgia, bleeding, conductive hearing loss, tinnitus - Tx: Keep Dry, 90% close spontaneously, 10% require surgical repair w/ fat plug, temporal fascia, tympanoplasty • Tympanosclerosis (scarring of TM) • Cholesteatoma - Definition: epidermal inclusion cyst of middle ear that contains desquamated keratin debris - DDx: Congenital (negative middle ear pressure from Eustachian tube dysfxn) or Acquired (growth of epithelium through a TM perforation) - S/S: Pearly, shiny mass behind TM, Conductive Hearing Loss - Complication: can erode into surrounding structures - Tx: Surgical Excision • Vertigo / Sensorineural Hearing Loss w/ Impaired Speech Development if repetitive • Facial Nerve Palsy b/c the nerve is not completely covered by bone as it courses thru middle ear • Infection: Mastoiditis, Cellulitis, Osteo, Meningitis, CNS abscesses, Bezold's Abscess (abscess behind SCM muscle) • Thrombosis: of lateral sinus, cavernous vein, carotid artery Diagnosis • Tympanocentesis if pt is toxic, cranial complication, newborn, taking antibiotics prior to development of infection, refractory to antibiotics	Prophylaxis • Amoxicillin x3-6mo following an acute infection • Myringotomy or Pneumatic Equalization (PE) Tube if: effusion >3mo (Sx of hearing loss but no F or ear pain), >3 episodes for 6mo, immuno-compromised Treatment • PO Amoxicillin x1-2wks and if chronic then try PO FQ x1-2wks b/c likely "The Others" • Face Decongestants • Analgesics

Sinusitis	Acute <4wks	Agent • "The Atypicals" - Bilateral, lasts <7d, will resolve with just supportive care • "The Big Three" - Unilateral, lasts >10d, will resolve only with abx, just more severe S/S (purulence, etc), imaging (air-fluid levels or complete opacifcation) Mechanism • In general all acute sinusitis begins viral and 2% become bacterial such that 15 of out-pt pts have bacterial sinusitis • 2/2 decreased ciliary action resulting in obstruction of sinus ostia lowering intrasinus oxygen tension and predisposing pts to bacterial infection • Ethmoid/Maxillary (most common children b/c these are the only sinuses present at birth) • Frontal/Sphenoid (most common adult, b/c these have already developed and are really the most prone to infection) RFs • prior h/o viral UTRI (classic picture: pt has a cold for >10d or has a cold, gets better, then gets worse "double sickening") • allergies	Symptoms • Constitutional Sx • Periorbital Pressure and HA • Sinus TTP • Nasal Obstruction/Stuffiness • Mucopurulent Discharge • Decreased Transillumination of Maxillary Sinuses • Pain when bending head forward • Maxillary Tooth Ache • Facial Swelling/Erythema Complications • Chronic Sinusitis Diagnosis • CT is the TOC b/c X-ray is 40% False Negative • Air Fluid Levels or Opacification on Sinus Radiograph Series (Frontal, Lateral, Water's projections)	Treatment • **Face Decongestants and if not better after 7d then Amoxicillin x2-4wks**
	Chronic >4wks or recurrent acute	Agent • "The Others" Mechanism • 2/2 permanent mucosal changes 2/2 inadequately treated acute sinusitis consisting of mucosal fibrosis, polypoid growth, and hyperstosis (increased bone density on CT) RFs • nasal obstruction by polyp • deviated septum • foreign object Other • Sinus Cancer - 2/3: Maxillary, 1/3: Ethmoid, Rare: Sphenoid/Frontal - 80% SCC, 15% Adeno, 5% Esthesioneuroblastoma - S/S: Nasal Obstruction, Epistaxis, Localized Pain, Cranial Nerve Deficits, Facial/Palate Asymmetry, Loose Teeth - Tx: surgery	Symptoms • same Complications • Mucocele • Polyps • Ethmoid - Orbital Cellutitis - Cavernous Sinus Thrombosis • Frontal - Epidural Abscess - Meningitis - Osteomyelitis aka "Pott's Puffy Tumor" • Sphenoid - Cavernous Sinus Thrombosis	Treatment • FQ 2-4wks (b/c likely "The Others") • If Fails then Functional Endoscopic Sinus Surgery (FESS) • Explore Unique RFs

Influenza "Flu"	Agent • Influenza Mechanism • Antigenic Drift (lack of proofreading resulting in a slight change in H1N1 but it is still H1N1) accounts for annual mild epidemics (there is some overlap immunity) while antigenic shift (genetic reassortment ie a change from the current circulating strain H1N1 to H2-16N2-9) account for rare serious pandemics (there is NO immunity therefore deadly even in healthy 20yos) NB pandemics can also occur if nonhuman species infect humans like the Avian Flu H5N1 (1918 (Spanish Flu), 1957 (Asian Flu), 1968 (Hong Kong), the next one is around the corner) • Regular Flu is H1N1 hence good immunity but there is now resistance to TamiFlu • Swine Flu is H1N1 but it has extreme Antigenic Drift hence very poor immunity, TamiFlu and Relenza are still effective • Bird Flu is H1N5 hence no immunity at all Epidemiology • Contagious 1d before Sx emerge to 7d after Sx resolve • via sneezing/coughing and just plain close contact Virology • RNA, three surface proteins: Hemagglutins (16 HAs) which attaches virus to cells and Neuraminidases (9 NAs) which releases virus from cells, there are also M2 Proteins only found on Strain A Strain A • circulate among humans AND animals w/ pigs being the main mixing vessel, causes annual epidemics AND pandemics that are severe Strain B • circulate among humans only, causes annual epidemics only that are moderate Strain C • circulate among humans only, causes rare epidemics only that are mild	Symptoms • Incubation: 2d Duration: 3d • Constitutional Symptoms (Sudden Onset High Grade Fever, Periodic Chills → Shakes → Myalgia, HA) along w/ Non-Productive Cough, Sore Throat • Comparison to Cold (gradual onset of Sx, low grade fever, more URT Sx and less constitutional Sx) Complications • 50,000 deaths/yr w/ most in elderly • Pneumonia that starts out as influenza pneumonia that then progresses to a Streptococcus / Staph PNA • Otitis Media, Conjunctivitis, et al • Mysositis • Myocarditis Diagnosis • Nasopharyngeal Swab	Prophylaxis (Vaccine is a combo of various subtypes of H1N1 that changes each year) • Type 1 Vaccine, called ?, manufactured from chicken eggs which takes a long time to make, composed of N from last year's endemic strain b/c the H varies much more, given to >6mo w/ chronic medical conditions, >50yo, women who will >3mo pregnant during flu season, any ped pt who is undergoing long-term aspirin therapy and thus could develop Reye Syndrome, healthcare workers, also administer pneumococcal vaccine if many RFs to reduce pneumonia complication, given IM b/t October to up to even March, SEs (sore arm, redness, low grade F, malaise, myalgia, otherwise very safe compared to other vaccines), Contraindication (egg hypersensitivity, prior reaction, the develop of Guillain-Barre to vaccine is actually based on false data), takes 6wks for Abs to build up therefore consider antiviral prophylaxis during this period esp for high risk pts, Effectiveness: <65yo: 80% against infection (sometimes when vaccines are not well made the efficacy can drop down as low as 25%) vs >65yo: 30% again st infection, 50% against hospitalization, 80% against death • Type 2 Vaccine, called FluMist, just like Type 1 vaccine except that it is given as 2 puffs INH, SEs (rhinorrhea, HA, cough, sore throat, myalgia) Contraindications (same + ASA therapy, asthmatics) • Type 3 Vaccine, called Acambis, still in development, manufactured from bacterial fermentation and thus can be made much more quickly, composed of M protein which is static and thus does not need to be given annually but rather just 1 vaccine with boosters every once and awhile Other • Antivirals: used as (1) an adjuvant to late vaccination, (2) a supplement to preseason vaccination in immunocompromised pts, and (3) a sole prophylaxis in pts who never got vaccine, 80% effective Treatment • Rest, Fluids, Antipyretics, Antiviral (best if started w/in 48hrs of symptoms, shortens duration by 2d and severity) Antibiotics (for high risk pts, no studies confirm effectiveness) Contact and Respiratory Isolation

	Antiviral "AROZ"	Px	Tx	Side Effects	Other
M2 Inhibitors	amantadine (Symmetrel) PO	Type A (>1yr)	Type A (>1yr)	CNS: severe nervousness, anxiety, diff concentrating, lightheaded GI: severe N and loss of appetite Renal elimination	• recently resistance has increased form 11% to 91% the past year therefore these drugs are no longer recommended
	rimantadine (Flumadine) PO	Type A (>1yr)	Type A (adult)	CNS: mild " " GI: mild " " Also more active than amantadine Liver elimination	
Neurominadase Inhibitors	oseltamivir (Tamiflu) PO	Type A&B (>12yo)	Type A&B (>1yo)	CNS: HA (10%) recently it has been found that there is increased r/o seizures in children GI: N/V (10%)	
	zanamivir (Relenza) INH	-	Type A&B (>6yr)	Resp: bronchospasm in pts w/ reactive airway disease (1%) hence not as common as Tamiflu	

Rhinitis "Cold"	Agent • 1° Rhinovirus 2° Type 4 Parainfluenza, RSV, Adenovirus, Coronavirus Epidemiology • Any Age but Highest in Kids who are 5yo • Fall/Winter Season RFs • Child Care Facilities, Crowded Living Conditions Other • Rhinitis Medicamentosa	Symptoms • Constitutional Symptoms (Low Grade Fever, Malaise, HA) • Sneezing, Rhinorrhea, Coryza (nasal mucosal congestion resulting in congestion) • Sore Throat, Postnasal Drip, Cough • NB Infants many times present w/ Feeding/Sleeping Difficulties and also sometimes V/D Complications • Otitis Media, Sinusitis, Pneumonia • Trigger Asthma • Bacterial Rhinitis (consider if purulent, >14d, high grade fever)	Treatment • General Remedies • Face Decongestants • Try Antihistamines in case there is an allergic component to it

Allergic Rhinitis	DDx • Vasomotor Rhinitis • Rhinitis Medicamentosa (decongestant abuse)	Symptoms • Paroxysms of Morning Sneezing, Rhinorrhea, Congestion • Nose/Conjuctival/Palate/Middle-Ear Pruritus • Lacrimating Eyes w/ Conjuctival Injection (Conjunctivitis) • Loss of Olfaction and Taste • Mouth Breathing or Snoring • Pale Boggy Bluish Edematous Nasal Turbinates coated w/ Thin, Clear Secretions • Cobblestoning and Mucus Streaming Down Posterior Pharynx • Epistaxis if severe rubbing - Most Common Location: Ant Septum b/c of Kiesselbach's Plexus - DDx: trauma, foreign body, dry air, intranasal drug use, thrombocytopenia, clotting deficiencies, angiofibromas, hereditary hemorrhagic telengectasia, head/neck vessel aneurysms, nasal tumors - Tx: pressure, alpha-agonist (phenylephrine aka PE nasal spray), chemical cautery with silver nitrate stick, packing w/ ribbon gauze or commercially available tampon impregnated w/ abx and petroleum jelly (only pack for <3d b/c if not then pressure necrosis, abscess, etc), cold pack on top of nose, antiemetics b/c of nausea induced from swallowed blood, if all else fails call ENT to do endoscopic arterial ligation or angiographic embolization • Transverse Nasal Crease (tip of nose) 2/2 "Allergic Salute" = rubbing nose up w/ palm of hand • Horizontal Nasal Crease (above lip) 2/2 side wiping • "Allergic Shiners" = dark, puffy eyelids from venous stasis caused by impaired blood flow through inflamed, edematous nasal mucosa • Other Allergic Disorder (asthma, eczema, etc.) Complication • Otitis Media, Sinusitis, Pneumonia • Tonsillar/Adenoid Hypertrophy • Nasal Polyps Diagnosis • Clinical • Eosinophilia and Elevated IgE • Skin Allergy Testing or Radio-Allergo-Sorbent Test (RAST) as an alternative • Stained Smear of Nasal Secretions Showing Eosinophils • Fiberoptic Rhinoscopy is indicated for unilateral nasal blockage that is refractory to medication	Prophylaxis • Allergy Testing then Immunotherapy aka Allergy Shots • HEPA filter, etc Treatment • Face Decongestants • Antihistamines • Steroids

Pharyngitis, Tonsilitis, Adenoiditis

- HIV aka Acute Retroviral Syndrome
- Oral Sex (GC/Chlamydia)
- DM/HIV (Candida)
- Ludwig's Angina
- Vincent's Angina

Acute Viral

Agent
- Rhino
- Adeno
- Entero
- Coxasckie

Epidemiology
- Age: 0-5yo
- (infants do not get Strept throat)
- Overall represents 80% of all sore throat!!!

Symptoms
- Constitutional Symptoms (Gradual Onset, Low Grade Fever, Malaise)
- Sore Throat, Inflamed Mucosa
- Unique: Conjunctivitis, Rhinitis, Ulcers, Exanthem, GI Symptoms (D)
- No: High Grade Fever, LAD, Exudates, HA, Palatal Petechiae

Treatment
- Warm Saline Gargles
- Anesthetic Throat Spray
  - Cetacaine Spray
  - Stomatitis Cocktail
- Analgesics

Mononucleosis "Mono"

Agent
- EBV
- CMV
- HIV
- T. gondii

RFs
- Kissing such that 90% of adults are carriers (spread via saliva, infecting epi cells in pharynx then infecting B-cells)

Epidemiology
- Age: 10-30yo
- Incubation: 4-8wks
- Duration: weeks for the acute URTI Sx but up to months for the constitutional Sx
- Symptoms and Duration much worse as you get older (where it is asymptomatic as a young child and dangerous as an adult with more complications)

Other EBV Diseases
- Burkitt's Lymphoma (suspect if LAD continues for a long time)
- Nasopharyngeal Carcinoma
- Oral Hairy Leukoplakia

Symptoms (when you have the Sx always check a Monospot, Rapid Strep Test, and if + RFs then HIV)
- Just Like GABHS but Low Grade Fever and More Pronounced Malaise/Fatigue
- Unique: hepatic/splenic involvement w/ SM
- Cervical LAD
- NB rash develops when you give ampicillin

Complications
- Splenic Rupture
- Airway Obstruction 2/2 Tonsillar/Adenoids Hypertrophy
- Self-Limited Reversible Neurologic Problems
  - Meningitis, Encephalitis
  - Peripheral Neuropathy
  - Guillain-Barre Syndrome
  - Bell's Palsy
- Hepatitis (20% subclinical, 5% icteric, <1% failure)
- Autoimmune Hemolytic Anemia
- Thrombocytopenia
- Acute Renal Failure
- Cardiac Problems
  - Mycarditis, Pericarditis
  - Complete Heart Block
- Pneumonitis

Diagnosis (if tests negative then consider other mono-like infections to the left)
- Leukocytosis w/ >50% Lymphocytosis w/ >10% Atypical Lymphocytes
- Elevated AS/LTs, Ab US to evaluate SM
- EBV PCR
- Heterophile Abs Titer (abs that react with Ags (horse RBCs) that are different from the Ags that induced their production) aka the Monospot Test (85% sens / 91% spec) serum test, b/c 15% false negative if suspicion high then check below
- EBV Ab Titer (true abs) (97% sens / 94% spec) never order!!!, designed in the 1980s when there was speculation about correlation b/t EBV and chronic fatigue syndrome

	EA (Early Ag)	VCA (Viral Capsid Ag)	EBNA (EB Nuclear Ag)
Acute	+	+ (IgM)	-
Convalescent	-	+ (IgG)	-
Recovered	-	+ (IgG) for life	+ for life

NB there was some studies done a long time ago (now refuted) trying to link EBV infection with chronic fatigue syndrome

Treatment
- Rest
- Fluids
- Analgesics
- PO Prednisone if:
  - airway compromise
  - severe thrombocytopenia
  - hemolytic anemia
  - neurologic dz
- Avoid Strenuous Exercise (0.1% r/o splenic rupture)
  - NO HSM: NonContact=3wks Contact=5wks
  - YES HSM: just a long time
- Avoid Straining w/ Bowel Movements
- EBV Vaccines are in development
- Tonsillectomy/Adenoidectomy ("T&A") if
  - airway obstruction

NB antivirals are not recommended

Strep Throat	Agent • GABHS Epidemiology • Age: 5-15yo • Season: Winter/Spring • Only 10% (adults) and 30% (children) of pharyngitis is GABHS • Complications more likely in children	Symptoms • Constitutional Symptoms (Gradual Onset, High Grade Fever, Malaise, HA) • Sore Throat, Inflamed Mucosa • Unique: White Exudates, Tender Cervical Anterior LAD, Palatal Petechiae • No: Conjunctivitis, Rhinitis, Ulcers, Exanthem, GI Symptoms (D) • Young Children: N/V, Ab Pain Complications • Abscess, Otitis Media, Sinusitis, Pneumonia • Rheumatic Fever • PSGN Diagnosis • Centor Criteria: (1) F (2) NO cough (3) tonsillar exudates (4) TTP over anterior cervical LNs • Posterior Pharyngeal Swab using Rapid Strep Antigen Test (RSAT) (>85% sensitive and 95% specific, takes 10min to do, only + during acute infection) • Posterior Pharyngeal Swab Strep Culture Test (takes a long time to grow, not sensitive or specific, rarely done) • Serum Anti-Streptolysin-O (ASO) Titer Ab Test (not sure when to order this???, can be + in pts with h/o infection in past therefore good in confirming RF) • Algorithm - 0-1 Centor Criteria then no need to test and no GABHS Tx just symptomatic Tx - 2-3 Centro Criteria then confirm w/ RAST and refer below/above for management - 4 Centro Criteria than no need to test and proceed w/ GABHS Tx	Treatment • NB usually resolves spontaneously over 3d without complications nevertheless Tx is recommended • PO PCN-V 500mg TID x10d or IM PCN-G 1.2 million units x1 (NB ACE if PCN allergy) • Tonsillectomy if sleep apnea, cor pulmonale 2/2 airway obstruction, suspect malignancy, hypertrophy causing dental malocclusion, abscesses, recurrent pharyngitis (>7/yr)
Diphtheria	Agent • Corynebacterium diphtheria Epidemiology • Incubation: 2-7d • RFs: elderly, poor, immigrants (b/c of vaccine)	Symptoms • Constitutional Symptoms (Low Grade Fever) • Sore Throat • "Psuedomembrane" • "Bull Neck" Complications • CV: Myocarditis • Systemic: DIC, Shock, Thrombocytopenia • CNS: Bulbar Palsy, Polyneuritis • Death (most common cause of death of in school aged children in prevaccination era) Diagnosis • Culture of Material Beneath Membrane on Tellurite Agar revealing Metachromic Granules	Prophylaxis • <7yo: DtaP (Dt: lower amount of toxoid) • >7yo: Td (Td: higher amount of toxoid) Treatment • Antitoxin • Penicillin x14d • Erythromycin (if PCN allergy)

Mumps	Agent • Paramyxovirus Epidemiology • always benign resolving spontaneously • highly contagious w/ transmission occurring 2d before and 7d after symptoms • Incubation: 2.5wks • Duration: peaks after 2d and resolves after 5d	Symptoms • Enlarged and Painful (radiating anterior/inferiorly w/ pain at opening of Stenson's Duct) Salivary Glands (esp Parotid Gland) • Low Grade Fever Complications • Orchitis & Oophoritis (but infertility is rare) • Pancreatitis • Complete and Permanent Hearing Loss • Meningoencephalitis • Nephritis • Thyroiditis • Myocarditis • Arthritis • Mastitis • TTP Diagnosis • Elevated Amylase	Prophylaxis • MMR or just M Treatment • Nothing

Head & Neck Cancer	Epidemiology • 50k cases/yr w/ 12k deaths/yr • RFs: 1 tobacco and alcohol 2 asbestos, EBV, HPV, certain chemical, GERD? Types • Leukoplakia/Erythroplakia (white/red patch representing hyperkeratosis and is known as a pre-malignant condition) to CIS to Invasive SCC • Salivary Gland Tumors (more malignant but less frequent the smaller the gland: parotid → submandibular → minor) - Benign:Pleomorphic Adenoma, Warthin's Tumor, etc - Malignant: Acinar Cell Cancer, Adenocarcinoma, Mucoepidermoid Carcinoma, Adenoid Cystic Carcinoma, etc • Lymphomas • Melanomas • Sarcomas • Neuroendocrine Tumors	S/S • A hallmark feature is the development of a second subsequent primary cancer after the index cancer • Lesion and LAD • S/S depend on location • Staged using TNM classification • 20% have distant mets primarily to lung then liver/bone	Treatment • Variable depending on location and size but usually includes all three modalities of surgical excision w/ LND and subsequent soft tissue and bone reconstruction, chemotherapy (5-FU, cisplatin, etc) and radiation • NB these tumors over express EGFR and it is found that cetuximab (Erbitux) and anti-EGFR is effective

Abscess	Peritonsillar Abscess (b/t superior pharyngeal contrictor and tonsils)	Agent • Mixed Aerobes and Anaerobes which are usually PCN resistant RFs • inadequately treated chronic pharyngitis	Symptoms (similar to epiglottitis but slow onset) • Constitutional Symptoms (High Grade Fever, Chills, Malaise) • Severe Throat Pain • Refusal to Speak/Swallow • Odynophagia/Dysphagia → Drooling • Trismus (limited opening of mouth) • Cervical LAD • "Hot Potato" Voice • Inflamed Tonsils • Inflamed Contralaterally Displaced Uvula	Treatment • I&D • IV antibiotics based on susceptibility profile • Tonsillectomy after resolution
	Retropharyngeal (b/t pharyngeal constrictors and pre vertebral fascia)	" "	Symptoms (similar to epiglottitis but slow onset) • Constitutional Symptoms (High Grade Fever) • Severe Throat Pain • Refusal to Speak/Swallow • Odynophagia/Dysphagia → Drooling • Hyperextension of Neck Diagnosis • Lateral Neck X-ray (pre-vertebral thickening)	" "

Epiglottitis	Agent • Haemophilus influenza type B not any more b/c of immunization • GABHS • "The Big Three" Epidemiology • Age: 2-7yrs	Symptoms • Sudden Onset and Very Rapid (4-12hrs) • Constitutional Symptoms (High Grade Fever, Toxic Appearing) • Toxic Appearing (Tachycardia, Inspiratory Stridor, Tripoid Position = Hyperextended Neck, Leaning Forward, Mouth Open) • Sore Throat • "Hot Potatoe" Voice • Odynophagia/Dysphagia → Drooling • NO Cough Complication • Death Diagnosis *** MUST DX CLINICALLY IF UNSURE PROCEED W/ TESTS B/C LIFE THREATENING IN MINUTES *** • Laryngoscopy - "Red-Cherry Sign" = swollen inflamed epiglottis - Problem: can cause laryngospasm worsening obstruction therefore visualize only when in OR and prepared to intubate (never in ER with a tongue depressor) • Lateral Neck X-ray - "Thumbprint Sign" = swollen inflamed epiglottis - Thickened Aryepiglottic Folds - Obliteration of Vallecula	Prophylaxis • Hib Vaccine • Rifampin (for all close contacts) Treatment • Keep child calm b/c agitation worsens • Intubation (first thing you do b/c progression is fast) • Ceftriazone x7-10d • ICU NEVER • Epinephrine • Corticosteroids

Laryngitis	Agent • Adenovirus • Influenza • Rhinovirus	Symptoms • Hoarseness or Loss of Voice ▪ DDx: meds that dry airways, laryngeal spasm, smoking, GERD, hypoTH, laryngeal polyps, head & neck surgery or cancer, s/p extubation Diagnosis • Mirror Examination (inflammation)	Treatment • Rest Voice • Humidified Air

Tracheitis	Agent • Viral and Bacterial • Parainfluenza • Influenza • Staphylococcus aureus • "The Big Three" Epidemiology • Age: 3mo-5yrs	Symptoms • Moderate Onset and Moderately Rapid (12hrs-5d) • Consitutional Symtpoms (Low Grade Fever, Toxic Appearing) • Biphasic Stridor (b/c b/t upper/lower resp tract) • Hoarseness • Croup Like Cough w/ Copius Purulent Secretions Complications • Death Diagnosis • CXR (same as Croup or normal)	Treatment • Intubation • IV Antibiotics • ICU

"Croup" Laryngo-Tracheo-Bronchitis	Agent • Type 1,2 Parainfluenza Epidemiology • Age: 3mo-3yrs • Season: fall/winter • Time of Day: Night • Incubation: 4d • Duration: 4d RFs • Preceding URTI NB • NON-Infectious Croup aka "Spasmodic/Midnight Croup" "Laryngiusmus Striulus" • Unknown etiology • Only difference is that it lasts <1d • Tx: Mild	Symptoms • Moderate Onset and Moderately Rapid (12hrs-5d) • Constitutional Symptoms (Low Grade Fever, Agitation and Tachypnea b/c of Resp Distress) • Inspiratory Stridor and Retractions • Prolonged Inspiration • Expiratory Rhonchi/Wheezes • Hoarseness or even Aphonia • "Seal-like", "Barking-like" non Prod Cough Complications • Hypoxemia • Hypercapnia • Secondary Infections Diagnosis • CXR - "Steeple Sign" = narrowing of tracheal air column below vocal cords - "Ballooning Sign" = distention of hypopharynx during inspiration	Treatment Mild (occurs w/ exertion or at rest but w/ no distress) • Outpt • Cool Mist Therapy from a Nebulizer • Humidified O2 from Vaporizer or Hot Shower • Keep child calm b/c agitation worsens Mod (occurs at rest, retractions, toxic looking, etc.) • Same + • Inpt • 2.5% Racemic Epinephrine Nebulizer Severe (altered level of consciousness) • Same + • Inpt ICU • Intubation • Dexamethasone Nebulizer NEVER • Expectorants • Bronchodilators • Antihistamines

Bronchitis	NON Pertussis	Agent 1° Virus • Influenza • Adenovirus • Parainfluenza, • Rhinovirus • Coxsackievirus 2° Bacteria • Mycoplasma pneumonia • Chlamydia pneumonia • Streptococcus pneumonia	Symptoms • Low Grade Fever • Productive Cough	Treatment • Nothing just send pt home and if Sx cont for >1wk then give a Z-pack
	Pertussis	Agent • Bordetella pertussis Epidemiology • Age: 1-5yo • Gender: Female • Season: Summer/Fall, • Endemic but epidemic Q4yrs • Incubation: 1-2wks • Duration: ~10wks (shorter if immunized) • Decreased in incidence from 300k cases in 1930 to 1k cases in 1980 BUT INCREASING TO 10K in 2000*** • Usual source is parents who have prior mild URI that is not recognized as pertussis	Symptoms "100-day Cough" • Low Grade Fever • Catarrhal Stage (1-2wks) - mild URI ~"cold" • Paroxysmal Stage (4-6wks) - increasing paroxysms of cough w/o interventing inspiration but after a series (10-30) of coughs an inspiratory whoop occurs followed by vomiting (chin forward, tongue out, watery eyes, bulging eyes, purple face, exhausted), cyanosis, sweating • Convalescent Stage (2-3wks) - decreasing paroxysms Complications • Physical Sequlae of Forceful Coughing: Hernia, Rectal Prolapse, CNS hemorrhage, Sunconjuctival Hemorrhage • CNS: Seizures, Encephalopathy • Pulm: Hypoxia, Pneumonia Diagnosis • CXR - "Butterfly Sign" = perihilar infiltrate/edema - BUT OTHERWISE NO TRUE CXR FINDINGS • PCR/Cx of nasopharyngeal swab	Prophylaxis • Old DTP/DTwP (whole cell: contains large number of nonspecific Ags) vs. New DtaP (acellular: contains few number of specific Ags resulting in lower incidence of SEs) - 80% efficacy after 3 doses - SEs aka Precautions for Future Use: (1) local reaction (2) F (3) febrile seizure (4) prolonged crying (5) shock - Contraindication aka Do NOT Administer Next Set: (1) Anaphylaxis (2) Encephalopathy • Erythromycin for all close contacts Treatment • Erythromycin 400mmg QID x1-2wks • Respiratory Isolation until cultures negative after 5d of therapy • Admit if <3yo, apnea, cyanosis

Bronchiolitis	Agent Viral • 1° RSV (>50%) • 2° Type 3 Parainfluenza, Bacteria • Mycoplasma Epidemiology • Age: 0-2yo w/ 90% <9mo • Season: Winter/Spring • Worse in younger children • Duration: 2-3d • Incubation: 2-5d RFs • prior URTI • crowded living conditions • not being breast-fed • smoking mothers • male	Symptoms • Slow onset URTI to LRTI • Low grade fever • Respiratory Distress (Dyspnea, Tachypnea, Wheezing Stridor, Flaring, Cyanosis) • Productive Cough • Apneic Spells *** very similar to Asthma, CHF, Foreign Body, CF, Pneumonia *** Complications • Quick progression to respiratory failure • Hypoxia • Dehydration 2/2 Tachypnea • Bacteremia • Pericarditis • Cellulitis • Empyema • Meningitis • Suppurative Arthritis Diagnosis • Sputum Viral Detection via Ag detection, PCR, Culture • CXR - Hyperinflation - Atelectasis - BUT OTHERWISE NO TRUE CXR FINDINGS	Prophylaxis • palivizumab (Synagis) o Mechanism: monoclonal Ab directed against the F glycoprotein on surface of RSV o SEs: minimal • ribavirin (Virazole – Inhaled) o Mechanism: inhibits synthesis of guanine nucleotides by competitively inhibiting IMP dehydrogenase o SEs: hemolytic anemia, rash, conjunctivitis, extremely teratogenic so much that pregnant health care workers are at risk from aerosolized ribavirin • Qmo during Season for High Risk Pts Treatment • Outpt vs Inpt (O2 <92%, toxic, poor feeding, etc) • Cold Humidified O2 • Fluids b/c of r/o dehydration • Rule out asthma w/ trial of albuterol • Respiratory Isolation • Ribavirin (Virazole) • Hospitalize/Contact Isolation • Apnea Monitoring if - comorbidity - severe bronchiolitis - requiring mechanical ventilation - <6wks old NEVER • Steroids • Epinephrine