

	Acute Bronchitis (PPP vol A pg. 121)
Essentials for Diagnosis	
Pathophysiology	<p>Inflammation of the bronchi</p> <p>Commonly VIRAL— adenovirus, parainfluenza, influenza, coronavirus, rhinovirus, coxsackie, respiratory syncytial virus (RSV)</p> <p>Bacterial causes (less common)—<i>S. pneumoniae</i>, <i>H. influenzae</i>, <i>M. catarrhalis</i>, <i>mycoplasma</i></p>
Risk Factors	
Presentation	<p>COUGH</p> <ul style="list-style-type: none"> - Present for at LEAST 5 days, usually lasts 1-3 weeks <p>Dyspnea, wheezing, rhonchi</p> <p>Runny nose, low grade fever, malaise, sore throat</p> <p>HEMOPTYSIS</p>
Diagnostics	<p>CLINICAL DIAGNOSIS</p> <p>No imaging required to diagnose</p> <ul style="list-style-type: none"> - CXR usually shows normal/nonspecific
Management/Prevention	<p>Treat symptoms with fluids, antitussives, antipyretics, analgesics</p> <p>Antibiotics NOT usually indicated</p>
Prognosis/Complications	<p>The following complications occur in approximately 10% of patients with acute bronchitis</p> <ul style="list-style-type: none"> - Bacterial superinfection - Pneumonia develops in ~5% of pts with bronchitis (incidence of subsequent pna, unaffected by abx treatment) - Chronic bronchitis may develop with repeated episodes of acute bronchitis - Reactive airway disease can occur as a result of acute bronchitis - hemoptysis

	Acute Bronchiolitis (PPP vol A pg. 123, Current pg. __)
Essentials for Diagnosis	<p>Insidious onset of cough and dyspnea</p> <p>Irreversible airflow obstruction of PFT</p> <p>Minimal findings on CXR</p> <p>Risk factors: toxic fumes, viral infections, organ transplantation, connective tissue disease</p>
Pathophysiology	<p>Inflammation of bronchioles</p> <p>VIRAL: respiratory syncytial virus (RSV)</p> <p>Other viral causes: rhinovirus, adenovirus, influenza, parainfluenza</p>
Risk Factors	<p>Infants 2 months – 2 years</p> <p><6 months, exposure to cigarette smoke, lack of breastfeeding, premature birth (<37 weeks), crowded conditions</p>
Presentation	<p>Viral prodrome: fever, HA, nausea and vomiting, lethargy, myalgias</p> <ul style="list-style-type: none"> - lasts 1-2 days <p>Followed by respiratory distress</p> <ul style="list-style-type: none"> - wheezing, rales, tachypnea, nasal flaring, cyanosis, retractions
Diagnostics	<p>CLINICAL DIAGNOSIS</p> <p>PULSE OXIMETRY: single best predictor in children</p> <p>Nasal washings using monoclonal antibody testing</p> <p>No imaging needed (CXR show as nonspecific)</p>
Management/Prevention	<p><u>Management:</u></p> <p>Humidified oxygen, IV fluids, nebulized saline, cool mist humidifier, antipyretics</p> <p>If severe: mechanical ventilation may be indicated</p> <p>If immunosuppressed or hx of heart/lung disease: Ribavirin</p> <p>Meds: limited role</p> <ul style="list-style-type: none"> - beta-agonists, nebulized racemic epinephrine <p>Corticosteroids: NOT indicated unless hx of underlying reactive airway disease</p>

	<p><u>Prevention:</u> At HIGH RISK: Palivizumab and HANDWASHING</p> <ul style="list-style-type: none">- During the first year of life for children <29 weeks- Symptomatic chronic lung disease of prematurity- Coronary heart disease (CHD)- Neuromuscular difficulties, immunodeficiency
Prognosis/Complications	<p>Various complications are possible, including those caused by therapy. In most cases, the disease is mild and self-limited. However, in immunosuppressed infants and those with preexisting heart or lung disease, RSV bronchiolitis can result in any of the following:</p> <ul style="list-style-type: none">- Acute ARDS- Bronchiolitis obliterans- Congestive heart failure- Secondary infection- Myocarditis- Arrhythmias- Chronic lung disease

	Influenza (Current p. 1459- 1462)
Essentials for Diagnosis	<ul style="list-style-type: none"> - Epidemic pattern: annual epidemics usually appear in the fall or winter in temperate climates <ul style="list-style-type: none"> - Influenza epidemics affect 10-20% of the global population on average each year and are typically the result of minor antigenic variations of the virus, or antigenic drift, which occur often in influenza A virus - Onset with fever, chills, malaise, cough, coryza and myalgias - Aching, fever, and prostration out of proportion to catarrhal symptoms - Leukopenia (low WBC)
Pathophysiology	<ul style="list-style-type: none"> - Orthomyxovirus (RNA virus) - Transmission occurs primarily by droplet nuclei - There are three types of influenza viruses that can infect humans: type A (can infect a variety of mammals, divided into subtypes based on hemagglutinin (H) and neuraminidase (N) surface expression), type B, type C - Influenza causes necrosis of the respiratory epithelium, increased adherence of bacteria to infected cells, and ciliary dysfunction, which predispose to secondary bacterial infections (most common: Pneumococcal pneumonia)
Risk Factors	Elderly (> 65 years), children, immunocompromised, pregnant women
Presentation/Physical Exam	<ul style="list-style-type: none"> - Incubation period of 1-4 days - In unvaccinated persons, uncomplicated influenza has an abrupt onset - Wide range of symptoms <ul style="list-style-type: none"> - May present as nearly asymptomatic - Systemic symptoms: fever (can last 1-7 days, but usually lasts around 3-5 days), chills, HA, malaise, myalgias - Respiratory Symptoms: rhinorrhea, congestion, pharyngitis, hoarseness, nonproductive cough, substernal soreness - Children: GI symptoms may be seen with influenza B - Elderly: may present with lassitude (ie. lethargy, fatigue) and confusion, often WITHOUT fever or respiratory symptoms - Signs: <ul style="list-style-type: none"> - Mild pharyngeal injection, flushed face, conjunctival redness - Moderate enlargement of cervical lymph nodes and tracheal tenderness may be observed - The presence of fever (higher than 38.2 C) and cough during influenza season is highly predictive of influenza infection in those older than 4 years

<p>Diagnostics</p>	<ul style="list-style-type: none"> - Rapid influenza diagnostic tests <ul style="list-style-type: none"> - Nasal and throat swabs are highly widely available, highly specific, and produce fast results—however, rapid tests have low sensitivity, leading to a high number of false-negative results - Viral cultures - When influenza pneumonia is suspected, lower respiratory tract specimens (swabs/cultures) should be collected and tested for influenza viruses (RT-PCR commonly used)
<p>Management/Prevention</p>	<ul style="list-style-type: none"> - Management: <ul style="list-style-type: none"> - Treatment for healthy individuals is supportive - Treatment for individuals at risk for developing complications with either a suggestive clinical presentation or lab-confirmed influenza: antivirals - Maximum benefit of antivirals is expected with earliest initiation of therapy (within first 48 hours of onset of symptoms), although benefit has been noted up to 4-5 days into illness - Three neuraminidase inhibitors used for treatment of influenza A and B: oral oseltamivir, inhaled zanamivir, IV peramivir - * Oral Oseltamivir: drug of choice for patients of any age, pregnant women, and patients who are hospitalized or have complicated infection; dosage—75 mg twice daily for 5 days - Inhaled Zanamivir: indicated for uncomplicated acute influenza in patients 7 years and older, contraindicated for individuals with asthma d/t risk of bronchospasm, lacks efficacy in presence of PNA infection; dosage—10 mg, 2 inhalations twice daily for 5 days - IV Peramivir: used for outpatient treatment of uncomplicated infection in patients 18 years or older, recommended when there is concern about inadequate oral absorption of oseltamivir - Prevention: <ul style="list-style-type: none"> - Vaccines, chemoprophylaxis, hand washing and surgical masks, isolation - Annual administration of influenza vaccine is the most effective measure for preventing influenza and its complications <ul style="list-style-type: none"> - Vaccination is emphasized for high-risk groups and their contacts and caregivers - Three vaccine forms: inactivated influenza vaccines, recombinant vaccines (recombinant is only flu vaccine completely egg free, safe for those with egg allergy), and live attenuated influenza vaccine - > 18 years, pregnant or not, can receive any of the vaccines (with few exceptions) - Elderly patients should only receive high-dose inactivated (trivalent) vaccine, usually with either hemagglutinin or an adjuvant to enhance the immune response to the vaccine

	<ul style="list-style-type: none"> - Take precautions if pediatric patient presents with Guillan-Barre syndrome 6 weeks after inoculation - When an antiviral chemoprophylaxis is used, it prevents 70-90% of influenza infections <ul style="list-style-type: none"> - Not recommended: prior to viral exposure to prevent development of resistance, after 48 hours after exposure - May be recommended: patients exposed to an infected pt within two weeks of vaccination at increased risk for complications from infection, low response to vaccine d/t immunosuppression after an exposure, those with contraindication to vaccine (severe allergic rxn to flu), prevention of infection in residents of institutions during an outbreak - Hand hygiene and surgical masks are found to be effective in preventing the transmission of flu to un-infected individuals in the home if worn within 36 hours of onset of symptoms - Isolation (droplet) precautions should be maintained until 7 days after symptom onset or 24 hours following symptom resolution (whichever is longer) <ul style="list-style-type: none"> - N95 masks should be worn for aerosol-generating procedures - When to Admit: <ul style="list-style-type: none"> - Limited availability of supporting services - PNA or decreased O2 saturation - Changes in mental status - Consider with pregnancy
<p>Prognosis/Complications</p>	<ul style="list-style-type: none"> - Prognosis: <ul style="list-style-type: none"> - Healthy, nonelderly adults: duration of uncomplicated illness is 1-7 days, excellent prognosis - Mortality among adults hospitalized with influenza ranges from 4-8%, although higher mortality may be seen during pandemics and among immunocompromised individuals - If fever recurs or persists > 4 days with productive cough and WBC count > 10,000/mcL, secondary bacterial infection should be suspected - Complications: <ul style="list-style-type: none"> - Hospitalization or ICU admission for influenza is often a consequence of diffuse viral pneumonitis with severe hypoxemia and sometimes shock - Individuals with asthma, residents of nursing homes/long-term care facilities, adults aged over 65 years, morbidly obese, and persons with underlying medical conditions are at higher risk for complications - Infection during pregnancy increases the risk of hospitalization, may be associated with severe illness, sepsis, PTX/ respiratory failure, spontaneous abortion, preterm labor, fetal distress

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| | <ul style="list-style-type: none">- Cardiovascular diseases are a complication of influenza infection, especially among older adults (influenza is postulated to be a significant trigger for MI, cerebrovascular disease, and sudden death)- Neurologic complications, including seizures and encephalopathy, may occur, although more rare- <i>Reye Syndrome</i> is a rare and severe complication of influenza (usually type B) in young children that causes rapidly progressive hepatic failure and encephalopathy—there is a 30% mortality rate; this syndrome is associated with aspirin use in the management of viral infections |
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	Upper Respiratory Infection (URI)
Essentials for Diagnosis	
Pathophysiology	<p>Rhinovirus causes 60% of URI cases</p> <ul style="list-style-type: none"> - $R_0 = 6$ - Case fatality = 0 <p>Many other organisms can cause URI</p> <p>Transmission via direct contact</p> <ul style="list-style-type: none"> - Droplet spread - Aerosolized via cough/sneeze - Contact with tissues - Contact with fomites
Risk Factors	<p>Younger populations</p> <p>Large group contact</p> <p>Immunocompromised, stress, malnutrition</p> <p>Smoking, second-hand smoke</p> <p>Anatomic changes, facial dysmorphism, upper airway trauma, nasal polyposis</p>
Presentation	<p>Non-specific Presentation</p> <ul style="list-style-type: none"> - Cough, sneezing, swollen nares (congestion), increase in mucus production (rhinorrhea) <p>Presentation in children: may present with fever, wheezing, loss of appetite, fussiness, drowsiness, dehydration</p> <p>Vital signs:</p> <ul style="list-style-type: none"> - High temp, high HR, high RR, either high or low BP
Diagnostics	<p>Diagnosis is usually based on signs, symptoms, and physical exam findings</p> <p>Diagnostic tests for specific organisms are ordered ONLY when therapy depends on results</p>
Management/Prevention	<p><u>Management:</u></p> <p>General treatment</p> <ul style="list-style-type: none"> - “There is no cure for the common cold” - Reassurance - Education - Instructions for symptomatic home treatment - Antibiotics are CONTRAINDICATED for the common cold

Treatment for congestion and rhinorrhea

- Saline drops or spray
- Humidification
- OTC nasal decongestant or oral product
- Bedtime 1st gen antihistamine

Treatment for aches

- Warm showers or baths (reduce aching)
- OTC analgesic prn for pain

Treatment for fever

- NSAID or antipyretic
- **NO aspirin in children** (REYES syndrome)

Treatment for sore throat

- Saline gargles every 4 hours
- Local anesthetic sprays or lozenges (small tablet)

Treatment for cough:

- Dextromethorphan or guaifenesin may help
- Local anesthetic sprays or lozenges

Prevention:

Avoid close contacts, avoid touching mucous membranes, cover your nose while sneezing, dispose of dirty tissues, wash your hands, social distancing (basically, don't be a dirty hoe)

Treatment of complications:

Rhinosinusitis

- Symptomatic management
- Radiology if complications are suspected (meningitis, orbital cellulitis, intracranial abscess)
- Amoxicillin for severe or uncomplicated rhinosinusitis

Pharyngitis

- Throat culture for unimproved pts
- Use Centor score for pharyngitis/tonsillitis (absence of cough, anterior cervical lymphadenopathy, fever, tonsillar erythema or exudates, age)

Croup (Laryngotracheobronchitis)

- Steeple sign on CXR, inspiratory stridor
- Corticosteroids
- Nebulized epinephrine +/- cool mist nebulized saline

	<p>Epiglottitis</p> <ul style="list-style-type: none"> - Thumb sign on lateral CXR - Don't examine the throat - Position for comfort - Have ETT/trach tube available if needed - Cool mist humidification - Oxygen - IV fluids - Antibiotics <p>Laryngitis</p> <ul style="list-style-type: none"> - Inhale humidified air to help clear secretions and exudate - Rest voice <p>Bronchiolitis and RSV</p> <ul style="list-style-type: none"> - Symptomatic treatment <p>Bronchitis</p> <ul style="list-style-type: none"> - Symptomatic treatment
Prognosis/Complications	<p>RED FLAGS</p> <ul style="list-style-type: none"> - Temp >100.4 F - Dyspnea or chest pain - Underlying chronic cardiopulmonary disease - Age <9 months or frail/elderly - Worsening/unresponsive to OTC medications - New symptoms suggesting complications <p><u>Complications:</u> Initial infection may spread to adjacent structures</p> <ul style="list-style-type: none"> - Sinusitis, otitis media, epiglottitis, laryngitis, tracheitis, bronchitis, pneumonia <p><u>Prognosis:</u> Typically mild and self-limited without sequelae</p> <p>Immunocompromised, elderly, and infants are more likely to have lethal complications</p>

	Acute Epiglottitis (PPP pg. 124, Current pg. __)
Essentials for Diagnosis	
Pathophysiology	<p><i>Haemophilus influenzae</i> causes infection in unvaccinated populations</p> <p><i>Streptococcal</i> species, <i>Staphylococcus aureus</i></p> <p>Cocaine use</p>
Risk Factors	Unvaccinated, cocaine use, diabetics
Presentation	<p>The “3 D’s”— dysphagia, drooling, distress</p> <p>Odynophagia out of proportion to apparently minimal oropharyngeal findings or rapidly developing sore throat</p> <p>Fever, inspiratory stridor, dyspnea, hoarseness, muffled “hot potato” voice, tripodding</p> <p>Cherry red epiglottitis with swelling</p>
Diagnostics	<p>Laryngoscopy</p> <p>Soft tissue lateral cervical radiographs: thumb or thumbprint sign (swollen, enlarged epiglottitis)</p>
Management/Prevention	<p><u>Management:</u></p> <p>Maintain clear airway</p> <p>Keep the patient calm</p> <p>Continuous monitoring of O2 saturation</p> <p>Dexamethasone for airway edema</p> <p>Hospitalization with IV abx</p> <ul style="list-style-type: none"> - Second or third gen cephalosporin - Penicillin, ampicillin, or anti-staphylococcal coverage may be added <p>Corticosteroids: taper use as signs and symptoms resolve</p> <p>Indication to intubate</p> <ul style="list-style-type: none"> - Dyspnea, rapid pace of sore throat where airway may close before effects of abx or corticosteroids kick in, endolaryngeal abscess on CT

	<p>10 day course of abx may be appropriate</p> <p><u>Prevention:</u> Rifampin given to all close contacts (prophylaxis)</p> <p>Hib vaccine</p>
<p>Prognosis/Complications</p>	<p><u>Prognosis:</u> Prognosis of adults with acute epiglottitis is good with appropriate and timely treatment. Most pts can be extubated within several days.</p> <p>Unrecognized epiglottitis may rapidly lead to airway compromise and resultant death</p> <p><u>Complications:</u> Meningitis, epiglottic abscess, cervical adenitis, vocal granuloma, subsequent necrotizing fasciitis of the head and neck (rare), cartilaginous metaplasia of the epiglottis, pna, pulmonary edema, empyema, ptx, pneumomediastinum (rare), pericarditis, septic arthritis, cellulitis, septic shock, death (via asphyxiation)</p>

	Pertussis (PPP pg. 122, Current pg. __)
Essentials for Diagnosis	<p>Predominately in pts <2 years (adolescents/adults are reservoirs)</p> <p>2 week prodromal catarrhal stage of malaise, cough, coryza, and anorexia</p> <p>Paroxysmal cough ending in a high-pitched inspiratory “whoop”</p> <p>Absolute lymphocytosis, culture confirms diagnosis</p>
Pathophysiology	<p><i>Bordetella pertussis</i> transmitted via respiratory droplets</p> <p>Incubation period of 7-17 days</p>
Risk Factors	Age less than 2 years
Presentation	<p>Time span of 6 weeks with 3 phases</p> <ol style="list-style-type: none"> Catarrhal stage (1-2 weeks): insidious onset, with lacrimation, sneezing, coryza, anorexia, malaise, and a hacking night cough that becomes diurnal Most contagious during this stage Paroxysmal stage (2-4 weeks): bursts of rapid, consecutive coughs, followed by a deep, high-pitched inspiration “whoop,” may have a post-cough emesis Convalescent stage: 4-6 weeks after onset of illness with a decrease in function and severity of paroxysms of cough <p>Lymphocytosis: WBC is usually 15,000-20,000 mcL with 60-80% lymphocytes</p> <p>Cough lasting more than 2 weeks in adults is suggestive of illness</p>
Diagnostics	<p>Isolation of organism from nasopharyngeal PCR or throat culture</p> <ul style="list-style-type: none"> Bordet-Gengou agar medium for throat culture: most sensitive during first 2 weeks of illness PCR assays for nasopharyngeal swab: sensitive up to 4 weeks of illness
Management/Prevention	<p><u>Management:</u> Supportive: oxygenation, nebulizers, mechanical ventilation as needed</p> <p>Antibiotic Treatment: macrolides</p> <ul style="list-style-type: none"> Erythromycin: 500 mg 4x/day orally for 7 days Azithromycin: 500 mg orally 1 day and 250 mg for next 4 days <ul style="list-style-type: none"> Better tolerated, and preferred treatment if pt < 1 month Clarithromycin: 500 mg orally 2x/day for 7 days Trimethoprim-sulfamethoxazole: 160 mg – 800 mg orally 2x/day for 7 days

	<p>Treatment shortens the duration of carriage and may diminish the severity of coughing paroxysms</p> <p><u>Prevention:</u> Acellular pertussis vaccine</p> <ul style="list-style-type: none"> - 5 doses of DTaP at 2 months, 4 months, 6 months, 15-18 months, and 4-6 years - Recommended for all infants - Combined with diphtheria and tetanus (DTaP) - Booster recommended to adolescents and adults (11-18 years) - Booter recommended during each pregnancy (during 27- 36 weeks gestation) <p>Antibiotics</p> <ul style="list-style-type: none"> - Same antibiotic regimen recommended for those in contact with an active case of pertussis, where exposure to the active case occurs within 3 weeks of the onset of the active case's cough
Prognosis/Complications	<p><u>Prognosis:</u> Mortality increases in infants due to apnea/cerebral hypoxia</p> <p><u>Complications:</u> Pneumonia, encephalopathy, otitis media, sinusitis, and seizures</p>

	Croup (PPP pg. 125)
Essentials for Diagnosis	Inflammation of the larynx and subglottic airway
Pathophysiology	Parainfluenza virus type I , RSV (2 nd), adenovirus and rhinovirus
Risk Factors	6 months – 6 years, especially during the fall and winter seasons
Presentation	<p>Harsh “seal bark” cough</p> <ul style="list-style-type: none"> - Especially noticeable in infants and young children <p>Inspiratory stridor and hoarseness</p> <ul style="list-style-type: none"> - More notable in older children and adults <p>URI symptoms: HA, malaise, sore throat, runny nose, low-grade fever</p> <p>Significant airway obstruction and respiratory distress</p>
Diagnostics	<p>CLINICAL diagnosis</p> <ul style="list-style-type: none"> - Once epiglottitis and foreign body aspiration are ruled out <p>Frontal cervical radiograph (CXR): steep sign (subglottic narrowing of airway)</p>
Management/Prevention	<p><u>Management:</u></p> <p>MILD: no stridor at rest, no respiratory distress</p> <ul style="list-style-type: none"> - Supportive: O2 therapy is <92% - Dexamethasone (provides relief after 6 hours of single dose) - Discharge following intervention <p>MODERATE: stridor at rest with mild to moderate retractions</p> <ul style="list-style-type: none"> - Supportive: O2 therapy if <92% - Dexamethasone (provides relief after 6 hours of single dose) - Nebulized epinephrine - Observe for 3-4 hours after intervention <p>SEVERE: stridor at rest with marked retractions</p> <ul style="list-style-type: none"> - Supportive: O2 therapy if <92% - Dexamethasone (provides release after 6 hours of single dose) - Nebulized epinephrine - Hospitalization

	<p><u>Prevention:</u> Handwashing!</p>
Prognosis/Complications	<p><u>Prognosis:</u> Children: most children have an excellent prognosis</p> <p>Most cases can be managed with outpatient care; fewer than 2% of patients require hospitalization</p> <p>The use of nebulized epinephrine and steroids has markedly lowered the need to intubate many patients</p> <p><u>Complications:</u> Complications are rare but can occur in some cases</p> <ul style="list-style-type: none">- Hospitalization, secondary bacterial infection, ptx, otitis media, dehydration, lymphadenitis