

**PERTUSSIS:**

**OVERVIEW:**

- “Whooping cough”
- Bacteria remain on the surface of airways
  - > Do not invade the tissues
- Spread by cough and nasal droplets
- Bacteria produces toxins which paralyze respiratory cell cilia
  - > Can cause other infections

**RISK FACTORS:**

- Contact with nasal or oral droplets from another human with pertussis
- Non-immunized
- Outbreaks every 3-5 years
- Regardless of climate, geographic, location, etc...
- “Equal opportunist”
- Infants most susceptible to severe disease

**COMMON PATHOGENS:**

- Bordetella pertussis: aerobic gram-negative coccobacillus
  - > Humans are the only host
  - > Endemic worldwide

**SIGNS & SYMPTOMS:**

- Catarrhal stage: 1-2 weeks
  - Runny nose
  - Sneezing
  - Low-grade fever
  - Mild cough
- Paroxysmal stage: 1-6 weeks
  - Bursts of coughs
  - Thick mucus
  - Long inspiratory effort (high-pitched whoop)
  - Vomiting
  - Exhaustion
  - *Appears normal between attacks*
- Convalescent stage: 2-3 weeks
  - Gradual recovery

**COMPLICATIONS:**

- Bacteria pneumonia
- Seizures
- Encephalopathy
- 12% mortality in infants < 6 months old

NOTE: in adults & older children pertussis usually not serious → they can give it to younger children (so still vaccinate)

**PHARMACOTHERAPY:**

- Antibiotics
  - Incubation/catarrhal stage: may prevent or minimize severity
  - Paroxysmal phase: decreased transmission to others
    - > Does not affect duration of pertussis or severity of disease
- Diphenhydramine or salbutamol: *no change* in cough episodes
- Pertussis immunoglobulin: decrease in whoops per day -3.1

**VACCINATIONS:** DtaP (diphtheria, tetanus, acellular pertussis)

- Effectiveness: approx. 85%, wanes over 6-12 years
  - > Q10 booster
- Dose: 0.5 mL IM

**PROPHALYXIS USING ANTIBIOTICS (MACROLIDES):**

1. Direct contacts prior to them developing S/S
  - > Does not change course of disease within a community if there is an outbreak
  - > Direct contact = face-to-face exposure for ≥ 5 min; shared confined space in close proximity (household, office) for ≥ 1 hr; respiratory/oral/nasal secretion exposure (kissing, coughed/sneezed upon)
2. Vulnerable persons
  - a. Infants < 2 months of age
  - b. Infants < 12 months (depending on comorbidities & vaccination status)
  - c. Pregnant women in 3<sup>rd</sup> trimester (azithromycin or erythromycin)

	Child	Adult
Azithromycin	<u>Infant &lt; 6 mo</u> : 10 mg/kg PO daily x 5 days  Child: 10 mg/kg PO x 1, then 5 mg/kg PO daily x 4 days	500 mg PO x 1 then 250 mg PO daily
Clarithromycin	7.5 mg/kg PO BID x 7 days	500 mg PO BID x 7 days
Erythromycin	10 mg/kg PO QID x 7 days	500 mg PO QID x 7 days
TMP/SMX (ALLERGY)	5 mg/kg TMP PO BID x 10 days	1 DS tab PO BID x 10 days

**CROUP:**

**OVERVIEW:**

- Laryngotracheobronchitis
- Common cause of upper airway obstruction in children
- Most common children < 6 years

**RISK FACTORS:**

- Late fall – early winter
- Age: 3 months to 3 years
- Boys > girls

**NON-PHARM MANAGEMENT:**

- Keep child calm (stress closes airways even more)
- Cold air: reduces inflammation

**PREVENTION:**

- Avoid exposure to respiratory viruses
- Handwashing
- Cover mouth when coughing

**COMMON PATHOGENS: VIRUSES**

- Parainfluenzae virus types 1 & 3
- Influenza A & B
- Adenovirus
- Respiratory syncytial virus (RSV)
- Humanmetapneumovirus
- Coronavirus

Mycoplasma: swabs show it's there but doesn't contribute to croup

**S/S:**

- Cough: seal-like barking cough
- Rhinorrhea
- Fever
- Symptoms worsen at night
- Inspiratory stridor (as worsen, also on expiratory)
- Chest wall retractions
- Xray: steeple sign (narrowing into a point/ tip)
  - > Problem in children since they already have smaller airways
- Respiratory failure

**PHARMACOTHERAPY:**

	Effects	Effectiveness/Safety
Corticosteroids <ul style="list-style-type: none"> <li>• Dexamethasone 0.6 mg/kg PO x 1 dose</li> <li>• Can be given IV (same dose)</li> </ul>	Reduce: <ul style="list-style-type: none"> <li>• Intubations</li> <li>• Duration of intubation</li> <li>• Need for re-intubation</li> <li>• Hospital admission</li> <li>• Hospital length of stay</li> <li>• Rate of return to HCP because of persistent sx</li> </ul> Relieve sx within 2-3 hours	<ul style="list-style-type: none"> <li>• Lower doses have some effectiveness</li> <li>• 0.6 mg/kg greatest effectiveness in majority of patients regardless of severity</li> </ul>
Budesonide 2 mg inh via nebulizer x 1 dose		<ul style="list-style-type: none"> <li>• Effective &amp; equivalent to systemic dexamethasone</li> <li>• Routine use limited by cost</li> </ul>
Epinephrine 5 mg inh via nebulizer	<ul style="list-style-type: none"> <li>• Reduces need for intubation</li> <li>• Reduces respiratory distress                             <ul style="list-style-type: none"> <li>○ Onset: 10 mins</li> <li>○ Duration: 1-2 h</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Tachycardia</li> <li>• Short-term effects                             <ul style="list-style-type: none"> <li>&gt; Sx management rather than txt</li> </ul> </li> </ul>

**BRONCHIOLITIS:**

**OVERVIEW:**

- Most common reason for admission to hospital for infants < 1 year old
- LOWER respiratory tract infxn
- Obstruction of small airways
  - Acute inflammation
  - Edema
  - Necrosis of epithelial cells
  - Increased mucus

**RISK FACTORS:**

- Age < 1 year
- Ex-prem (born < 35 weeks CGA)
- Congenital cardiac disease
- Chronic pulmonary disease
- Immunodeficiency
- Winter and spring
- Viral URTI

**COMMON PATHOGENS:** viruses (multiple at once)

- RSV
- Human metapneumovirus (HMPV)
- Influenza A & B
- Rhinovirus
- Adenovirus
- Parainfluenza

**S/S:**

- Viral prodrome: fever, cough, rhinorrhea
- Decreased feeding
- ↑ RR, wheeze, crackles
- Respiratory distress
  - Grunting
  - Nasal flaring
  - Indrawing
  - Retractions
  - Abdominal breathing

**MONITORING:**

- Respiratory isolation
- Continuous vital signs (RR, O<sub>2</sub> sat, HR, BP)
- Temperature q4h
- Lethargy, agitation
- Chest auscultation at least q4h
- Apnea monitoring if severe
- Hydration status (ins & outs)

**PHARMACOTHERAPY:**

- Self-limiting disease: lasts > 21 days; peaks around days 8-10
- Supportive care

Oxygen	<ul style="list-style-type: none"> <li>• If O<sub>2</sub> sat &lt; 90%</li> </ul>
Epinephrine – inhaled	<ul style="list-style-type: none"> <li>• Small reduction in hospital admissions if given in ED</li> <li>• Inadequate data for routine use to change outcomes</li> <li>• Used for bronchodilation, increase cardiac output &amp; BP</li> </ul>
3% NaCl – inhaled	<ul style="list-style-type: none"> <li>• MOA: increased mucociliary clearance &amp; rehydration of airway</li> <li>• Variable effectiveness in studies</li> <li>• Optimal dose &amp; duration unknown</li> <li>• No evidence for outpatient use</li> <li>• Controversial</li> </ul>
Not recommended	<ul style="list-style-type: none"> <li>• Salbutamol</li> <li>• Corticosteroids</li> <li>• Antibiotics</li> <li>• Antivirals EXCEPT oseltamivir (for influenza A &amp; B)</li> </ul>

**PREVENTION:**

- Handwashing
- Avoid exposure to others with URTI
- Breastfeeding

**PALIVIZUMAB:**

- Monoclonal antibody against RSV
  - Immunoprophylaxis: passive immunity
    - > Not a vaccine
    - > Cost ++++
  - Season changes annually
    - > Nov 14, 2016 to Mar 31, 2017
  - Dose: 15 mg/kg IM monthly x 3-4 doses
- > Decreased hospitalizations from RSV (NNT = 16-20)
- > No evidence that prevents mechanical ventilation or death