ACUTE RESPIRATORY ILLNESS RECOGNITION & MANAGEMENT

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Review common pediatric acute respiratory conditions with a focus on recognition of warning signs of worsening illness and general management principles

- Croup
- Community Acquired Pneumonia
- Acute Bronchiolitis
- Asthma Exacerbation
Croup
Croup - Epidemiology

- Most common in the fall and winter months
- More common in males
- Most common age group: 6 – 36 months
- ED / Hospital Statistics:
  - Most commonly seen in the ED 10PM – 4AM\(^1\)
  - Approx 5.6% of ED visits for croup result in admission to the hospital\(^2\)
Inflammation of the Larynx and Sub-glottic airway

Presenting Symptoms:
- Runny nose and congestion
- Fevers
- Hoarse voice
- Inspiratory Stridor
- ‘Barky’ Cough

Etiology
- Viral (parainfluenza virus)
Fever: The absence of fever is suggestive of spasmodic croup or a noninfectious etiology (foreign body aspiration).

Hoarseness and barking cough: typically absent in children with acute epiglottitis and foreign body.

Drooling: Drooling and dysphagia may occur in children with peritonsillar or retropharyngeal abscesses and epiglottitis, & foreign body.
Croup – Exam / Differential Dx

- **Overall appearance:** Is the child comfortable and interactive, anxious and quiet, or obtunded? What is the position of the child?

- **Voice Quality:**
  - Does the child have a hoarse or diminished cry?
  - Is the voice muffled (concern for epiglottis, retropharyngeal or peritonsillar abscess)?
  - If there is stridor, is it present at rest or only with agitation (Stridor at rest is a sign of significant upper airway obstruction)?

- **Lung examination:**
  - Is there respiratory distress?
  - Are there abnormal respiratory sounds during inspiration or expiration (crackles, wheezing, etc.)?
Croup – Emergent Management

- Early Identification of risk factors for respiratory arrest:
  - Fatigue and listlessness
  - Marked retractions and stridor at rest
  - Decreased or absent breath sounds
  - Depressed level of consciousness
  - Tachycardia out of proportion to fever
  - Cyanosis / Hypoxemia

- Intubation required in less than 1% of children with croup\(^4\)
Croup - Treatment Options

- Conservative cares: Cool or warm mist humidifier, steamy shower, cool night air
- Medications:
  - Dexamethasone 0.6mg/kg (PO or IM)
  - Prednisolone 1mg/kg every 12 hours
  - Racemic Epinephrine (0.05mL/kg/dose) every 1-2 hours as needed
Acute Epiglottitis

- High fever, sore throat, dyspnea, and rapidly progressive airway obstruction
- Exam: Toxic appearance, drooling, and labored breathing; may assume a ‘tripod’ position
  - Barky cough is rare
- *H. influenzae* type B
- X-ray may show the ‘thumb sign’
- Treatment is emergent airway stabilization
  - Avoid traumatic procedures if possible until the airway is stabilized
Peritonsillar Abscess

- Typically seen in adolescents with recent history of a throat infection
- History: sore throat, fever, trismus, and dysphagia
- Exam: asymmetric tonsillar bulge with displacement of the Uvula
- CT scan helpful in making the diagnosis
- Treatment: Antibiotics and surgical drainage
Retropharyngeal Abscess

- History: Fever, irritability, decreased PO intake, and drooling; sore throat and neck pain
- Exam: Neck stiffness, torticollis, cervical lymphadenopathy, bulging posterior pharynx
- CT scan helpful in diagnosis
- Treatment is IV antibiotics and surgical drainage
Community Acquired Pneumonia
Common Presenting Symptoms:
- Preceding Upper Respiratory Infection
- Fever
- Cough
- Chest Discomfort
- Abdominal Pain
- Labored Breathing
Clinical features of *S. pneumonia* infection\(^5\)

- Fever: 90%
- Cough: 70%; productive cough: 10%
- Tachypnea: 50%
- Malaise/lethargy: 45%
- Emesis: 43%
- Hypoxemia (oxygen saturation ≤95 percent): 50%
- Decreased breath sounds: 55%
- Crackles: 40%
CXR PA and Lateral Views
- Focal Infiltrate, Effusion
- May lag behind clinical findings

Blood Tests
- CBC
- Acute Phase Reactants

Microbiology:
- Blood culture (yield of approx 10%)
- Serologic studies
CAP – Admission Guidelines

- Hypoxemia (oxygen saturation <90% on room air)
- Dehydration
- Moderate to severe respiratory distress: Tachypnea, retractions, nasal flaring, difficulty breathing, apnea, grunting
- Toxic appearance
- Underlying conditions that may predispose to a more serious course of pneumonia
  - Cardiovascular disease, immune compromise, chronic medical conditions
- Presence of CAP complications (effusion/empyema)
- Suspicion or confirmation that CAP is due to a pathogen with increased virulence, such as *Staphylococcus aureus* or Group A *Streptococcus*
- Failure of outpatient therapy (worsening or no response in 48 to 72 hours)
Supportive cares

Antibiotic therapy
  • PO for outpatient cases
  • IV for inpatient cases

Fluid Management

Oxygen Supplementation
Acute Bronchiolitis
Bronchiolitis

- A syndrome of upper respiratory and lower respiratory tract infection
  - Typically viral (RSV)
  - Rarely atypical bacterial (Mycoplasma)
  - Typically presents in children < 2 years of age, during the winter months
  - Lower respiratory symptoms peak at 4-7 days

- At risk groups:
  - Younger age, chronic lung or cardiac disease / medical conditions, prematurity
Bronchiolitis - Presentation

- History
  - Preceding viral URI symptoms with acute worsening
  - Runny nose & congestion – clear and copious
  - Productive sounding coughing
  - Labored breathing
  - Decreased appetite
  - Fevers
  - Vomiting, loose stools
Bronchiolitis - Presentation

- Physical Exam
  - Ill appearance - ? Toxic appearance
  - Runny nose and congestion
  - Coarse breath sounds, +/- wheezing
  - ? Retractions / Work of Breathing
  - ? Signs/symptoms of dehydration
Bronchiolitis – Considerations for Hospital Admission

- Persistently increased respiratory effort
  - Tachypnea, nasal flaring, intercostal/subcostal/suprasternal retractions; accessory muscle use, grunting
- Hypoxemia (SpO₂ <90% on room air);
  - SpO₂ should be interpreted in the context of other clinical signs and the state of the patient (e.g. awake vs. asleep)
- Apnea / Acute respiratory failure
- Dehydration
- Family reliability / situation
Bronchiolitis - Treatment

- Supportive cares:
  - Upright positioning, nasal saline / suctioning, humidified air, fluid management, Tylenol/Motrin

- Medications:
  - Tylenol / Motrin for symptomatic relief
  - Albuterol / Racemic Epinephrine
  - Steroids generally not indicated
  - Hypertonic Saline
  - Antibiotics generally not indicated
Reactive Airway Disease
Reactive Airway Disease

- Pathophysiology:
  - Brochospasm
  - Chronic Airway Inflammation
Suspected cause of the exacerbation

The time of onset of exacerbation

Current medications

Recent use of beta agonists (dose and frequency) and/or systemic glucocorticoids

Risk factors for severe, uncontrolled disease, such as emergency department (ED) visits, hospital and intensive care unit admissions, repeated courses of oral glucocorticoids, and history of intubation, rapidly progressive episodes, or known allergic triggers.
Vital signs and pulse oximetry
Assessment of level of consciousness, anxiety, and agitation
Assessment of breathlessness, wheezing, air entry, accessory muscle use, and retractions
Measurement of Peak Flow Rate?
Response to bronchodilatory therapy?
Various Scores have been developed:

- PRAM (Pediatric Respiratory Assessment Measure)
- PIS (Pulmonary Index Score)
- PASS (Pediatric Asthma Severity Score)
- RAD (Score based on Respiratory Rate, Accessory muscle Use, and Decreased breath sounds)
Albuterol, Levalbuterol (Short-Acting Beta Agonist)
Ipratropium (Anti-cholinergic agent)
Corticosteroid (IM / IV, or PO)
  - Prednisone, Dexamethsone, Methylprednisolone
Fluid management?
Lack of prolonged response to bronchodilators
Persistent hypoxemia on room air
Dehydration
Reliability of family / follow-up


