Bronchiolitis Guidelines 2014

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Disclosures

- We have no financial relationships with the manufacturers of any commercial products and/or providers of commercial services discussed in this CME activity.
Objectives

- Review the most recent Bronchiolitis Guidelines based on "Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis" published in Pediatrics on 10/27/14
- Discuss the updated "Bronchiolitis Protocol" for all patients admitted to ACH
- Q&A session with the experts:
  - Dr. Akhter (Peds Pulm)
  - Dr. Dharia (Peds Pulm)
  - Dr. Collins (Peds ID, Gen Peds)
  - Dr. Schroeder (Peds ER)
Methods

- June 2013 subcommittee formed to review/revise 2006 guidelines with Key Action Statements (KAS)
  - Subcommittee: general pediatricians, family physician, pediatric hospitalists, pulmonologists, emergency physicians, pediatric infectious disease physicians
  - Literature review 2004 – May 2014

- Inclusion criteria: children 1 month – 23 months

- Exclusion criteria: h/o immunodeficiency, underlying respiratory illnesses, neuromuscular disease, cystic fibrosis, congenital heart disease
 Methods

- “The clinical practice guidelines is not intended as a sole source of guidance in the management of children with bronchiolitis. Rather, it is intended to assist clinicians in decision-making. It is not intended to replace clinic judgment or establish a protocol for the care of all children with bronchiolitis. These recommendations may not provide the only appropriate approach to the management of children with bronchiolitis.”

 Guidelines NOT Mandates!!!
Classifying Recommendations

<table>
<thead>
<tr>
<th>AGGREGATE EVIDENCE QUALITY</th>
<th>BENEFIT OR HARM PREDOMINATES</th>
<th>BENEFIT AND HARM BALANCED</th>
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<tbody>
<tr>
<td>LEVEL A</td>
<td>STRONG RECOMMENDATION</td>
<td>WEAK RECOMMENDATION</td>
</tr>
<tr>
<td>Intervention: Well designed and conducted trials, meta-analyses on applicable populations. Diagnosis: Independent gold standard studies of applicable populations.</td>
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<tr>
<td>LEVEL B</td>
<td>MODERATE RECOMMENDATION</td>
<td>WEAK RECOMMENDATION (based on balance of benefit and harm)</td>
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<tr>
<td>Trials or diagnostic studies with minor limitations; consistent findings from multiple observational studies.</td>
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<tr>
<td>LEVEL C</td>
<td>WEAK RECOMMENDATION (based on low quality evidence)</td>
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<tr>
<td>Single or few observational studies or multiple studies with inconsistent findings or major limitations.</td>
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<tr>
<td>LEVEL D</td>
<td>No recommendation may be made.</td>
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<tr>
<td>Expert opinion, case reports, reasoning from first principles.</td>
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<tr>
<td>LEVEL X</td>
<td>STRONG RECOMMENDATION</td>
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<tr>
<td>Exceptional situations where validating studies cannot be performed and there is a clear preponderance of benefit or harm.</td>
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**Recommendation Implications**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Definition</th>
<th>Implication</th>
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<tbody>
<tr>
<td>Strong recommendation</td>
<td>A particular action is favored because anticipated benefits clearly exceed harms (or vice versa), and quality of evidence is excellent or unobtainable.</td>
<td>Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present.</td>
</tr>
<tr>
<td>Moderate recommendation</td>
<td>A particular action is favored because anticipated benefits clearly exceed harms (or vice versa), and the quality of evidence is good but not excellent (or is unobtainable).</td>
<td>Clinicians would be prudent to follow a moderate recommendation but should remain alert to new information and sensitive to patient preferences.</td>
</tr>
<tr>
<td>Weak recommendation (based on low-quality evidence)</td>
<td>A particular action is favored because anticipated benefits clearly exceed harms (or vice versa), but the quality of evidence is weak.</td>
<td>Clinicians would be prudent to follow a weak recommendation but should remain alert to new information and very sensitive to patient preferences.</td>
</tr>
<tr>
<td>Weak recommendation (based on balance of benefits and harms)</td>
<td>Weak recommendation is provided when the aggregate database shows evidence of both benefit and harm that appear similar in magnitude for any available courses of action.</td>
<td>Clinicians should consider the options in their decision making, but patient preference may have a substantial role.</td>
</tr>
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</table>
Diagnosis KAS

- KAS 1a: Clinicians should diagnose bronchiolitis and assess disease severity on the basis of history and physical examination (Evidence Quality: B, Strength: Strong)

- KAS 1b: Clinicians should assess risk factors for severe disease, such as <12 weeks, a history of prematurity, underlying cardiopulmonary disease, or immunodeficiency, when making decisions about evaluation and management of children with bronchiolitis (Evidence Quality: B, Strength: Moderate)
Diagnosis KAS

- KAS 1c: When clinicians diagnose bronchiolitis on the basis of history and physical examination, radiographic or laboratory studies should not be obtained routinely (Evidence Quality: B, Strength: Moderate)
Summary of Diagnosis KAS

- Diagnosis is to be based on history and physical exam
- Take risk factors into account when making decision on diagnosis and treatment
- Routine imaging and labs not recommended
  - Only time Viral PCR should be sent is in premature infant receiving pavlivizumab (Synagis), so that if they are RSV +, Synagis can be discontinued
  - CXR poorly correlates with disease severity, increased administration of antibiotics
    - Reserve for respiratory distress severe enough for ICU or if suspecting complications such as pneumothorax
Treatment KAS: Albuterol

- **KAS 2**: Clinicians should not administer albuterol (or salbutamol) to infants and children with a diagnosis of bronchiolitis (Evidence Quality: B, Strength: Strong)
  - May improve clinical symptom score
  - Does not affect disease resolution, need for hospitalization, or length of stay (LOS)
  - Adverse effects (tachycardia/tremors) and cost outweigh benefit
  - No longer recommend trial of β-agonist
    - Greater strength of evidence showing no benefit
Treatment KAS: Epinephrine

- KAS 3: Clinicians should not administer epinephrine to infants and children with a diagnosis of bronchiolitis (Evidence Quality: B, Strength: Strong)
  - Epi has a transient effect, and home administration is not routine, thus symptoms will likely return in a short period of time
Treatment KAS: 3% Saline

- KAS 4a: Nebulized hypertonic saline (3% saline) should not be administered to infants with a diagnosis of bronchiolitis in the emergency department (Evidence Quality: B, Strength: Moderate)

- KAS 4b: Clinicians may administer nebulized hypertonic saline to infants and children hospitalized for bronchiolitis (Evidence Quality: B, Strength: Weak)
  - No effect on hospitalization rates from ER
  - May shorten LOS for pts with LOS >3 days
    - Hard to predict LOS on admission
  - Adverse effects of increased wheezing and secretions, cost
Treatment KAS: Steroids

- KAS 5: Clinicians should not administer systemic corticosteroids to infants with a diagnosis of bronchiolitis in any setting (Evidence Quality: A, Strength: Strong)
  - Steroids do not significantly reduce outpatient admissions when compared with placebo
  - Steroids do not reduce LOS for inpatients
  - May prolong viral shedding
Treatment KAS: Oxygen

- **KAS 6a:** Clinicians may choose not to administer supplemental oxygen if the oxyhemoglobin saturation exceeds 90% in infants and children with a diagnosis of bronchiolitis (Evidence Quality: D, Strength: Weak)

- **KAS 6b:** Clinicians may choose not to use continuous pulse oximetry for infants and children with a diagnosis of bronchiolitis (Evidence Quality: C, Strength: weak)
  - Oxygen saturation is a poor predictor of respiratory distress
  - Transient hypoxemia is common in healthy infants between 2 weeks and 6 months
  - Alarm fatigue
  - Continuous pulse ox prolongs length of stay
Treatment KAS: Chest Physiotherapy

- **KAS 7:** Clinicians should not use chest physiotherapy for infants and children with a diagnosis of bronchiolitis (Evidence Quality: B, Strength: Moderate)
  - No clinical benefit appreciated with chest PT
  - Insufficient data to make a recommendation about suctioning
    - Routine use of deep suctioning may not be beneficial (longer LOS)
Treatment KAS: Antibacterials

- KAS 8: Clinicians should not administer antibacterial medications to infants and children with a diagnosis of bronchiolitis unless there is a concomitant bacterial infection, or a strong suspicion of one (Evidence Quality: B, Strength: Strong)
  - No benefit of routine antibiotic therapy for children with bronchiolitis
  - Use of antibiotics associated with adverse effects, increased bacterial resistance, increased cost
  - May consider in patient on mechanical ventilation for respiratory failure
  - AOM common in pts with bronchiolitis, difficult to distinguish viral vs bacterial, bulging TM more consistent with bacterial so may consider antibiotics in these pts
Treatment KAS: Nutrition & Hydration

- KAS 9: Clinicians should administer nasogastric or intravenous fluids for infants with a diagnosis of bronchiolitis who cannot maintain hydration orally (Evidence Quality: X, Strength: Strong)
  - RR > 60 may compromise feeding (increased work of breathing when fed, increased risk of aspiration)
  - No difference in LOS in NG vs. IV groups
  - NG had higher success rate of insertion than IV route
  - Parental satisfaction scores did not differ between NG and IV groups
Summary of Treatment KAS

- Do not use:
  - Albuterol
  - Epinephrine
  - 3% saline in the ER setting
  - Corticosteroids
  - Oxygen (unless Sat <90%)
  - Continuous Pulse ox
  - Chest Physiotherapy
  - Routine Antibiotics

- May consider 3% saline if anticipate LOS >3 days, but the strength of evidence is weak

- Please provide nutrition & hydration to those who cannot maintain their hydration orally
Prevention: Synagis KAS

- KAS 10a: Clinicians should not administer palivizumab (Synagis) to otherwise healthy infants with a gestational age of 29 weeks, 0 days or greater (Evidence Quality: B; Strength: Strong).
  - Data show that infants born at or after 29 wks, 0 days gestation have an RSV hospitalization rate similar to the rate of full-term infants
  - Risks of overuse: Increase adverse side effects, increased visits to healthcare provider with increased exposure to illness.
Prevention: Synagis KAS

- **KAS 10b**: Clinicians should administer palavizumab during the first year of life to infants with hemodynamically significant heart disease or CLD of prematurity defined as preterm infants <32 weeks, 0 days gestation who require >21% oxygen for at least the first 28 days (Evidence Quality: B, Strength: Moderate).
  - Insufficient data available to recommend routine use of prophylaxis in children with Down syndrome, CF, pulmonary abnormality, neuromuscular disease, or immune compromise.
Prevention: Synagis KAS

- KAS 10c: Clinicians should administer a maximum of 5 monthly doses (15mg/kg/dose) of palivizumab during the RSV season to infants who qualify for palivizumab in the first year of life (Evidence Quality: B, Strength: Moderate).
  - Depending on the month of birth, fewer than 5 monthly doses will provide protection for most infants for the duration of RSV season.
  - Do not need it in the second year of life unless the patient continues to require oxygen, chronic steroids or diuretic therapy within 6 months of the onset of the second RSV season.
ACH-OL 2014 Bronchiolitis Guidelines: Diagnosis

- **Based on history & physical, including risk factors**

- **No viral PCR**
  - Exception: Receiving synagis and having breakthrough symptoms. If RSV positive, stop synagis.

- **No CXR**
  - Exception: if prolonged or atypical course

- **No other labs**
ACH-OL 2014 Bronchiolitis Guidelines: Management

- **No continuous pulse ox**
  - Poor predictor of respiratory distress
  - Prolong LOS

- **Only spot check pulse ox**
  - Q4H with vitals
  - Check respiratory rate first
  - Low normal: 90%
ACH-OL 2014 Bronchiolitis Guidelines: Treatment

- **No SABA**
  - May improve clinical symptom score, but does not affect disease resolution, hospitalization or LOS

- **No test dose of Albuterol**
  - Exception: Assess modified asthma predictive index
  - In the past 12 months, ≥ 4 wheezing episodes (>24hrs) with at least 1 physician-confirmed, PLUS…
  - 1 MAJOR: Parent with asthma, Atopic dermatitis or allergic sensitization to ≥ 1 aeroallergen (house dust mites, cockroaches, dog, cat, mold, grass, tree or weed)
  - OR 2 MINOR: Wheezing a part from colds, Eosinophilia, Allergen sensitization to milk, eggs or peanuts
ACH-OL 2014 Bronchiolitis Guidelines: Treatment

- No epinephrine

- No steroids
  - Do not affect disease resolution, hospitalization or LOS
  - May prolong viral shedding

- No antibiotics

- No CPT
ACH-OL 2014 Bronchiolitis Guidelines: Treatment

- **Hypertonic (3%) saline:**
  - Do not use as trial or in ER
    - Short term use shows no change
  - May use hypertonic (3%) saline inpatient
    - Use to everyone’s discretion. Strength: weak
    - Use Q3H x 24 hours and then re-evaluate
ACH-OL 2014 Bronchiolitis Guidelines: Treatment

- **Suctioning:**
  - Use if patient has upper airway secretions
  - Can use acorn or nasopharyngeal (not deep)
  - Education for home: nasal saline with bulb syringe
  - Overall, more research needed
**Nutrition: IV vs NG**
- Consider if poor PO, dehydration or RR>60
- If IV placed in ER, use
- If no IV, consider NG first
  - Better nutrition source

**Discharge home on oxygen:**
- Can consider
- Do not send home with pulse ox
Management of Viral Bronchiolitis.
(Based on AAP Guidelines 2014)

**Diagnosis of RSV Bronchiolitis should be clinical**
No PCR, Chest X-ray

- Judicious Suctioning
- Oxygen Therapy for Sats ≤ 90% (Saturation q 4 hrs with vitals, no continuous measurements. (Keep sats between 90-94%)
- Adequate Hydration
- Consider NG tube for hydration and nutrition

**“Possible asthma” based on modified asthma predictive index. (See attachment)**

- Consider SABA (Albuterol)
- Reassess, if there is response to Albuterol consider adding Prednisolone or Methylprednisolone¹,²,⁵

**Consider 3%. Saline via neb q 4 hrs for 24 hrs and reassess.**
- No benefit of 3% saline in the ED

**For persistent secretions,**
consider discharge home with nasal bulb suction Freida or acorn.

- No benefit of albuterol, steroids, epinephrine, antibiotics and chest physical therapy

Notes:
- Use of antibiotics is not warranted with no risk of serious bacterial infection: Risk of serious bacterial infection in young febrile infants with RSV infections. *Pediatrics*. 2004 Jun;113(6):1728-34
- The use of chest physiotherapy is discouraged: Chest physiotherapy for acute bronchiolitis in paediatric patients between 0 and 24 months old. - Perrotta C - Cochrane Database Syst Rev - 01-JAN-2007(1) CD004873
- Ipratropium Bromide (Atrovent) has not been shown to improve the course for RSV/Bronchiolitis.⁵
- Levalbuterol (Xopenex) has not been studied for RSV/Bronchiolitis.
- Pulmicort has not been shown to improve either short term or long term outcomes. *Cade, A, Brownlee, KG, Conway, SP, et al. Randomised placebo controlled trial of nebulised corticosteroids in acute respiratory syncytial viral bronchiolitis. Arch Dis Child 2000; 82:126.*
- Use of 3% nebulized hypertonic saline may decrease length of stay: Kuzik BA - J Pediatr - 01-SEP-2007; 151(3): 266-70, 270

References:
Patient Education

Bronchiolitis

Bronchiolitis is one of the most common diseases of infancy and usually gets better by itself, but it is one of the most common reasons for hospital admission. It is a viral illness, and the most common cause is infection with the respiratory syncytial virus (RSV).

The viruses that cause bronchiolitis are contagious and can spread from person to person. The virus is spread through the air when we cough or sneeze and can also be spread from person to person by physical contact. The most effective way to prevent the spread of the viruses that cause bronchiolitis is to frequently wash your hands, cover your mouth or nose when coughing or sneezing, and stay away from people with coughs and colds.

CAUSES

Probably all bronchiolitis is caused by a virus. Bacteria are not known to be a cause. Infants exposed to smoking are more likely to develop this illness. Smoking should not be allowed at home if you have a child with breathing problems.

SYMPTOMS

Bronchiolitis typically occurs during the first 3 years of life and is most common in the first 6 months of life. Because the airways of older children are larger, they do not develop the characteristic wheezing with similar infections. Because the wheezing sounds so much like asthma, it is often confused with this. A family history of asthma may indicate this as a cause instead.

Infants are often the most sick in the first 2 to 3 days and may have:

- Irritability.
- Vomiting.
- Diarrhea.
- Difficulty eating.
- Fever. This may be as high as 103° F (39.4° C).

Your child's condition can change rapidly.

DIAGNOSIS

Most commonly, bronchiolitis is diagnosed based on clinical symptoms of a recent upper respiratory tract infection, wheezing, and increased respiratory rate. Your caregiver may do other tests, such as tests to confirm RSV virus infection, blood tests that might indicate a bacterial infection, or X-ray exams to diagnose pneumonia.

TREATMENT

While there are no medications to treat bronchiolitis, there are a number of things you can do to help:

- Saline nose drops can help relieve nasal obstruction.
- Nasal bulb suctioning can also help remove secretions and make it easier for your child to breath.
- Because your child is breathing harder and faster, your child is more likely to get dehydrated. Encourage your child to drink as much as possible to prevent dehydration.
- Elevating the head can help make breathing easier. **Do not** prop up a child younger than 12 months with a pillow.
- Your doctor may try a medication called a bronchodilator to see if it allows your child to breathe easier.
- Your infant may have to be hospitalized if respiratory distress develops. However, antibiotics will not help.
- Go to the emergency department immediately if your infant becomes worse or has difficulty breathing.
- Only give over-the-counter or prescription medicines for pain, discomfort, or fever as directed by your caregiver. **Do not** give aspirin to your child.

Symptoms from bronchiolitis usually last 1 to 2 weeks. Some children may continue to have a postviral cough for several weeks, but most children begin demonstrating gradual improvement after 3 to 4 days of symptoms.

SEEK MEDICAL CARE IF:

- Your child's condition is unimproved after 3 to 4 days.
- Your child continues to have a fever of 102° F (38.9° C) or higher for 3 or more days after treatment begins.
- You feel that your child may be developing new problems that may or may not be related to bronchiolitis.

SEEK IMMEDIATE MEDICAL CARE IF:

- Your child is having more difficulty breathing or appears to be breathing faster than normal.
- You notice grunting noises when your child breathes.
- Retractions when breathing are getting worse. Retractions are when you can see the ribs when your child is trying to breathe.
- Your infant's nostrils are moving in and out when they breathe (flaring ).
- Your child has increased difficulty eating.
- There is a decrease in the amount of urine your child produces or your child's mouth seems dry.
- Your child appears blue.
- Your child needs stimulation to breathe regularly.
- Your child initially begins to improve but suddenly develops more symptoms.
Any Questions?
Questions for the Panel

Pulmonology: when would you consider a CXR?
Questions for the Panel

ID: When do you see a benefit in obtaining a viral PCR?
Questions for the Panel

Pulmonology: In what circumstances, would you use hypertonic (3%) saline?
Questions for the Panel

Knowing that infants can have transient hypoxemia with bronchiolitis, would you ever change to continuous pulse ox if spot check pulse ox is <90% in ER or on the floor?
Questions for the Panel

Advice on how to convince parents to place NG over IV?
Questions for the Panel

Do you have any suctioning criteria before discharge home?
Questions for the Panel

In what circumstances would you consider discharging home with oxygen?
THANK YOU!

- Dr. Akhter
- Dr. Dharia
- Dr. Collins
- Dr. Schroeder
- Pediatric Respiratory Therapy
- Pediatric & ER Teams