

CONTAGIOUS COMMENTS

Department of Epidemiology

Bronchiolitis 2011: Questions and Answers from the Emergency Department at TCH

Sarah Halstead, MD & Lalit Bajaj, MD, MPH

What Causes Bronchiolitis?

Bronchiolitis is the most common reason for hospital admission in children less than 1 year of age with an estimated 150,000-200,000 hospitalizations per year. The viruses that have been associated with bronchiolitis include Respiratory Syncytial Virus (RSV), Rhinovirus, Human Metapneumovirus (HMPV), Influenza, Coronavirus, Bocavirus and many others. The primary reasons for admission include respiratory distress, poor feeding, and hypoxia or need for supplemental oxygen. Hospital admissions have been drastically increasing in the past 3 decades. One theory for this is that the widespread use of pulse oximetry has resulted in the identification of many children who meet a cutoff for "hypoxia", but are in minimal distress. Although there has been considerable research on therapy and combinations of therapies, there is little evidence for the routine use of any specific therapy in bronchiolitis except supportive care and supplemental oxygen for those who are hypoxic. This is reflected in the AAP Bronchiolitis Consensus Clinical Care Guideline, and the TCH Bronchiolitis Guideline.

How Should We Treat Children with Bronchiolitis?

First – deep suction. Because most babies are obligate nose breathers, deep suctioning can improve not only their respiratory status but also their ability to drink fluids. Albuterol is rarely used in our emergency department in patients with classic bronchiolitis symptoms as data does not support its routine use. For those patients with moderate to severe respiratory distress, racemic epinephrine is usually our first line treatment as the data would suggest it has some

benefits, although it is usually only for the first one to two doses. For those patients who are significantly improved following racemic epinephrine, they are usually admitted into ED observation and watched for an extended period to determine disposition. Most providers will admit patients who require more than one racemic epinephrine. Blood gases, chest x-rays and viral tests are usually obtained only in those patients with significant distress, who are being admitted to an intensive care unit, or if results will change management (i.e. stop antibiotics sooner if viral DFA is positive).

Patients who are well appearing, tolerating oral intake, and have normal oxygen saturation, are discharged home with good return precautions and a recommendation to follow up with their primary care provider. Patients with low or borderline oxygen saturations or those with increased work of breathing are placed on a continuous pulse oximetry. While every provider has their own cut off for placing oxygen on a patient, most are comfortable with dips down to 88% especially while sleeping, but will place oxygen for sustained saturations of 87% or less. If after suctioning, patients have moderate increased work of breathing, even without hypoxia, oxygen will often be placed to see if it improves their work of breathing. If a patient is placed on oxygen, and meets home oxygen criteria, they are admitted into ED observation and monitored to determine if they are safe for home oxygen. If their condition worsens, or anyone on the care team including the child's caregivers are uncomfortable, the child is admitted.

What is the Home O₂ Clinical Care Guideline?

The home O₂ clinical care guideline was introduced in 2005 and recommends that patients between the ages of 3-18 months (minimum of 48 weeks corrected for prematurity), and otherwise healthy be observed in the ED for a minimum of 8 hours on continuous pulse-oximetry with vital signs recorded every 2 hours. If the patients O₂ saturations are greater or equal to 90% on 0.5 L/min nasal cannula O₂ or less while awake, asleep and feeding, the patient is able to maintain hydration, and there are no signs of deteriorating respiratory status, they are discharged home on O₂ with a 24 hour follow-up arranged with either the PCP or the ED (if the PCP is unavailable). The patient is given a small portable O₂ tank and a home health care company is contacted by our respiratory therapists to deliver additional O₂ tanks and supplies to their home. If the patient does not meet these criteria, they are admitted to the hospital.

Does the Home O₂ Clinical Care Guideline Work?

We recently performed a retrospective chart review of all visits of patients with bronchiolitis who presented to our emergency department or one of the four satellite ED/urgent care centers in our system between November and April of 2005-2009. A total of 4060 patients with a total of 4214 discrete illnesses met the inclusion criteria. 2394 (57%) were discharged home on room air, 655 (15%) were discharged home on O₂ and 1165 (28%) were admitted. Of the 2394 patients who were discharged home on room air, 79 (3%) were subsequently admitted. Of the 655 patients who were discharged home on O₂, 39 (6%) were subsequently admitted. The most common reasons for subsequent admission were increased O₂ requirement or increased work of breathing. There were no adverse outcomes,

including ICU admission or need for advanced airway management in those patients initially discharged home on O₂. Our overall admission rate for bronchiolitis has dropped from a historical rate of 39-40% to 30% over the past 4 seasons (unpublished data). This is one of the few home oxygen programs from the ED in the country, and there are many sites using our program as a model for their own. The mainstay of bronchiolitis care is supportive and the need for supplemental oxygen no longer mandates a costly and inconvenient hospital admission here at TCH.

Suggested reading (references)

[Diagnosis and management of bronchiolitis.](#)

American Academy of Pediatrics Subcommittee on Diagnosis and Management of Bronchiolitis. *Pediatrics*. 2006 Oct;118(4):1774-93. PMID: 17015575

[A randomized trial of home oxygen therapy from the emergency department for acute bronchiolitis.](#)

Bajaj L, Turner CG, Bothner J. *Pediatrics*. 2006 Mar;117(3):633-40. PMID: 16510641

[Bronchodilators for bronchiolitis.](#)

Gadomski AM, Brower M. *Cochrane Database Syst Rev*. 2010 Dec 8;12:CD001266. Review. PMID: 21154348

[Epinephrine for bronchiolitis.](#)

Hartling L, Wiebe N, Russell K, Patel H, Klassen TP. *Cochrane Database Syst Rev*. 2004;(1):CD003123. Review. PMID:14974006

We are modifying our distribution process for Contagious Comments. If you wish to receive this publication please provide us with your E-mail address below.

Name: _____

E-mail Address: _____

Both the Contagious Comments and Bug Watch publications are always posted on The Children's Hospital website at:
<http://www.thechildrenshospital.org/news/publications/index.aspx>

Please return your E-mail address to: Carolyn Brock, The Children's Hospital, Epidemiology – Box B276, 13123 E. 16th Avenue, Aurora, CO 80045 or E-mail address: brock.carolyn@tchden.org.

Thank you for your interest in our publication.

CONTAGIOUS COMMENTS
Department of Epidemiology©

EDITOR:

Kelly Pearce, Staff Assistant III
The Children's Hospital, Dept. of Epidemiology, B-276
13123 E. 16th Avenue, Aurora, CO 80045
Phone: 720-777-6072; FAX: 720-777-7295

<mailto:pearce.kelly@tchden.org>

<http://www.thechildrenshospital.org>

We Recycle!