



## Five Things Physicians and Patients Should Question

### 1 **Avoid stepping up asthma therapy (adding new drugs or going to higher doses) before assessing adherence, appropriateness of device, and technique with current asthma medications.**

The 2007 Expert Panel report from the National Asthma Education & Prevention Program discusses in detail the importance of monitoring asthma control in pediatric patients, stepping up therapy, and stepping down therapy, when appropriate. There are key evaluations that should occur before stepping up therapy, though. Providers should first review with the family how they are administering the present asthma medications to determine whether the asthma controller is being administered properly and effectively for the age of the patient. Another evaluation is to confirm adherence both by discussion with the family and learning the refill history from the pharmacy. It is also important to explore other barriers to adherence for the patient and family. There is no reason to step up to a higher-dose steroid inhaler or to a combination therapy if the patient is not receiving the lower dose asthma controller with the correct technique and frequency.

### 2 **Do not use LABA/steroid combination drugs as initial therapy for intermittent or mild persistent asthma.**

Long acting beta agonist (LABA) medications provide sustained bronchodilation over a 12- to 24-hour period after delivery. For the treatment of asthma, they are supplied in combination with an inhaled steroid medication via a metered dose inhaler (MDI) or dry powder inhaler (DPI). Children with intermittent asthma have only occasional need for bronchodilators and do not benefit from the use of LABAs on a daily basis. Children with mild persistent asthma are usually well-controlled with a single agent – either a leukotriene modifier or a low-dose inhaled corticosteroid medication. The addition of a LABA is not recommended in these circumstances and should be reserved for children with moderate persistent or severe persistent asthma.

### 3 **Avoid administering nebulized medications by “blow by,” or placing the mask or nebulizer tubing near the child’s nose and mouth rather than securing the mask properly to the face. A t-piece with mouthpiece or face mask should be used instead.**

There are many different formulations of asthma medications for pediatric patients. Accurate delivery of each medication to a pediatric patient is extremely important. There is a high rate of error by caregivers and, unfortunately, by health care workers in health care settings. Small children and infants are especially challenging. During a nebulizer treatment, a well-fitting, properly-placed mask to the face is required in a quietly breathing, younger patient who is not crying. An older cooperative child may use a t-piece with mouthpiece. If the drug being delivered can be converted to an inhaler, administered using a valved holding chamber with a face mask, this change should be considered. Finally, it is important to note that, if treatment failure is occurring with a nebulized inhaled steroid, it could be secondary to the family administering the medication using the “blow by” method by placing the mask or nebulizer tubing near the child’s nose and mouth rather than securing the mask properly to the face. Studies have shown that there is a 40% to 85% decrease in aerosol delivery when a mask is held 2 centimeters away from a child’s face while giving a nebulizer treatment.

## **Do not interpret pediatric sleep studies using adult standards. Pediatric sleep studies should be performed and interpreted according to pediatric standards, even if performed in a laboratory that predominantly studies adults.**

Clinicians should use the AAP “Clinical Practice Guideline: Diagnosis and Management of Childhood Obstructive Sleep Apnea Syndrome” to determine who might benefit from ordering a sleep study or polysomnogram. In addition, the practitioner should determine in which laboratory the polysomnogram may be most appropriately conducted. Testing should evaluate physiological parameters that include cardiac, respiratory, and central nervous system functions. Because of the complex nature of the testing, sleep laboratories must have experience with children to perform an adequate test. Inclusion of caregivers is vital in providing a child-friendly environment. It is suggested that the referring physician inquire about the experience that the sleep laboratory personnel have with children prior to making a referral. If the study is not performed by personnel who can properly interpret pediatric studies, then the study would need to be repeated in a pediatric sleep center, thereby adding to the cost of the evaluation. Differences exist between normal values for adults and children with regard to sleep-disordered breathing. Obstructive events while asleep are uncommon in children, so their presence needs to be thoroughly assessed. In adults, the frequency of obstructive apneas increases with age, and the oxygen saturation while asleep may dip lower than in children. Therefore, it is vital that the diagnosis of obstructive sleep apnea (OSA) be made on the basis of pediatric criteria. Further, the severity determination of OSA must take into account the patient’s age, because these values are different in children than adults.

## **Do not routinely use airway clearance therapy in conditions such as asthma, bronchiolitis, and pneumonia.**

There is little evidence that airway clearance techniques play any significant role in the management of children with an acute respiratory problem or, chronically, in the outpatient setting for any condition other than bronchiectasis. Airway clearance techniques appear to be safe and somewhat effective for children with stable bronchiectasis and suppurative chronic bronchitis (such as cystic fibrosis) and may account for improvements in sputum expectoration, selected measures of lung function, symptoms, and health-related qualities of life. Common strategies for maintaining a clear airway in patients who have chronically impaired clearance of pulmonary secretions include 1) chest percussion alone; 2) chest percussion combined with proper positioning and postural drainage; 3) augmentation of the patient’s own cough; 4) manually assisted coughing (MAC), active cycle of breathing technique, forced expiratory technique, and autogenic drainage; and 5) positive pressure therapy with the use of Flutter valves®, positive expiratory pressure (PEP) therapy, intermittent positive pressure breathing (IPPB), intrapulmonary percussive ventilation (IPV), high-frequency chest wall compression (HFCWC), and even continuous positive airway pressure (CPAP).

In both Cochrane and Hayes reviews, chest physical therapy techniques did not appear to reduce the overall severity of disease for bronchiectasis but there may be reduction in the rate of progression of disease and improvement in the health-related qualities of life noted above.

There may be some advantages to certain techniques and devices in neuromuscular disease with impaired ability to expectorate airway secretions, both acutely and chronically. Physicians should not routinely prescribe airway clearance techniques in previously healthy children with acute bronchiolitis, pneumonia, or an exacerbation of asthma.

# How This List Was Created

The AAP Section on Pediatric Pulmonology and Sleep Medicine (SOPPSM) expressed interest in Choosing Wisely at Celebration of Pediatric Pulmonology in 2015. Over the course of the 2-day meeting, group breakouts occurred during which the attendees identified the top 21 potential Choosing Wisely recommendations. These were voted on and ranked by the attendees. The AAP Section on Pediatric Pulmonology and Sleep Medicine (SOPPSM) membership was then surveyed to select the top 5 items on the basis of the scientific evidence provided. The list was extensively peer reviewed, refined, and approved by all relevant AAP Committees, Councils, and Sections. The AAP Board of Directors and Executive Committee awarded the final approval.

AAP's disclosure and conflict of interest policy can be found at [www.aap.org](http://www.aap.org).

## Sources

- 1 National Asthma Education & Prevention Program. *Expert Panel Report III: Guidelines for the Diagnosis & Management of Asthma*. Bethesda, MD: National Heart, Lung, and Blood Institute; 2007.  
Weinberger M. Asthma. In: Light M, ed. *Pediatric Pulmonology*. Elk Grove Village, IL: American Academy of Pediatrics; 2011:250-261.  
Yawn B. The role of the primary care physician in helping adolescent and adult patients improve asthma control. *Mayo Clin Proc*. 2011;86(9):894-902.
- 2 National Asthma Education & Prevention Program. *Expert Panel Report III: Guidelines for the Diagnosis & Management of Asthma*. Bethesda, MD: National Heart, Lung, and Blood Institute; 2007.  
Global Initiative for Asthma. *Global Strategy for Asthma Management and Prevention*, 2016. Available at: [www.ginasthma.org](http://www.ginasthma.org)
- 3 Geller D. Comparing clinical features of the nebulizer, metered-dose inhaler, and dry powder inhaler. *Respir Care*. 2005;50(10):1313-1321.  
Geller D. Aerosol delivery of medication. In: Light M, ed. *Pediatric Pulmonology*. Elk Grove Village, IL: American Academy of Pediatrics; 2011:916-917.  
Rubin B. Nebulizer therapy for children: the device-patient interface. *Respir Care*. 2002;47(11):1314-1319.  
Rubin B. Bye-bye, blow by. *Respir Care*. 2007;52(8):981.
- 4 Marcus CL, Omlin KJ, Basinki DJ, et al. Normal polysomnographic values for children and adolescents. *Am Rev Respir Dis*. 1992;146(5 Pt 1):1235-1239.  
Alsubie HS, BaHammam AS. Obstructive sleep apnea: children are not little adults. *Paediatr Respir Rev*. 2017;21:72-79.  
Katz ES, Marcus CL. Diagnosis of obstructive sleep apnea. In: Sheldon SH, Ferber R, Kryger MH, Gozal D, eds. *Principles and Practice of Pediatric Sleep Medicine*. Philadelphia, PA: Elsevier Saunders; 2014:221-230.  
Wagner MH, Torrez DM. Interpretation of the polysomnogram in children. *Otolaryngol Clin North Am*. 2007;40:745-759.  
Marcus CL, Brooks LJ, Draper KA, et al; American Academy of Pediatrics. Clinical practice guideline. Diagnosis and management of childhood obstructive sleep apnea syndrome. *Pediatrics*. 2012;130(3):576-584.
- 5 Hayes Reviews: (Publication Date: March 28, 2014/Annual Review: Mar 15, 2017). High-Frequency Chest Wall Compression for Diseases Other than Cystic Fibrosis. (Publication Date: April 30, 2015/Annual Review: April 4, 2017). CoughAssist Mechanical Insufflation-Exsufflation Device (Philips Respironics) for Respiratory Insufficiency. (Publication Date: April 21, 2016). Intrapulmonary Percussive Ventilation for Home Use in Children.  
Lee AL, Burge AT, Holland AE. Airway clearance techniques for bronchiectasis. *Cochrane Database Syst Rev*. 2015;(11):CD008351.  
Figuls MR, Gine-Garriga M, Rugeles CG, Perrotta C, Vilaro J. Chest physiotherapy for acute bronchiolitis in pediatric patients between 0 and 24 months old. *Cochrane Database Syst Rev*. 2016;(2):CD004873.  
Gajdos V, Katsahian S, Beydon N, et al. Effectiveness of chest physiotherapy in infants hospitalized with acute bronchiolitis: a multicenter, randomized, controlled trial. *PLoS Med*. 2010;7(9):e1000345  
De Boeck K, Vermeulen F, Vreys M, Moens M, Proesmens M. Airway clearance techniques to treat acute respiratory disorders in previously healthy children: where is the evidence? *Eur J Pediatr*. 2008;167(6):607-612.  
Strickland SL, Rubin BK, Drescher GS, et al. AARC clinical practice guideline: effectiveness of non-pharmacologic airway clearance therapies in hospitalized patients. *Respir Care*. 2013;58(12):2187-2193.  
Panitch HB. Respiratory implications of pediatric neuromuscular disease. *Respir Care*. 2017;62(6):826-848.

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