

Asthma: From childhood to adulthood

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Parents often want to know how long asthma will persist in their children. In a longitudinal, population based study from New Zealand, children were enrolled shortly after birth, and they or their parents were surveyed about respiratory events from ages 9 to 26 years. Subjects were also tested for atopy, hyperresponsiveness to methacholine, and responsiveness to bronchodilators at various times.

Of 613 subjects who responded to all surveys, 51.4% had reported wheezing on at least two surveys by age 26. By age 26, 14.5% had asthma persisting from onset; of the rest, 27.4% reported never wheezing; 21.2% had transient wheezing (reported once); 15% were wheeze free at age 26; 12.4% had relapsed (wheezing had stopped and recurred); and 9.5% had intermittent wheeze (reported at some assessments). Of the 168 who reported remission, 45.2% relapsed by age 26. Persistence of wheeze was significantly related to positive skin test for dust mites at age 13, female sex, smoking at age 21, and airway hyperresponsiveness. Airway hyperresponsiveness, dust-mite allergen sensitivity, and young age were significantly related to relapse.

Comment: The good news: Many children who wheeze stop by the time they become young adults. The bad news: About 15% of children will wheeze for their entire lives, and about half of those who stop wheezing during childhood relapse by early adulthood. Results of other studies indicated that children of asthmatic parents are more likely to wheeze as they get older. A family history of asthma, early age at onset, and a history of atopy are all predictors of adult wheezing.

Sears et al. A longitudinal population based, cohort study of childhood asthma followed to adulthood. N Engl J Med 2003 Oct 9;349:1414-22.

Nebulized Therapy Not Useful For Bronchiolitis

The treatment for bronchiolitis in infants is controversial. Therapies such as racemic epinephrine and nebulized albuterol (salbutamol) improve outcomes within the first few hours of use, but their longer-term efficacy is questionable. These Canadian researchers found epinephrine and (salbutamol) albuterol to be no more effective than placebo during several days of use.

They studied 149 infants younger than 12 months who had diagnoses of bronchiolitis requiring hospitalization and who had no previous history of wheezing or bronchodilator use. Infants were randomized to receive epinephrine, albuterol (salbutamol), or placebo by nebulization every 1 to 6 hours. Outcome was assessed in a blinded manner.

There were no significant differences among groups in a primary outcome, mean length of hospital stay (about 2.5 days in all groups). Secondary outcomes - time to normal oxygenation, respiratory distress, adequate oral intake of fluids, and time to infrequent nebulizations (every 4 hours or less) - were also comparable among the groups.

Comment: It is possible that children older than 12 months would have responded to epinephrine or albuterol (salbutamol). Unfortunately, corticosteroids, also often used to treat bronchiolitis, were not evaluated. Oxygen and supportive care should be the mainstays of treatment. However, as I have seen many children respond dramatically to nebulization therapy, I will continue to give epinephrine or (salbutamol) albuterol as a therapeutic trial, but I will maintain that medication only if it appears to benefit the child.

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Patel et al. A randomized, controlled trial of the effectiveness of nebulized therapy with epinephrine compared with albuterol and saline in infants hospitalized for acute viral bronchiolitis. *J Pediatr* 2002 Dec;141: 818-24.

Update on the use of Automated External Defibrillators in Children

Automatic external defibrillators (AEDs) are the first line of treatment for cardiac arrest in adults. Recent technology has made AEDs widely accessible and has decreased the time to defibrillation. The primary determinant of survival from cardiac arrest due to ventricular fibrillation is the interval from collapse until defibrillation. New recommendations have been published to address the use of AEDs in children.

When the Pediatric Advanced Life Support Task Force's International Liaison Committee on Resuscitation guidelines were published in 2000, AEDs were not designed or FDA approved for use in children younger than 8 years. Children with cardiac arrest had to wait for the arrival of advanced life support and treatment with a manual defibrillator, increasing the crucial time to defibrillation. All commercially available AEDs use algorithmic rhythm analysis programs derived from libraries of adult shockable and nonshockable rhythms and are programmed to deliver doses that some have worried could be dangerous in children. There were no data on the use of rhythm analysis programs to differentiate shockable from

nonshockable rhythms in children and on appropriate defibrillation doses or dosing sequences.

The new recommendations support AED use in children aged 1 year or older who have no signs of circulation. The change reflects published evidence that rhythm analysis programs in commercially available AEDs have satisfactory specificity and sensitivity in children. New pediatric pad and cable systems reduce the energy delivered to children, and AEDs have been modified to use biphasic waveforms, which allow effective defibrillation with smaller shocks, reducing the risk for myocardial damage. AED use is still not recommended in children younger than 1 year.

Comment: Extending the use of AEDs to younger children means more lives saved and a greater potential for neurologic recovery after cardiac arrest. Manufacturers deserve to be commended for modifications in pad and cable systems that allow AED use in young children. AEDs marketed for pediatric use should have their rhythm detection algorithms tested against a pediatric arrhythmia database to demonstrate their efficacy in this patient population.

Samson et al. Use of automated external defibrillators for children: An update-An advisory statement from the pediatric advanced life support task force, international liaison committee on resuscitation. *Pediatrics* 2003 Jul;112:163-8.