Pediatric asthma: Initial assessment and first steps in the young child

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Clinical questions
How do I identify asthma in my pediatric patients? When should I refer to an asthma specialist?

Why did we choose this topic?
Asthma affects over 7 million children under 18 years old in the United States. Asthma causes 2 million emergency department visits per year. Correct diagnosis, family education, and home management action plans have reduced asthma mortality and morbidity.

How could this change my practice?
• Accurate diagnosis and management will reduce morbidity due to asthma in your pediatric patient population.
• Improved asthma control will improve a child’s quality of life, development, and growth.

Recommendations
1. Invest in the initial assessment for asthma-related symptoms to make an accurate diagnosis. Consider the differential to assess for other conditions.
2. Initiate appropriate acute management based on asthma severity.
3. Monitor asthma control opportunistically using the Asthma Control Test (ACT).
4. Consider referral to pediatric specialists to confirm diagnosis or manage moderate to severe cases that are not well controlled.

1. Initial assessment and diagnosis

Does the history support bronchoconstriction?
• Is there a history of the same respiratory symptoms over time? Typically, there are multiple symptoms with varying intensity as recurrent events.
• Are the symptoms worse at night or upon awakening?
• Are there suspected triggers? Common triggers for asthma are infectious respiratory illness, tobacco smoke and wood smoke. Known allergens, such as seasonal pollens, molds, dust, and animal dander can also trigger asthma.
• Is there an atopic family history in first-degree relatives? The atopic triad includes asthma, eczema, and allergies.

Does your initial exam support expiratory airflow limitation?
• There is expiratory wheezing and not inspiratory stridor.
• The expiratory wheezing originates from the lower airways and not the upper respiratory tract.
• The absence of wheezing does not exclude asthma. Cough-variant asthma is common in children. Additionally, during an acute exacerbation, airflow may be too restricted to produce an audible wheeze.

Ideally, a diagnosis of asthma is confirmed with lung function testing—including spirometry in children greater than age 5 years—before asthma therapy is started. Asthma diagnosis and severity scoring are more challenging when medication has been started. However, empiric treatment is appropriate when the initial presentation is urgent and other diagnoses are unlikely.

Infants: Bronchiolitis, airway anomalies, and aspiration can cause wheezing. Consider congenital anomalies that may narrow airway passages, such as vascular rings, laryngeal webs, and stenosis. Viral pathogens can cause inflammation, mucus congestion, and impaired airflow. The resulting bronchiolitis is associated with an expiratory wheeze that is classically not responsive to albuterol. However, albuterol responsiveness as a distinguishing rule between asthma and bronchiolitis is often muddied by the infant with bronchiolitis and a positive history for atopy. Aspiration or reflux may cause both upper and lower airway wheezing, cough, and shortness of breath.

Older infants and small children may present with wheezing, cough, or dyspnea for allergic rhinitis, foreign body in the airway, and croup. Stridor is often confused with wheezing by parents and health care providers. Post-nasal drip from viral illness is a common cause for cough. The accompanying rhinitis can cause congested breathing, reported as wheezing by the caregiver.

The differential for cough-variant asthma includes chronic sinusitis, post-nasal drip, vocal cord dysfunction, and gastroesophageal reflux.

2. Acute management

An albuterol inhaler with aerochamber is the gold standard for albuterol administration in most cases of acute asthma management. Routine prescribing of nebulizer machines and solution or of oral albuterol is an outdated practice. Using an albuterol inhaler and aerochamber in most acute exacerbations to control symptoms builds patient confidence in this drug form. This practice is aligned with national evidence-based standards and the asthma pathway used in the Seattle Children's Emergency Department.

Key points to emphasize for appropriate albuterol use
• Preparing the canister for administration.
• Correct use of the aerochamber device.
• Importance of the aerochamber device for effective albuterol dosing.
• Appropriate breath control for small children and infants for each administration of albuterol. Infants and small children typically require the aerochamber with mask because they cannot follow instructions to control their breath.
• For children aged > 4 years, use of a mouthpiece with breath holding for increased aerosol delivery to the lungs.

Consider the need for controller medication at the initial visit.

3. Opportunistic monitoring of asthma control

An Asthma Control Test (ACT) should be provided to every patient with a previous diagnosis of asthma as the standard flow staff work for rooming. Versions are available for patients aged 4–11 years and those aged 12 years and up. Copies should be available in every clinic.
4. Referral to Allergy & Asthma

Consider referral to Allergy & Asthma if:

- The initial presentation occurs after the age of 5 years. Diagnostic lung function testing would be appropriate, especially if the presentation is unclear or if the primary symptom is cough.
- There are aspects of the initial evaluation that raise concerns for another etiology.

Additional resources

KPWA Asthma Diagnosis and Treatment Guideline

Clinical Pearls

- Asthma diagnosis in four easy steps
- The beta agonist paradox: Why albuterol overuse is dangerous

Global Initiative for Asthma (GINA)

National Heart, Lung, and Blood Institute

- Asthma Action Plans