

# RECOGNIZING AND MANAGING PEDIATRIC ASTHMA

FOR PRIMARY CARE PROVIDERS



**Asthma is the most common chronic lung disease in children**, with birth cohort studies suggesting that nearly 25% of children may be affected. The burden is especially high among young children, yet asthma remains underdiagnosed—particularly in rural communities. This underdiagnosis can have serious consequences. Children with persistent asthma who rely solely on albuterol, without any form of steroid therapy, face a significantly increased risk of death.

**In Iowa, this issue is especially urgent.** Despite having lower rates of asthma diagnosis compared to neighboring states, Iowa experiences higher asthma-related mortality. This paradox likely reflects underdiagnosis and undertreatment. Our goal is to improve asthma recognition and management at the primary care level. By improving diagnosis and initiating appropriate treatment, we can improve outcomes, and ultimately lower asthma-related deaths across the state.

## Diagnosing asthma

Asthma is a clinical diagnosis based on history and response to treatment.

**There is no minimum age for diagnosis**, and early recognition is critical, especially in children under four, where incidence is highest.



### Core diagnostic criteria

- Recurrent respiratory symptoms: cough, wheeze, shortness of breath
- Reversibility of symptoms with bronchodilators (e.g., albuterol) and/or corticosteroids
- Avoid using the term “reactive airways disease”, as it delays appropriate asthma management

### Additional Supportive Details

- Family history of asthma or atopy
- History of smoke exposure
- Presence of other atopic conditions (e.g., eczema, allergic rhinitis)
- Repeated, reversible signs of broncho-constriction are key, which include:
  - Dry cough (especially at night)
  - Chest tightness
  - Dyspnea or shortness of breath
  - Increased work of breathing
  - Wheezing (typically heard only with auscultation)
  - Prolonged expiratory phase
  - Tachypnea
  - Decreased air entry

### Diagnostic workup in primary care

- History and physical exam are usually sufficient
- Identify asthma triggers, including:
  - Viral infections
  - Smoking or vaping exposure
  - Allergic or environmental triggers

### Optional tests

While testing can support the diagnosis, medical tests are not required to diagnose asthma. Optional tests include:

- Spirometry (pre- and post-bronchodilator) in children  $\geq 5$  years
  - Reversible airflow obstruction is defined by  $> 10\%$  improvement in FEV1
  - 30-34% improvement in FEF25-75
- Chest X-ray to rule out anatomic abnormalities
- Swallow study if neurologic impairment or signs of dysphagia (e.g., choking, coughing with liquids) and chronic wet cough are present

### Red flag findings that suggest other conditions

These findings warrant further evaluation and may indicate more serious underlying disorders:

- Chronic low oxygen or digital clubbing
- Growth faltering (formerly failure to thrive) paired with chronic cough, wheezing, or other respiratory symptoms
- Neurologic impairment or dysphagia
- Chronic/ daily wet cough

## Treating asthma

Avoid albuterol monotherapy. Instead, consider using anti-inflammatory reliever (AIR) therapy and single maintenance and reliever therapy (SMART) when age-appropriate, as these approaches provide both symptom relief and inflammation control.

Medications should be delivered using a metered-dose inhaler with a spacer, and an age-appropriate facemask, if needed. Inhaler and spacer delivery is just as effective as nebulizers for medication deposition, while being more portable, faster, and not reliant on a power source.

In addition to pharmacologic treatment, it is essential to address asthma triggers, including encouraging smoking and vaping cessation among caregivers and ensuring children are up to date on vaccinations, particularly influenza and COVID-19.



### For children under 5 years

**Intermittent asthma** (*No oral steroids, ER visits, or hospitalizations in the past 12 months*)

**AIR therapy:** Start inhaled steroids at onset of illness:

- Fluticasone 110 mcg: 3 puffs twice daily for 7–10 days
- Asmanex 100 mcg: 3 puffs twice daily for 7–10 days
- Budesonide 1 mg nebulized BID for 7–10 days at onset of runny nose/URI symptoms

**Albuterol:** 2–6 puffs every four hours as needed for cough, wheeze, or shortness of breath

Prednisolone (1 mg/kg twice daily for 3–5 days) if:

- Albuterol is required every 4 hours
- Albuterol is used  $\geq 4$  times in 24 hours
- ED visit would otherwise be necessary

**Persistent asthma** (*Symptoms not controlled or  $\geq 1$  severe episode in past year*)

- Start daily low-dose ICS (e.g., Fluticasone 44 mcg: 2 puffs twice daily with spacer and facemask)
- Ensure proper technique and adherence for at least three months before considering treatment failure
- Refer to pediatric pulmonology as needed (see next page for referral criteria)

### For children ages 5–11 years

**Intermittent asthma** (*Lack of symptoms between illness or symptoms only with occasional triggers*)

**AIR therapy:** Symbicort 80 mcg (Budesonide/Formoterol), 2 puffs every 4 hours as needed (max 8 puffs/day). Always with a spacer.

- Formoterol is a long-acting albuterol that is also fast acting, so it can be used as a rescue medication.
- If symptoms persist after 8 puffs:
  - Take prednisolone or prednisone 1 mg/kg BID for 3–5 days
  - Albuterol may be added if Symbicort maxed out
  - Resume Symbicort the next day (2 puffs every 4–6 hours, max 8/day)
  - Go to ED if needing reliever more than every 4 hours

**Persistent asthma** (*Symptoms between illnesses or frequent reliever use*)

**SMART therapy:** Symbicort 80 mcg, 2 puffs twice daily and 2 puffs every 4 hours as needed (max 8 puffs/day). Always with a spacer.

- If symptoms persist after 8 puffs:
  - Take prednisolone or prednisone 1 mg/kg BID for 3–5 days
  - Albuterol may be added if Symbicort maxed out
  - Resume Symbicort the next day (2 puffs every 4–6 hours, max 8/day)
  - Go to ED if needing reliever more than every 4 hours
  - Refer to pediatric pulmonology as needed (see next page for referral criteria)



### For children ages 12 years and older

**Intermittent asthma** (*Lack of symptoms between illness or symptoms only with occasional triggers*)

**AIR therapy:** Symbicort 80 mcg, 2 puffs every 4 hours as needed (max 12 puffs/day). Always with a spacer.

- If  $\geq 12$  puffs/day or symptoms persist:
  - Take prednisolone or prednisone 1 mg/kg BID for 3–5 days
  - Albuterol may be added if Symbicort maxed out
  - Resume Symbicort the next day (2 puffs every 4–6 hours, max 12/day)
  - Go to ED if needing reliever more than every 4 hours

**Persistent asthma** (*Symptoms between illnesses or frequent reliever use*)

**SMART therapy:** Symbicort 80 mcg, 2 puffs twice daily plus 2 puffs every 4 hours as needed (max 12 puffs/day). Always with a spacer.

- If  $\geq 12$  puffs/day or symptoms persist:
  - Take prednisolone or prednisone 1 mg/kg BID for 3–5 days
  - Albuterol may be added if Symbicort maxed out
  - Resume Symbicort the next day (2 puffs every 4–6 hours, max 12/day)
  - Go to ED if needing reliever more than every 4 hours

### When to refer your patient to pediatric pulmonology

You should refer your patient to a pediatric pulmonologist if they have:

#### Persistent symptoms despite appropriate treatment

- Children <5 years: No improvement after 3 months of consistent, correct use of low-dose ICS
- Children  $\geq 5$  years: No improvement with low-dose Symbicort using SMART therapy

#### Concerning clinical signs

- Growth faltering (formerly “failure to thrive”) with chronic respiratory symptoms
- Persistent wheezing or crackles
- Chest X-ray infiltrates that do not resolve
- Digital clubbing or ongoing low oxygen saturation

#### Severe or recurrent episodes

- More than one hospitalization for respiratory issues
- Any PICU admission for respiratory symptoms with clear response to albuterol and steroids
- Any hospitalization after starting daily inhaled steroids

### References

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