

Crackles

Generalized inspiratory and expiratory wheezing; increasingly high pitched

### With Repeated Episodes

Barrel chest

Elevated shoulders

Use of accessory muscles of respiration

Facial appearance—flattened malar bones, dark circles beneath the eyes, narrow nose, prominent upper teeth

The diagnosis is determined primarily on the basis of clinical manifestations, history, physical examination, and, to a lesser extent, laboratory tests. Generally, chronic cough in the absence of infection or diffuse wheezing during the expiratory phase of respiration is sufficient to establish a diagnosis.

**Pulmonary function tests (PFTs)** provide an objective method of evaluating the presence and degree of lung disease, as well as the response to therapy. Spirometry can generally be performed reliably on children by 5 or 6 years old. The National Asthma Education and Prevention Program recommends that spirometry testing be done at the time of initial assessment of asthma, after treatment is initiated and symptoms have stabilized, and at least every 1 to 2 years to assess the maintenance of airway function ([National Asthma and Education Prevention Program, 2012](#)).

Another measurement to consider is the **peak expiratory flow rate (PEFR)**, which measures the maximum flow of air (in liters per minute) that can be forcefully exhaled in 1 second using a **peak expiratory flow meter (PEFM)**. The reliability of the PEFM is controversial, because it relies on the child's ability to use the PEFM and willingness to participate. Because of this, some institutions no longer rely on the PEFR results to guide asthma management. The child's technique on doing the PEFR should be examined on an ongoing basis and reeducation provided when needed. Families are encouraged to record PEFM at regular intervals and to bring a