

Asthma

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One of the most common diseases physicians refer to a pulmonologist is asthma. Asthma affects nearly 19 percent of children and is the leading cause of missed school days, accounting for nearly 7.5 million days missed yearly. Although most asthma cases may be cared for in a primary care setting, the more severe cases, such as those not responding to treatment and cases that demonstrate high risk factors, should prompt referral to a specialist.

Signs and symptoms

- Varying pattern of symptoms ranging from paroxysmal to constant.
- Symptoms include wheezing, coughing, exercise-induced wheezing, prolonged exhalation and nighttime coughing.

Trigger factors

- Exposure to infections (especially viral), exercise, cold air, smoke and other pollutants and allergens such as pollens, molds and house dust mites.
- Comorbidity might include sinusitis and gastroesophageal reflux.

Risk factors

- Infants with recurrent wheezing and a family history of asthma, accompanied by eczema, are more likely to have asthma into the teenage years.
- Environmental smoke exposure and severe lower respiratory infections during infancy.

Differential diagnosis

- **Acute onset:** foreign body aspiration.
- **Infants:** Cystic Fibrosis, croup, bronchiolitis and tracheobronchiomalacia.
- **Older patients:** hyperventilation syndrome, habit cough and vocal cord dysfunction.
- **Less common entities:** bronchopulmonary aspergillosis, tuberculosis, recurrent pulmonary emboli, congestive heart failure, vascular abnormalities and mediastinal masses.

Laboratory evaluation

- Laboratory evaluation in asthma is limited. There are no specific serologic tests that are abnormal; screens for immunodeficiency and elevated IgE are considered in isolated cases. Sweat tests must be considered with infant asthmatics.
- With asthma follow-up, pulmonary function testing is most important. Additional tests might include:
 - Spirometry, importance emphasized in the 2007 NIH Asthma Guidelines.
 - Challenge testing, including exercise tolerance.
 - Asthmatics should have at least one chest X-ray to document normalcy. There is no need for follow-up X-rays with each exacerbation, unless there are focal auscultatory findings.



Treatment

- Control environmental irritants, including dust mites and insect droppings or parts.
- Asthma education, including a written action plan.
- Spacer device for use with all metered dose inhalers.
- Six major classes of medications: inhaled and oral steroids, beta agonist, leukotriene modifiers, anticholinergics and less commonly methylxanthines. Recently, IgE-blocking drugs have been added to the armamentarium for use in special cases.

Intermittent asthma

- Symptoms less than two days each week; nighttime awakenings less than two times each month and normal FEV1 between exacerbations.
- Treat with intermittent, short-acting beta agonists.

Persistent asthma – mild

- Wheeze more than two days each week and nighttime awakenings three to four times a month, leading to minor limitation in activity.
- Lung function remains normal between exacerbations.
- Treat with low-dose inhaled corticosteroids. Leukotriene modifiers are an alternative; if they are not effective, switch patient to low-dose inhaled corticosteroids.

Persistent asthma – moderate

- Daily symptoms and nighttime awakenings weekly, leading to some limitation of activity.
- Lung function is not normal, FEV1 is > 60 percent, but < 80 percent predicted.
- Treat with low-dose inhaled corticosteroids, plus a long-acting beta agonist or medium-dose inhaled corticosteroids. Leukotriene modifiers are an alternative.

Persistent asthma – severe

- Symptoms throughout the day, awakens often at night, short-acting beta agonists used daily and activity is significantly limited. FEV1 is < 60 percent predicted.
- Treat with high-dose inhaled corticosteroids and long-acting beta agonists.
- Consider Omalizumab for patients who are difficult to control and have allergies.
 - Omalizumab (Xolair) is a monoclonal IgE binding antibody for patients with moderate to severe persistent asthma, poorly controlled with inhaled steroid and other treatments. Patients must have allergy (positive skin test or RAST testing) and moderately elevated IgE-levels. This medication is administered by subcutaneous dosing every two to four weeks and is very expensive, up to \$12,000 yearly.
- Also consider adding theophylline or long-term corticosteroids, preferably an alternating day regimen.

Consider referring to a pulmonary specialist for moderate to severe asthmatics. All high-risk asthmatics should receive specialty care. In general, asthma prognosis is excellent, as long as general health, medications and symptoms are carefully monitored.

However, mortality risk with asthma increases with:

- History of ventilation
- More than two hospitalizations yearly
- Systemic steroid dependence
- History of syncope with asthma
- History of noncompliance

