CONDITION

Asthma

Learn how asthma affects breathing, what can trigger symptoms, how it is diagnosed, and how inhalers and an asthma action plan can help.

WHAT IT IS
Long-term lung condition with narrowed inflamed airways

BODY SYSTEM
Lungs and breathing

MAIN SYMPTOMS
Wheezing, shortness of breath, chest tightness, cough

WHAT CAUSES IT
Inherited, environmental and immune factors

HOW IT IS DIAGNOSED
Medical history and spirometry

MAIN TREATMENT
Inhaled corticosteroid preventive treatment

CAN IT BE CURED?
Sometimes, usually controlled but not cured

IS IT AN EMERGENCY?
Sometimes, with severe breathing difficulty

LONG-TERM OUTLOOK
Usually controllable, but severe attacks can be life-threatening

Overview

Asthma is a long-term lung condition that causes episodes of narrowed and inflamed airways. The airways are tubes that carry air in and out of the lungs. In asthma, their lining can swell, the muscles around them can tighten, and extra mucus may form. These changes can make breathing difficult.

Symptoms often come and go. They may be mild at times and severe at others. Some people have symptoms only with exercise, respiratory infections, allergens, or workplace exposures. Others have more frequent breathing problems.

Asthma can begin at any age. It is not contagious. There is no single test or symptom that confirms it in every person, so diagnosis usually combines a medical history with breathing tests.

Asthma cannot always be cured, but it can usually be controlled. Effective care reduces symptoms, supports normal activity, and lowers the risk of an asthma attack, also called an exacerbation or flare-up. Even people with few daily symptoms may sometimes have a serious attack, which is why preventive treatment and an asthma action plan can matter.

Symptoms

Asthma symptoms vary from person to person and may change over time. Common symptoms include:

Symptoms that follow a pattern can provide useful clues. They may worsen during a cold, in a particular season, around animals, at work, or after exposure to smoke or strong odors. Exercise can trigger symptoms, but well-controlled asthma should not routinely prevent physical activity.

Contact a healthcare professional for routine review if symptoms are becoming more frequent, are waking you at night, limit activity, or require a quick-relief inhaler more often than usual. A flare that required urgent care or oral corticosteroids also calls for follow-up.

Seek emergency help for severe breathing difficulty, inability to speak more than a few words at a time, blue or gray lips, confusion, unusual drowsiness, fainting, or symptoms that are not improving after using prescribed quick-relief treatment according to the asthma action plan.

- Wheezing, which is a whistling sound during breathing
- Shortness of breath
- Chest tightness or pressure
- Cough, especially at night, early in the morning, during exercise, or after laughing
- Trouble keeping up with usual physical activities
- Waking from sleep because of coughing or breathing difficulty

Causes and risk factors

Asthma does not have one simple cause. It likely develops through a combination of inherited tendencies and environmental exposures. The condition often involves an immune response called type 2 inflammation, but not everyone has the same type of airway inflammation.

Factors associated with asthma include:

A risk factor does not mean that someone will develop asthma. People without obvious risk

factors can also have it.

A trigger is different from a cause. Triggers bring on symptoms in someone whose airways are already sensitive. Common triggers include respiratory infections, exercise, pollen, dust mites, mold, animal allergens, smoke, cold air, air pollution, and strong fumes.

Some medicines can worsen asthma in certain people. Examples include aspirin or other nonsteroidal anti-inflammatory drugs and medicines called beta blockers. These medicines do not affect everyone with asthma. Do not stop a prescribed medicine without discussing it with a healthcare professional.

Symptoms that improve away from work and return during work periods may suggest work-related asthma. Early evaluation is important because continued exposure can make the condition harder to control.

- A close family history of asthma
- Allergic conditions such as eczema or hay fever
- Exposure to tobacco smoke, including secondhand smoke
- Air pollution or repeated exposure to airway irritants
- Certain workplace dusts, fumes, chemicals, or allergens
- Viral respiratory infections, especially early in life
- Obesity
- Premature birth or impaired lung growth

Diagnosis

Asthma assessment begins with a detailed history. A clinician may ask when symptoms occur, what seems to trigger them, whether they vary over time, and whether there is a personal or family history of allergies. The examination may be normal when symptoms are absent.

Whenever possible, diagnosis includes evidence that airflow out of the lungs changes over time. Spirometry is the main breathing test. It measures how much air a person can forcefully exhale and how quickly. The test may be repeated after an inhaled bronchodilator, a medicine that relaxes airway muscles. A meaningful improvement supports asthma, but one normal test does not always rule it out.

If initial spirometry is normal or uncertain, further testing may include:

No single result should be interpreted alone. Exhaled nitric oxide, for example, can be affected by allergies, smoking, and corticosteroid treatment.

Diagnosing asthma in young children can be more difficult because reliable spirometry may not be possible and wheezing is common with viral infections. Clinicians may use the symptom pattern, examination, family history, and response to monitored treatment.

Other conditions can resemble asthma, including chronic obstructive pulmonary disease, vocal cord problems, heart disease, reflux, anxiety-related breathing symptoms, and some infections. Testing is chosen according to the person's age, history, and examination.

- Repeating spirometry when symptoms are present
- Recording peak expiratory flow at home over several weeks
- Exercise or airway challenge testing under medical supervision
- Measuring exhaled nitric oxide, which can suggest a type of airway inflammation
- Allergy testing when allergic triggers are suspected

Treatment and management

Asthma treatment is adjusted to symptom control and the risk of future attacks. It should also reflect age, inhaler technique, treatment preferences, other health conditions, and access to medicines.

Inhaled corticosteroids like budesonide or fluticasone, often called ICS medicines, are the main preventive treatment. They reduce airway inflammation and lower the risk of severe flare-ups. They are different from anabolic steroids used to build muscle.

Current international guidance advises against treating adults and adolescents with a short-acting bronchodilator alone. An ICS-containing plan provides protection against inflammation as well as relief of airway tightening. Depending on the clinical plan, this may involve an ICS-formoterol inhaler used when needed, a daily ICS-containing controller with a separate reliever, or another age-appropriate approach.

Formoterol is a long-acting bronchodilator that begins working quickly, but only specific ICS-formoterol products and plans are used for symptom relief. Other combination inhalers should not be substituted without medical advice. A long-acting bronchodilator should not be used without an inhaled corticosteroid for asthma.

If asthma remains uncontrolled, a clinician may first check the diagnosis, inhaler technique, adherence, triggers, and other medical conditions. Treatment may then be stepped up. Options can include a combination ICS and long-acting bronchodilator, maintenance-and-reliever therapy with an appropriate ICS-formoterol inhaler, or add-on medicines.

Other treatments may include:

Montelukast has a boxed warning about serious mood, behavior, and sleep-related effects. Patients and caregivers should discuss these risks and report concerning changes promptly.

Biologic treatment is generally considered by an asthma specialist after testing identifies features such as allergic or eosinophilic inflammation. Eosinophils are white blood cells that can contribute to airway swelling. Biologics are not suitable for every type of asthma.

Good inhaler technique is essential. Different devices require different breathing patterns. A pharmacist, nurse, respiratory therapist, or clinician can demonstrate the device and watch the patient use it. A spacer used with some metered-dose inhalers can make delivery easier. Rinsing the mouth after an inhaled corticosteroid like budesonide or fluticasone may reduce hoarseness and oral thrush, a yeast infection in the mouth.

Non-medicine management is also important. This may include avoiding tobacco smoke, addressing relevant workplace exposure, remaining physically active as tolerated, and reducing confirmed triggers when practical. Broad or costly allergen-removal measures are not helpful for everyone, so trigger control should be targeted.

Each patient should have a written asthma action plan. It explains usual treatment, how to recognize worsening asthma, when to adjust treatment as directed, and when to seek urgent or emergency care.

- A long-acting muscarinic antagonist, another type of inhaled airway-opening medicine
- A leukotriene modifier, such as montelukast
- Biologic medicines that target specific immune pathways in severe asthma
- A short course of oral corticosteroids for some significant flare-ups

Complications

Poorly controlled asthma can disturb sleep, reduce exercise tolerance, and interfere with school or work. Flare-ups may require urgent treatment or hospitalization. Severe attacks can be life-threatening, although appropriate preventive treatment and early response to worsening symptoms reduce risk.

Long-standing airway inflammation may contribute to lasting changes in the airway walls and less reversible airflow limitation. This does not happen to everyone.

Medicines can also cause side effects. Inhaled corticosteroids like budesonide or fluticasone may cause hoarseness or oral thrush. Frequent or prolonged systemic corticosteroid exposure can affect bones, blood pressure, blood sugar, eyes, mood, and infection risk. Clinicians try to use preventive treatment effectively so that repeated oral corticosteroid courses are less

likely to be needed.

Follow up

Asthma should be reviewed periodically, even when symptoms are mild. Follow-up is also important soon after a flare-up or treatment change.

A routine review may cover:

Treatment may be stepped up when control is poor. When asthma has been well controlled for a sustained period, a clinician may consider carefully stepping treatment down to the lowest level that maintains control. Preventive medicine should not be stopped or reduced without a plan, because symptoms alone may not reflect the risk of a future attack.

Arrange a routine appointment if breathing is gradually worsening, night symptoms return, usual activities become difficult, or quick-relief treatment is needed more often. Seek urgent or emergency care for severe symptoms or when the action plan indicates that home treatment is not working.

- Daytime symptoms, night waking, activity limits, and reliever use
- Flare-ups, urgent visits, and oral corticosteroid treatment
- Inhaler technique and whether medicines are being used as planned
- Side effects, cost, or other barriers to treatment
- Smoking, vaping, allergens, workplace exposures, and other triggers
- Lung function when appropriate
- Whether the written action plan is current and understood

Sources

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