

ASTHMA

What is asthma?

Asthma is a chronic lung disease that comes in the form of acute attacks. It is characterized by inflammation and intermittent constriction of the airways, which obstruct airflow into the lungs, making it difficult to breathe.

The airways are the part of the respiratory system responsible for transferring air in and out of the lungs. In asthma, the inside walls of these tubular structures are sensitive and highly susceptible to allergens and irritants.

When asthma is triggered, the airways become swollen and narrow, hindering airflow into the lungs. [\(1\)](#)

How Common Is Asthma?

As reported in the *World Health Organization Estimates*, asthma currently affects approximately 235 million people, with its highest mortality rate in older adults. [\(2\)](#)

Approximately 8.3% of Americans have been [diagnosed with asthma](#). Out of these 26.5 million affected people, 20.4 million are adults, while the other 6.1 million are children. [\(3\)](#)

Although asthma-caused death rates are more significant in low-income and lower-middle-income countries, it is prevalent in high-income countries as well.

Severity Levels of Asthma

Asthma varies in severity among individuals. Some patients may have mild asthma throughout, whereas others may face severe asthma later in life as a result of disease progression.

Asthma severity is classified into four groups:

- **Mild intermittent asthma:** This type of asthma is relatively easy to control as the symptoms are occasional. Treatment involves a nominal amount of medicines.
- **Mild persistent asthma:** This type of asthma is characterized by a normal lung function of 80% or more. The symptoms manifest more than two times in a week, but not every day. Flare-ups at night may be experienced beyond twice a month but less than one time in a week.
- **Moderate persistent asthma:** This type of asthma requires regular use of rescue medication as symptoms appear every day. At nighttime, flare-ups may happen more than one time in a week. The frequent attacks significantly affect daily activity.
- **Severe persistent asthma:** Around 10% of [patients with asthma](#) have consistent coughing, shortness of breath, wheezing, and chest tightness. Individuals with severe asthma are the most adversely affected among all groups.

Types of Asthma

There are several types of asthma and the common ones include:

1. Allergen-triggered asthma

The body's immune system may show a hypersensitive reaction to otherwise harmless factors known as allergens, resulting in the development of asthma symptoms. This is the most frequent type of asthma and can be triggered by dust, mold, pollen, animal dander, etc.

2. Nonallergic/nonatopic asthma

This fairly rare form of asthma usually starts in the later stages of life and is unrelated to any allergy, but it is more serious than allergic asthma.

3. Exercise-induced asthma

At times, strenuous physical activity may cause constriction of the airways, leading to asthma symptoms.

Approximately 90% of individuals with asthma develop exercise-induced bronchitis as well. However, it is uncommon for people with exercise-induced bronchitis to have asthma. [\(4\)](#)

4. Cough-variant asthma

Cough-variant asthma causes cough only. Other common asthma symptoms such as wheezing and dyspnea are absent. [\(5\)](#)

5. Occupational asthma

It is caused by exposure to certain factors in the workplace that cause bronchial inflammation, constricted airflow, or hyperresponsiveness. Work-related asthma (WRA) includes both work-exacerbated and occupational asthma. [\(6\)](#)

6. Aspirin-induced asthma

Aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs) can induce severe asthma in some adults and rarely in children. This aspirin sensitivity is lifelong and can be triggered by virtually any cyclooxygenase-inhibiting analgesics. [\(7\)](#)

Causes of Asthma

Asthma is caused by inflammation in the airways as a result of sensitization toward certain factors. However, the phenomenon behind it remains unknown.

It is speculated that the interaction between environmental and genetic factors results in asthma. Such factors may include:

- Atopy, or the inherent tendency to develop allergic responses
- Family history of asthma
- Exposure to certain triggers during the development of the immune system in early childhood
- Frequent respiratory tract infections during childhood

Symptoms of an Asthma Flare-Up

Asthma attacks occur due to a mucus buildup in the airways, resulting in inflammation and constriction. This may be accompanied by symptoms such as:

- Coughing, especially in the morning or at bedtime, which can develop into a dry or phlegm-producing chronic cough
- Chest tightness

- Wheezing during exhalation
- Shortness of breath
- Frequent respiratory infections
- Throat irritation
- Difficulty falling and staying asleep
- Trouble in breathing, which may be characterized by rapid breathing or breathing through the mouth
- Anxiety
- Fluctuating respiratory rate
- Sweating
- Elevated heart rate

Different cases of asthma produce diverse symptoms and might include symptoms other than those listed above.

Asthma Triggers

Asthma can be easily triggered on exposure to various allergens and irritants, causing a flare-up. In extreme cases, it may result in a sudden attack, which might be fatal if not treated promptly. [\(8\)](#)

Asthma triggers may include:

- Physical strain
- Cold weather
- Chemicals
- Sulfites in foods
- Cigarette or tobacco smoke
- Air pollution
- Animal dander
- Pollen
- Scented products
- Dust mites
- Mold
- Smoke from burning grass or wood
- Respiratory infections
- Strong odors from paint or food
- Medications such as NSAIDs, aspirin, and beta-blockers (used for managing heart conditions, high blood pressure, and migraine)

- Extreme emotions such as excessive laughing or crying, stress, fear, or anger

Urbanization has also been shown to cause an increase in asthma cases, but the reason is unclear.

Warning Signs of an Asthma Attack

Asthma attacks are generally preceded by warning signs that may occur 24–48 hours before the attack. Initially, these signs may be difficult to identify as they are mild and may seem unrelated.

However, after a few episodes, you can easily recognize the warning signs. A mention of these signs in your Asthma Action Plan by your doctor facilitates recognition.

All patients have different signs that may include:

- Wheezing
- Excessive coughing
- Chest tightness
- Fingernails or lips turning grey or blue
- Confusion and lack of response
- Frequent use of quick-relief inhalers (more than once within 4 hours)
- Unresponsiveness to blue reliever inhalers

Risk Factors for Asthma

Certain factors can predispose you to develop asthma, including:

- **Age:** Children (9.4%) are more prone to asthma than adults (7.7%). [\(3\)](#)
- **Gender:** Asthma is more common among boys in childhood and among females during adolescence and adulthood, [\(3\)](#) but their tendency decreases as they approach menopause unless they are undergoing postmenopausal hormone replacement therapy.
- **Genes:** A history of asthma, eczema, hay fever, or allergies in your family increases your risk of developing asthma.
- **Ethnicity:** Puerto Ricans are most affected by asthma, but African-Americans face the highest asthma mortality in the United States. This increased risk among specific ethnicities may be due to low incomes, poor air quality, allergens, lack of patient education, and lack of access to health care.
- **Obesity:** High amounts of fat consumed by obese people can cause metabolic disorders and inflammation, thus decreasing lung volume. This elevates the risk of developing asthma by 50% in obese individuals.
- **Occupational hazard:** Exposure to gases, chemical fumes, or dust during mining, spraying, and welding increases the chances of acquiring asthma.
- **Alcohol:** Despite being a mild bronchodilator, alcohol may induce asthma symptoms due to its acetaldehyde and sulfite content.

- **Smoke:** Individuals who smoke are highly prone to asthma. Children may develop asthma when exposed to secondhand smoke regularly or if their mothers smoked at the time of pregnancy.
- **Allergies:** People with preexisting allergies are more likely to develop asthma.

Complications Related to Asthma

Rarely, asthma may result in the following complications:

- Lung infections, such as [pneumonia](#)
- Persistent exhaustion
- Respiratory failure characterized by a severe drop in oxygen levels or alarmingly high carbon dioxide levels
- Psychological problems, such as depression, anxiety, or stress
- Airway remodeling, which refers to any structural changes that may occur in the airways due to persistent inflammation or frequent flare-ups
- [Lung collapse](#) involving the whole or a part of the lung
- Severe [asthma attacks](#), which are unresponsive to regularly prescribed medications, also known as *status asthmaticus*
- Health problems such as obesity and high blood pressure due to the inability to exercise

How is asthma diagnosed?

Your health care provider may use many tools to diagnose asthma:

- Physical exam
- Medical history
- [Lung function tests](#), including spirometry, to test how well your lungs work
- Tests to measure how your airways react to specific exposures. During this test, you inhale different concentrations of allergens or medicines that may tighten the muscles in your airways. Spirometry is done before and after the test.
- Peak expiratory flow (PEF) tests to measure how fast you can blow air out using maximum effort
- Fractional exhaled nitric oxide (FeNO) tests to measure levels of nitric oxide in your breath when you breathe out. High levels of nitric oxide may mean that your lungs are inflamed.
- Allergy [skin](#) or [blood](#) tests, if you have a history of allergies. These tests check which allergens cause a reaction from your immune system.

What are the treatments for asthma?

If you have asthma, you will work with your health care provider to create a treatment plan. The plan will include ways to manage your asthma symptoms and prevent asthma attacks. It will include:

- **Strategies to avoid triggers.** For example, if tobacco smoke is a trigger for you, you should not smoke or allow other people to smoke in your home or car.
- **Short-term relief medicines,** also called quick-relief medicines. They help prevent symptoms or relieve symptoms during an asthma attack. They include an inhaler to carry with you all the time. It may also include other types of medicines which work quickly to help open your airways.
- **Control medicines.** You take them every day to help prevent symptoms. They work by reducing airway inflammation and preventing narrowing of the airways.

If you have a severe attack and the short-term relief medicines do not work, you will need emergency care.

Your provider may adjust your treatment until asthma symptoms are controlled.

Sometimes asthma is severe and cannot be controlled with other treatments. If you are an adult with uncontrolled asthma, in some cases your provider might suggest bronchial thermoplasty. This is a procedure that uses heat to shrink the smooth muscle in the lungs. Shrinking the muscle reduces your airway's ability to tighten and allows you to breathe more easily. The procedure has some risks, so it's important to discuss them with your provider.

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When to See a Doctor

It is recommended to visit a pulmonologist or respiratory therapist if you recognize asthma symptoms.

The symptoms of asthma are similar to the symptoms of other lung diseases, such as a chest infection, and therefore should be checked by a doctor for a timely diagnosis.

The doctor can recommend emergency care if:

- Rescue medicine does not alleviate the symptoms.
- The lips or nails turn gray or blue.
- The heartbeat is elevated.
- The nostrils flare on breathing.
- There is difficulty in walking or talking.
- The neck, chest, or ribs are pulling with each breath, called retractions.

If you experience an asthma attack, call 911 or your local emergency number immediately.

Home Remedies for Asthma

The following home remedies can be tried to [relieve the symptoms of asthma](#).

1. Consume turmeric

Turmeric contains curcumin, which has anti-inflammatory properties. [\(1\)\(2\)](#) Taking turmeric capsules containing curcumin has been found beneficial in relieving asthma. However, more studies are needed to establish its role. [\(3\)](#)

How to use:

Add turmeric as a spice to your food or consume warm turmeric milk or tea. Take supplements only upon consulting your doctor.

Caution: Avoid excessive intake of turmeric as it can lead to ulcers, acidity, and blood thinning.

2. Increase your vitamin C and D intake

It is vital to consume a well-balanced diet with vegetables and fruits that are rich in flavonoids and antioxidants, such as vitamins C and D. These compounds also act as anti-inflammatory agents and aid relief. [\(4\)\(5\)\(6\)](#)

How to use:

Include citrus foods such as orange and lemon, kiwi, potato, and vitamin D-rich foods such as milk, fish, egg, liver, cheese, and cereals in your diet. Use supplements only after consulting your doctor.

3. Consume caffeinated drinks

Caffeine is a mild bronchodilator and also helps in alleviating respiratory muscle fatigue. Furthermore, caffeine may slightly improve airways function for around 4 hours in [patients with asthma](#). [\(7\)](#)

However, avoid large amounts of caffeine as it does not have any long-term effects on asthma and the available scientific evidence regarding its use is insufficient. [\(8\)\(9\)](#)

4. Use ginger

Ginger exhibits anti-inflammatory effects on the swollen airways, helps clear excessive mucus, and relaxes the airways. [\(10\)](#) However, not many human trials have been conducted to establish the efficacy of this treatment yet. [\(11\)\(12\)](#)

How to use:

Use ginger in preparing your meals or consume ginger lemon tea.

Caution: Consume ginger in moderation as otherwise it can cause bloating, flatulence, and minor heartburn.

5. Inhale eucalyptus oil

Eucalyptus oil is known to help reduce chronic inflammation and airway inflammation. It also helps clear out excess mucus from the nasal passageways. [\(13\)\(14\)](#)

How to use:

Pour a few drops of eucalyptus oil on a napkin and place it close to your nose while sleeping. Alternatively, you can put a few drops of the oil in a bowl of boiled water and inhale the steam.

Caution: Make sure to dilute the essential oil before inhaling to avoid allergic response and irritation.

6. Consume black seed

Black seed oil contains thymoquinone, which can help reduce asthma-related inflammation and muscle constriction. [\(15\)\(16\)\(17\)](#)

How to use:

You can add black seeds as well as black seed oil in your diet. Avoid excessive consumption to prevent kidney and liver damage.

7. Drink apple cider vinegar

Apple cider vinegar (ACV) helps relieve inflammation by balancing body pH. It also contains various nutrients that support the respiratory system. Thus, ACV is a popular anecdotal remedy for asthma symptoms. However, there is no scientific evidence to substantiate its effects.

How to use:

Dilute a few drops of ACV in a glass of water and consume.