# About asthma

## What is asthma?

Asthma is a chronic respiratory condition that affects an estimated **350 million people worldwide** with **400,000 deaths** reported due to the disease in 2015[1]

The number of people affected by asthma is expected to grow to **400 million by 2025**[2]

Asthma is a condition of the lungs in which respiratory airways are narrowed due to **inflammation**, **excessive mucus** and **tightening of the smooth muscles** in the airways. This leads to **breathing difficulties**[3].

Asthma can cause a **significant personal**, **health and financial burden** when not adequately controlled[1,4].

**"significant personal, health and financial burden."**

## Asthma symptoms and triggers

- Symptoms of asthma include **coughing**, **wheezing**, **breathlessness** and **chest tightness**[5].
- Asthma symptoms can be initiated and worsened by a variety of **environmental**, **physical** and **emotional triggers**. Avoiding individual triggers, when possible, can help reduce the risk of an asthma exacerbation[6].
- Patients who have **predictable** asthma triggers can more easily manage their condition than those affected by **unpredictable** triggers[7].

| Predictable asthma triggers | Unpredictable asthma triggers |
|---|---|
| Seasonal allergies | Year-round allergies |
| Physical activities | Persistent asthma |
| Workplace irritants (e.g. chemicals, fumes) | Upper respiratory infections |
| Cigarette smoke | Pollution |
| Cold weather | Emotional factors (e.g. grief, laughter, stress) |

## Asthma exacerbations (attacks)

- Asthma exacerbations, also known as asthma attacks, can be a terrifying experience[8]. They occur when symptoms worsen suddenly.
- Symptoms such as **coughing**, **wheezing**, **breathlessness** or **chest tightness** become **more severe**, and can be accompanied by other symptoms, such as **faster breathing**, **faster heartbeat**, **drowsiness** and **exhaustion**[9].
- During an exacerbation, **airways become narrower** as the muscles lining them contract. Inflammation of the airways can also cause them to swell and fill with excess mucus, making breathing more difficult[9].
- Asthma exacerbations can **last minutes**, **hours or even days**, depending on what causes the attack, and how long the airways have been inflamed[9].

## Diagnosing asthma

Asthma is most commonly diagnosed and monitored through clinical examinations and tests that measure lung function[9].

### A spirometry test will measure:

- Forced expiratory volume in one second ($FEV_1$), which is the maximum amount of air that can be forcefully blown out of a person's lungs in one second[10]. Asthma severity is determined by the extent of airflow obstruction; the lower the $FEV_1$, the more severe the disease[11].
- Forced vital capacity (FVC), which is the total amount of air that a person can blow out in one complete breath after taking a deep breath in[12].

### A peak flow test will measure:

- Peak expiratory flow (PEF), which is how quickly a person can blow the air out of their lungs after a full breath in[13].

## Asthma treatment and management

Asthma management involves a continuous cycle of **assessing**, **adjusting treatment** and **reviewing how a patient is responding**[9].

Several classes of asthma medications are available, many in portable, handheld inhaler devices, which deliver medicine directly to the airways and lungs[14]. The most commonly used treatments can be classified into controller and reliever medications.

To prevent asthma exacerbations and control symptoms, global treatment guidelines recommend that all adult patients should receive inhaled corticosteroid (ICS)-containing controller medication. Every patient with asthma should also have a reliever inhaler[9].

### Controller medication

**Inhaled corticosteroids (ICS):**

ICS suppress inflammation of the airways to provide long-term control of asthma symptoms[15].

**Long-acting $beta_2$-agonists (LABAs):**

LABAs stimulate $beta_2$-receptors in the smooth muscle of the airways, causing them to relax and dilate (a process known as bronchodilation). LABAs provide a relatively long duration of bronchodilation, with effects lasting at least twelve hours. LABAs are prescribed in addition to regular corticosteroid controller treatments, to help prevent asthma symptoms, such as breathlessness[16].

**Long-acting muscarinic antagonists (LAMAs):**

LAMAs inhibit the effect of neurotransmitters on muscarinic receptors in the smooth muscle of the airways, preventing the narrowing of the airways (bronchoconstriction)[17]. LAMAs can be used as add-on treatment when symptoms remain uncontrolled[18].

### Reliever medication

**Short-acting $beta_2$-agonists (SABAs):**

SABAs should be used only as needed and at the lowest dose and frequency required[9].

## Uncontrolled asthma impacts daily activities and quality of life

The long-term goals of asthma management are risk reduction and symptom control[19]. But despite the availability of effective medications, a large unmet medical need exists among patients with asthma who remain uncontrolled. Barriers, such as treatment mismatch, safety issues with an oral corticosteroid and ineligibility for biologics, have created an unmet medical need in asthma[19,20].

### A patient with uncontrolled asthma exhibits one or both of the following[19]:

- Poor symptom control, i.e. frequent symptoms, **activity limited by asthma**, **night waking due to asthma** and **frequent use of reliever medication**.
- **≥2 exacerbations** per year requiring emergency medical care, or **≥1 serious exacerbation** requiring hospitalization.

Patients with uncontrolled asthma may downplay or underestimate the severity of their disease and are at a **higher risk of exacerbation**, **hospitalization or death**[21–23].

### Uncontrolled asthma can have a significant impact on daily and professional lives[4]:

- **93%** of patients report disruption of physical activities
- **88%** of patients report disruption of daily activities
- **57%** of adult patients report that asthma has negatively impacted their working lives
- **54%** of patients suffer from depression
- **78%** of patients say their asthma is "always in the back of their mind"
- **83%** of patients report a negative impact on personal relationships


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