

## Asthma

Asthma is a disease affecting the airways that carry air to and from the lungs. Asthmatic airways are usually swollen or inflamed on inside walls. This swelling or inflammation causes the airways to be extremely sensitive to irritation and increases the susceptibility to allergic reactions. As inflammation causes the airways to become narrower, less air can pass through the lungs making it difficult to breathe. Asthma is an incurable illness, however, with good treatment and management, a person with asthma can live a normal and active life.

by *Thabiso Mphehlo - Clinical Analyst*

### What are the symptoms of Asthma?

Symptoms of the narrowing include wheezing (a hissing sound while breathing), chest tightness, difficulty in breathing and coughing. These symptoms are most frequent at night and early in the morning.

### What is an Asthma Episode/Attack?

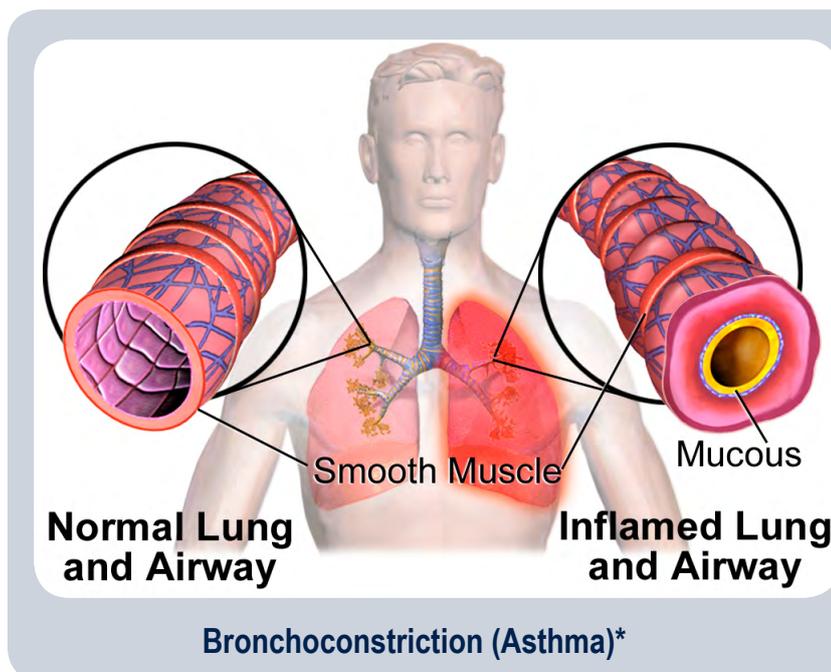
An asthma episode, or an asthma attack, is when symptoms are worse than normal. The attack can be mild, moderate or severe although the onset of the attack is sudden.

### What happens during an asthma attack?

During an asthma attack, the muscles around the airways tighten up, narrowing the airway. There is less air flow. Inflammation also sets in, increasingly narrowing the airway. Mucus is also produced, undermining the flow of air even more.

In some instances, airways become so blocked that oxygen fails to enter the lungs. By extension, this also prevents oxygen from entering the blood stream and traveling to the body's vital organs. Asthma attacks of this type can be fatal, and the patient may require urgent hospitalisation.

At the onset, an asthma attack does allow some air to get into the lungs, but it does not let the carbon dioxide to leave the lungs at a rate fast enough. Carbon dioxide is poisonous if not expelled, and can build up in the lungs during a prolonged attack as it lowers the amount of oxygen getting into the bloodstream.



**Bronchoconstriction (Asthma)\***

### What are the causes of Asthma?

Exposure to various irritants and substances that give rise to allergies (allergens) can trigger signs and symptoms of asthma. Asthma triggers are different from person to person and can include:

- Airborne allergens, such as pollen, animal dander, mold, cockroaches and dust mites
- Respiratory infections, such as the common cold
- Physical activity (exercise-induced asthma)
- Cold air
- Air pollutants and irritants, such as smoke
- Certain medications, including beta blockers, aspirin, ibuprofen (Advil, Neurofen, others) and naproxen
- Strong emotions and stress

- Sulfites and preservatives added to foods and beverages such as shrimp, dried fruit, processed potatoes, beer and wine
- Gastroesophageal reflux disease (GERD), a condition in which stomach acids back up into your throat
- Tests to measure lung function: the patient may be taken to lung (pulmonary) function tests to determine how much air moves in and out as they breathe. These tests may include:
  - Spirometry: this test estimates the narrowing of bronchial tubes by checking how much air can be exhaled after a deep breath and how fast the patient can breathe out.
  - Peak flow: a peak flow meter is a simple device that measures how hard one can breathe out. Lower than usual peak flow readings are a sign that the lungs may not be working as well as they should and that asthma may be getting worse. The treating doctor will give the patient instructions on how to track and deal with low peak flow readings.

## **Risk factors for Asthma**

### **Family history**

A parent with asthma increases the likelihood of their offspring by three to six times more.

### **Viral respiratory infections**

Respiratory problems during infancy and childhood can cause wheezing. Some children who experience viral respiratory infections go on to develop chronic asthma.

### **Allergies**

Allergic conditions, such as atopic dermatitis (eczema) or allergic rhinitis (hay fever), is a risk factor for developing asthma.

### **Occupational exposures**

Exposure to certain dusts (industrial or wood dusts), chemical fumes and vapors, and molds can cause asthma to develop. In addition, exposure to certain elements in the workplace can awaken symptoms in existing asthma sufferers.

### **Smoking**

Cigarette smoke irritates the airways. Smokers have a high risk of asthma. Women who smoke during pregnancy or who were exposed to second hand smoke are also more likely to have asthma.

### **Air Pollution**

The main component of smog (ozone) exposure increases the risk for asthma. Dwellers of urban areas have a higher propensity to asthma because of pollution.

### **Obesity**

Children and adults who are overweight or obese are at a greater risk of asthma. Although the reasons are unclear, some experts point to low-grade inflammation in the body that occurs with extra weight. Obese patients often use more medication, suffer worse symptoms and are less able to control their asthma than patients in a healthy weight range.

### **Diagnostic tests**

- Physical exam: to rule out other possible conditions such as a respiratory infection, or chronic obstructive pulmonary disease (COPD) — the treating doctor will perform a physical exam and ask questions about signs and symptoms and other health problems.

- Lung function tests are often done before and after taking a medicine called a bronchodilator to open the airways. If lung function improves with a use of a bronchodilator, it is likely that the patient has asthma.
- Radiology tests: a chest x-ray of the lungs can identify any structural abnormalities or diseases (such as infection) that can cause or aggravate breathing problems.
- Laboratory tests: a full blood count to identify anaemia or polycythemia (increase in the total red cell mass).
- Additional tests may include a CT scan of the chest to investigate symptoms that seem inconsistent with the spirometric results and to investigate abnormalities seen on a chest x-ray.

## **Prevention of Asthma**

- Avoid exposure to personal and second-hand smoke
- Avoid contact with furry animals such as dogs and cats
- Reduce pollen exposure
- Reduce exposure to house dust mites
- Avoid sensitizers and irritants (dust and fumes) which aggravate or cause asthma, especially in the workplace
- Avoid food and beverages containing preservatives
- Avoid drugs that aggravate asthma such as beta-blockers (including eye drops) and aspirin and non-steroidal anti-inflammatory drugs

Early and aggressive asthma treatment is key to relieving symptoms and preventing asthma attacks. The treatment includes asthma medication as well as inhalers.

## **Medical Management**

Asthma management is done in a stepwise approach depending on the severity of the disease. The following table illustrates the severity of asthma.

	Intermittent	Persistent		
		Mild	Moderate	Severe
Category	i	ii	iii	iv
Daytime symptoms	≤2/week	2-4/week	>4/week	Continuous
Night-time symptoms	≥1/month	2-4/month	>4/week	Frequent
Peak Expiratory Flow (predicted)	≤80%	≥80%	60-80%	>60%

## Treatment Methods

Treatment steps	Treatment
Step 1: Mild Intermittent Asthma	Inhaled short acting Beta2 agonist as required
Step 2: Mild Persistent Asthma	Reliever: Beta2 agonist as required Preventer: Add inhaled corticosteroids 400-800µg/day
Step 3: Moderate Persistent Asthma	1. Short acting Beta2 agonist as required 2. Increase dose of inhaled corticosteroids to 1200µg/day <b>If not controlled:</b> 3. Add inhaled long acting Beta2 agonist to 1200µg/day inhaled corticosteroids 4. Reassess control: • If adequate continue long acting Beta2 • If no response stop long acting Beta2 and consider SR theophylline
Step 4: Severe Persistent Asthma	1. Short acting Beta2 agonist as required 2. Increase inhaled steroids to 2000µg/day plus long acting Beta2 or SR theophylline
Step 5: Very Severe Persistent Asthma	1. Therapy in step 4 2. Review for oral steroids

## What must be funded under PMB level of care?

Asthma is included in PMB regulations under both the diagnostic treatment pairs (DTPs) and in the chronic disease list (CDL). The DTP includes 157D- Acute asthmatic attack; pneumonia due to respiratory syncytial virus in persons under age 3.

PMB regulations specify that medical schemes must fund in full the diagnosis, treatment and care of Asthma. It is important to remember that medical schemes may use managed care protocols to manage their financial risk. Such protocols must however be evidence-based taking into account cost effectiveness and affordability. Medical schemes may further appoint designated service providers (DSPs) and charge a co-payment if such providers are not used.

It is also important for the treating doctor to register the condition with the medical scheme so that benefits for treatment can be paid as PMB. The medical scheme must make provision beyond the drugs listed on its CDL in cases where the medication on the CDL does not work for the member or causes harm. Confirm with your medical scheme about the diagnostic tests covered for the condition and how many per year they cover. This is important because the scheme is allowed to limit the number and types of tests covered per year. If the doctor deems it necessary for additional tests to be done, the doctor should write a clinical motivation to the scheme for payment for the tests to be considered as PMB.

## References

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