



## 22282VIC Course in the Management of Asthma Risks and Emergencies in the Workplace

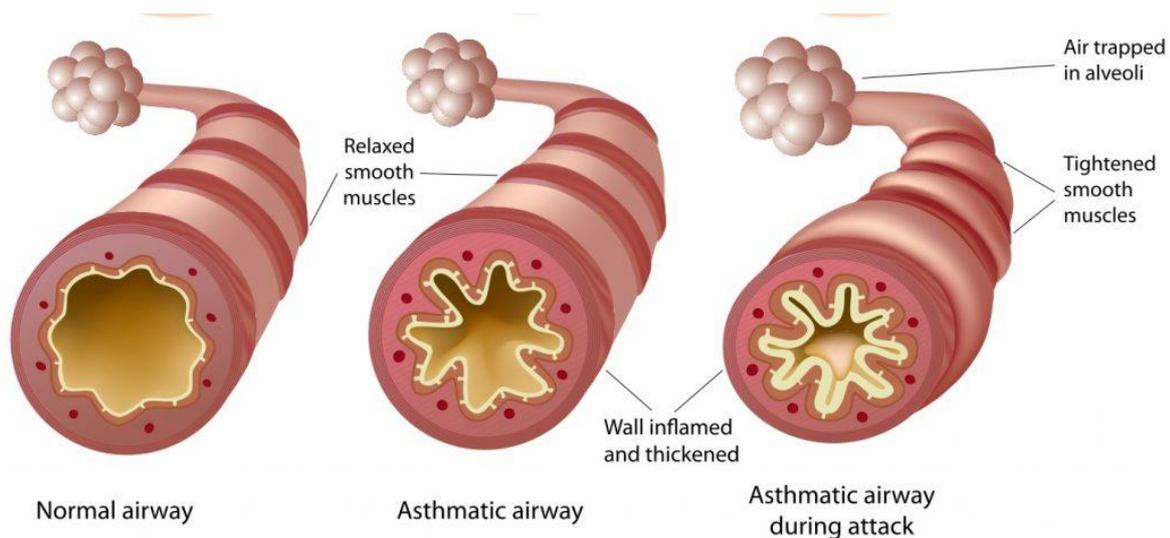
### Learner Guide

#### What is Asthma?

Asthma is chronic inflammatory disease that affects the airways (small tubes) in our lungs.

The effects of asthma are reversible, but they cause difficulty in breathing and other symptoms. If an asthma attack is severe, a person may need emergency treatment to restore normal breathing.

An asthma attack is often triggered by things in the environment. These triggers vary from person to person, but common ones include cold air, tobacco smoke, exercise, allergens such as dust mites, mould, pollen or animal fur, and some types of viral infections.



When you breathe in, air travels through your nose and/or mouth through the trachea. From the trachea, it enters a series of smaller tubes that branch off from the trachea. These branched tubes are the bronchi, and they divide further into smaller tubes called the bronchioles. It is in the bronchi and bronchioles that asthma has its main effects.

When the airways come into contact with an asthma trigger, the tissue inside the bronchi and bronchioles becomes inflamed (inflammation). At the same time, the muscles on the outside of the airways tighten up (constriction), causing them to narrow.

A thick fluid (mucus) enters the airways, which become swollen. The breathing passages are narrowed still more, and breathing is hampered. Because inspiration is an active process involving the muscles of respiration, this obstruction of the airways is overcome by breathing in.

Expiration occurs with muscle relaxation and is severely delayed by the narrowing of the airways. The process just described can be normal, up to a point. Everyone's airways constrict somewhat in response to irritating substances like dust and mould. But in a person with asthma, the airways are hyperreactive. This means that their airways overreact to things that would just be minor irritants in people without asthma.

In the early stages of attack the obstruction is reversible, however, as the attack progresses it becomes increasingly difficult to reverse the process.

## **Asthma triggers**

Acute asthma attacks are commonly caused by two types of trigger factors; they can be allergenic or non-allergenic. Sometimes, there is no identifiable trigger.

- Allergenic asthma triggers
- Pollens
- Spores and moulds
- House dust mites
- Animal fur or wool
- Chemicals such as glues and solvent pens
- Food (especially food 'dust')
- Non-allergenic asthma triggers
- Exercise
- Colds and other viral infections
- Temperature (changes in temperature can cause significant attacks)
- Cold air
- Cigarette smoke
- Stress

## Signs and Symptoms

Signs and symptoms of an asthma attack include:

- A wheezing sound when breathing
- Difficulty in breathing and increased respiratory rate
- The feeling of chest tightness
- Unable to complete a full sentence
- Fast heart rate (tachycardia)
- Anxiety and panic
- Reducing levels of consciousness (late sign)
- Cyanosis (late sign)

Remember not all of these signs and symptoms may be obvious.

The casualty may wear a bracelet on their wrist/ankle/neck with details of their asthma. Also, they may carry their medication (normally an inhaler) with them.



## Assessment of Asthma attacks

The severity of an asthma attack can vary. Different guidelines use different criteria to define the severity of an asthma attack. However, there are three broad categories

### Mild

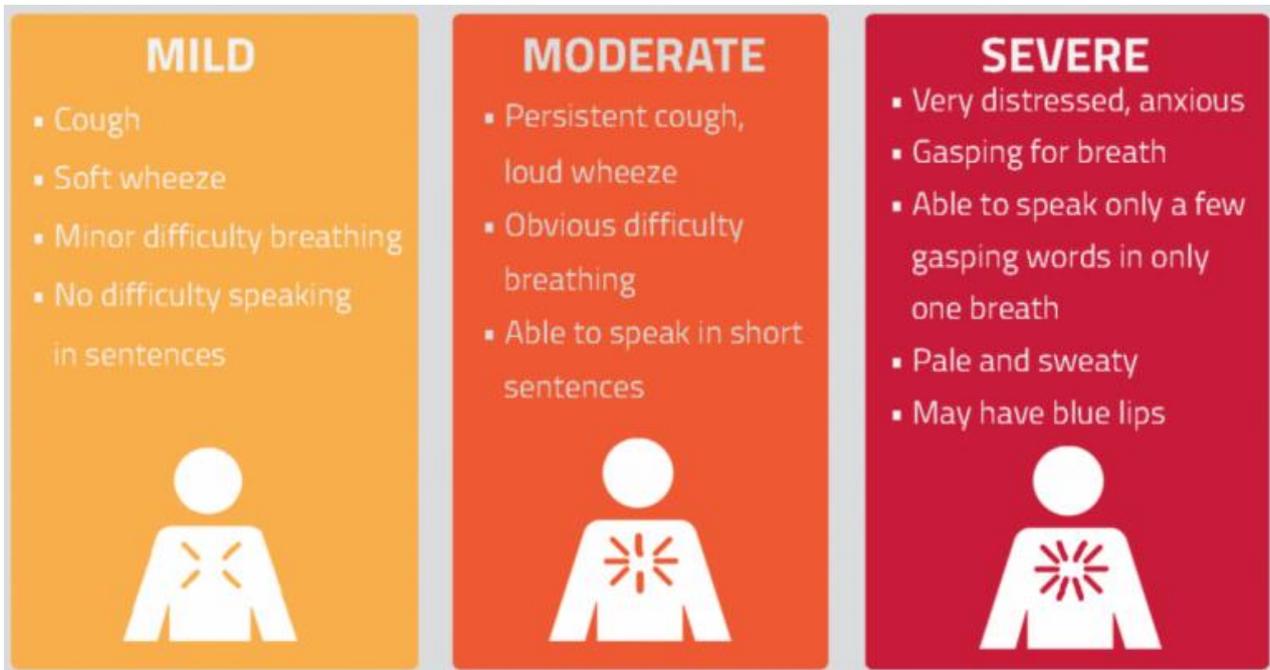
- Able to talk in full sentences
- Slight wheeze
- Peak flow > 50% (best or predicted)

### Moderate

- Talking in short sentences/phrases
- Loud wheeze
- Peak flow < 50% (best or predicted)

### Severe / immediately life-threatening

- Reduced level of consciousness
- Unable to speak
- Cyanosis (blueish tinge to lips / fingernails)
- Wheeze may be absent ('silent chest')
- Exhaustion



## **Asthma statistics**

According to the World Health Organisation, approximately 235 million people suffer from asthma worldwide. It is the most common chronic disease among children. In total, it is estimated there were 383,000 deaths worldwide due to asthma in 2015.

Asthma is under-diagnosed and under-treated, creating a substantial burden to individuals and families and possibly restricting individuals' activities for a lifetime.

## **Living with Asthma**

This short video highlights some of the challenges patients and families face when dealing with asthma every day.

<https://youtu.be/pxHQb9-VXV4>

## Peak flow readings

A peak flow device is used to monitor how well asthma patients are responding to treatment. Patients with asthma may carry a peak flow device with them to enable them to monitor their breathing.



Asthma patients should know their normal best peak flow reading.

## First aid treatment

Asthma is still responsible for many deaths worldwide. One of the most important steps is to recognise the signs and symptoms of a life-threatening asthma attack described in the last unit.

If you are concerned about a patient with asthma, you must not delay in calling for emergency medical assistance.

## General first aid steps

**Step 1: Sit the casualty down in the position they find most comfortable for their breathing.**

**Step 2: Find their medication,** which is normally an inhaler (possibly with a spacer device) containing a drug such as Albuterol. Albuterol is also known as Ventolin.

**Step 3: Assist the casualty to use their medication.** They should know how many doses to take and how to use the inhaler. There may be different recommendations of how many ‘puffs’ of an inhaler to take depending on local guidelines. As a guide, a maximum of up to 10 puffs over 30 – 60 seconds each is recommended however this will vary depending on local guidelines.

**Step 4: Provide reassurance and help calm the person’s breathing** if they are hyperventilating.

**Step 5: Call for emergency medical help if the Albuterol inhaler has no effect,** or the patient shows any signs of deterioration.

Delays in calling for emergency medical assistance could be fatal

## How does Albuterol work?

Albuterol (Ventolin) makes breathing easier for people with asthma.

Albuterol is a prescription medication used to treat bronchospasm (narrowing of airways) in people who have reversible obstructive airway disease. It may also be used to prevent exercise-induced bronchospasm. Albuterol belongs to a group of drugs called beta agonists. These cause the smooth muscle of the airways to relax, making it easier to breathe.

Albuterol comes as a tablet, a syrup, and an extended release tablet to take by mouth. The tablets and syrup are usually taken three or four times a day. The extended release tablets are usually taken once every 12 hours.

Albuterol also comes as a solution to be inhaled into the mouth using a nebulizer and is usually used 3 or 4 times a day.

This medication also comes as an aerosol to inhale by mouth using an inhaler. When the aerosol is used to treat or prevent symptoms of lung disease, it is usually used every 4 to 6 hours as needed. When the aerosol is used to prevent breathing difficulty during exercise, it is usually used 15 to 30 minutes before exercise.

The most common side effects of albuterol include:

- palpitations
- chest pain
- fast heart rate
- shakiness
- nervousness
- headache
- dizziness
- sore throat
- runny nose

## Complications of Asthma

In rare cases, asthma can lead to a number of serious respiratory complications, including:

- pneumonia (infection of the lung tissue)
- a collapse of part or all of the lung (pneumothorax)
- respiratory failure, where the levels of oxygen in the blood become dangerously low, or the levels of carbon dioxide become dangerously high
- status asthmaticus – severe asthma attacks that do not respond to treatment
- rib fractures – from severe coughing associated with asthma

All of these complications can be life-threatening and will need urgent medical treatment.



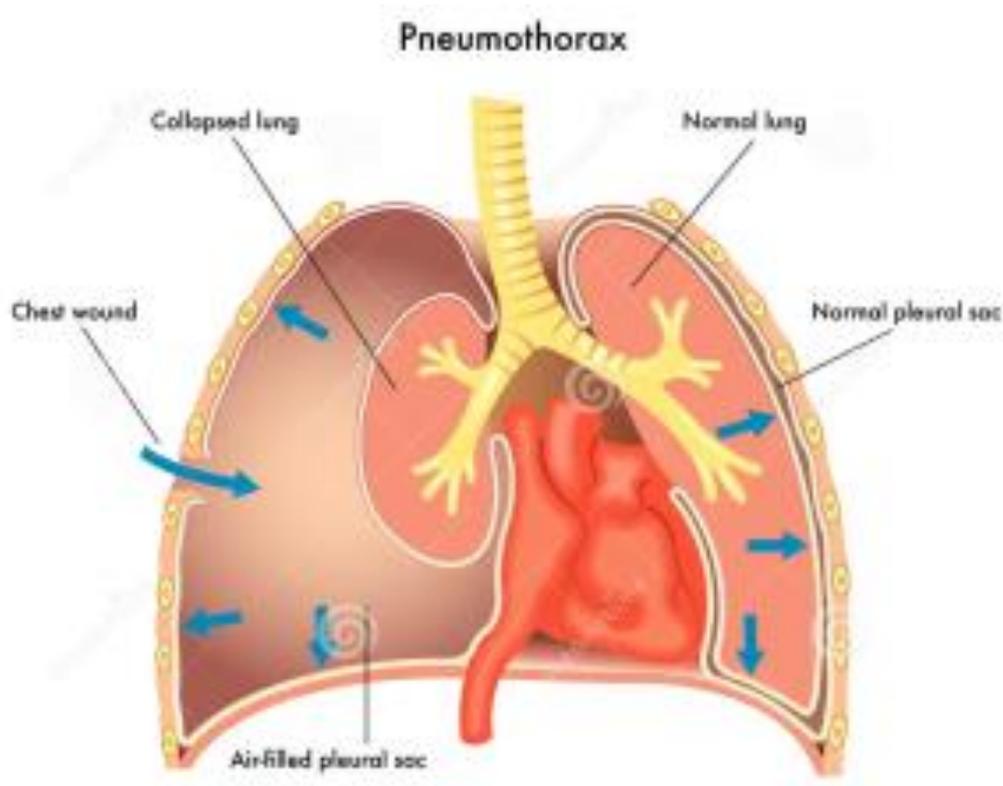
## What is a pneumothorax?

'Pneumo' means air (as in pneumatic) and 'thorax' means chest, so pneumothorax simply means 'air in the chest'. However it is not air in the normal anatomy of the air passages, but air in the pleural cavity.

As result of underlying disease in the lung or injury such as stab wound or a gunshot wound, air enters the pleural cavity from either the lung or through a hole in the chest wall. Each time the casualty breathes in, air enters this cavity.

As air accumulates within the pleural cavity, the lung underneath collapses.

A severe asthma attack is a risk factor for developing a pneumothorax.



### In summary:

- Asthma is a chronic disease characterised by episodes of shortness of breath, wheezing and chest tightness
- Asthma attacks can be triggered by a variety of environmental factors
- Do not delay in calling for help if you are concerned about a patient with asthma
- Albuterol (Ventolin) is the main initial treatment for asthma attacks

### Video summary

This video from TED-Ed provides a useful summary of asthma and its treatment.

<https://youtu.be/PzfLDi-sL3w>