Module One: Understanding Your Lungs and COPD

Welcome

Welcome to Module One of Lung Foundation Australia's C.O.P.E program.

C.O.P.E. stands for **COPD. Online. Patient. Education.**

This module is designed to help you understand the respiratory system and to provide an introduction to COPD.

Please move through this module at your own pace by clicking through the 'Prev' and 'Next' buttons, located in the navigation bar.

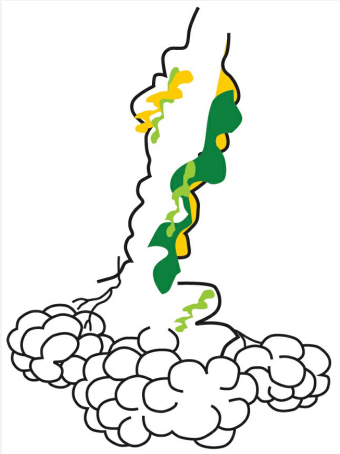
Learning objectives

Learning more about your lungs and increasing your knowledge about COPD will help you to better look after yourself.

Upon completion of this module, you should understand:

- How your lungs work;
- The various conditions that are included under the term COPD (chronic bronchitis, emphysema and chronic asthma that isn’t fully reversible);
- The lung function tests that diagnose COPD; and
- Other conditions that can occur with COPD

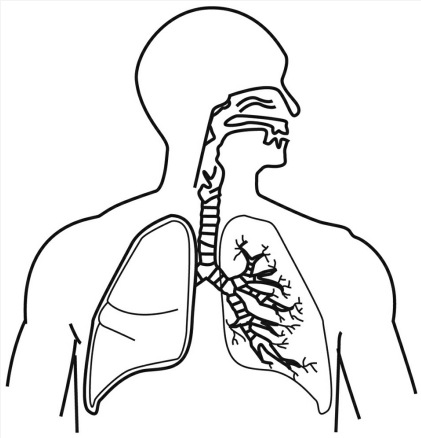
Understanding your lungs and COPD



Chronic Obstructive Pulmonary Disease (COPD) is an umbrella term for a group of conditions that cause an obstruction to the airflow in the lungs either by:

- Damage to the air sacs (alveoli) and breathing tubes (bronchi and bronchioles).
- Swelling and sputum/mucus production in the breathing tubes.

What is the respiratory (or breathing) system?



The respiratory system includes the upper and lower respiratory tract. **The upper respiratory tract** consists of:

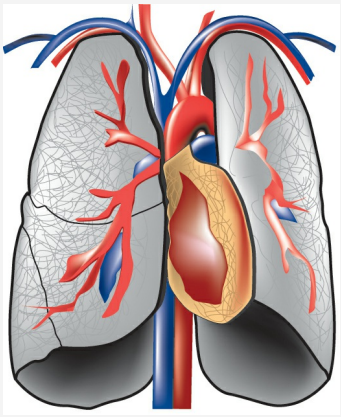
- The nose and nasal cavity.
- The throat (*pharynx*).
- The voice box (*larynx*).

The lower respiratory tract consists of:

- The windpipe (*trachea*).
- Breathing tubes (*bronchi* and *bronchioles*).
- Air sacs (*alveoli*).

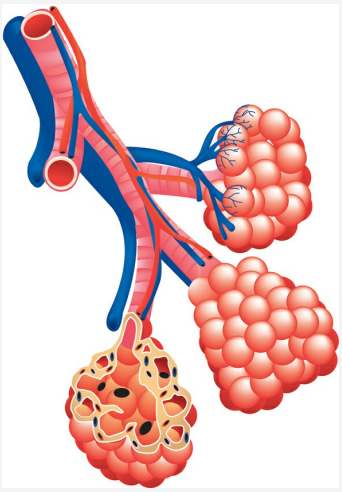
What is the structure of the lungs?

Both lungs and the heart are located within the chest. There are two lungs inside the chest: the left lung and the right lung. Each lung is divided into segments called lobes. The lungs are soft and protected by the ribcage.



Within the lungs is a transport system for oxygen (O_2) and carbon dioxide (CO_2). Each time you breathe, air is drawn via the mouth and nose into the windpipe (*trachea*).

The windpipe splits into two breathing tubes (*bronchi*): one to the left lung and one to the right lung. The breathing tubes continue to divide into smaller and smaller tubes (*bronchioles*), which take air down into each lung.



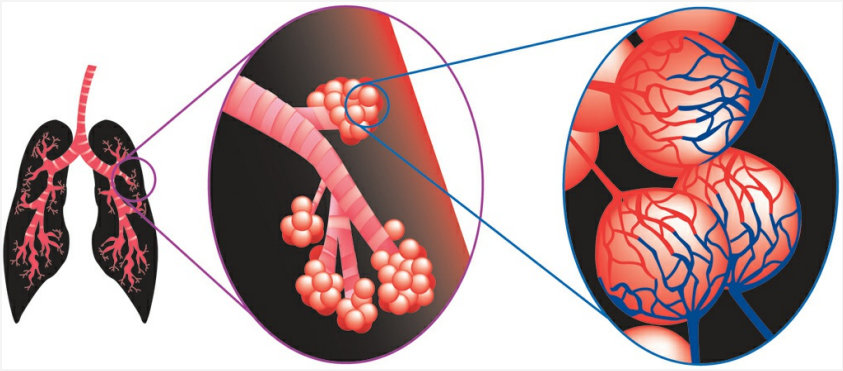
What do the lungs do?

To survive, your body needs oxygen which you get from the air you breathe. The lungs help take the oxygen from the air, through the air sacs (*alveoli*) and into the body.

The air sacs are surrounded by tiny blood vessels (*capillaries*), which crisscross the walls of the air sacs. The air sacs are where oxygen, which is a gas, is absorbed into the bloodstream.

Oxygen is then carried along in the bloodstream to the heart. The heart then pumps the blood to where it is needed in the body.

Carbon dioxide is a waste gas product that is produced by the body. Carbon dioxide moves from the bloodstream back into the air sacs and through the breathing tubes or airways, where it is breathed out.



How do you breathe?

To ensure you have a thorough understanding of COPD, it is important that you know how your lungs work. This video will take you through the breathing process so you can visualise what your respiratory system looks like each time you take a breath.

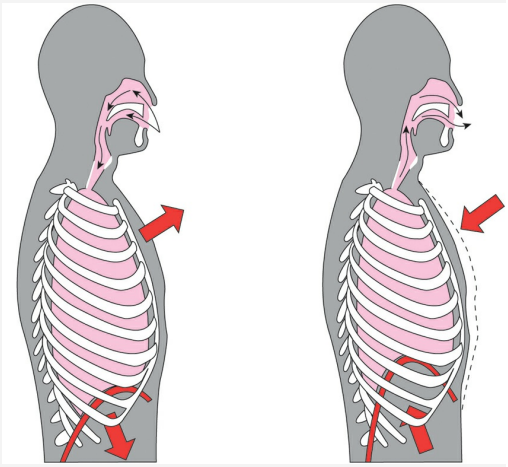
The lungs are not a muscle and do not move on their own. The diaphragm, located under the bottom of the rib cage, is the main breathing muscle, acting like a suction pump.

Understanding how your lungs work will help you to better understand why COPD affects your breathing. This video will take you through the breathing process so you can visualise what your respiratory system looks like each time you take a breath.

What is the role of the nose and nasal cavity?

The nose and nasal cavity perform a number of functions, including

- Providing us with a sense of smell.
- Warming and moistening the air that is breathed in.
- Filtering the air that is breathed in of irritants, such as dust and foreign matter.
- Assisting in the production of sound.



The nose is the preferred route to deliver oxygen to the body as it is a better filter than the mouth. The nose decreases the amount of irritants delivered to the lung, while also heating and adding moisture (humidity) into the air we breathe.

When large amounts of air are needed, the nose is **not** the most efficient way of getting air into the lungs. In these situations, mouth breathing may be used. Mouth breathing is commonly needed when exercising.

Infection or irritation of the nasal cavities can result in swelling, a runny nose or blocked sinuses, which can interfere with breathing.

How does your respiratory system protect against irritants or foreign particles?

The respiratory system provides protection against irritants or foreign particles entering the lungs. The respiratory system has several protection mechanisms.

Firstly, the nose filters the air when breathing in, preventing irritants such as dust and foreign matter from entering the lungs.

Secondly, if an irritant enters the airways or breathing tubes, sputum that lines the airways traps unwanted particles. Tiny hair-like structures called cilia line the breathing tubes or airways. They move in a sweeping motion to help move the sputum and unwanted particles up into the mouth where they can be cleared. The function of the tiny hairs can be affected by smoke, alcohol and dehydration.

The third protective mechanism for the breathing system is the cough. A cough is the result of irritation to the breathing tubes (*bronchi* and *bronchioles*). A cough can clear sputum from the lungs.

Lastly, the lungs also have a built-in immune system that acts against germs.

What causes respiratory conditions?

Lung or respiratory conditions can be caused by:

- Infections.
- Acute or long term breathing in of toxic agents (for example, cigarette smoke or chemical fumes).
- Genetic causes (for example, cystic fibrosis).
- Another disease, such as a muscular disorder, that impairs the function of the lungs.
- Sometimes lung disease can be caused by unknown reasons.

While many parts of this education program will be helpful to people with a wide range of lung conditions, the primary focus will be on chronic obstructive pulmonary disease, commonly known as COPD.

What is chronic obstructive pulmonary disease (COPD)?

The term chronic obstructive pulmonary disease (COPD) is commonly used to describe a person who has:

- chronic bronchitis;
- emphysema;
- chronic asthma that is not fully reversible; or
- a combination of these conditions.

COPD is the new and preferred term, although you may still hear it referred to using the terms chronic obstructive airways disease (COAD) and chronic airflow limitation (CAL).

Chronic bronchitis, emphysema and chronic asthma are common long term lung conditions that cause shortness of breath. Each condition can occur separately, but many people have a mixture of these conditions.

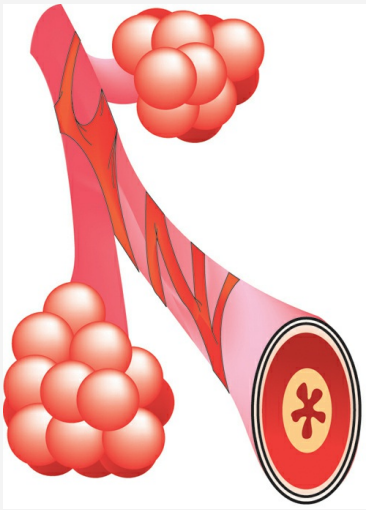
Click here to download the *Breathe Easier Fact Sheet*.

COPD conditions

In Australia, chronic bronchitis and emphysema usually occur in people who have smoked or continue to smoke cigarettes, but they can be caused by environmental or genetic factors. Asthma commonly occurs in non-smokers as well as smokers. It is caused by a number of different factors including but not limited to the environment, allergy and genes.

A small number of people can get emphysema from an inherited protein deficiency called alpha-1-antitrypsin deficiency.

Chronic bronchitis



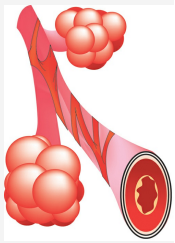
Chronic bronchitis is a constant swelling and irritation of the breathing tubes (*bronchi* and *bronchioles*) and results in increased sputum production, a thick liquid secreted from the respiratory tract.

This condition usually occurs as a result of infection and is often related to smoking. Chronic bronchitis is recognised or identified when sputum is produced on most days for at least three months, for two consecutive years.

Airway obstruction occurs in chronic bronchitis because the inflammation and excessive sputum production causes the inside of the breathing tubes to be narrower than usual. Frequent infections occur due to the increased sputum.

As the breathing tubes or airways become narrower, it is harder for air to move in and out of the lungs and breathlessness results.

Emphysema



Emphysema is a condition where the air sacs (*alveoli*) become enlarged and the walls between them break down causing larger air spaces.

If you suffer from emphysema, this video should help you to visualise how your lungs are working to overcome your narrowing bronchi and bronchioles. You will also be able to see how the loss of elasticity in your lungs may make it more difficult for you to breathe out. This will help you to better understand how COPD affects your lungs.

Alpha-1 antitrypsin deficiency

Alpha-1 antitrypsin deficiency is a genetic disorder and those with Alpha-1 antitrypsin deficiency are at greater risk of developing COPD.

Alpha-1 antitrypsin (AAT) is a substance normally present in the blood; its role is to protect the lungs from damage. Over the course of a lifetime, the delicate tissues of the lungs are exposed daily to a variety of inhaled materials, such as pollutants, germs, dust and cigarette smoke. AAT helps the body fight against the damage caused by these pollutants.

People with a deficiency of AAT have too low a level to protect their lungs from the damaging enzymes produced by the body in reaction to the pollutants. This puts them at greater risk of developing COPD. COPD occurring at an early age is an important clue to this inherited disorder.

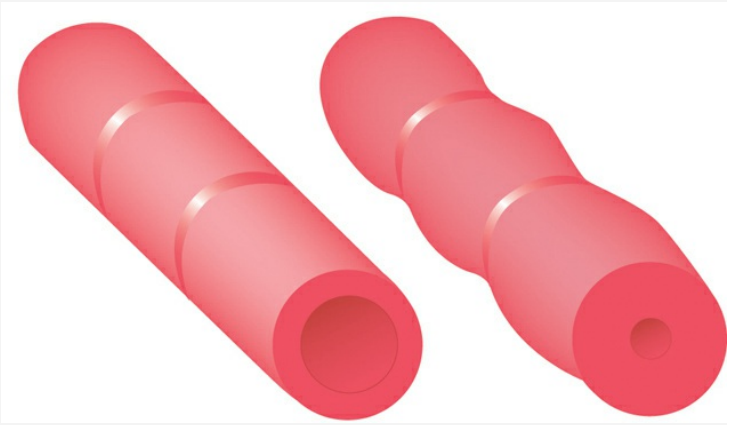
Click here to learn more about *Alpha-1 antitrypsin*.

Common conditions that co-exist with COPD

In addition to the lung diseases that come under the COPD umbrella there are other lung conditions that commonly co-exist with COPD. These include: asthma, bronchiectasis and interstitial lung disease. These are briefly explained below.

Asthma

Asthma is a condition of chronic swelling of the breathing tubes or airways. There are many factors that can trigger an asthma attack including infection, exercise and environmental factors, such as cold air or pollens.



Swelling of the airway wall and tightening of the muscles around the airway results in the narrowing of the breathing tubes (*bronchi* and *bronchioles*). Wheeze, chest tightness, breathlessness and cough are classic symptoms of asthma.

The swelling may produce an obstruction of the breathing tubes or airways, similar to COPD. Some people have both COPD and asthma.

Asthma is often believed to be a disease that affects children and young adults. However, asthma is found in all age groups.

During an asthma attack, the breathing tubes or airways become inflamed, swollen and blocked with sticky sputum (as shown in the previous diagram). This makes breathing more difficult. For more information on asthma visit *Asthma Australia* or call 1800 278 462

COPD and Asthma Overlap

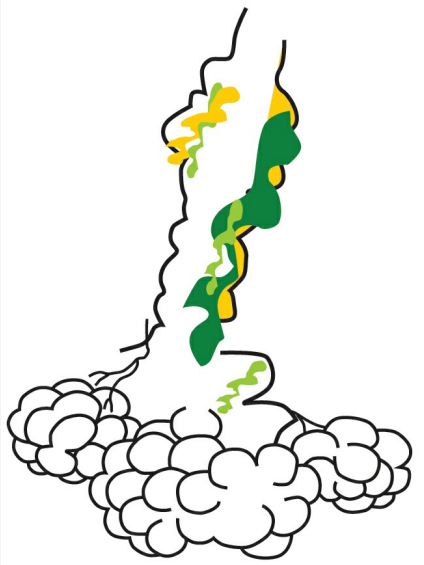
Because asthma and COPD have similar symptoms, it may be difficult to distinguish between the two conditions. We know that many older Australians being treated for asthma, in fact, have COPD and vice versa.

Asthma and COPD have different causes, affect the body differently and some of the treatments are different. It is important, therefore, to determine if you have asthma, COPD or both. The best way to do this is by having your doctor perform a lung function test (*spirometry*).

Bronchiectasis

Bronchiectasis is a lung condition involving the destruction of the airways' or breathing tubes' inner lining and widening or *dilatation* of the breathing tubes (*bronchi* and *bronchioles*).

Bronchiectasis is not caused by cigarette smoking and is usually caused by a previous severe infection of the lungs. Bronchiectasis may occur in anyone who has had severe infections, including those with COPD.



Bronchiectasis is characterised by repeated episodes of acute bronchial or airway infection with increased coughing and sputum production. This alternates with periods of chronic infection and mild coughing.

In bronchiectasis, sputum becomes difficult to clear. Sputum can be trapped in 'pockets' within the breathing tubes, which can lead to further infections and damage to the breathing tubes or airways.

Sputum is often white. If it changes to a different colour such as yellow, brown or green, it usually means there is an infection. Sometimes people with bronchiectasis will have discoloured sputum even when well.

What is interstitial lung disease?

Interstitial lung disease refers to a group of lung conditions, including pulmonary fibrosis, in which the lungs harden and stiffen (become fibrosed or scarred).

During interstitial lung disease, the walls of the air sacs (*alveoli*) thicken, which reduces the transfer of oxygen (or other gases) to and from the blood.

Interstitial lung disease may be caused by immune conditions, asbestosis, exposure to chemicals or irritants, or have no known traceable cause (idiopathic).

How COPD affects the lungs

Watch the video below to see how COPD affects the lungs.

Why are lung function tests important in the diagnosis and treatment of COPD?

Lung function tests assist in the diagnosis and management of COPD.

The tests used are spirometry, gas transfer measurements and lung volume measurements. These tests measure how well, and spirometry measures how much air, you breathe in and out of your lungs.

Gas transfer measurements can show how well oxygen enters your body and how lung volume measurements show how much air you have in your lungs.

Click here to download the *Lung Function Tests Fact Sheet.*

What are the lung function tests?

Community based screening devices

Community-based COPD screening tests assist your healthcare team in identifying who needs to be referred to a GP for a spirometry test diagnosis. Please note: you do not need to do a screening test if you have already been diagnosed with COPD. The tests may be undertaken in conjunction with the *Lung Health Checklist.*

Watch the videos below to learn more about the Piko-6 and COPD-6 screening devices. These videos should help you to feel better prepared for your lung function tests.

Spirometry

What is spirometry?

Spirometry is the most commonly used test. It is vital to confirm the diagnosis of COPD by spirometry. This test measures the amount of air you are able to breathe in and out, and how quickly you are able to breathe air out. Typically, if you have COPD, you will take longer to breathe all of your air out.

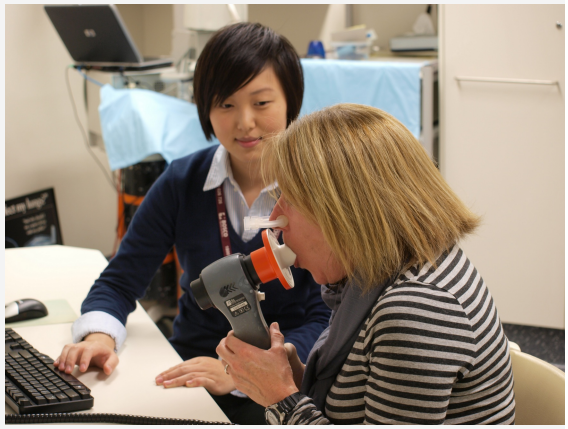
Spirometry is done by breathing into a machine called a spirometer. You will be asked to take your biggest breath in and to breathe all the air out as fast as you can into the machine. This is usually done several times to get your best result and can take up to 20 minutes to complete the tests. Spirometry is often repeated after you have taken some breathing medicines (for example, Ventolin® or Bricanyl®). This is done to find out if your lung function improves with these medicines.

Spirometry will be used to monitor your COPD and to check how well your treatment is working. Sometimes spirometry will also be used to monitor your COPD when you have an infection or soon afterwards.

What should I know before taking the spirometry test?

- You may be asked to not take your breathing medicines on the day of the test. **However, if you feel really breathless, take your quick acting breathing medicines (e.g. Ventolin or Asmol) and let the person conducting your test know when you took your breathing medicines.**
- As effort is required to do this test, you may get tired. This is not unusual.
- As effort is required in blowing out, it is a good idea to go to the toilet before the test.
- The person conducting the spirometry test will give you instructions on how to do the test. If you do not understand them, ask for the instructions to be repeated or for a demonstration on how the test should be undertaken.
- You can sometimes become light-headed during the test. If this happens, stop breathing into the machine and let the person conducting your test know.
- To get the best results, you will be asked to do the test several times, this may take some time.
- Inform the operator if you have had chest pain or recent surgery prior to this test.
- Breathing test results vary according to a person’s age, height, whether they are male or female, and their ethnic background.

Breathing test results



The results of these breathing tests allow your lung function to be compared with people who are like you, but who do not have lung conditions.

Your breathing test results can be used to classify the severity of your lung condition and assist in tailoring appropriate treatments. Different measurements are taken to assess your lung function. The most important measures are:

1. **Forced Expiratory Volume in one second (FEV1).** This is the maximum amount of air that can be expelled from the lungs during the first second of breathing out following a maximal breath in.
2. **Vital Capacity (VC).** This is the maximum amount of air that can be expelled from the lungs while breathing out following a maximal breath in.
3. **Forced Vital Capacity (FVC).** This is the maximum (total) amount of air that can be expelled from the lungs while breathing out forcefully. VC and FVC are equal in a normal lung but can differ in patients who have a chronic lung condition.
4. **FEV1/FVC.** This measures how much air is blown out in the first second proportional to the total amount blown out of the lung. So it shows how quickly the lungs can be emptied. People with healthy lungs can usually blow out 70% to 90% of their air in the first second.

What is a gas transfer measurement?

The gas transfer measurement is a test that measures how well oxygen in the air moves from your lungs across the air sacs (*alveoli*) and into your blood stream, and thus to your vital organs.

This test is done by breathing into a mouthpiece connected to a machine.

You will be asked to breathe out as much as you can, to take a large breath in, and to hold your breath for 10 seconds before breathing back into the machine. To get the best results, you will be asked to repeat the test.

This test will take about 15 minutes to complete. If you are on oxygen, you will be asked to take the oxygen off for a few minutes before the test.

Typically, if you have severe COPD, your results will be low when compared with people who are like you, but who do not have lung conditions.

This test is used to assess the severity of lung conditions such as COPD.

What is a lung volume measurement?

The lung volume measurement is a test that measures the amount of air in your lungs. There are three measurements, which are taken:

- At the end of a normal breath.
- When you have taken in a deep breath.
- When you have blown out all the air.

No matter how hard you try, when you have blown out all the air, there is still some air left in your lungs. It is this amount of air that is left in the lungs that is measured.

Lung volumes are measured in a machine called a body plethysmograph, which is like a box with glass walls. This test is done in a box because very small pressure changes need to be measured while you are breathing.

During the test, you will sit in the box with the door closed and breathe through a mouthpiece attached to the machine.

If you suffer from claustrophobia in small spaces, let the operator know. They may ask you to attempt the test as most people can do the test even if they have claustrophobia.

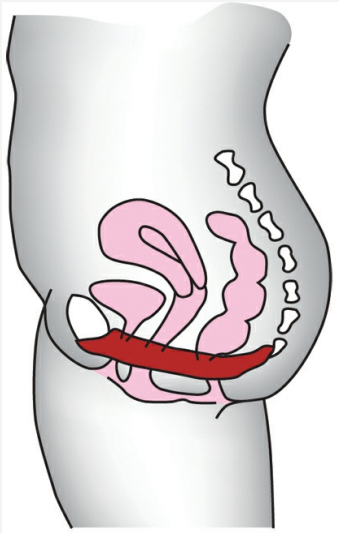
You will be instructed to breathe normally through the mouthpiece. However, every now and then, you will be asked to breathe against a blockage and to also breathe all the air out and then take a large breath in. The test will take approximately 10 minutes to complete. If you are on oxygen, usually you will be asked to come off the oxygen during the test.

Typically, if you have COPD, your lungs will be a lot bigger than normal because of the amount of air trapped in your lungs (*hyperinflation*).

You may need a similar test for fitness to fly called a high altitude simulated test (HAST). This is done to see if it is safe for you to fly in an aircraft.

Incontinence

Incontinence



Incontinence is a term that describes any accidental or involuntary loss of urine from the bladder (urinary incontinence) or bowel motion, faeces or wind from the bowel (faecal or bowel incontinence).

Incontinence is a widespread condition that ranges in severity from 'just a small leak' to complete loss of bladder or bowel control.

Incontinence and other complaints that suggest weakness in the muscles supporting the bladder, uterus or bowel (the pelvic floor muscles) are common for many people who have chronic obstructive pulmonary disease (COPD) and other chronic lung conditions.

Going to the toilet between four and six times a day and no more than twice at night is normal. However, if you suffer from any of the following complaints, you may have a weak **pelvic floor muscles**:

- **Urgency:** a sudden and urgent need to go to the toilet and an inability to ‘hold on’.
- **Incontinence:** a leakage of urine or faeces from the bladder or bowel.
- **Stress incontinence**: a small leakage of the urine from the bladder when the pelvic floor is stressed by activity, such as coughing, laughing, sneezing, straining or lifting, jumping, running or doing exercise.
- **Constipation or straining:** the inability to empty without great effort.
- **Frequency**: a need to go to the toilet frequently, which indicates an inability to ‘hold on’.
- **Other symptoms:** such as vaginal flatus (wind) or inability to keep tampons in.

About the pelvic floor

The pelvic floor is made up of layers of muscle and other tissues.

Contraction of the pelvic floor muscles is important in preventing urgency (the urgent need to go to the toilet), constipation and incontinence (the leakage of urine or faeces). The pelvic floor muscles also contribute to good posture. The pelvic floor muscles can be weak from:

- Chronic coughing.
- Pregnancy and childbirth.
- Continual straining to empty bowels (constipation).
- Heavy lifting.
- Growing older.
- Being overweight.
- Being unfit.
- Changes in hormone levels at menopause.

What can you do to strengthen your pelvic floor?

The pelvic floor holds up and supports the organs in the pelvis including the bladder, the bowel, the uterus (or womb) in women and the prostate in men.

The pelvic floor helps to control bladder and bowel function. When the pelvic floor muscles contract, they contribute to the functional control of the bladder, the bowel and the uterus during daily activities. Coughing and sneezing causes increased pressure on the pelvic floor muscles.

A weak pelvic floor cannot do its job properly. Research has shown that the pelvic floor responds to regular exercise of these muscles. In fact, the sooner you start pelvic floor muscle exercises, the better your chance of preventing or

overcoming many of the problems associated with a weak pelvic floor.

If you experience stress incontinence, contracting the pelvic floor before any activity (for example, coughing, sneezing, lifting or jumping) will increase pressure to the pelvic floor and can help to protect you against leakage. Practise this technique regularly to ensure that it becomes a lifelong habit.

Some simple steps to keep your bladder and bowel healthy

- Try to drink at least six to eight cups (one and a half litres) of fluid a day (unless advised otherwise by your doctor).
- Limit the amount of caffeine (for example, coffee, cola and tea) and alcohol you drink as these drinks irritate the bladder.
- Try to go to the toilet only when your bladder is full and you need to go (emptying your bladder before going to bed is fine).
- Take your time when urinating so that your bladder can empty completely.
- Keep your bowels regular and avoid constipation.
- Do not strain when using your bowels
- Keep your pelvic floor muscles in good condition.

Click here to download a PDF of Pelvic Floor Exercises.

Pelvic Floor Exercises

How to tighten your pelvic floor muscles

- Sit or lie comfortably with the muscles of your thighs, buttocks and abdomen relaxed.
- Tighten (and then relax) the ring of muscles around your back passage (anus) as if you are trying to control diarrhoea or wind. Practise this movement until you are able to exercise the correct muscles.
- Tighten your muscles as if you are trying to stop yourself passing urine or going to the toilet.

How to do your pelvic floor routine

- For men: tighten and draw in strongly the muscles around your rectum (back passage) and urethra (urine tube) all at once, trying to hold them up inside. Hold this contraction as you count to five and then relax. You should have a feeling of letting go as you relax. Rest for at least 10 seconds and repeat. Aim to do 10 contractions.
- For women: tighten and draw in gently the muscles around your rectum (back passage), vagina and urethra all at once, trying to hold them up inside. Hold this contraction as you count to five and then relax. You should have a feeling of letting go as you relax. Rest for at least 10 seconds and repeat. Aim to do 10 contractions.
- When doing these exercises:
    - Do not hold your breath.
    - Do not push down;
    - Squeeze and lift up; and
    - Do not tighten your buttocks or thighs

What else do you need to know?

- Strengthening the pelvic floor muscles takes time. If you have very weak muscles initially, they will fatigue easily. Don’t give up. These exercises do work if done regularly.
- These exercises should be done regularly and you can add them into your daily routine, such as after going to the toilet, when having a drink or when lying in bed.
- A position that enhances pelvic floor function should be chosen if you regularly perform airway clearance techniques. When sitting, this is achieved with feet flat on the floor, your hips at 90 degrees and your lumbar spine in neutral or straight (not slumped). Ensure you contract the pelvic floor muscles before huffing and coughing.
- For more information, please contact your doctor, physiotherapist or continence advisor, or contact the **National Continence Helpline** (phone: 1800 330 066) or visit their website www.continence.org.au. There are specialist health care professionals that deal with the problem of incontinence.

What is Obstructive Sleep Apnoea (OSA)?

Obstructive sleep apnoea (OSA) and other breathing conditions are common for many people who have COPD and other chronic lung conditions.

People who suffer from OSA reduce or stop their breathing for short periods while sleeping because in deep sleep, the muscles of the throat relax and this may reduce the space at the back of the tongue, through which air must pass to reach the lungs. Normally this doesn't cause any problems with breathing. In OSA, however, complete relaxation of the throat muscles may cause blockage of the upper airway so that breathing stops temporarily. Such an episode is called an apnoea.

This can happen many times during the night. These breathing stoppages interrupt sleep which results in poor sleep quality with excessive sleepiness during the day. Because these events occur during sleep, a person suffering from OSA is usually unaware of them and is often the last one to know what is happening.

In OSA, the breathing stoppages can last for ten or more seconds and the cycle of apnoeas and broken sleep is repeated hundreds of times per night in severe cases. Most sufferers are unaware of their disrupted sleep but awaken unrefreshed, feeling tired and needing more sleep.

What are the symptoms of Obstructive Sleep Apnoea (OSA)?

A person with OSA may not be aware of the many arousals from deep sleep caused by their condition. Symptoms of OSA include:

- A perception of poor quality sleep despite long periods of time spent in bed.
- Difficulty maintaining concentration during the day.
- Poor memory.
- Excessive daytime sleepiness.
- Snoring

Other symptoms of OSA include:

- Morning headache.
- Depression.
- Short temper.
- Grumpiness.
- Personality change.
- Loss of interest in sex.
- Impotence in males.

If you are concerned about your sleep, discuss this with your doctor. Your doctor may ask you a series of standard questions to determine whether you require further investigations in order to make a diagnosis of obstructive sleep apnoea.

What other problems can develop from OSA?

OSA can be life-threatening. It is a risk factor for high blood pressure, heart attack, heart failure, and stroke. All these conditions occur more frequently in people with OSA.

OSA-associated poor concentration and daytime sleepiness have been associated with an increased risk of accidents in the workplace and on the road.

How is OSA assessed and treated?

In a person suspected of having OSA, their doctor will need to ask questions about waking and sleeping habits. Reports

from the sleeping partner or other household members about any apnoeas are extremely helpful.

Referral to a sleep disorders specialist and an overnight sleep study will assist with the diagnosis of OSA and measurement of its severity.

Click here to download the *Obstructive Sleep Apnoea Fact Sheet.*

General Guidelines

- In an overweight person, weight loss is an important part of treatment. Even a small loss of weight can lead to improvement in symptoms of OSA.
- Avoiding alcohol up to two hours before going to sleep and not using any sleeping tablets or tranquillisers can also help.
- Nasal obstruction may respond to nasal decongestant sprays and smoking cessation.
- For the patients whose sleep apnoea is worsened by lying on their back, positioning devices such as special pillows, rubber wedges and tennis balls attached to pyjama backs encourage sleep in other positions but are of limited value in very severe OSA.

Specific Treatment Options

Continuous positive airway pressure

A CPAP pump is the most common treatment for OSA and is very effective in many cases. A CPAP pump delivers air to the upper breathing tubes or airways via a plastic tube attached to a close-fitting nose or face mask.

Other non-surgical treatments

- Individually designed oral appliances or mouth splints made by dentists may help patients with snoring or apnoea.
- Tongue retainer devices may be useful in those who no longer have their own teeth.
- Specially designed ‘mouth plates’ may help patients who have a narrow maxilla (e.g upper jaw bone).

Surgery options and more OSA information

Further information about OSA including surgical options can be found in the Lung Foundation’s *Obstructive Sleep Apnoea Fact Sheet*.

What is osteoporosis?

What is osteoporosis?

Over 2 million Australians have osteoporosis, a condition, where your bones become thin and break more easily. Referred to as a ‘silent disease’ where often no symptoms are present and for many, a fractured (or broken) bone is the first sign of osteoporosis.

Fractures due to osteoporosis can occur at any age but increase as you age. Common sites for osteoporotic fractures are the spine, hip, wrist, and ribs. Hip fractures are common in the over 75 years. Men after hip fracture have higher mortality rates and disability than women.

What are the risks for developing osteoporosis?

There are a number of risk factors that contribute to osteoporosis seen in COPD patients. These risk factors include:

- Smoking.
- Vitamin D deficiency.
- Low body mass index (BMI).
- Hypogonadism (*deficiency in the secretory activity of the ovaries and testis*).
- Lack of physical activity
- Family history.
- Menopause.
- Thin and small body frames.
- Caucasian or Asian.
- Advancing age.

In addition to these risk factors, oral steroid use in many patients with COPD is thought to be a contributing factor in the development of osteoporosis.

What lifestyle changes can I make?

Lifestyle factors can play a role in reducing age-related bone loss that contributes to osteoporosis risk. These include:

- Adding calcium to your diet if you are deficient.
- Sensible sun exposure.
- Doing weight bearing exercises.
- If you smoke, quit.
- Minimise your alcohol intake (no more than 2 standard drinks per day for both women and men with several alcohol free days per week).

How is osteoporosis assessed and treated?

A bone density test is a quick test for measuring:

- Osteoporosis or osteopenia (bone density that is lower than the normal peak density but not low enough to be classified as osteoporosis.
- Evaluate response to therapy.
- Predict fractures occurring in the future.

Your doctor may order blood and urine tests along with x-rays to have a closer look at your bone health.

There are a number of medicines available to treat osteoporosis through the Pharmaceutical Benefits Scheme (PBS). The medicines work by maintaining or improving bone density and strength. This can reduce the risk of fractures. Lifestyle changes may also be required.

Useful Resources

Fracture Risk Calculator: *www.fractureriskcalculator.com*

Osteoporosis Australia: *www.osteoporosis.org.au* or call 1800 242 141

Calcium Counter: *www.arthritisvic.org.au*

Conclusion

The aim of this module was to help you learn more about your lungs and increase your knowledge about COPD in order to help you better look after yourself.

On completion of this module, you should now understand:

- How your lungs work;
- The various conditions that are included under the term COPD (chronic bronchitis, emphysema and chronic asthma that isn’t fully reversible);
- The lung function tests that diagnose COPD; and
- Other conditions that can occur with COPD.

You can revisit this module at any time by selecting Module One from the dashboard.