

# Chronic Obstructive Pulmonary Disease (COPD) and exercise

## What is COPD?

In Australia, 1.45 million people have some form of Chronic Obstructive Pulmonary Disease (COPD) (5), and 14% of all deaths in Australia in 2011 were caused by lung disease (6). COPD is a progressive long term disease of the lungs which causes shortness of breath(1) and includes emphysema, chronic bronchitis and chronic asthma. Despite there being no cure, it is treatable and largely preventable, and there are things people with COPD can do to breathe easier, keep out of hospital, and improve their quality of life (1).

Cigarette smoking is the most important cause of COPD. Other risk factors include genes, exposure to particles, occupational dusts, indoor and outdoor air pollution, oxidative stress, and age (2).

The main symptoms of COPD are breathlessness, cough and sputum production (1). A persistent cough, typically worse in the mornings with mucoid sputum, is common in smokers. Fatigue, poor appetite, reduced exercise capacity, reduced quality of life and weight loss are more common in advanced disease states.

## How does exercise help?

Despite feelings of breathlessness and loss of exercise capacity, patients with COPD are capable of exercise training (3). It will however be a case of modifying and adjusting the exercise intensity and duration to suit the individual and their capabilities and symptoms. Almost any level of physical activity, including exercise, can cause favourable improvements in oxygen utilisation, work capacity, breathlessness, strength, anxiety and quality of life in people with COPD (4).

The exercise and physical activity benefits can be seen in the following table;

Exercise increases (4)	Exercise decreases (3)
cardiovascular conditioning and endurance	breathlessness and the sensation of breathlessness
energy levels	ventilatory requirement at a given work rate (4)
immune strength	hyperinflation (4),
muscle strength and endurance	risk factors of heart and other diseases
ability to sleep and relax	blood pressure
bone density	side effects of medicine
self confidence, self esteem and body image	anxiety and depression

Regular exercise creates benefits in physical conditioning and functional capacity, giving individuals with COPD better ability to participate in recreational or lifestyle activities, thus enhancing quality of life. Research also indicates that exercise can increase cognitive function for individuals with COPD, with studies showing an increase of blood flow to the brain (9).

## What exercise is best?

Pulmonary rehabilitation followed by an ongoing exercise maintenance program is shown through strong medical evidence to have a significant effect on improving quality of life and managing symptoms (3).

Individuals with COPD are at high risk of relapsing into a state of inactivity and deconditioning, so it is important that exercise programming is individualised for best results. Modifications to duration, frequency and type of exercise will be necessary along the way, as individuals may experience exacerbations and infections due to their disease.



Exercise programming should include the following;

Type of exercise	Intensity	Frequency	Duration
<b>Aerobic*</b> ; Walking, cycling, swimming.	40 - 80% of maximal effort (Modified Borg 2-4 )	1-2 sessions, 3-5 days per week	30minutes; broken into smaller durations if necessary due to symptoms
<b>Strength training**</b> ; free weights, therabands, body weight exercises, inspiratory muscle training (7).	<ul style="list-style-type: none"> <li>• 60 - 80% of maximal effort (Modified Borg 3-4 )</li> <li>• IMT = &gt; 30%, or respiratory muscle training in a controlled manner (7).</li> </ul>	2-3 days/week	<ul style="list-style-type: none"> <li>• 1 set of 8-12 reps; additional sets added when strength improves.</li> <li>• 8-10 exercises, or 30-40minutes; depending on exercise capacity and any symptom limitations.</li> </ul>
<b>Flexibility;</b> stretching, yoga, tai chi.	Low to moderate; depending on capability and function	3 or more days per week; preferably on all days that aerobic or strength exercise is performed (8)	30 seconds minimum for each static stretch.
<b>Neuromuscular;</b> tai chi, yoga, breathing exercises.	Low to moderate; depending on capability and function	In conjunction with other exercises on their program and taking into consideration their goals and capacity.	As tolerated.

\* Walking would be the emphasised mode of aerobic exercise, since it requires no equipment, and has been shown to be essential for maintaining function in daily life (3). The emphasis is to progress duration of aerobic exercise, rather than the intensity, for better functioning in daily life. Reduce intervals of exercise to 5-10minutes, until adaptations have occurred allowing longer durations to be achieved.

\*\* The goal of strength exercises is to increase maximal number of reps, as opposed to using heavier weights. Keep in mind exercising up to Borg of 4.

Exercise testing, prior to prescribing exercise in this disease population, is extremely valuable and will allow distinguishing among the possible causes of limited exercise capacity; cardiac, respiratory, and other exercise limitations (1, 4). The 6 minute walk test and shuttle tests are valid and useful clinical tests (1, 4), can indicate if exercise oxygen desaturation is occurring, and will indicate if improvements are occurring throughout the exercise program.

### References and further information

Exercise is Medicine Australia [www.exerciseismedicine.org.au](http://www.exerciseismedicine.org.au)

Find an Accredited Exercise Physiologist [www.essa.org.au](http://www.essa.org.au)

Exercise Right [www.exerciseright.com.au](http://www.exerciseright.com.au)

Lung Foundation Australia [www.lungfoundation.org.au](http://www.lungfoundation.org.au)

Lungs in Action [www.lungsinaction.com.au](http://www.lungsinaction.com.au)

The Thoracic Society of Australia and New Zealand [www.thoracic.org.au](http://www.thoracic.org.au)

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4. Anzeto, A., Bourbeau, J., Jenkins, C., Rodriguez – Roisin, R., et al. Global Initiative for the diagnosis, management and prevention of Chronic Obstructive Lung Disease, 2010.

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7. Dressendorfer, R.H., Haykowsky, M.J., Eves, N. Exercise for Persons with Chronic Obstructive Pulmonary Disease – ACSM current comment. American College of Sports Medicine. 2014 [www.acsm.org](http://www.acsm.org).

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