Pulmonary rehabilitation for COPD

'Breathe easy, walk easy'

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Referring patients with chronic obstructive pulmonary disease to a pulmonary rehabilitation program can have significant benefits on important patient outcomes.

GPs play a pivotal role in the management of people with chronic obstructive pulmonary disease (COPD) and are often the first point of contact for such patients. The prevalence of COPD in Australia is about 7.5% in people aged 40 years or older, which increases to 29% in those aged 75 years or older.[1] As COPD is the second leading cause of avoidable hospital admissions (and in some rural and remote regions, COPD is the leading cause) it places a significant burden on the health system.[2] If well managed in primary care, hospital admissions for COPD may be avoided.

Although the role of pharmacology in the management of COPD is well recognised, physical management is often neglected. This is despite high-level evidence for the positive impact of pulmonary rehabilitation on the outcomes of the disease and recommendations of both national and international guidelines that strongly endorse referral of patients with COPD to pulmonary rehabilitation programs.[3-6]

Key points

- **Pulmonary rehabilitation is an effective nonpharmacological therapy for chronic obstructive pulmonary disease (COPD).**
- **Pulmonary rehabilitation improves symptoms of breathlessness and fatigue, exercise capacity and quality of life, and reduces hospital admissions.**
- **Spirometry is essential to confirm the diagnosis of COPD. Spirometry should be performed on all patients presenting with symptoms of breathlessness and suspected COPD.**
- **All people with COPD should be offered pulmonary rehabilitation.**

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This article emphasises the importance of early identification of patients with COPD and GP referral to pulmonary rehabilitation programs, which will lead to improved patient outcomes.

Presentation of COPD

Patients with COPD may present with symptoms such as shortness of breath, fatigue and/or cough and sputum, as well as difficulty with daily activities due to general exercise intolerance. Such symptoms can come on gradually over years and some patients may dismiss their symptoms as 'normal' signs of ageing or due to a lack of fitness or they modify their lifestyle to adapt to breathing difficulties.

Common causes of COPD

The most common cause of COPD is cigarette smoking; however, COPD can occur in nonsmokers due to passive smoking or a high exposure to environmental or occupational dust, gas or fumes.[7] Alpha-1 antitrypsin deficiency, which results in early-onset emphysema, is a less common cause of COPD.[4]

Initial investigations for COPD

Spirometry should be performed on all patients presenting with symptoms of breathlessness and suspected COPD – that is, those who are older than 40 years who have a smoking history of 10 or more pack years or have had high environmental or occupational exposure to dust, gas or fumes. Spirometry testing is important to ascertain the degree of airflow limitation. A postbronchodilator forced expiratory volume in one second (FEV_1)/ forced vital capacity (FVC) ratio of less than 0.7 is required to confirm the diagnosis of COPD. Information on case finding of COPD using screening devices, such as COPD-6, PiKo-6 or the AirSmart Spirometer, are available on the Lung Foundation Australia website (https://lungfoundation.com.au).[8]

Importance of an early COPD diagnosis

Although it is not possible to reverse the lung damage caused by COPD, much can be done to improve patient outcomes and give patients the best chance to live their life fully.[9] Earlier diagnosis provides an opportunity for GPs to initiate management strategies that have been shown to enhance patients' lives, such as avoiding risk factors for disease progression (e.g. smoking cessation), optimising medication use, ensuring regular influenza and pneumococcal vaccinations to reduce the risk of exacerbations and referral to pulmonary rehabilitation programs.

Pulmonary rehabilitation

Pulmonary rehabilitation is an evidence-based intervention for patients with chronic lung disease. It includes patient assessment, exercise training and patient education on disease management. It is an effective form of nonpharmacological management for people with COPD.[10,11] The benefits of pulmonary rehabilitation in patients with COPD are shown in Box 1.[11-13]

1. Benefits of pulmonary rehabilitation in patients with COPD[11-13]

- Reduces symptoms of breathlessness and fatigue
- Increases exercise tolerance
- Reduces anxiety and depression
- Improves quality of life
- Reduces hospitalisations

What is involved for the patient?

Patients who are referred to pulmonary rehabilitation programs are asked to attend twice a week for eight weeks.[14] At the initial visit, patients undergo the following assessments:

- a full patient history, including current medications and any comorbid conditions
- spirometry, if a recent result is not provided in the referral letter
- assessment of breathlessness via the modified Medical Research Council Breathlessness questionnaire
- measure of functional exercise capacity with a six-minute walk test
- assessment of health-related quality of life; the most commonly used quality of life questionnaire for COPD in Australia is the St George's Respiratory Questionnaire. Many programs also use the COPD Assessment Test (CAT) to monitor the impact of COPD on a patient's life.

Patients are asked to set the goals they would like to achieve from the program and they are reassessed at the end of the program (using the same measures as above) to evaluate their response to rehabilitation. The online Pulmonary Rehabilitation Toolkit (www.pulmonaryrehab.com.au) provides full details of the assessments conducted throughout a pulmonary rehabilitation program.[15]

At subsequent sessions, patients undertake a program of exercise training. An exercise prescription is developed for a walking and/or stationary cycling program (aerobic training) and is based on the results of the six-minute walk test. Resistance exercises for both the upper and lower limbs are also provided to improve muscle strength. The therapist works with the patient to tailor the exercise program, ensuring that the exercises are appropriate and achievable for the individual and adjusted for any pre-existing musculoskeletal or other comorbid conditions. Within Australia, physiotherapists are responsible for exercise prescription and training in more than 90% of programs, with nurses or exercise physiologists trained in pulmonary rehabilitation providing supervision in the remaining programs.[14]

The exercise sessions last between 60 and 90 minutes (allowing for rests). A group of patients attend each session, although each patient will follow their individual program. Exercising in a group environment can be beneficial as it provides support and motivation from others.

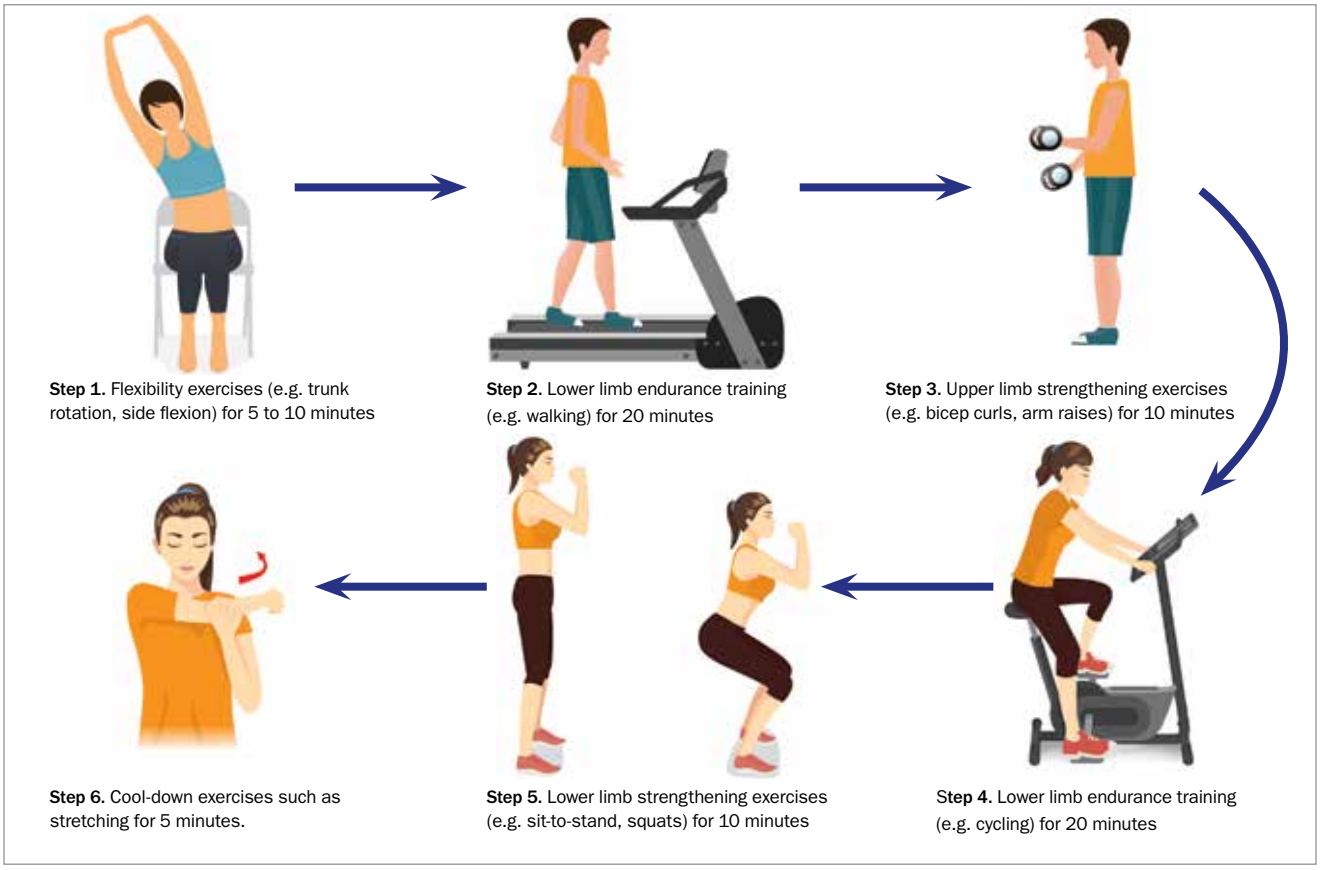

Figure. An example of a pulmonary rehabilitation program session.

In addition to the supervised exercise sessions patients are encouraged to exercise at home, on at least two to three other days in the week. Therapists work with the patient to develop a home program that is feasible for the patient. Establishing a home exercise routine is important so the benefits gained during the pulmonary rehabilitation program can be maintained after completion.

Patient education is also included as part of the pulmonary rehabilitation program. Common education topics are: how the lungs work; how and why to use inhaled medications; how to manage breathlessness; why it is important to exercise and stay physically active; and a review of action plans in case of an exacerbation. A pulmonary rehabilitation program also provides the opportunity for referral to smoking cessation programs, psychological support and nutritional advice, if required.

Most pulmonary rehabilitation programs are provided in hospital outpatient departments or community settings. However, there is growing evidence that home-based programs and tele-rehabilitation programs are also effective for patients who have difficulty with transport or live in remote regions.[3,16]

What types of exercise are important?

Lower limb endurance training using a walking or cycling program is the most important component of a pulmonary rehabilitation program. Most programs emphasise walking as the mode of lower limb endurance exercise because walking is an essential component of everyday life. To achieve benefits, patients need to walk or cycle for at least 30 minutes per session two to three days each week.[5] If necessary, patients can take short rests to limit the degree of breathlessness or muscle fatigue. Patients need reassurance that breathlessness during activity is not harmful and are taught strategies for managing breathlessness.

Exercises to improve the strength and endurance of the arm and leg muscles are also included so that the patient can more easily perform activities of daily living. In addition, exercises to improve balance in those patients who have had a fall or a 'near miss' fall may be included. An example of a pulmonary rehabilitation program session is provided in the Figure.

As it is important that exercise is continued long term, most programs will use simple equipment to allow replication of the exercises in the home setting.

Why does pulmonary rehabilitation work?

Breathlessness and/or fatigue on exertion are common symptoms in people with COPD, and leads to avoidance of daily activities that elicit these symptoms. This results in a downward spiral of progressive inactivity with adverse consequences that includes

2. Criteria for referral to a pulmonary rehabilitation program

Inclusions

- Clinical diagnosis of chronic obstructive pulmonary disease confirmed by spirometry
- Optimised medical management
- Breathlessness on physical activity, especially if the patient walks slower than people of the same age on the level because of shortness of breath
- Current smokers (pulmonary rehabilitation programs can assist with smoking cessation as part of lifestyle modifications)

Exclusions

- Comorbidities that compromise a patient's safety or ability to participate in exercise testing or training (e.g. unstable cardiovascular disease, uncontrolled diabetes, recent exertional syncope, severe neurological impairment, severe cognitive impairment)
- No motivation to attend

muscle deconditioning, depression, social isolation and poor quality of life.

Endurance training involving the large muscle groups in the legs induces physiological changes in the exercising muscles. This, in turn, improves the oxidative capacity of the muscles, reduces lactate build up during exercise and leads to a decrease in ventilation and breathlessness.[17] Significant psychological benefits occur as the patient becomes more confident to undertake physical activities. This helps to reduce anxiety, depression and social isolation, and improve the patient's quality of life.[17]

Who should be referred to a pulmonary rehabilitation program?

Any patient with lung disease whose lifestyle is affected by breathlessness may gain benefits from a pulmonary rehabilitation program. Improvements following rehabilitation have been demonstrated in patients with mild, moderate and severe COPD. Often, symptoms of breathlessness when walking up inclines or climbing stairs are ignored and attributed to ageing, weight gain or lack of exercise and not the underlying lung problem. As a result, many patients who potentially would benefit are not identified as candidates for rehabilitation. GPs may find it useful to use the CAT to measure the impact of COPD on the patient's life and help determine whether referral to a pulmonary rehabilitation program may be beneficial. A CAT score of 10 or higher indicates that referral to a pulmonary rehabilitation program would be beneficial.[18,19] The criteria for referral of patients with COPD to a pulmonary rehabilitation program is provided in Box 2.

Although there is high-level evidence for the benefits of pulmonary rehabilitation for people with COPD, there is growing evidence of similar benefits for patients with bronchiectasis, interstitial lung diseases and pulmonary hypertension.[3] GPs should consider referring patients with these conditions to pulmonary rehabilitation programs that have experience in managing such patients and are able to provide airway clearance techniques for patients with bronchiectasis and oxygen (if necessary) for patients with interstitial lung diseases.

Where can a pulmonary rehabilitation program be found?

Lung Foundation Australia has a list of pulmonary rehabilitation programs offered throughout Australia (https://lungfoundation.com.au/exercise-classes/?event_category=127).[20] Most programs take place in hospitals although some take place in community centres. More pulmonary rehabilitation programs are required to meet the need for this effective intervention.

Lung Foundation Australia has applied for MBS item numbers for pulmonary rehabilitation but this was rejected earlier this year. An independent economic evaluation was strongly in favour of the use of pulmonary rehabilitation for COPD as a low-cost, high-benefit intervention, so a new application is planned.

Important role of GPs

GPs play a crucial role in referring patients to pulmonary rehabilitation programs and can increase the likelihood of a patient participating in such a program by being enthusiastic and advocating the benefits.[21-23] GPs can reassure patients that, although pulmonary rehabilitation includes an exercise program, the therapists running the programs will work with each patient to ensure the exercise program is safe and manageable for them.

The pulmonary rehabilitation program co-ordinator will send a letter to the referring GP. This reassures the GP that their patient is attending the program and informs them of the key findings from the assessment. At program completion, another letter is sent to the GP to provide the results of the end of program assessment and highlight improvements and any ongoing needs. Patients are referred back to the GP at any stage throughout the program if the therapist has any concerns.

Conclusion

Pulmonary rehabilitation can have a significant positive impact on the physical and psychological consequences of COPD, as well as reducing healthcare costs. GPs have an important role in identifying early patients with COPD and referring them to a pulmonary rehabilitation program so that improved patient outcomes can be achieved. RMT

References

A list of references is included in the online version of this article (www.respiratorymedicinetoday.com.au).

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