

Opinion

Pulmonary Rehabilitation

Pulmonary rehabilitation (PR) is a multi-disciplinary programme of care for patients with chronic lung disease. It is individually tailored and designed to optimise physical and social performance and functional independence. It is usually performed in groups. The programme consists of exercise, education and psycho-social support. The key components are defined in an IMPRESS report.¹ This opinion sheet will concentrate on outpatient-based group rehabilitation, as opposed to less common in-patient and home based programmes.

There is grade A evidence that PR improves health related quality of life, functional exercise capacity and breathlessness. The effect size on these factors is significantly greater than the effects of bronchodilator therapy. There is also evidence that PR is associated with a reduction in bed days, but it may not affect the number of admissions. PR is popular with patients and in some individuals has a profound, life-transforming impact. While there may be theoretical grounds to expect that PR may prolong life, the data is lacking and definitive studies are considered unethical.

PR is cost effective, the cost per QALY is estimated as being between £2,000-£8,000.² PR is strongly recommended in the guidelines by the National Institute for Health and Clinical Excellence (NICE) and by the Consultation document for a National Strategy for COPD in England.^{2,3}

Patients

PR is designed for patients with functional limitations caused by their chronic lung disease.⁴ The NICE COPD guideline⁵ states that it should be offered to all those who consider themselves functionally impaired by their breathlessness (usually MRC dyspnoea scale 3 or above). Although most experience has been gained in COPD, PR is also effective in other progressive lung diseases e.g. bronchiectasis and

interstitial lung disease.

PR does require a degree of motivation and there are some patients in whom PR may not be suitable. These are:

- Where COPD is not the main reason for their functional impairment,
- Any condition liable to make exercise unsafe such as cardiac disorders, including myocardial infarction in the last 4 weeks or unstable angina,
- Any condition which prevents patients from undertaking exercise training, including arthritis or stroke. (more details are available on http://www.pcrs-uk.org/news/pul_rehab.php)

Although depression is a risk factor for failing to complete a programme, PR can improve depression; therefore causes of depression should be addressed before referral.

PR may be important after an exacerbation.⁶ A recent study indicated that there may be important individual and health service benefits to early rehabilitation post exacerbation.

Setting

The success of pulmonary rehabilitation is largely independent of the environment within which it is conducted, most of the evidence is based upon out-patient rehabilitation. The evidence for home based rehabilitation is weak. Traditionally, PR has been performed in hospitals; now there is a trend to community settings, which have ease of access and potentially a larger capacity. Irrespective of the setting, PR can and should be performed to the highest standards as described in guidelines using experienced staff with full access to equipment.

The psycho-social aspects of groups are beneficial to most COPD patients, but home PR may be the only option for patients with severe COPD.

The programme contents

All programmes should include exercise and education. In the UK programmes are offered for 6-8 weeks.

Exercise

The most recent guidelines recommend that exercise training should be completed at least 3 times a week for up to 30 minutes (two of these sessions should be supervised). The assessment of exercise capacity is important to identify the limitation to exercise and prescribe a training regime for the individual. Patients should be assessed using a test of exercise tolerance usually the incremental shuttle walking test (ISWT) in conjunction with the endurance shuttle walking test (ESWT), or the six minute walk. The maximum speed of walking from the ISWT can be used as a guide for the prescription walking required for training. During the assessment of exercise tolerance measures of oxygen saturation, heart rate and breathlessness should be recorded. If patients have significant hypoxia, referral for a formal home oxygen therapy assessment should be instigated according to guidelines. The evidence for supplemental oxygen during rehabilitation is weak. The ideal strategy to treat exercise limitation in more disabled groups appears to be a combination of endurance and strength training. Upper limb and trunk mobility should be considered.

Education

Education usually occurs in groups and is delivered by the multidisciplinary team. Topics covered include the roles of exercise and relaxation, understanding the disease and its treatment, exacerbations, psychological impacts and minimizing their effects, nutrition and breathing control (see http://www.pcrs-uk.org/news/pul_rehab.php)

Duration

Programmes are usually twice weekly for 6-8 weeks; other models such as once weekly or prolonged courses are used, but with less evidence of effectiveness. Rolling programmes are an alternative to having fixed groups and appear to have advantages in reducing

Table 1. Outcome Measures for Pulmonary Rehabilitation

Test	Variable	Comments	Recommended
Incremental shuttle walking test (ISWT)	Maximal exercise capacity	Easy to use, less sensitive to change than endurance SWT	***
Endurance shuttle walking test (ESWT)	Endurance walking	More time consuming as an ISWT needs to be done first	**
6 minutes walking test	Maximal exercise capacity	Easy to use, may take longer than ISWT, and preferably performed in a 30 meter corridor	**
Chronic respiratory disease questionnaire	Disease specific health status	Lengthy but reliable, self-complete version easiest to administer	***
St George's respiratory questionnaire	Disease specific health status	Lengthy but reliable. Complex wording and scoring	**
Clinic COPD questionnaire	Disease specific health status	Very easy, but less track record of use,*(www.ccq.nl) may become established in time	**
Hospital anxiety and depression scale	Anxiety and depression	Standard questionnaire	***
Lung information needs questionnaire	Patients' information needs	Assesses education in PR (www.linq.org.uk). Limited reports of value	**

waiting list times.⁷ A rolling programme can accommodate drop-out and exacerbations.

Outcome measures

It is essential to assess the outcomes of a PR programme, firstly to demonstrate results to an individual patient and secondly to assess the effectiveness of the programme and modify it if needed. The more frequently used measures are listed in table 1. Other measures include self-efficacy, activities of daily living, and some even use accelerometers to record activity.

Many programmes use a system of goal setting and use goal achievement as an outcome. Such goals may include going out to the shops, swimming a length of a pool, and doing the gardening.

Staffing

The members of a PR team need to be competent to perform their functions. Patients need to be assessed for suitability, that they are on optimum therapy and that it is safe for them to exercise. Their exercise programme needs individual prescription, monitoring and progressed. The education requires expertise. It therefore follows that PR should be delivered by staff with knowledge, training, skills and confidence. Most programmes are run by core staff of a specialist nurse and physiotherapist, with

input from other disciplines e.g. doctors, occupational therapists, psychologists, dieticians, exercise practitioners.

For the safe conduct of PR, there should be an adequate number of staff for the group of patients. Larger groups or groups with higher risk, more disabled patients require higher ratio of staff to patients. It is important to continually assess the risks and manage those risks appropriately.

Maintenance programmes

The effects of rehabilitation with no maintenance appear to last for about 12 months.⁸ Intuitively, maintenance would appear to be advantageous, but the evidence for maintenance is not strong. A number of models have been tested. Compared to cardiac rehabilitation there are few trained exercise instructors in the community able to accept patients with COPD and complex disabilities.

Contentious issues

Activity for unimpaired: little evidence exists for the value of pulmonary rehabilitation in early COPD, while there may be benefits to improving fitness and retaining muscle bulk, many patients without problems are reluctant to take part. All patients with COPD should be encouraged to be as active as possible, in order to maintain their lean body mass and cardiovascular fitness.

Generic rehabilitation: little evidence exists on the benefits of a rehabilitation programme for patients with mixed diseases. Cardiac rehabilitation after an acute cardiac event has a different agenda, patients are less disabled and the focus is on secondary prevention. However, there may be scope to offer rehabilitation to 'breathless' patients, that is, chronic heart failure patients and COPD, where the level of disability is similar. Educational needs of these groups will however be different.

Pulmonary rehab the future

The draft National Strategy for COPD, places a strong emphasis on the importance of improving patients ability to help themselves. Pulmonary rehabilitation, patient education and self management are at the heart of the document. Separate publications are anticipated on the importance of PR and how to commission PR to ensure that it is available to patients across the nation.

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