PULMONARY REHABILITATION IN AUSTRALIA
An Evidence-based Manual
Executive Summary

This Summary encapsulates a larger “Manual for Pulmonary Rehabilitation In Australia: Evidence Base and Standards”, which provides a comprehensive review of evidence relevant to pulmonary rehabilitation as a support for pulmonary rehabilitation practice and management in Australia. The two documents provide evidence support for the practical “Pulmonary Rehabilitation Toolkit”, which has been developed to assist new practitioners and administrators, and to enable continuous quality improvement for established programs. In turn, all these modules are part of a suite of tools supporting management of chronic obstructive pulmonary disease (COPD) prepared by and regularly updated by The Australian Lung Foundation (ALF), the Thoracic Society of Australia and New Zealand (TSANZ) and Australian Physiotherapy Association (APA). Other modules are evidence-based clinical practice guidelines (“COPD-X”), a diagnostic algorithm, a COPD-Checklist and COPD Action Plans.

Description of Pulmonary Rehabilitation
Pulmonary rehabilitation (PR) is a system of care that includes education, exercise training and psychosocial support delivered by an interdisciplinary team of therapists. It was originally designed for patients with moderate to severe COPD, but people with other respiratory disorders who have disabling breathlessness can also benefit. Although it does not alter traditional lung function parameters [Level II], PR can help people achieve and maintain a maximum level of independence and functioning in the community [Level I]. It has favourable interactions with other interventions [Level II], particularly nutritional and pharmacotherapeutic, and can be delivered in a range of settings.

Evidence Statements

Comprehensive Integrated Rehabilitation
Each component of PR is beneficial, but comprehensive integrated programs have greater efficacy. Effective PR requires close liaison among care providers and support for informal caregivers as well as the patient. Patient-specific goal-setting, shared with all care providers, should be reviewed regularly. As benefits wane after six to twelve months, continuing exercise should be encouraged, knowledge should be updated regularly, and social support structures should be optimised.

*Meta-analyses and randomised controlled trials show that comprehensive Pulmonary Rehabilitation enhances health-related quality of life and self-efficacy, improves exercise performance and mental health, reduces breathlessness, and reduces health care utilisation (and associated costs) more effectively than each component. [Level I]*

**Exercise training**

Exercise training includes aerobic training of upper and lower limbs and trunk muscles, flexibility and muscle strength, guiding efficient energy expenditure, targeted inspiratory muscle training and teaching breathing control during exertion. Supervision helps build patient confidence, maximises skeletal muscle training, improves breathing techniques, optimises cardiovascular fitness, and encourages exercise maintenance.

*Large randomised controlled trials and meta-analyses of exercise training alone in COPD have shown improvements in cardiovascular fitness, exercise tolerance, breathlessness, muscle strength, functioning, self-efficacy, mood and health-related quality of life. Training of multiple muscle groups is more beneficial than confining exerciseto individual muscle groups alone. [Level I]*

**Education**

Education improves the patient’s knowledge about breathing and the various treatments to control breathlessness. Of primary importance is assisting smokers to quit and sustain quitting. Patients should be trained to optimise activities and nutrition, gain control over anxiety, panic or depression, and use appropriate medications and therapeutic devices effectively. A background of respiratory anatomy and physiology is traditionally given, to assist with problem solving and building the patient's capacity to co-manage their condition.

*Small randomised trials of education alone show better self-efficacy, mood and health-related quality of life, above usual medical care, though the evidence for education alone is less robust than for exercise. [Level II]*

**Psychosocial support**

Depression, anxiety and panic are frequent complications of chronic disabling breathlessness, with dependency and social isolation being common consequences. General support, specific behavioural training and use of appropriate antidepressant medications where needed may enhance quality of life for the patient and the family caregiver.

*Small randomised controlled trials show better exercise tolerance, mood, self-efficacy and health-related quality of life from cognitive behaviour therapy alone in COPD. There is limited evidence that anxiolytics or antidepressant medications can help some people. [Level II]*

**Roles and Responsibilities of Health Professionals**

Health professionals involved in PR should have a high level of understanding about COPD and other chronic respiratory diseases, and the relevance of disability and handicap. They and their employers should recognise and respect the roles of all members of the care partnership, including the patient and family caregivers. They should have commitment to quality of care and continuous improvement. They should understand clinical indicators that reflect risk factors, and outcome measurements that reflect changes in impairment, disability and cost-effectiveness. They need to be timely, clear and relevant when communicating with each patient’s health care providers. Above all, they must remember that PR represents an ideal opportunity to alter people’s lives for the better, contribute to their patients’ lifetime care and lessen the burdens at a societal level. [Level IV]

**Patient Goals**

Patients should be encouraged to explore their own needs and to plan their goals of treatment accordingly. After completing PR patients should be confident to monitor and manage their lung condition more effectively so they will have fewer sudden exacerbations and need for
emergency treatment, and their dependency level is reduced. PR should enable patients to collaborate in an informed manner with their doctor and other care providers in planning their own care. [Level III-3] Their informal caregivers should also feel more confident and less restricted. [Level IV]

**Levels of Evidence**

Throughout all ALF documents a similar system for recording levels of evidence is used.

<table>
<thead>
<tr>
<th>Level</th>
<th>Sources of Evidence</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>systematic review of all relevant randomised controlled trials</td>
</tr>
<tr>
<td>II</td>
<td>at least one properly designed randomised controlled trial</td>
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<tr>
<td>III-1</td>
<td>well-designed controlled studies without randomization</td>
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<tr>
<td>III-2</td>
<td>well-designed cohort or case-control studies preferably from more than one centre or group</td>
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<tr>
<td>III-3</td>
<td>multiple time series, including dramatic results in uncontrolled experiments</td>
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<tr>
<td>IV</td>
<td>opinions of respected authorities, case series, descriptive studies, or reports of expert committees</td>
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**Strength of Recommendations**

The strength of support for recommended management is graded in a standard way throughout all ALF documents.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Sources</th>
<th>Definition</th>
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<tbody>
<tr>
<td>A</td>
<td>Rich body of data</td>
<td>Randomised controlled trials</td>
<td>Evidence from well-designed RCTs with clear endpoints providing consistent patterns of outcomes, involving large numbers of studies with substantial numbers of participants systematically reviewed in meta-analysis. This implies very low risk of bias, high degree of consistency, and direct applicability to the target population.</td>
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<tr>
<td>B</td>
<td>Limited body of data</td>
<td>Randomised controlled trials</td>
<td>Evidence from intervention studies that include limited numbers of participants, sub-group analysis of RCTs, case control or cohort studies. This implies good quality evidence with low risk of confounding or bias, and good applicability to the target population.</td>
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<tr>
<td>C</td>
<td>Very limited data</td>
<td>Non-randomised trials. Observational studies.</td>
<td>Evidence from outcomes of uncontrolled or non-randomised trials or from observational studies, well conducted case control or cohort studies with low risk of confounding and moderate applicability to the target population.</td>
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<tr>
<td>D</td>
<td>Opinion</td>
<td>Panel consensus. Judgement.</td>
<td>Little direct evidence apart from case studies, case reports, or opinions of respected authorities, extrapolated from clinical experience, cohort studies with potential confounding bias, descriptive studies or reports of expert committees.</td>
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**Evidence-Based Recommendations**

1. **Comprehensive pulmonary rehabilitation should be an integral part of treatment for all people with moderate to severe COPD (A), as it provides extra benefits over standard medical care in terms of clinically and statistically significant improvements in:**
   - Exercise capacity (A)
   - Health-related quality of life (A)
   - Psychosocial problems (B)
   - Dyspnoea (A)
   - Fatigue (A)
   - Functional status (A)
   - Mastery and self-efficacy (A)
   - Cost-effectiveness (B)

2. **Comprehensive pulmonary rehabilitation should be considered for people with other disabling lung conditions.** The following in particular are recommended:
   - Training for correct use of and asthma medications and devices (A)
Training for ensuring adherence to asthma treatment plan (A)
Exercise conditioning for people with asthma (B)
Sputum clearance for people with bronchiectasis including Cystic Fibrosis (B)
Education, psychosocial support, relaxation and exercise training for people with Pulmonary Fibrosis (D)

3. **Exercise training for people with COPD is more effective than standard medical care**, in terms of:
   - Exercise capacity (B)
   - Health-related quality of life (B)
   - Fatigue (B)

4. **Additional benefit from exercise training may be provided by**
   - Breathing control (slower deeper breathing pattern) (B)
   - Inspiratory muscle strength and endurance training (A)
   - Oxygen supplementation – inconsistent evidence (B)
   - Helium-oxygen breathing (B)
   - Use of long-acting bronchodilator (tiotropium) (B)

5. **Educational training alone for people with COPD appears more effective than standard medical care**, in terms of:
   - Health-related quality of life (B)
   - Self-efficacy (B)
   - Mastery (B)
   - Dyspnoea (C)
   - Functional status (C)
   - Psychosocial problems (C)

6. **Psychosocial support through pulmonary rehabilitation and/or support groups is recommended for people with disabling COPD**, as it is effective for the patient in terms of:
   - Self-efficacy (B)
   - Mastery (C)
   - Depression (C)
   - Panic disorder (D)
   - Functional status (B)
   - Health-related quality of life (B)
   - Carer health (D)

7. **Pulmonary rehabilitation is effective in a variety of settings**, including hospital inpatients (A), hospital outpatients (A) and community settings (B).

8. **Core staff for pulmonary rehabilitation** should be health professionals who understand lung and exercise physiology, pharmacology, and psychosocial issues (D).

9. **The Program Director** should be a health professional with a high level of commitment to outcome evaluation, quality improvement and economic aspects (D). The appointment will depend on local requirements and staff limitations.

10. **A medical consultant should take a lead role** in program content, patient assessment and program safety supervision (D). Medical input into educational training is also recommended (D).

11. **A referral process should be agreed with consumers, administrators and professionals**, and adhered to (D), taking into account local needs and limitations. Referring
professionals should be required to document all conditions and treatments applicable to the patient.

12. All patients referred for pulmonary rehabilitation should undergo an initial clinical assessment (D), to include as a minimum:
   - Age, gender, racial or ethnic background, occupations, family respiratory history
   - Place of residence and presence of family caregiver, plus other important supports
   - Smoking status (past and present, quantity, readiness to quit if still smoking, level of nicotine dependence and other habit issues)
   - Nutritional status (current weight and body mass index, recent weight loss)
   - Functional status (mobility, causes of limitations)
   - Primary respiratory and secondary diagnoses (comorbidities & complications of the primary disease or treatment)
   - Pharmaceutical and other treatments (oxygen, physical, psychological, and complementary)
   - Patient perceived problems and their goals

13. All patients enrolled in pulmonary rehabilitation should have documentation of clinical indicators (D), which should address:
   - Nutritional measures (eg height, weight, body mass index, etc)
   - Symptoms and dyspnoea scoring (eg MRC Dyspnoea Grade, etc)
   - Respiratory impairment (eg spirometry, gas transfer, etc)
   - Mental health status (eg General Health Questionnaire, Hospital Anxiety and Depression Scale, etc)
   - Level of disability (eg 6-minute walk, shuttle walk, functional index, etc)
   - Level of handicap (eg functional / ADL assessment)
   - Health-related quality of life (eg St George Respiratory Questionnaire, SF-36, etc)
   - Current level of achievement of negotiated goals

14. All patients completing pulmonary rehabilitation should have changes in outcome measures documented, addressing the above clinical indicators (D)

15. Timely feedback should be provided to health professionals involved in the care of each patient (whether referring the patient or not) (D) about:
   - Initial assessments and recommendations relating to new findings
   - Post-program assessments and recommendations for ongoing care
   - Long-term assessments