Pulmonary Rehabilitation in Chronic Obstructive Pulmonary Disease (COPD)

Development of disability in COPD

- The decline in airway function may initially go unnoticed as people adapt their lives to avoid dyspnea.
- Up to 50% of FEV1 may be lost before significant symptoms come to medical attention.
- Significant disability develops late in the course of disease when reversal of airway obstruction may not be possible.
- Dyspnea, limb muscle dysfunction, hypoxemia, poor nutrition ,steroid myopathy,loss of confidence,may contribute to the development of disability.

The burden of disability in COPD

- The general failure of others to appreciate the degree of disability.
- Old people/co-morbidities.
- The growing global prevalence of COPD.
- The burden of disability falls on relatives, as well as the sufferer.
- The economic burden of COPD diseases is large and underestimated.

Rehabilitation: Definition

- "Pulmonary rehabilitation is a multidisciplinary continuum of services directed to persons with pulmonary disease and their families, usually by an interdisciplinary team of specialists, with the goal of achieving and maintaining the individuals maximum level of independence and functioning in the community“

- **Cole, T.M., Fishman, A.P. *Workshop on pulmonary rehabilitation research. A commentary*. Am J Phys Med Rehabil 1994, 73: 132-3.**

Aims of rehabilitation

- To improve physical performance and independence
- To reduce dyspnea
- To improve exercise tolerance
- To improve health status
- Economic benefits
- **Do not expect increase in survival**
- **Do not expect a reduction in lung function decline**

Overview of program content

- **Exercise training**: Upper limb and lower limb training/ respiratory muscle training/ breathing exercises.
- **Optimal pharmacological management.**
- **Educational support: Smoking cessation**,medical management, early signs of infection, the benefits of exercise, the disease process, energy conservation, dietary advice.
- **Psychosocial support.**
- **Assessment of outcome**.

Pursed Lip Breathing

- **What Does It Do?**

- Improves ventilation
- Decreases air trapping in the lungs
- Decreases the work of breathing
- Improves breathing patterns
- Relieves shortness of breath
- Causes general relaxation

How?

- Prolongs exhalation – slows down the breathing rate.
- Causes a slight back pressure in the lungs that keeps the airways open longer.

Procedure

- REMEMBER – Exhalation must be 3-4 times longer than inhalation, so do not force the air out.
- 1. Sit down but sit up straight, relaxed.
- 2. Breath in, preferably through the nose.
- 3. Purse lips slightly (as if to whistle).
- 4. Breath out slowly through pursed lips.
- 5. Do not force the air out.
- Practice this procedure 4-5 times a day .
- Use when there is increased breathlessness

Diaphragmatic Breathing

- **What Does It Do?**
- Strengthens the diaphragm.
- Less effort required to breathe.
- Less energy utilized for breathing.

Procedure

- Practice this procedure for 5-10 minutes, 3-4 times a day.
- 1. Like on your back in a bed with your knees bent.
- 2. Place one of your hands on your abdomen.
- 3. Place your other hand or your upper chest.
- 4. As you inhale through your nose, make your stomach move out and keep your upper chest as still as possible.
- 5. As you exhale through pursed lips, let your stomach fall inward. Your hand on the upper chest must remain as still as possible during the entire procedure.

Fig.1. Leg exercises.

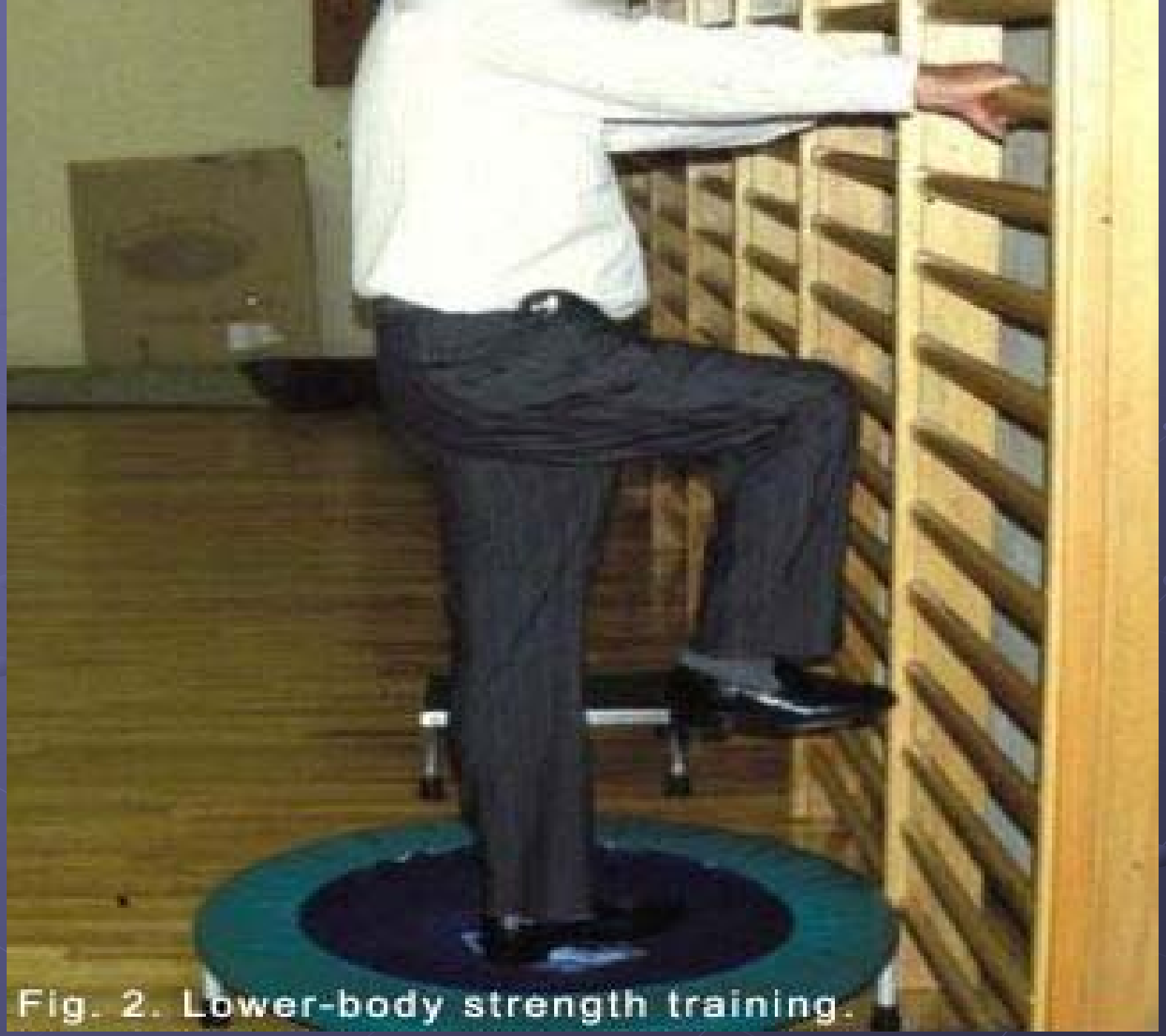

Fig. 2. Lower-body strength training.

Fig. 3. One-on-one counseling.

Implementation

- **Program duration**
- The minimum recommended time is 6 weeks.
- More disabled patients require a longer period of supervised training.
- Health-related quality-of-life improvements appear to continue until a maximum of 12 weeks.
- Supervision of exercise is considered important in order to maximize benefits.
- Participants should be encouraged to adhere to a home exercise program in between times.

Patient selection

- Patients classified as Grade 3 or 4 [MRC] are likely to do well in an outpatient rehabilitation program *

- ***Wedzicha, J.A., Bestall, J.C., Garrod, R., Garnham, R., Paul, E.A., Jones, P.W. *Randomized controlled trial of pulmonary rehabilitation in severe chronic obstructive pulmonary disease patients, stratified with the MRC dyspnea scale*. Eur Respir J 1998, 12: 363-9.**

MRC Breathlessness Scale.

- Grade 1: Not troubled by breathlessness, except on strenuous exertion.
- Grade 2: Short of breath when hurrying on the level or walking up a slight hill.
- Grade 3: Has to walk slower than most people on the level.
- Grade 4: Has to stop for breath after walking about 100 yd. on the level.
- Grade 5: Too breathless to leave the house or breathless after undressing.

- *(Adapted from Fletcher, C.M. et al. The Medical Research Council Dyspnea Score: The significance of respiratory symptoms and the diagnosis of chronic bronchitis in a working population. Br Med J 1959, 2: 257-66.)*

Safety issues

- Simple first aid medication should be available -- oxygen, nebulized bronchodilators and glyceryl trinitrate.
- Oxygen requirements during exercise should be made prior to pulmonary rehabilitation, usually a simple walking test with pulse oximetry.
- Gentle warm-up and cool-down programs are incorporated in the exercise sessions.


Fig. Stretching as part of the cool down.

Assessment of Outcome in Pulmonary Rehabilitation

- exercise performance
- dyspnea
- health status
- domestic activity
- Economic impact

All the best..