

Energy Conservation Techniques

Pulmonary Rehabilitation Educational Booklet



Hospital Authority

Coordinating Committee-Grade in Occupational Therapy

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Foreword

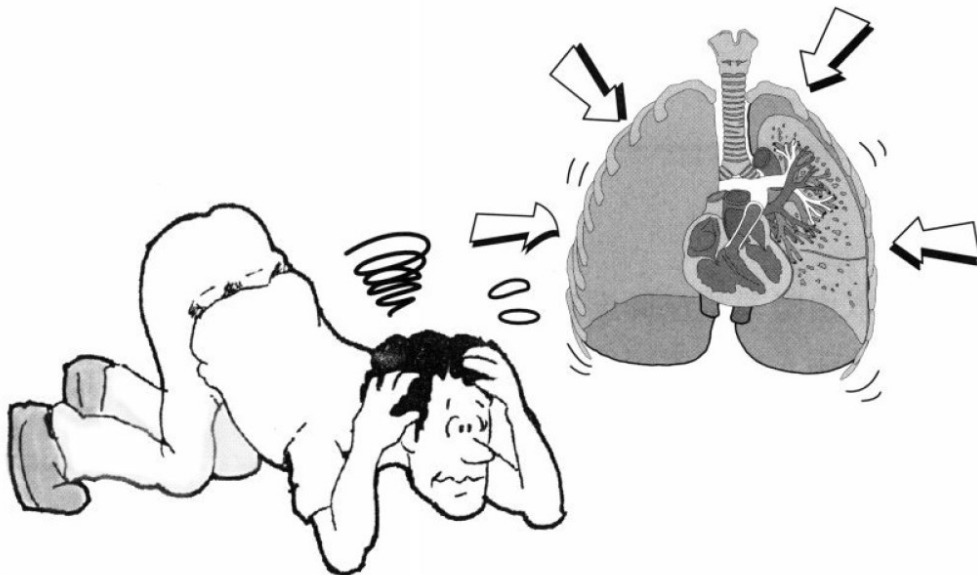
This booklet is compiled by Occupational Therapists with the aim to guide patients with chronic respiratory conditions to deal with their problems in activities of daily living with the application of energy conserving techniques to improve their quality of life.

Energy Conservation Techniques and Patients with Chronic Respiratory Problems

The following problems are commonly experienced by patients with chronic respiratory conditions:

1. Reduced lung functions limiting energy expenditure and functional capacity for meeting daily exertional demands.
2. Dyspnea may induce fear which will further aggravate shortness of breath even when patients attempt the slightest exertion. Patients may become progressively dependent as their activity tolerance deteriorates in time.

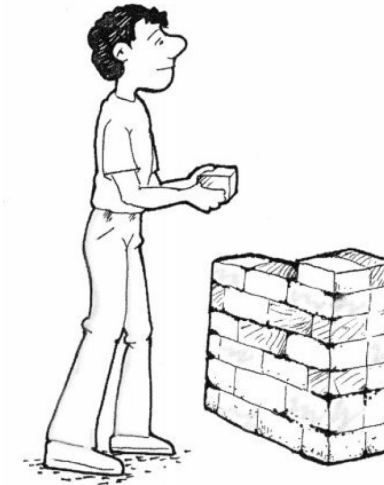
The use of energy conservation techniques with coordinated breathing and proper body mechanics will help to relieve dyspnea and in turns will enhance patients' ability to cope with daily activities.



Principles of Energy Conservation Techniques

The rationale behind energy conservation is to reduce unnecessary oxygen expenditure in the body. There are five major principles which can be incorporated into daily activities. These principles are meant to be internalized into daily habits.

1. Plan and Prioritize your activities



- Plan daily activity schedule alternating with heavy and light tasks. Also eliminate unnecessary steps of a task when possible.
- Gather and arrange supplies or tools for daily activities before start.
- Have sufficient rest after completing a task and before moving onto the next one.

2. Prescription of aids and adaptation

- Use of modern household utensils or electric appliances to save energy, e.g. non-stick kitchen wares, electric can opener, microwave oven etc.

- Use assistive devices such as long handled reachers to minimize the need to stoop or bend over when retrieving objects from the floor.

- Use wheeled trolleys to assist pushing and carrying heavy objects.



3. Pacing

- Allow ample time to finish an activity, keep a slow and steady pace and not to rush.

- Listen to your body messages, rest before you are exhausted.



4. Pursed-lip breathing

1. Basic technique:

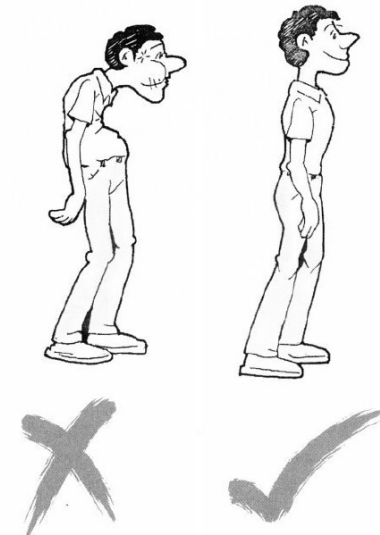
Control the breathing rhythm. Slowly inhale through your nose and exhale through your mouth. The duration of exhalation should be double that of inhalation, e.g. for 2 seconds for inhalation, allow 4 to 6 seconds for exhalation.

2. Adjust speed and posture of your body to get into the rhythm of breathing:

Breathe in when stretching out your arms and expanding your chest, e.g. straightening up the trunk or reaching up with the arms. Breathe out when moving in opposite direction, e.g. crouching or moving arms back towards body.

3. Coordinate breathing with body movements:

Learn to coordinate the exhalation phase of breathing for the exertional movements of the activity. Breathe in when preparing for exertion, breathe out when delivering a force.



5. Positioning and posture

1. Avoid tiring and awkward posture that may impair breathing

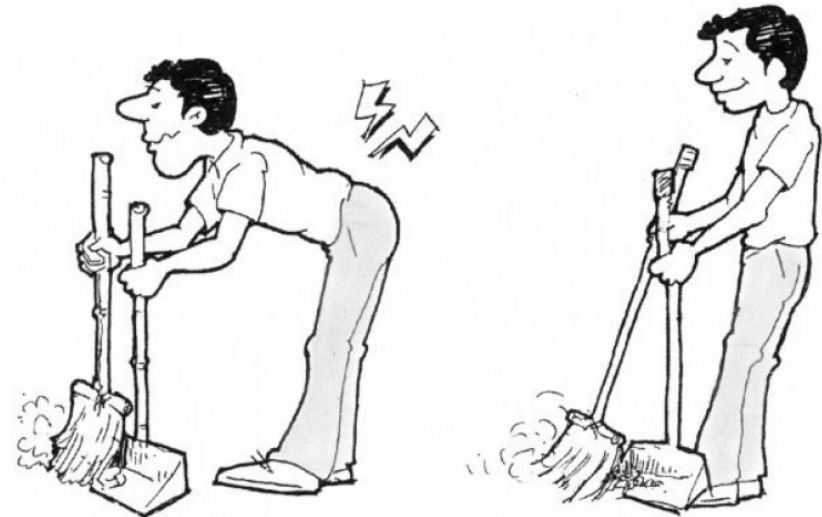
- Sit down for your activities whenever possible. Avoid tasks that required prolonged standing, squatting or stooping.
- Avoid raising your arms too high above shoulder level.



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2. Use of proper body mechanics

- Keep your body straight while performing a task, poor posture consumes more energy.
- Keep your arms straight and close to your body while carrying objects and spread the load between both arms at the same time.
- Support your elbows on table or a firm surface while performing a task to avoid positions that make you tired, e.g. during shaving,



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3. Proper posture

1. When sitting down to rest, lean your body forward slightly. Relax your shoulders while keeping your hands on both thighs and rest your feet comfortably on floor. This posture facilitates diaphragmatic breathing.
2. Raising your arms too high for prolonged period of time while working is energy consuming. Avoid this posture by lowering the height of working table to the appropriate level.
3. Stooping or crouching will impede breathing. Avoid this posture by raising the working table to an appropriate height.
4. Avoid bending over while retrieving objects from the floor. Before lifting, try keeping your body straight by bending your hips and knees. Then straightening your legs will assist lifting up objects.
5. Keep the heavy objects close to your body while lifting and carrying.



Application of energy conservation techniques—basic self-care activities

1. Feeding:

- Good posture should be ensured and avoid stooping or semi-incline positions.
- Elbows should be supported on table and all dishes should be placed at nearest position within reach.
- Light and more frequent meals can ensure enough time for enjoyment so as to minimize shortness of breath.

2. Grooming:

- Sit in front of water basin for cleaning face, brushing teeth, shaving and combing hair.
- Elbows should be supported on the rim of water basin while grooming.
- Small towel should be used and coordinated breathing should be applied when wringing towel. Never cover nose and mouth together while cleaning face.
- Electric tooth brush and razor should be used to minimize upper limbs exertion.

3. Dressing (include upper garment, pant, socks and shoes):

- Avoid wearing tight clothing and clothing with zips or buttons at the back.
- Wear shoes without shoe-laces to avoid bending trunk when tying shoe-laces.
- Sit where possible when putting on and taking off clothing.

4. Toileting:

- Install an exhaust fan and ensure good ventilation in toilet.
- Keep coordinated breathing during bowel open to minimize shortness of breath. Regular intake of vegetables and fruits will promote bowel movements.
- Adjust height of sitting toilet or install raised toilet device to ensure appropriate height of toilet bowl.

5. Bathing

Preparation:

1. Arrange bathing time when you have the stamina and energy.
2. Take a bath after using bronchodilators and use home oxygen for those who are indicated after assessment.
3. Prepare and setup as appropriate before bathing e.g. the towels, soap and clothing should be ready.
4. Sit down if you can. You may sit on a shower chair, bath-board, or the toilet. Place shower and bathing utensils nearby.
5. For those using basin to hold water for bathing and washing hair, the basin should be elevated to a suitable height to avoid the need to bend excessively at the trunk or to squat. Using water heater for generating hot shower eliminates the inconvenience. Bathing in the bath-tub is also comfortable and less energy-consuming.

Bathroom environment:

1. Ensure good ventilation in the bathroom by switching on exhaust fan or keeping windows open.
2. Avoid too much water vapor or steam. Turn on cold water first then hot water minimizes steam production.



Bathing time:

1. Take off clothing first and wrap body around with a large towel to rest. Adjust water temperature at this time if using water heater for showering.
2. Use long handle sponge and long towel for washing back and apply coordinated breathing while washing body, e.g. breathe in for upwards movement and breathe out for downwards movement.
3. If intermittent rests are required, cover your body with a large towel to keep warm. After washing the upper body, cover it with a large towel to rest and continue to wash the lower body.
4. After completion of bathing, wrap body with a large towel to dry water up. Keep relaxed and alleviate shortness of breath with appropriate breathing techniques. Put on clothing after rest if required.

Application of energy conservation techniques — household tasks

1. Placing of daily necessities:

- Seasonal clothing and underwear should be kept in drawers or wardrobes nearby.
- Kitchen utensils should be placed in a rack for drying. This saves energy from drying and tidying.

2. Cooking:

- Install an exhaust fan and a range hood to ensure good ventilation in kitchen during cooking time.
- While cooking, minimize handling multi-tasks at the same time, e.g. frying vegetables and steaming fish together. It will make you tense.
- Frying and stir-frying trigger fumes and smoke leading to shortness of breath.
- Sit down for the preparation work, e.g. sitting down for cutting vegetables, peeling and marinating food.
- Place a chair inside or outside kitchen for intermittent rests.



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3. Laundry:

- Use the washing machine and drying machine.
- Avoid squatting down to do laundry by hands. Sit whenever possible.
- If the laundry is too heavy, handle a part of the load at one time.
- When hanging clothing, sit down and perform the actions slowly. Practice coordinated breathing during hanging clothing.



4. Home cleansing:

- Seek help for heavy household tasks.
- Sit in front of the cupboard when cleaning the bottom part of the cupboard. Use coordinated breathing technique when bending at trunk.
- Schedule housework evenly with one task every day in order to avoid exhausting yourself, e.g. laundry on Mondays, sweeping floor on Tuesdays, cleaning on Wednesdays, etc.
- Wear masks and use a vacuum cleaner for dusting at home.



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Application of energy conservation techniques — outdoor and leisure

1. Eating out:

- Plan the route, the time involved with consideration of the location (any stairs or slope) beforehand. Match the demand with your own physical abilities and tolerance.



2. Strolling in the garden in the morning:

- In summertime, it will be more comfortable to arrange strolling in the garden at about five to six o'clock in the morning to avoid the heat. During winter, arrange to have walks at around eight to nine o'clock in the morning with sunny and warm temperature. Put on clothing with higher collar or use scarf to keep yourself warm.

3. Shopping:

- Plan the route for shopping to avoid getting exhausted.
- Seek help from relatives/friends for heavy groceries or buy only one heavy load every day.
- Arrange delivery service for heavy groceries.
- Use shopping bags to carry over shoulders or use trolley for shopping.



4. Attend medical follow-up:

- Arrive at the location of medical follow-up in time.
- Apply non-emergency ambulance transportation services via nurses whenever necessary.
- Seek for assistance from oxygen vending agents or occupational therapists for arrangement/information of transportation for oxygen users.
- Buy or loan of wheelchair if one feels difficult to manage the trip.

5. Long tour trip:

- Bring along adequate medication with additional dosage for emergency situations.
- Avoid getting exhausted by planning intermittent rests for the trip.
- Prepare medical reports and medication lists for emergency use.
- Use a trolley to carry luggage or ask relatives to help.

Conclusion

This booklet introduces some general techniques and principles of energy conservation for patients with chronic obstructive pulmonary disease. It only serves as a general reference for application in activities of daily living. For those who have enquires or change of medical conditions, they should contact relevant occupational therapists for assistance.

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