

Exercise

Considerable controversy surrounds the prescription of exercise for post-polio patients because the pathophysiology of this condition remains unclear and because there have been case reports of overwork weakness amongst this population. It has been shown that individuals with a history of polio can increase their muscle strength and cardiovascular endurance by following a well structured, individualised training program.

Exercise prescription for the post-polio patient should only be carried out by a physiotherapist who has a thorough knowledge of the general principles of exercise prescription and an understanding of the effects of exercise on this group of patients. Even though several different forms of exercise have been shown to be beneficial in this population, exercise should be used judiciously and should be completely avoided in some patients.

Exercise must be individualised because:

- Each person has a varying degree of weakness and musculature affected;
- Exercise must be modified according to pain, fatigue, exercise tolerance and posture;
- Medical history and any previous surgical procedures must be taken into account; and
- Every person has his or her own needs, goals and interests.

Who should not be exercising?

People who push themselves beyond the point of fatigue with their daily tasks should probably not be prescribed an exercise program. These people may have weakness due to overuse of their muscles. They may notice an improvement in their strength and fatigue levels in they reduce their activity. These patients should be taught the principles of energy conservation and be assisted to modify their lifestyle to reduce fatigue and muscular overuse. Specific muscle groups that are being overused may benefit from rest or supportive devices. If these measures are effective, the person may then become a candidate for an exercise program.

Who should be exercising?

Post-polio patients who should be prescribed an exercise program include:

- Those who keep their fatigue under control by practising energy conservation and pacing themselves;
- Those who lead more sedentary lives where fatigue is no longer a problem; and
- People who are overweight.

The types of exercise that may be prescribed to a post-polio patients will be briefly explained.

Cardiovascular Exercise

The aims of aerobic exercise include:

- Improved heart function and efficiency – the average level of aerobic fitness in post-polio patients is 5 METS – similar to the fitness of patients following a myocardial infarction;
- Improved circulation;
- Improved respiratory function;
- Improved efficiency of working muscles; and
- Decreased blood pressure.

On the basis of scientific studies of the effects of aerobic exercise on post-polio subjects, the general features of aerobic exercise programs should be:

- Low intensity and non-fatiguing exercise;
- Activities the patient enjoys – to improve compliance; and
- Low resistance activities that are least likely to fatigue compromised muscles. These activities may include walking, cycling on a level surface, swimming and hydrotherapy

Strengthening Exercise

Several studies have shown that people with a history of polio can improve their muscular strength and endurance by following an individualised, carefully monitored exercise program. However, at this stage, there is no consensus in the literature regarding the best strengthening exercise protocol to follow. The key factor appears to be intensity. Most authors recommend that strengthening exercise should be non-fatiguing.

Isometric exercise is most useful in muscles with a grade of less than 3 or in muscles over a painful joint. Isometric exercise may promote circulation and help retain some joint stability in body parts with this degree of weakness. Isotonic and isokinetic exercise is most useful in muscles with grade 3 or better strength and without a painful joint.

Stretching Exercise

Shortening of trunk and limb muscle is common in patients with a history of polio, particularly in those patients who are non-ambulatory. Muscle shortening may contribute to pain and decrease movement efficiency. Prescription of specific stretches for localised muscle tightness may be indicated as part of a physiotherapy program.

Gentle stretching of tight muscle in the post-polio patient may:

- Improve posture;
- Relieve muscle tension and cramping;
- Reduce the risk of musculotendinous and joint range of motion;
- Prevent irreversible contractures; and
- Increase general flexibility before strengthening exercises.

It must be noted that reduced flexibility is not necessarily detrimental. Tightness of certain structures may help to provide stability and improve function. Therefore, stretching is not always appropriate.

Hydrotherapy

Hydrotherapy is often the exercise method of choice for post-polio patients. When hydrotherapy is used in combination with other physiotherapy techniques, it has been found to improve muscle strength, range of movement, balance, coordination and endurance.

Hydrotherapy is particularly beneficial to the post-polio population because:

- The scope of water activities can benefit post-polio patients with all levels of ability;
- Exercising in water is a very pleasant and encouraging way to exercise particularly for non-mobile patients;
- Warm water promotes muscle relaxation and improved circulation;
- It allows particular movements to be either assisted, supported or resisted by the buoyancy of water; and
- It reduce weight bearing and can decrease mechanical stress on limbs, depending on the level of immersion.

It is essential that the instructor or therapist is aware of the patient's medical condition and the approach to exercise that is appropriate for these patients.