PARKINSON'S DISEASE & EXERCISE

PROFESSIONAL

WHAT IS PARKINSON'S DISEASE?

Parkinson's disease is a common, progressive and debilitating disorder affecting many areas of the nervous system. Historically, it was believed that only dopaminergic neurons in the brain were affected, leading to motor impairments including tremor, rigidity (stiffness), bradykinesia (slow movements), akinesia (freezing or absence of movement) and balance problems. However, as the neurological changes are diffuse, there are also many other motor and non-motor impairments, such as anxiety, depression, impaired cognition, sleep disorders and pain. Autonomic function may also be affected by the disease and some medications.

Medications can control the symptoms in most people, but unfortunately only for a limited time. Parkinson's medications either replace or maintain the neurotransmitter dopamine in the brain. However, not all Parkinson's disease symptoms are caused by a lack of dopamine. Additionally, as the disease worsens with time, medication dosage must gradually increase to control the symptoms. At these higher doses, the medications can cause serious side effects (e.g. dyskinesia and impulse control disorders). Surgery (e.g. deep brain stimulation) can sometimes be used to manage Parkinson's disease resulting in the need for less medication. However, surgery does not help with some symptoms, such as poor balance, and symptoms continue to worsen over time. Neither medication or surgery can cure or slow the progression of the disease.

WHY IS EXERCISE IMPORTANT?

People with Parkinson's disease often do not do much exercise. This can add to the effects of the disease, leading to premature and unnecessary disability. Additionally, lack of exercise can contribute to other health conditions such as heart disease, diabetes and osteoporosis. People often live with Parkinson's disease for a long time, which has profound implications for the care and treatment of individuals and has significant impacts for their families and the health-care system.

Evidence from systematic reviews and randomised controlled trials shows that exercise, when used in conjunction with medication, can reduce symptoms, improve mobility, muscle strength and balance, reduce falls and may slow disease progression. Exercise may also have positive effects on mood, fatigue, pain, constipation and may improve cognition and sleep. These benefits can help people with Parkinson's disease to optimise their abilities, improve their quality of life and remain independent for as long as possible. Exercise also provides a means by which individuals can actively participate in the management of their disease.

HOW DOES EXERCISE HELP?

People with Parkinson's disease benefit from a variety of exercise modes. For example, targeted exercise can improve aerobic fitness, muscle strength, balance, coordination and overall mobility as well as reduce freezing when walking. Additionally, exercise can reduce psychological symptoms. Some studies have shown that increased exercise and/or Parkinson's disease-specific physiotherapy are associated with slower disease progression and lower morbidity in people with Parkinson's disease.

Exercise has also been shown to have beneficial effects on the central nervous system. Exercise leads to structural, vascular and neurochemical changes in the brain, and in people with Parkinson's disease these changes have been linked to improvements in impairments and the ability to perform activities. Direct impacts on brain function have been shown with high intensity exercise (e.g. cycling or treadmill training) and exercise which challenges thinking as well as movement (e.g. walking in a virtual reality environment).

Cues and strategies for complex movement sequences can assist the person with Parkinson's disease to compensate for difficulties with automatic movements. These strategies involve using visual or auditory cues and/or breaking tasks down into component steps to direct attention towards features of the task that would usually be performed automatically.

WHAT EXERCISE IS BEST?

There is no evidence that one specific type of exercise is best for people with Parkinson's disease. Exercise programs should incorporate a variety of different modes of exercise (e.g. aerobic, balance, coordination and progressive resistance), and should commence as soon after diagnosis as possible. General exercise prescription guidelines should be incorporated into the program. Referral to an Accredited Exercise Physiologist or Physiotherapist is recommended for people commencing an exercise program and for people experiencing increasing disability and/or falls.

Prescription of exercise programs should adhere to the following principles:

High/moderate intensity aerobic exercise may provide greater benefits to the central nervous system. Gradually increase exercise intensity and duration as tolerated, aiming for at least 30 minutes on most days.

Task specificity and complexity are important considerations. Exercise programs should address movement problems by initially practising in a simplified environment, then (where possible), gradually introducing complex and varied motor and cognitive challenges. For example, a person with difficulties with freezing when walking may initially practice walking with big steps using visual cues in an environment with no distractions or obstacles, and progress to walking in different environments with varying dual cognitive (e,g, counting/talking) and motor (e,g, carrying a glass of water) tasks.

Exercise preferences can influence whether a person starts and continues exercising in the long term. There are many ways of performing each mode of exercise. For example, balance exercises could be performed through Tai Chi or dancing, and progressive resistance exercise could be performed using machines at a gym or weighted vests at home. Individual preferences for exercise location and delivery methods (e.g. group or individual sessions) should also be considered to maximise enjoyment and adherence.

One size does not fit all. Exercise should be carefully prescribed for each individual with Parkinson's disease, taking their impairments, disease severity, fall risk and goals into account. As an individual's disease progresses over time, their exercise program will need to be reviewed and updated to meet their changing needs and ensure their safety.

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RELATED INFORMATION AND REFERENCES

Exercise is Medicine Australia www.exerciseismedicine.org.au

Exercise Right www.exerciseright.com.au

Find a Physiotherapist www.choose.physio (select clinical area neurology)

Find an Accredited Exercise Physiologist www.essa.org.au

Parkinson's Australia www.parkinsons.org.au

Michael J Fox Foundation www.michaeljfox.org/

Parkinson's UK www.parkinsons.org.uk/

If you have any concerns about the safety of your patient in commencing an exercise program, please consider referral to a Sport and Exercise Physician.

Find a Sport and Exercise Physician www.acsep.org.au/

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