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How to Stay Active with Parkinson's Disease

Abu A. Qutubuddin
Virginia Commonwealth University, Richmond, Virginia, U.S.A.

1. Introduction

The key management of Parkinson's disease (PD) other than medications is rehabilitation. Three main areas – flexibility, strength, and cardio respiratory endurance must be considered for rehabilitation with these patients. The following are the basics of the rehabilitation:

1. Physical therapy (PT),
2. Occupational therapy (OT),
3. Recreational therapy (RT) and
4. Speech and language therapy (SLP).

One should be working with these disciplines closely to overcome any limitations and eventually to attain their functional goals. We all know flexibility can be restricted by rigidity or tightness in any of the structures surrounding the joints, by pathology of the joints like arthritis, or by pain.

Older adults lose cardio respiratory endurance or stamina primarily due to decreased physical activities with age. People with PD go through the same age-related changes in range of motion (ROM), strength, flexibility, power, and endurance as does the general geriatric population. However, PD patients have a greater risk of secondary musculoskeletal impairments because of their primary disease process. ROM can be affected by the decreased amplitude and bradykinesia (slowness of movements), rigidity, and impaired proprioception commonly seen in PD patients. Activities can be further reduced secondary to the increased difficulty with movements.

The focus of this chapter is to offer guidelines and examples of various types of exercise. Our goal is to achieve rehabilitation and long-term maintenance of desired activity through educating the PD population and their caregivers. However, knowledge alone is insufficient. Participation and adherence to the program is vital and up to the individual with Parkinson's.

To optimize gains, patients should exercise when they are ON STATE with medications because it reduces the rigidity and bradykinesia. Exercise should not cause any pain. If pain occurs, any exercise should be discontinued or modified.

The ultimate goal or purpose of exercise is to help the PD patients to lead a better quality of life.

We need to understand that before starting any exercise one should consult his/her doctor. Generally, a combination of medications and exercise well tailored to your individual situation and needs will provide an improved state of activity and functioning.

Flexibility and balance are important first considerations in start an exercise program. By improving flexibility, ROM and pain free movement will be improved. By improving balance, safety and life enjoyment will be maximized. If the exercise prescription is right, they will feel comfort rather than pain and discomfort.
Strength is the next exercise priority. It requires weight lifting with different kinds of weight for muscle strength.
The next goal is to increase stamina with different types of movements so that the cardio respiratory condition of the PD patients can be improved.
Dexterity is another important, but often overlooked, factor in assisting the PD patients. Due to tremor, rigidity and inflexibility these patients have difficulties buttoning dresses, holding and turn pages, and writing or signing their checks. To improve these we do have several rehabilitative activities that often are helpful in assisting these patients with their daily tasks that allow for independence and dignity.

2. Rehabilitation

What is Rehabilitation: It is a process of active change by which a person who has become disabled acquires the knowledge and skills needed for optimum physical, psychological and social function.

2.1 Neurological rehabilitation of PD

The patient with PD needs multiple ways to keep themselves active and mobile. Though we know that rehabilitation is the KEY to success, there is presently a lack of well-designed research studies looking at specific rehabilitation techniques. While there are reviews examining studies involving various physical therapy techniques in Parkinson's disease, they have found insufficient evidence to support or refute the efficacy of any form of physical therapy over another form.
The aim of rehabilitation with persons with PD will vary between individuals and between client groups. In general the aim is to provide individuals and their families with the knowledge, skills and support necessary to maintain their autonomy, minimize disability and maximize their level of participation. This includes prevention of complications and secondary disabilities.
Before explaining the different exercise modules, we need to emphasize speech and voice problems that occur with PD progression. Many patients have trouble with speech clarity, volume and swallowing. As we all know if we want to communicate with others we need our voice to be heard loud and clear. So, PD patients need to keep up with their voice exercises to prevent low voice volume (hypophonia) and word slurring (dsyarthria). A simple way to maintain our voice/speech is daily practice preferably twice a day. A simple exercise is to scream at the top of the voice the vowel sounds "A E I O U" for 2-5 minutes. The other simple way to keep your voice loud and clear is to sing along with your favorite song. In my practice most of my patients are benefiting from these two simple, cheap, and easy exercises to keep their speech or to improve their voice. This also helps to improve the swallowing process. There are no real well designed research studies comparing rehabilitation for voice, speech or swallowing. This is purely from my experience.
Before prescribing any exercise program, one has to take into consideration the patient's underlying physical condition and other disease processes. As we know, PD patients appear to exercise with decreased metabolic and mechanical efficiency. To overcome this

disadvantage they might be amenable to treatment with aerobic conditioning. Prescribing conditioning exercise to PD patients is only useful in the setting of an optimized medication regimen. This is why it has been agreed to start exercise when the patient is on "ON STATE". That means they should wait at least 30-45 minutes after the dose when most of the patients medication kicks in.

3. Flexibility

For a well-rounded routine exercise, stretching is an important component. Some basic guidelines and practical examples for an effective stretching program are discussed below.

3.1 General considerations

To be effective and to maximize flexibility, patients should and need to be educated about the three components of stretching and how they affect their flexibility. First, they must achieve their current available full range of movement to maintain their flexibility. Compensatory strategies might be required for PD patients. Second, optimal frequency of stretching must be addressed. And finally, holding time for stretching should be determined.

3.2 Achieving maximum range of motion

Slow movements, referred to as bradykinesia in the PD population, can contribute to losing potential flexibility of all the joints of the body. Centrally impaired proprioceptive integration can also contribute hypo metric movements (Jacobs & Horak, 2006).

Cueing strategies may be used to overcome and encourage a larger excursion of movement to obtain full range of motion. This has been shown in gait improvements.

Cueing can also help in an exercise program as well. Attention strategies may be sufficient for obtaining full range in patients with mild PD patents. But to achieve the same results with moderate to severe PD, patients, may need more that just attention strategy. Those patients may do better with verbal, visual, or tactile cues from professionals and caregivers to accomplish optimal flexibility.

To optimize trunk rotation, a person first stands with the back to the wall. Then he or she is asked to touch the wall on the left side by reaching across with his or her right hand. The movement is then reversed. Touching the wall ensures that maximum range has been achieved (Fig.1). Types of cueing needed should be assessed on an individual basis. The patient should be encouraged to obtain full range. Available range will not maximize or be maintained if full range of motion is not utilized "if you don't use it, you lose it".

3.3 Frequency

The American College of Sports Medicine (ACSM) guidelines recommend that adults should stretch a minimum of 2-3 days per week and ideally 5-7 days a week focusing on the areas of reduced range of motion (ROM). There are no specific guidelines for patients with PD. In my experience it is a good practice to do stretching 5-10 minutes at least twice a day, first after getting up from bed in the morning and then before retiring at night. This is in addition to the regular exercise. Holding for the stretching 45-60 seconds with 4-6 repetitions has been shown to be optimal.

3.4 Range of motion exercises

ROM exercises depend on the exercise goals. It is also important to consider the effectiveness, tolerance, and adherence to exercise. It is very important to consider the

diagnosis of osteoporosis among the PD patients as many of them have sedentary life styles. Precautions should be observed prescribing ROM exercises to minimize complications.

3.5 Cervical retraction

This type of exercise improves balance and swallowing. This can be done sitting on a chair or lying in bed. While sitting on a chair push the back and head against the wall. The wall will serve as a tactile cue. If it is difficult a pillow can be placed between the head and the wall.

3.6 Cervical rotation

Practicing this exercise helps walking, driving and even sitting with friends in a meeting or restaurants. We need our neck to be flexible in all directions so that when we are walking we can scan our walking path and when driving we can move the neck when needed without much intervention due to tightness. Cervical rotation should be done with the neck in an optimal neutral position without much forward flexion. Having said this, it is advisable to do the cervical retraction exercise before the cervical rotation.

3.7 Shoulder flexion

This can cause loss of balance and falling backwards when trying to reach up.
Ex: if someone has limited shoulder flexion it will restrict reaching for a high shelf. Commonly, people substitute with extending and rotating the trunk. This is not a suitable position for people who already have postural instability as seen in some patients. Sitting with the back fully supported in a chair can help isolate the motion in the shoulder. Folding hands together in front of the chest and above the shoulder can reduce the irritation to the rotator cuff muscles. Patients can then focus on excursion rather than just arm position. As with any exercise it should not cause any pain, it should be performed to comfort. Pre-existing problems of shoulder should require individualized attention.

3.8 Trunk

Tightness or stiffness of the trunk is pretty common and often leads to discomfort or pain. Patients with PD can have this type of stiffness which is partly due to bradykinesia.

3.9 Trunk flexion

PD patients have common problems with the low back due to paravertebral muscle tightness. This can aggravate the symptoms of spinal stenosis. Forward trunk bending while sitting in a chair helps relief of symptoms than just sitting. While keeping the hand on the knees and forward flexion of the trunk helps stretch the back muscles. Patients can easily perform this exercise as needed for pain control.

3.10 Trunk extension

Typically there is limited extension in thoracic and lumbar spine so tolerance to these exercises varies widely. Younger people have fewer co-morbidities that restrict trunk extension. Trunk extension exercises can range from prone press-up to a gentle supine position. This can be performed by longitudinal stretch with reaching arms and legs. Extension can aggravate symptoms of spinal stenosis so the patient may need to rely on a gentle approach.

3.11 Trunk rotation

This exercise can be performed in a supine, sitting, or standing position. This type of exercise should be avoided by people who have osteoporosis. Golf players understand the relevance of trunk rotation exercises. The patient can use tactile cues by attempting to touch the elbow to the opposite knee. Patients who are less flexible may attempt to touch the forearm to the opposite knee. Visual cues can facilitate the motion in which the patient attempts to look at a target behind.

4. Lower extremity

Limitations in range of motion in the lower extremities can affect ones balance, gait, activities of daily living (ADLs), and transfers.

4.1 Hip extension

Sedentary people exhibit an increased forward-flexed posture due to hip flexors tightness. They also walk with reduced stride length. Hip flexors tightness can also contribute to low back strain and aggravates the symptoms of spinal stenosis. Hip flexors stretching vary widely.

One method of stretching the quadriceps (hip flexors) is to lie supine with one leg hanging off a bed while holding the opposite knee to the chest. Pulling the knee to the chest prevents arching of the back. If it is difficult just lie flat in the bed, resting one leg on the bed and try to pull the other knee close to the chest. It might be difficult the first couple of times, but eventually it is possible to do. This way the hip flexors are stretched, not the back. People who cannot tolerate the hip flexors stretching can do active hip extension while standing. They also can perform this exercise by forward lunge.

4.2 Hip abduction

Activities like getting in and out of the bathtub and maintaining hygiene need relaxed adductors muscles of the hip. If the adductors are tight it causes limitations in hip abduction, i.e. difficulty moving the hips and thigh outwards. It also sometimes causes narrowing the base of support which may interfere with ambulation. Another way this can be achieved is by standing behind a chair holding the backrest of the chair. Squat halfway keeping the heels together and the front of the feet spread outside. This will help release the tone of the adductors.

4.3 Hip flexion

It is difficult to don and doff shoes and socks when hip flexion is restricted. Restricted hip flexion can cause lack of forward trunk leaning. One common reason people do not lean forward because of fear of falling. This can reduce ability to stand up from a sitting position. This can be improved by sitting in a chair straight then forward flex the trunk and try to touch the feet with the hands. If there is back pain then keep the hands on the knees.

4.4 Hamstring tightness

This interferes with bed mobility. Presence of rigidity in PD patients and if there is hamstring tightness, this will create bed mobility difficult. It is easier to stretch the hamstring muscles in a sitting position. The patient sits on the edge of a chair with one knee straight and heel on the ground. Then the patient slides both the hands down the extended

leg until they feel the stretch in back of the leg while keeping the spine in a neutral position. This can be done safely at home as one of the regular home exercises. Another easy way to stretch the hamstrings is while sitting in a chair with the back supported in a neutral position just extend the knees actively.

4.5 Ankle dorsiflexion or calf tightness

Reduced dorsiflexion of the ankle can be the cause of falls. Falls are common in PD patents. An easy way to stretch the calf tightness is to stand with the forefeet on the edge of a wooden/cement block with the heels resting on the ground. Stretch can be modified by adjusting forward lean. This can also be done easily by standing on the forefeet without any block, holding the edge of a table, sink or kitchen counter, provided they are securely placed. Then do the repetitions by standing on the forefeet with 10 to 20 reps.

Other training for the PD patient includes resistance exercises like strength training, training for power, and also to increase cardio respiratory endurance.

The above exercises can be done with the help of trained therapist to start with if necessary. The important aspect to keeping our body in shape is to adhere to the exercise program. Exercise is a lifelong commitment, not just for the short time. There is no short cut in keeping our body fit for the activities of daily living.

5. References

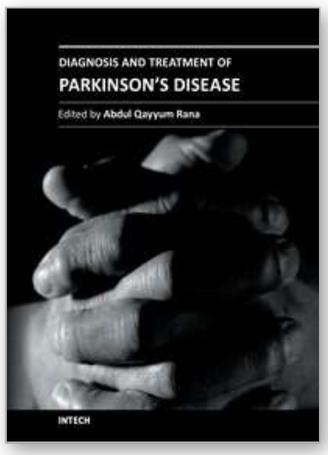
[1] Parkinson's Disease Diagnosis and Clinical Management, Second Edition by Stewart A. Factor/William J. Weiner

[2] Movement Disorders Neurologic Principles and Practice by Ray L. Watts and William C. Koller.

[3] Neurological Rehabilitation of Parkinson's Disease, Queen Square Neurological Rehabilitation Series, Edited by Diane Playford.

[4] Health Professionals' Guide to Physical Management of Parkinson's Disease by Miriam P. Boelen.

[5] Exercise & Physical Activity, Your Everyday Guide from The National Institute on Aging.



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Parkinson's disease is diagnosed by history and physical examination and there are no laboratory investigations available to aid the diagnosis of Parkinson's disease. Confirmation of diagnosis of Parkinson's disease thus remains a difficulty. This book brings forth an update of most recent developments made in terms of biomarkers and various imaging techniques with potential use for diagnosing Parkinson's disease. A detailed discussion about the differential diagnosis of Parkinson's disease also follows as Parkinson's disease may be difficult to differentiate from other mimicking conditions at times. As Parkinson's disease affects many systems of human body, a multimodality treatment of this condition is necessary to improve the quality of life of patients. This book provides detailed information on the currently available variety of treatments for Parkinson's disease including pharmacotherapy, physical therapy and surgical treatments of Parkinson's disease. Postoperative care of patients of Parkinson's disease has also been discussed in an organized manner in this text. Clinicians dealing with day to day problems caused by Parkinson's disease as well as other healthcare workers can use beneficial treatment outlines provided in this book.

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InTech Europe
University Campus STeP Ri
Slavka Krautzeka 83/A
51000 Rijeka, Croatia
Phone: +385 (51) 770 447
Fax: +385 (51) 686 166
www.intechopen.com

InTech China
Unit 405, Office Block, Hotel Equatorial Shanghai
No.65, Yan An Road (West), Shanghai, 200040, China
中国上海市延安西路65号上海国际贵都大饭店办公楼405单元
Phone: +86-21-62489820
Fax: +86-21-62489821

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