

Pilates as a modality to increase movement and improve quality of life
for those suffering from Parkinson's Disease

Miranda Handke

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Abstract

The aim of this paper is to explore the use of Pilates as a modality to increase movement and improve the quality of life for those suffering from Parkinson's disease. Parkinson's disease is a progressive complex neurological condition that affects the control of body movements. The leading symptoms of Parkinson's disease include tremors, rigidity and stiffness, slowing of movements, and difficulty walking. Parkinson's disease is chronic and progressive and no drug or therapy, at this point, will prevent the progression of the disease. However, many believe that exercise is key to slowing the progression of Parkinson's disease. This paper will specifically focus on the use of Pilates with an individual with the advanced stages of Parkinson's disease with a high fall risk and limited mobility.

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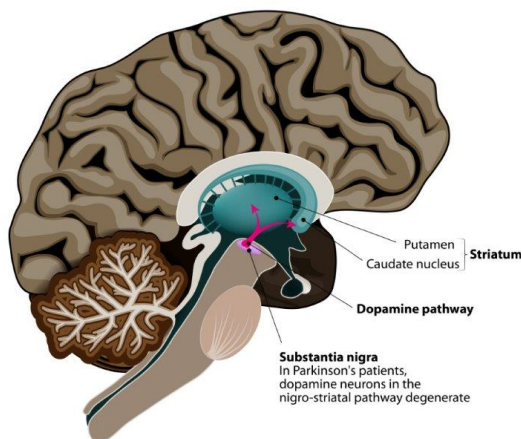
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An Overview of Parkinson's disease

Parkinson's disease (PD) is a devastating neurological condition which slowly robs patients of their movement and quality of life. PD affects 1 in 100 people over the age of 60, which is the average age of onset. PD is a motor system disorder that is caused by the loss of dopamine producing cells primarily in region of the brain called the substantia nigra.

Dopamine is a chemical messenger responsible for transmitting signals within the brain that allow for coordination of movement. Loss of dopamine causes neurons to fire without normal control, leaving patients less able to direct or control their movement.

PARKINSON'S DISEASE



PD is a very individual disease; symptoms are not uniform and patients may experience them in different variations and severities.

However, PD is characterized by four main

motor

symptoms;

these

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symptoms,

which are also called the "cardinal" symptoms

of Parkinson's disease, are resting tremor, slowness of movement (bradykinesia), postural instability (balance problems) and rigidity.

PD can also inflict a range of non-motor symptoms that may greatly impact a patient's quality of life. Common non-motor symptoms include cognitive impairment, mood disorders, such as depression and anxiety, sleep difficulties, loss of sense of smell, constipation, speech and swallowing problems, unexplained pains, drooling and low blood pressure when standing.

Treatments

At present, there is no cure for Parkinson's disease; however, there are a range of promising treatments that can help control PD symptoms. PD treatments include drug therapies, complementary therapies, surgical inventions and symptom management.

Medications can be used to help patients manage problems with walking, mobility and tremors. The two main drugs that are used to treat PD are dopamine replacement therapies and dopamine agonists, which mimic the effect of dopamine on the brain. Drugs used to treat PD have a range of side effects and because PD is experienced uniquely by each patient, treatments must be highly individualized. As the disease progresses, the effectiveness of the medications may lessen and dosing will need to be adjusted to meet the patient's symptoms. While drugs are effective in controlling symptoms, there are no drugs available to delay or reduce the progression of the disease.

There are a range of complementary therapies, including Pilates, used as PD treatments in conjunction with traditional drug therapies. Several exercise therapies commonly used by PD patients include Pilates, Yoga, Dance Therapy, T'ai chi, Alexander technique, and the Feldenkrais method. While there is minimal scientific evidence to prove that complementary therapies benefit PD patients, patients who use these therapies have reported experiencing numerous positive outcomes, such as decrease in pain; feeling more relaxed; improvement in motor symptoms, mobility, and speech; and a greater sense of wellbeing.

The most common surgical intervention for PD is Deep Brain Stimulation (DBS) surgery and is most often performed on those with advanced PD. During DBS surgery, electrodes are implanted in specific areas of the brain that are powered by battery packs placed in the chest. Patients receive electrical impulses in their brain which helps reduce and control their symptoms. DBS can help stabilize medication fluctuations, reduce or halt involuntary movements (dyskinesias), reduce tremor, reduce rigidity, and improve slowing of movement. However, DBS isn't helpful for problems that don't respond to drug therapy apart from tremor.

Parkinson's disease and Pilates

While there is little scientific evidence to prove that Pilates alleviates the symptoms of PD, many PD patients report a therapeutic value from their Pilates practice. Furthermore, the research that has been conducted is promising; a preliminary study, published in 2013 in *Advances in Parkinson's Disease*, evaluating the effects of a supervised Pilates training program on balance in Parkinson's disease found that a 6 week Pilates exercise program was beneficial to PD patients who are prone to falls, and resulted in a significant improvement in their balance and mobility and increased confidence in performing their activities of daily living.

Pilates focus on flexibility, posture and alignment, breathing and balance make it an excellent tool to help combat some of PD's primary motor symptoms. Some of the primary symptoms of PD that may be helped by Pilates are slowness of movement, stiffness, weak pelvic floor or bladder control and the loss of balance and posture.

One of the most common non-motors symptoms that PD patients suffer from is depression. Joseph Pilates referred to his method as “complete coordination of mind, body and spirit.” This integration of the mind and body is also beneficial for PD patients, helping them regain confidence and emotional wellbeing.

Case Study

Paul is 62 and has suffered from PD for over 20 years. He was officially diagnosed as a young onset patient at 39 years old. After years of drug therapy, Paul underwent DBS surgery in 2008 in attempt to help better control his symptoms and decrease the dyskinesia he was experiencing from his high dose of medications. While the DBS was successful and lessened Paul’s symptoms and has improved his quality of life, it has done little to improve his gait or mobility.

Given his PD is quite advanced, Paul suffers from numerous PD motor and non-motor symptoms. For the last several years, his mobility has been severely restricted due to his freezing gait and lack of balance. He is a high fall risk and falls regularly when not using his mobility devices. Paul’s shoulders and knees have taken the impact of several bad falls. His right rotator cuff was strained in particularly bad fall. Due to his DBS implants, Paul is not able to have MRIs. After an external assessment, his doctor determined surgery was not needed on the rotator cuff and he underwent physical therapy for it. He also previously had surgery on the right shoulder to remove bone spurs which are also believed to be a result of falls. He still has a limited range of motion in both shoulder joints.

Due to his fall risk, Paul is limited to using a mobility scooter or wheelchair and is very sedentary. He has a stooped, kyphotic posture, which is very common with PD patients, with weak and tight hip flexors and a weak core. He is very stiff and is often in pain. He also suffers from insomnia, fatigue and depression. He uses a rowing machine and swims at home and finds that this exercise improves his rigidity and stiffness.

Using the BASI block system, Paul’s program is focussed on increasing mobility, flexibility, balance and core strength. Due to the advanced nature of his PD and his high fall risk, exercises have been kept to mostly fundamental and some intermediate, transitions between apparatus are minimised, and the sequence of blocks are varied during sessions to minimise changing positions. Sessions are also kept to 30-45 minutes due to fatigue. Arm work is kept under the line of the shoulder to avoid aggravating any potentially undetected shoulder pathologies since he is not able to have MRIs. Prone position, where pressure is placed on the chest, is also avoided due to the battery packs implanted in his chest.

Conditioning Program

Block	Apparatus	Exercise
Program 1		
Warm Up		Standing Roll down (against the wall and with spotting/support) Pelvic Curl (modified to half bridge for first 3-4) Supine Spine Twist – feet on floor or supported on the foot bar of the reformer Leg Lifts
Footwork	Reformer	Heels Parallel, Open V Heels, Calf Raises, Prances, Single Heel (modified series due to time restriction/fatigue; attempt toes when a reduction in calf cramping allows)
Abdominal	Reformer	Short Box Series (Modified and with spotting) – Flat back (modified range), Tilt, Twist

Hip Work	Reformer	Hip Work Series – Frog, Circles Down and Up, Openings
Stretches	Reformer	Standing Lunge (with spotting)
Arm Work	Reformer	Supine Arms Series – modified to a limited range and sometimes abbreviated due to time and fatigue restrictions
Leg Work	Wunda Chair	Leg Press Standing – modified to use supports on the side of the chair for balance
Lateral Flexion	Wunda Chair	Side Stretch
Back Ext	Wunda Chair	Swan Basic – modified range, position on chair does not press into his battery packs
Program 2		
Warm Up	Mat	Standing Roll down (against the wall and with spotting/support) Pelvic Curl (modified to half bridge for first 3-4) Supine Spine Twist – feet on floor Chest Lift (modified to half lift or with theraband under the body supporting neck and head)
Footwork	Cadillac	Heels Parallel, Open V Heels, Calf Raises, Prances, Single Heel (modified series due to time restriction; attempt toes when calf cramping allows)
Abdominal	Cadillac	Mini Roll-ups, Mini Roll-ups obliques
Hip Work	Cadillac	Frog, Circles Down and Up, Walking
Stretches		Stretching using theraband in supine or hip flexor and hamstring stretch on PT bar while kneeling
Arm Work	Wunda Chair	Shrugs, Tricep Press Sit
Leg Work	Wunda Chair	Leg Press Standing – modified to use supports on the side of the chair for balance
Lateral Flexion	Wunda Chair	Side Stretch
Back Ext	Cadillac (used as a mat)	Cat Stretch

Conclusion

PD is a progressive neurological disorder that afflicts individuals in varying ways and degrees. While there is limited scientific research to prove the benefits of Pilates to PD symptoms, patients report positive outcomes from their training and the research undertaken thus far is very promising.

The individual nature of this disease must be considered first and foremost when planning session and working with PD patients. Every session will be different depending on how their PD symptoms are affecting them that day or whether they are at peak or “on” time with their medication.

While Paul will never progress to most advance or intermediate repertoire, he enjoys his sessions and reports feeling less pain and stiffness and a greater sense of well-being and independence from being able to exercise in a supported and safe environment. Even though the evidence based research is still catching up, the outcomes for PD patients practicing Pilates are real and tangible. It is improving their lives by reducing pain and rigidity, increasing balance, and restoring their confidence and sense of autonomy.

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