

Homecare Strategies for Parkinson's Disease

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Continuing education activity:

Parkinson disease also called 'The shaking palsy'. Parkinson disease is a disease of movement disorder it has non-motor feature such as cognitive impairment, autonomic dysfunction, disorder of sleep, depression and hyposmia, are part of disease. There is not complete cure occur on Parkinson disease in with the help of medicine, with the help of medicine physiotherapy treatment is also important in Parkinson disease. With physiotherapy treatment home exercises are important to maximize functional ability and minimize secondary complications (1).

Introduction:

Parkinson disease is the second most common neurodegenerative disorder affecting 2-3% of the population aged 65 or older. In Parkinson, neuronal loss in the substantia nigra causing striatal dopamine deficiency. Parkinson's disease is best known for effect on movements. The patient will primarily experience resting tremors, bradykinesia and rigidity. Parkinson's disease patients have substantially impaired balance, leading to diminished functional ability and an increased risk of falling. Parkinson's disease often causes an unsteady gait, resulting in trips and falls. Patients will suffer from difficulty in swallowing, difficulty with speech, sleep disturbances. Driving can be difficult or restricted for people with Parkinson's disease. If exercise is done routinely encouraged by health care providers, the risk will be decreased (3).

Homecare is considered as an adjuvant to medical treatments for Parkinson's disease (PD) to maximize functional ability and minimize secondary complications (4). There is no permanent cure for Parkinson's disease, but physiotherapy has symptomatic benefits in Parkinson's disease. A wide range of physiotherapy techniques are currently used to treat Parkinson's disease (2). This is more effective when all the exercises given by the therapist are performed at home with proper care taken. Some people with Parkinson's disease need extra help with activities of daily living like bathing, dressing, eating and using the bathroom. Right at Home's skilled caregivers are sensitive to the slowed pace the neuromuscular disorder presents, and respect privacy and the need for a normal routine. For people with Parkinson's disease, exercise is vital to maintaining balance, mobility and strength. Right at Home's in-home caregivers can assist with stretching, walking and other light exercise programs.

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with Parkinson's disease. If exercise is done routinely encouraged by health care providers, the risk will be decreased (2).

The homecare will improve balance impairments, functional capacity, strength of the muscles, posture and will give psychological support to the patient. Exercise increases synaptic strength and influences neurotransmission, thus potentiating functional circuitry in PD(4). In addition, exercise is an essential element of motor learning. Homecare training, as an accessory treatment and complementary therapy, can improve the plasticity of cortical striatum and increase the release of dopamine. Exercise training has been proven to effectively improve motor disorders (including balance, gait, risk of falls and physical function) and nonmotor disorders (such as sleep impairments, cognitive function and quality of life) in PD patients (5).

Homecare is an approach that improves the quality of life of patients and their families facing the problem associated with all life-threatening illnesses (7). Homecare is important in neurology as the trajectory of many neurological conditions is progressive and incurable. Homecare seeks to reduce suffering in PD patients and their families through physical, psychosocial and spiritual support.

Patients with PD benefit early from exercises and techniques in view of the impact of the disease impairing autonomy and quality of life. The provision of homecare in patients with PD focuses on unmet needs and should be aligned with patient priorities. It is recommended that a homecare approach should be applied from the early phase, throughout the course of the disease, complementing but not replacing other treatments (8). The services can be triggered at times of particular symptoms or psychosocial issues—such as the start of new interventions (e.g., artificial nutrition) or at the very end of life.

The awareness of exercises and homecare is greater in urban areas than in rural. In urban areas the hospital set ups, physiotherapy clinics and multidisciplinary team is highly active. The mentality of the people is flexible, they easily adapt to newer techniques and implement it in their daily life. They know the importance of homecare plan, so follow it. The people are well educated and reach the facilities. On the other hand, in rural areas the people are less educated, they believe in superstitions and miracles. They are not much dependent on medical facilities. The need for awareness of homecare is more in rural areas. We should help them to understand effectiveness of homecare in Parkinson's disease.

- There are two types of care:

Basic care: This provides services that will help to maintain a person's ability to carry out necessary daily functions, like personal care and getting around. They will also ensure that the person is supervised and safe.

Skilled care: This is care that requires the services of a registered nurse for treatments and procedures on a regular basis. Skilled care also includes services provided by specially trained professionals, such as physical, occupational, and respiratory therapists (9)

History

Obtaining through details in history and performing a comprehensive physical examination is important in determining whether the symptoms appear from how many times. Parkinson primarily experience resting tremors, bradykinesia and rigidity also difficulty in swallowing, difficulty with speech, sleep

disturbances. This symptom outlines the evaluation and management of Parkinson disease. Physical therapy in Parkinson disease will improve the patient condition.

Before rigidity actually develop, patients have significant difficulty performing ordinary daily activity. before tremors patient movement get slower and need more effort with time lapse to complete the one ordinary activity.

Complications: -

Thinking difficulty

Depression

Swallowing

Chewing and eating difficulty

Sleep problem

Constipation.

Epidemiology:

PD is rare before age of 50, common in increasing decades. worldwide incidence is increase by 5/100,00 to the 35/100,00 new cases yearly. Mortality is not increase after first decade after onset of Parkinson disease, after first decade mortality is increased by double. number of cases with Parkinson disease associated is almost double between 2005 and 2030. Patients lived disability and disability adjusted life year 1990 and 2010 and progressively increase in social and economic burden of PD.

PD is most common in male than in women population. PD incidence appears to vary with race, ethnicity, genotype, or environment. PD may be less common in Africa, America and Asians populations and prevalence is high in Inuit, Alaska native and native American populations, above factors play role in that. (1)

Pathophysiology:

Neuropathophysiological: - Characteristic feature of PD include neuronal loss of substantial nigra and widespread intracellular protein (α -synuclein) accumulation. These two majors

Gross macroscopic atrophy of brain is not a feature of PD, rather neuronal degeneration occurs in only type of neuron in some brain injury. In early stage of disease loss of pigmented dopaminergic neuron is restricted to the ventrolateral substantia nigra with relative sparing of other midbrain dopaminergic neurons but widespread by end stage.

The other pathophysiology is abnormal deposition of α -synuclein in cytoplasm in different brain regions.

Molecular pathogenesis: - heritability form of PD shows only 5-10% of all cases, some of the mutant genes represent particular molecular pathways that can trigger a neuropathology that resemble from idiopathic PD. Also, genes encoding for protein involve in these molecular pathways can play a role in sporadic PD.

Mitochondrial dysfunction: - Mitochondrial dysfunction as a key element in the pathogenesis of PD. α -synuclein and mitochondrial dysfunction exacerbate each other.

Neuroinflammation: - A large no of postmortem, brain imagining, and fluid biomarker studies show that neuroinflammation is salient feature of PD. (1)

Evaluation:

Imaging: - visualisation of striatal dopamine depletion in PD using L-dopa was breakthrough in molecular neuroimaging in 1985. From this year there was dramatic advances in imagining specially in PD. Advance MRI techniques and post-processing procedure including diffuse weighted imaging, volumetric imaging, multimodal imaging and automated subcortical volume segmentation are being explored to enhance diagnostic accuracy for PD and other type of Parkinson.

Genetics: -the list of mutation causing monogenic form of PD continues to grow as does the number of gene associated with complex phenotype that include Parkinson.

CSF, blood and gut microbiota: - Although several studies have assessed variety of protein in CSF but there is currently no clinically useful CSF diagnostic PD biomarker.

This also true for blood biomarker, although, although recent study that found 11 plasmas proteins.to be associated with PD onset.

The application of microbiota as powerful tool capable of mass analyses to identify small changes in protein, metabolism or RNA profiles in fluid or even tissues from healthy disease individual, and they have been started to be used in PD.

Tissue biopsy: - biopsy of the salivary gland as well as gastrointestinal biopsy with the ultimate goal to define diagnostic marker for the earliest stage of PD. (1)

Treatment /Management:

Huge progress has been made in the treatment of Parkinson's disease. As a result of advances in experimental therapeutics, many promising therapies for PD are emerging. Levodopa remains the most potent drug for controlling PD symptoms yet is associated with significant complications such as the "wearing off" effect, levodopa-induced dyskinesias and other motor complications. Catechol-o-methyl-transferase inhibitors, dopamine agonists and nondopaminergic therapy are alternative modalities in the management of PD and may be used concomitantly with levodopa or one another. The renewed interest in surgical treatment of movement disorders has been stimulated in part by improved understanding of the functional anatomy underlying motor control, as well as refinement of methods and techniques in neurosurgery, neurophysiology, and neuroimaging. Besides thalamotomy and pallidotomy, another promising surgical approach for the treatment of tremors and other movement disorders is high-frequency DBS via electrodes implanted in the VIM nucleus of the thalamus, GPi, STN or other subcortical nuclei. The mechanism of electrical stimulation is not known, but the following explanations have been offered: 1) disruption of the network ("jamming" of feedback loop from the periphery), 2) depolarization block, 3) preferential activation of inhibitory neurons, and 4) a functional ablation by desynchronizing a tremorgenic pacemaker. Apart from conventional pharmacologic and surgical treatments, there are many other strategies currently being explored in the treatment of some PD symptoms. Speech therapy designed to stimulate increased vocal fold adduction with instructions to "increase loudness", the so-called Lee Silverman Voice Treatment (LSVT), using various verbal cues to regulate speech volume, and percutaneous collagen augmentation of the vocal fold have been used successfully to treat the hypophonic, hypokinetic dysarthria associated with PD.

Physiotherapy has been proven to maintain health and well-being in Parkinson's and now importantly it is shown to play a big role in addressing secondary prevention (focusing on strength, endurance, flexibility, functional practice and balance). Exercise for neuroprotection focuses on endurance and uses motor learning principles approaches, such as mental imagery and dual task training.

Neuroprotection training, to be effective, should be introduced in the early stages, but helps at all stages. It involves complex, powerful and intensive exercises. Exercise undertaken in a group setting has the added value of providing a social connection to those becoming increasingly isolated as the condition progresses, or for those who are newly diagnosed, so they can see the benefits of maintaining exercise and activity. Transition Care setting improves the independence and functioning of the patients to delay their entry into residential aged care. Provides time-limited, goal-oriented and therapy-focused packages of services to older people after a hospital stay which includes low-intensity therapy—such as physiotherapy and occupational therapy—social work and nursing support or personal care. Physical activity, in particular, aerobic exercise might slow down the motor skill degeneration and depression. Furthermore, it increases the quality of life of patients with Parkinson's.

Homecare strategies:

Exercises aim to enable patients with Parkinson's disease to maintain their maximum level of mobility, activity and independence through the provision of appropriate protocol. A range of approaches to movement rehabilitation are used which aims to enhance quality of life by maximizing physical ability and minimising secondary complications.

1. Self Help Strategies:

Remember 'ABCDEF' to make the task simpler:

A: pay "Attention" to what you are doing

B: "Breakdown" the sequences of your work. Do your work in small pieces.

C: use "Cues" (external and auditory) to guide movements.

D: do not Dual task. Do one thing at a time.

E: take precautions in "Environment".

: 1. Use antiship mats in the bathroom.

2. Use florescent stickers in the house that will glow at night and help in the dark.

F: wear comfortable "Footwear". Avoid wearing slippers.

1. I walk slower and take small steps. How can I take bigger steps?

- Step 1: think about taking bigger steps.
- Step 2: step over visual or imaginary lines on the floor, landing heel first before toes.

2. When I walk my feet feel stuck to the floor. What should I do?

- Step 1: stop, stand upright and take a deep breath.
- Step 2: shift your weight from side to side. This will free up the weight on the leg taking the first step.
- Step 3: think about taking big steps or step over visual or imaginary lines on the floor, landing heel first before toes.

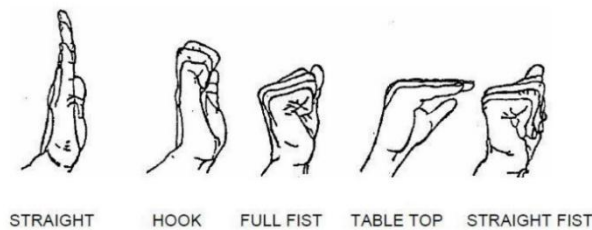
3. I have difficulty in walking narrow spaces. What should I do?

- Tip 1: try walking sideways.
- Tip 2: focus on walking and think about taking bigger steps.
- Tip 3: if necessary, remove clutter that is blocking your way before walking.

4. Have trouble turning when I walk. What should I do?
- Tip 1: walk around in an arc. Avoid quick sharp turns.
 - Tip 2: use clock face strategy.

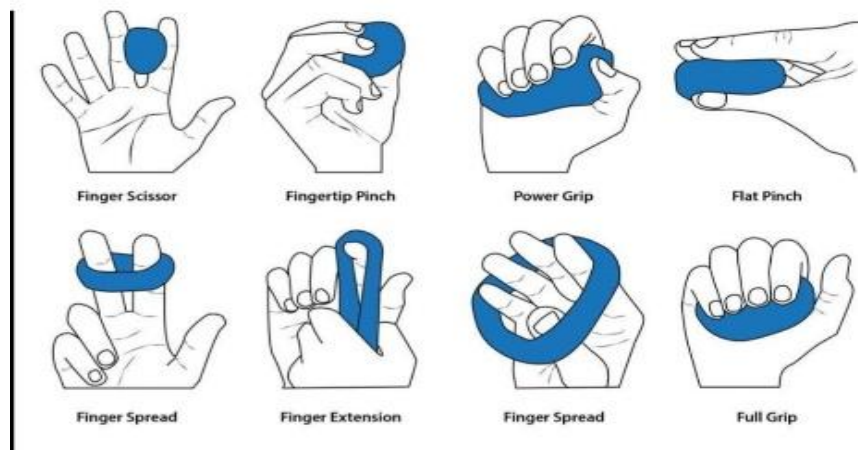
2. Exercises based strategies:

- For treating tremors:
- Tendon gliding exercises (10 times each exercise)



Rigidity, seldom a main symptom of Parkinson’s is experienced mostly in stiffness of hands and legs. It can be reduced or prevented by tendon gliding exercise. These exercises allow each tendon to reach its maximum movement. Tendon gliding exercise are as important to the hand as aerobic exercise to the heart.

- Finger strengthening exercises (10 times each exercise)



Tremor is the common symptom of parkinson’s. It will affect the day to day activity of the patient. For improving the condition some hand exercises are to be done. Finger exercises help to increase

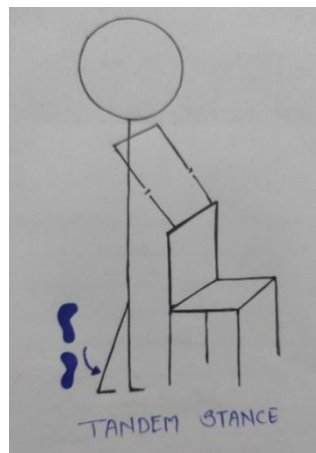
steadiness, reduce tremors, and improve finger and hand dexterity. It will improve the fine motor skills of the fingers like writing, dressing, etc.

- Wrist exercises (10 times each exercise)
 - Active range of motion of wrist (flexion-extension, radial and ulnar deviation)
 - Wrist stretch (flexion- extension)
 - Activities with cane or bottle (flexion- extension, radial and ulnar deviation, supination- pronation)
 - Grip strengthening

2. Balance training:

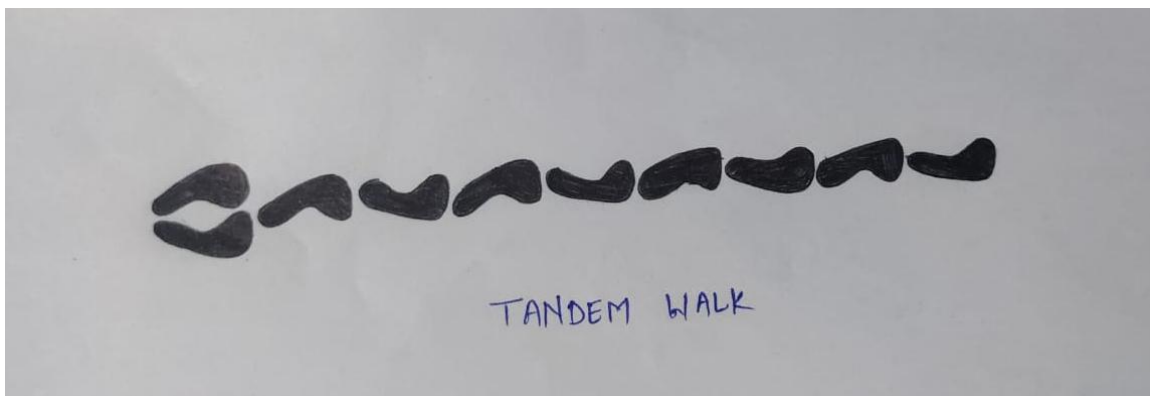
Having good balance is important for many activities we do every day, such as walking and going up and down the stairs. Exercises that improve balance can help prevent falls, a common problem in older and Parkinson's patients. A loss of balance can occur when standing or moving suddenly. Balance exercises improve your ability to control and stabilize your body's position. These exercises are also important for reducing injury risk.

- Tandem standing (5min)



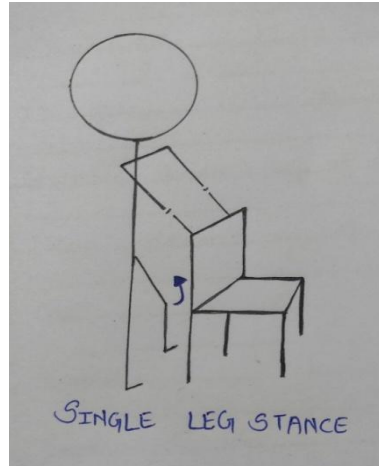
- Tandem walk (5min)

Parkinson's patients have freezing or fascinating gait. It is the characteristic feature of the PD. Tandem walk is a diagnostic test as well as therapeutic exercise. In this walking is done by placing one foot in front of other



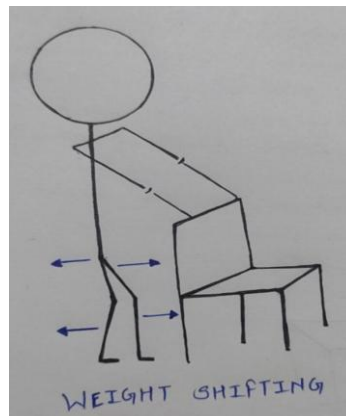
- single leg standing (10 times on each leg)

In single leg stance hip flexors, glutes and core muscles work. By doing this exercise the strength of these muscles increases which helps in maintaining balance. It will improve static balance of the body.



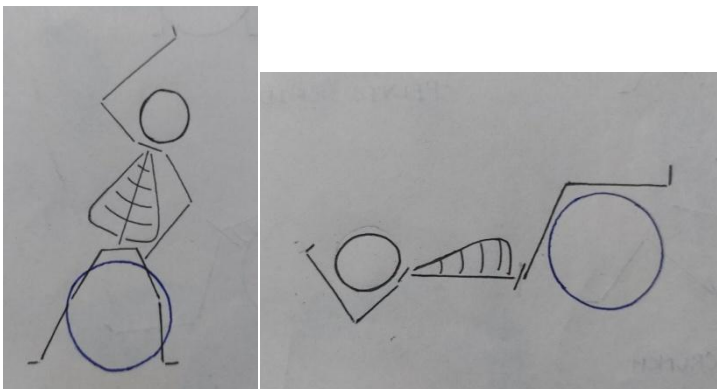
- Lateral weight shifts (10 times on each leg)

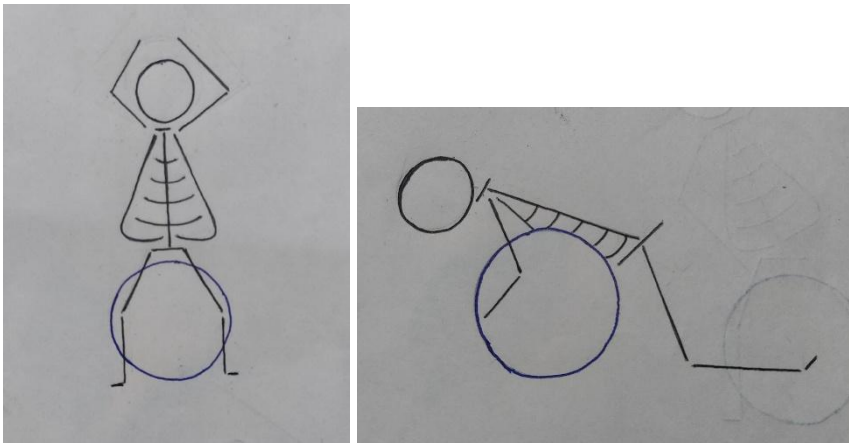
Lateral weight shifts exercise is done by shifting weight alternately on each leg. Weight shifting exercise will improve coordination, strengthen the muscles in lower extremities and teach slower and precise movements. It will help to maintain dynamic balance of the body.



- Balance training on Swiss ball / BOSU ball (each exercise 10 repetition, 3 times)


















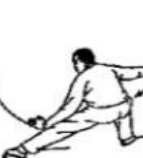









On Swiss ball and bosu ball exercise can be done in sitting, standing or lying position. Simply by sitting on ball engages the stabilizer muscles in the core. Training on ball forces body to improve balance to complete exercises and will also help in keeping healthy posture.





- Tai chi exercises(each exercise 10 repetition 3times)

Tai chi, a balance-based exercise, has been shown to improve strength, balance, and physical function and to prevent falls in older adults. Two pilot studies suggest that it may also improve axial symptoms of Parkinson’s disease, such as postural stability.

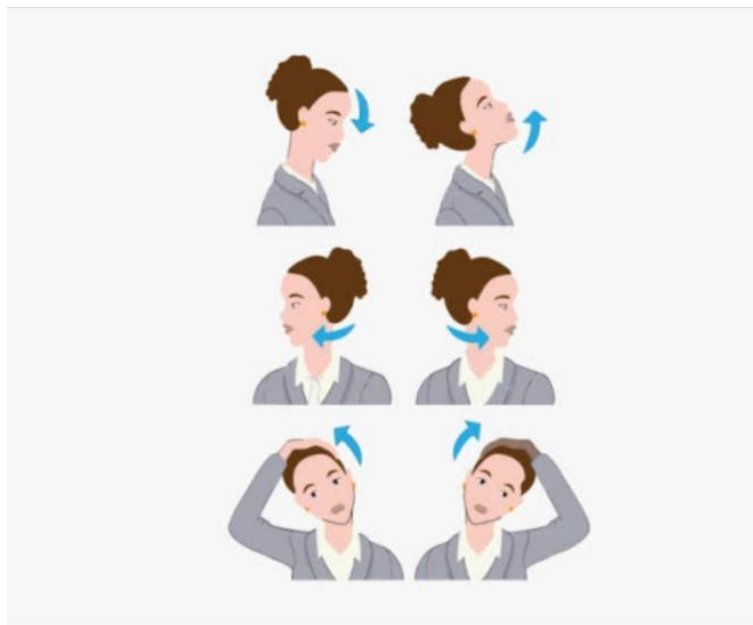
						
Starting	Parting The Wild Horse's Mane. 3 times.	White Crane Spreads It's Wings.	Brush Knee, Push. 3 times.	Playing The Guitar/Lute/Pipa.	Repulse Monkey. 4 times.	Hold The Ball, Ward Off.
						
Grasp The Bird's Tail.	Press, Sit Back.	Open up and Push. Repeat the last 4 moves, going right.	Single Whip.	Cloud Hands, going left.	Single Whip again, High Pat on Horse.	Right Heel Kick.
						
Carry The Tiger Over The Mountain.	Turn.	Left Heel Kick.	Snake Creeps Through The Grass.	Stand on one leg. Repeat on Right side.	Shuttle Back And Forth.	Needle At Bottom Of The Sea.
						
Fan Through The Back.	Turn.	Right Back Fist.	Parry and Punch.	Apparent Closing.	Cross Hands.	Close.

3. Posture correction:

PD is the inability to balance due to loss of postural reflexes—specifically, balance reaction, adoption of a flexed posture, and trunk rotation. These motor impairments are caused by dopaminergic neuronal deficits, comorbid white matter disease, and cholinergic system

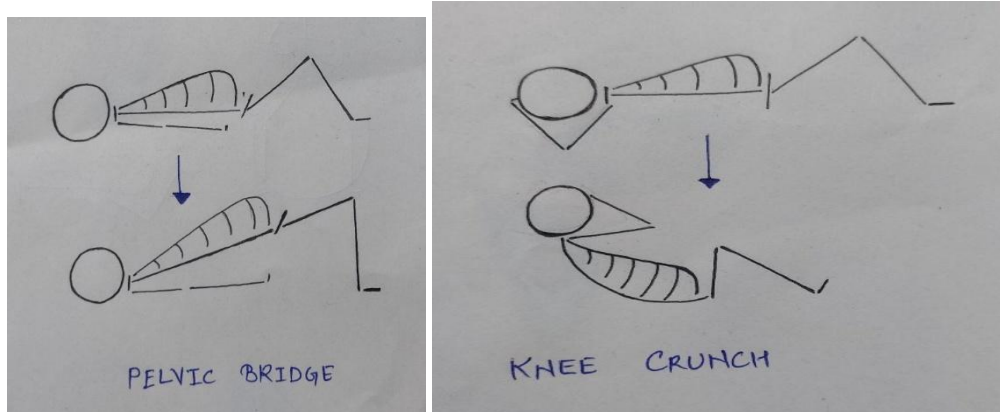
degeneration. It is important to try to maintain an upright posture because stooped posture can have other negative effects:

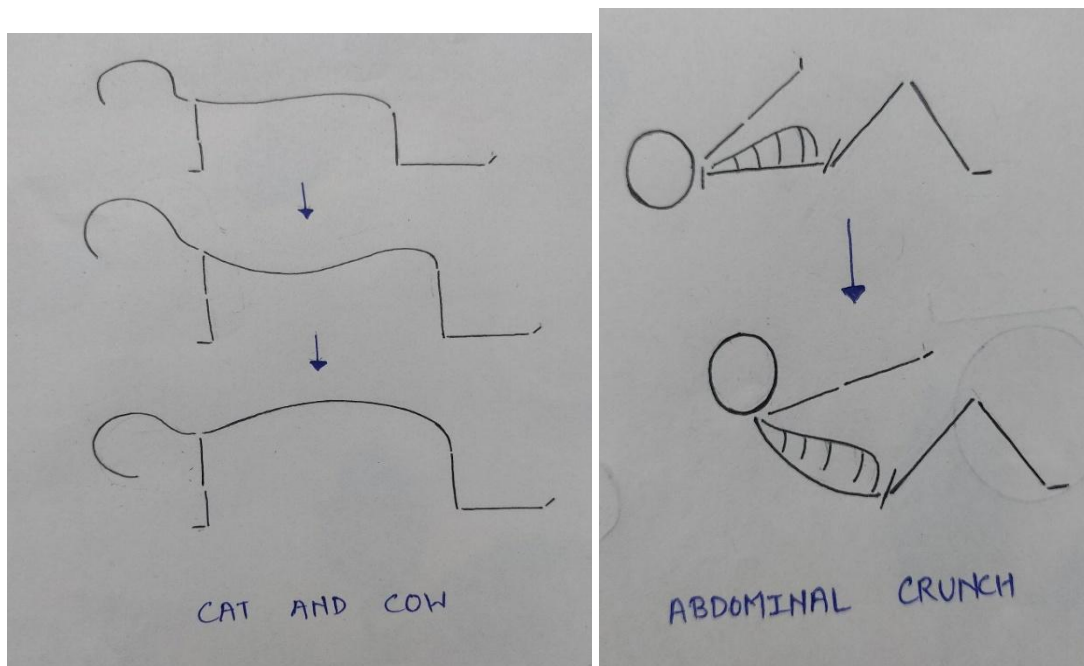
- Neck or back pain can occur when natural spine curves are out of alignment.
- Stooped posture reduces your ability to take deep breaths, which impacts your ability to speak clearly and loudly. Stooped posture also reduces eye contact. Combined with other Parkinson's symptoms like low voice volume and facial masking, this can have a big impact on your ability to communicate.
- Loss of flexibility from changing posture can make it hard to do many small movements in your day, like raising arms overhead while getting dressed or getting up out of a chair.
- Poor posture can put you off balance and lead to falls.
- Neck exercises (each exercise 10times)



- Scapular stabilization exercises (each exercise 10 repetition 3 times)
- Core strengthening exercises (each exercise 10 repetition 2 times)

Core muscles include abdominal, spinal and pelvic floor muscles. These provides stability in static and dynamic postures. They act as corset around trunk and are important as all other movements are generated from here. Core strengthening exercises designed to improve strength and efficiency of these muscle. They help to improve posture, maintain balance and coordination and increase flexibility.





4. Relaxation Exercises:

It helps the mind shed unhealthy thought patterns and builds mental muscle that can make it easier to cope with the unpredictability of life with PD. And, like regular physical activity, mindfulness meditation can serve as the cornerstone for self-care that people with PD can use to manage their symptoms. It can be used to relax and focus on breathing or negative emotions and thoughts. It can also be used to help a person become more aware of his or her surroundings or body movements.

- Meditation (5-7 min)
- Various relaxation techniques; eg: Jacobson relaxation (15min)
- Diaphragmatic breathing (5min)

5. **Architecture model-based strategies:**

Parkinson's Toolkit; when you have Parkinson's disease (PD), symptoms can affect your daily life. As the disease progresses, it can turn routine tasks—such as eating, dressing, and writing—into daunting chores. Assistive devices make these tasks easier so you're able to do more.

- **Cooking Tools:** Parkinson's disease itself or medication side effects can cause trembling, twisting, or writhing movements that turn the kitchen into a danger zone. Rocker knives, which have rounded blades used in a rocking motion, can make cutting safer. Electric models of can openers, vegetable peelers, and scissors may be easier to use than manual ones.
- **Eating Utensils:** A travel mug with a lid and attached straw helps prevent drink spills, and a non-skid mat under your plate helps hold it securely in place. Utensils with oversized or angled handles may be easier to use, and a scoop plate with a rim on one side can keep food from sliding off.
- **Dressing Tools:** Clothing fasteners, such as buttonhooks and zipper pull, can help you dress with success. Lightweight, supportive shoes with Velcro tabs or elastic shoelaces are easier to put on.
- **Writing Tools:** A common symptom of PD is handwriting that becomes small, cramped, and laborious. A pen grip—a rubber or foam cylinder that fits over your pen—may help your hand stay more relaxed as you write.

- **Voice Devices:** Voice changes are common in PD. If your voice is very soft, a personal voice amplifier may help, particularly in social situations where several people are talking against background noise. There are also telephone amplifiers to increase the volume of your voice on the phone.
- **Organizing Tools:** In some cases, PD may affect your memory. A pillbox with compartments for organizing your pills and an alarm to remind you to take them can help. The calendar function on a smartphone can alert you to appointments. The memo function is convenient for grocery and to-do lists.

6. Group therapy-based strategies:

Cognitive Behavioural Group Therapy appears to be an effective way for patients with PD to lessen stress and improve their quality of life. Patients treated with group therapy maintain their functional status for long time, demonstrate a significant decrease of bradykinesia, and significant improvement in their psychological well-being. This confirms the value of group approach and its benefits to the functional independence, to the improvement of physical and motor symptoms, and to the quality of life of persons with Parkinson's disease. Group therapy shows the cost effectiveness for patients. Cognitive behavioural group therapy was effective in treating depression and anxiety symptoms as well as reducing the severity of non-motor symptoms in PD patients.

In group therapy one can take group yoga sessions, group aquatic therapy, group exercise sessions. This will encourage patients to recover fast as there will be competition in one and other patient. Group therapy help to balance the psychological status of the patient. There will be a positive vibe in a group and patient will perform happily there without any hesitation because there will be similarity in the population.

Discussion:

Homecare exercises include and newer technical models designed to improve relaxation, flexibility, strength, and cardiopulmonary function. The important element is regular daily exercise and avoidance of prolonged periods of inactivity. Exercise improves efficiency by modifying the areas of the brain where dopamine signals are received — the substantia nigra and basal ganglia. The homecare program is realistic and of moderate duration and intensity. The patient should be cautioned against overactivity, which could result in excessive fatigue. Early morning warm-up exercises are often helpful in reducing the increased stiffness which patient may experience on arising. Stretching and strengthening exercises are performed in supine, sitting and standing positions (9).

Homecare exercise programs have been found to be effective in improving postural control and mobility in people with PD. It will help them to better living. Exercise carried out at home can be extremely valuable, particularly because it can require minimal equipment and resources, and can be continued over a long period of time. Homecare program can be performed with the help of assistive devices like wand, cane, chair, wall, etc.

Physiotherapy is important because a professional can guide you through the right moves to increase mobility and strength. The physiotherapist will assess the patient how the disease is affecting the movements and will help to keep up the fitness levels and maintain the posture and balance of the patient. By improving balance, it will decrease the risk of fall. The physiotherapist plays an important role teaching homecare program to the Parkinson's patient. It will improve the functional ability and

make the patient independent. Exercises will give the ability to perform daily activities. Therapist performs all the therapeutic techniques at his/her clinical set up but along with that patient should do exercises at home that exercise program is prescribed and taught by the physiotherapist. Exercise will help to reduce the psychological stress and boost the psychological well being of the patient. It will support the patient as well as family's mental health. Overall, it will enhance the quality of life.

In this new era, it is very necessary to follow homecare program as everyone can not reach daily to the rehabilitation centre due to lack of connectivity especially in rural areas. The therapist will teach the program in the rehabilitation centre once a week or will go to each door step of the village to encourage them to follow homecare program. In urban areas patients come to physiotherapy clinic daily and therapist make them perform all the exercises in front of him/her and guide the patient about daily homecare routine according to the patient's progress. The progression of urban patients will be fast because of daily observation by the therapist. All these facilities should be started soon in the rural areas as it will be very effective to patients' health. Now a days due to internet the world has come closer hence one can consult online with the therapist and continue the program at home. All the advance techniques are now arrived which will be beneficial for everybody. These types of facilities are used by urban areas. Now a days in urban areas group therapy is also very popular. People join group yoga classes, group gymnasium, group aquatic therapy centre.

Differential diagnosis:

- ◆ Progressive external ophthalmoplegia
- ◆ Ataxia
- ◆ Peripheral neuropathy
- ◆ Huntington chorea
- ◆ Dementia.

Complications:

- ◆ Thinking difficulty
- ◆ Depression
- ◆ Swallowing
- ◆ Chewing and eating difficulty
- ◆ Sleep problem
- ◆ Constipation.

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