One Size Fits One

PATIENT CENTERED, IMPAIRMENT BASED CARE FOR PERSONS WITH PARKINSON'S DISEASE

ALAPTA ANNUAL CONFERENCE
AUGUST 17, 2019

Welcome!

Parkinson's Care Clinic

APDA
TO EASE THE BURDEN TO FIND THE CURE
American Parkinson Disease Association

Southeast HEALTH
Neurobalance Program

UAB MEDICINE
Knowledge that will change your world

One Size Fits One

Ellis T., Rochester L. 2018.

The burden of disease...[2-5]

The # of persons with PD worldwide is expected to **DOUBLE by 2030**.

Arthritis

Deconditioning

"On average persons with disabilities report **4-13 secondary conditions**"

Fatigue

The projected total cost to the U.S. alone is expected to be **$52 BILLION ANNUALLY.**

Osteoporosis

Muscle/Joint pain

Mobility Problems

Patient Centered Care

"Care that is respectful and responsive to individual preferences, needs and values, ensuring that the person with Parkinson's Disease (PwP) guides all clinical decision making."

van der Eijk et al. 2011

Objectives

Review barriers and facilitators for exercise for persons with PD

Provide evidence-based intervention strategies for motor symptoms and non-motor symptoms

Provide evidence-based support, existing guidelines and clinical expertise to support decision making strategies for examination, evaluation and intervention to optimize patient centered impairment based care

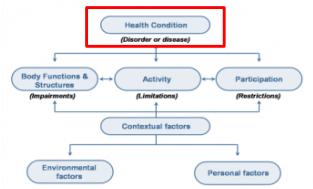
Discuss the importance/provide evidence supporting allied health interdisciplinary care

Discuss rehab and wellness implications for objectives 1-6

14% of Medicare beneficiaries are utilizing PT, OT and Speech

Fullard et al. 2017

ICF Model[8,9]



History Taking

Review non-PD related info first

Drug-Induced Parkinsonism

Table 1

Common offending drugs of drug-induced parkinsonism

	Drug frequently causing parkinsonism		Drug infrequently causing parkinsonism
Typical antipsychotics	Phenothiazine: chlorpromazine, prochlorperazine, perphenazine, fluphenazine, promethazine Butyrophenones: haloperidol Diphenylbutylpiperidine: pimozide Benzamide substitutes: sulpiride	Mood stabilizer	Lithium
Atypical antipsychotics	Risperidone, olanzapine, aripiprazole, ziprasidone	Antidepressant	SSRI: citalopram, fluoxetine, paroxetine, sertraline
Dopamine depletes	Reserpine, tetrabenazine	Antiepileptic drugs	Valproic acid, phenytoin
Antiemetics	Metoclopramide, levosulpiride, cisbopride	Antiemetics	Domperidone, lopride
Calcium-channel blocker	Flunarizine, cinnarizine		

SSRI: selective serotonin reuptake inhibitor.

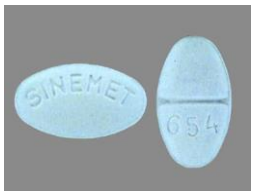
Shin H. and Chung S. 2012

Tell me about your journey with PD.

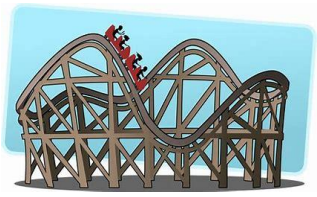
Meet Jim! He's going to talk about getting diagnosed.

Prodromal features

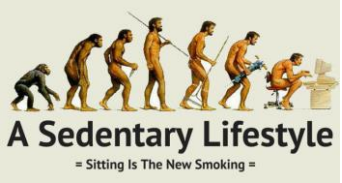
What meds do you take for your PD?



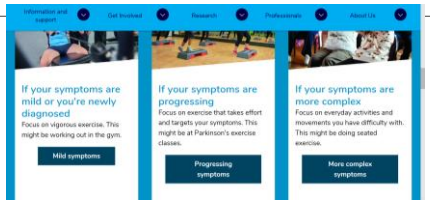
ON/OFF times



Exercise History



Newly Diagnosed? Advanced Stages?



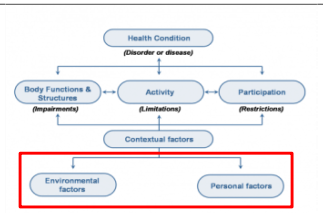
Parkinson's UK. www.parkinsons.org.uk/information-and-support/exercise-progressing-symptoms

Falls History

Falls History and Home Safety

Davis Phinney Foundation. www.dpf.org

ICF Model[8,9]



Addressing Personal and Environmental Factors

What are the Barriers?

Ellis, T., Boudreau, J.K., DeAngelis, T.R. et al. 2013.

What are the Barriers? – Low Self Efficacy

Rimmer, J.H., Riley, B., Wang, E. 2004.

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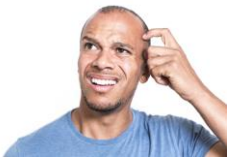

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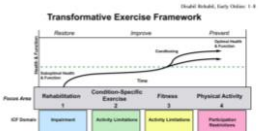
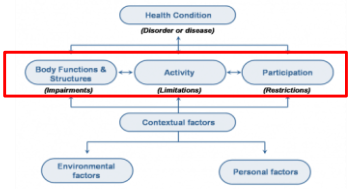
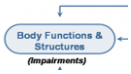


Rimmer and Henley. 2013.
Rimmer and Lai. 2015.

ICF Model[8,9]





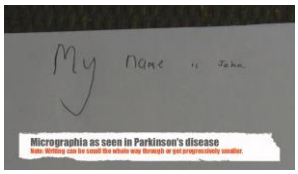
Primary Motor Impairments Bradykinesia[18-20]

Bradykinesia, Hypokinesia, Akinesia – slowness and smallness, reduction of movement amplitude or absence of movement

Shortened step length, decreased UE swing, pelvic motion and heel strike

People will report their world has gotten very "small"

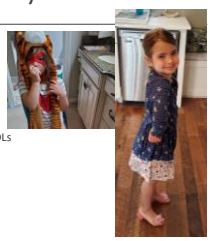
Measure using: UPDRS motor exam



Bradykinesia[17,19,21,22]

Measurements to consider : UPDRS motor ADL scale, 6 MWT, 10 meter walk test, MiniBESTest, 5x sit to stand, Functional Gait Assessment, PDQ-39, PDQ-8

- Speed of ADLs completion
- Bed mobility, Transfers
- Slower navigation in the home, slower to complete IADLs
- Curtail community activities because of time
- Handwriting : comparison study
- Deficits in balance performance



Bradykinesia Intervention[23-39]

Repetitive Aerobic training

Large amplitude movements with intensity

Kinesthetic awareness of the "new amplitude"

Keep it simple to start, positive, provide early success

Specificity of training

Removal of cueing

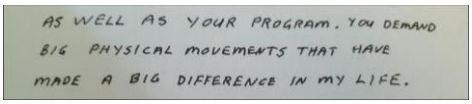
Bradykinesia Intervention[23-39]

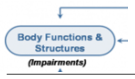
Resistance training

Interval training

Forced exercise

Handwriting Recommendations


AS WELL AS YOUR PROGRAM. YOU DEMAND BIG PHYSICAL MOVEMENTS THAT HAVE MADE A BIG DIFFERENCE IN MY LIFE.

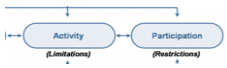


Primary Motor Impairments[40,41]

Rigidity

- resistance to passive motion across a joint
- cogwheel rigidity, leadpipe rigidity in advanced stages
- may be the cause of or associated with pain and result in orthopedic conditions
- assess limb and axial rigidity, Pisa Syndrome, camptocormia, striatal hand with ulnar drift, striatal toe

Measure using: UPDRS motor exam and consider AROM/PROM, segmental spinal mobility, pelvic mobility, mobility of other affected joints



Rigidity[42-47]

Measurements to consider: same as bradykinesia

Compromises ability to complete ADLs independently

Bed mobility

Transfers

Gait

Postural abnormalities and balance performance deficits due to decreased available ROM and decreased joint mobility, soft tissue limitations

Rigidity Intervention[42-47]

Full body movements with axial rotation, reciprocal motions, cross multiple planes in a variety of positions (supine, prone, quadruped, tall kneel, half kneel, etc…) with repetition

AROM/PROM, use cueing to achieve range if needed

Manual techniques for mobilizations of trunk, hip, pelvis

Deep breathing and relaxation techniques, modalities if needed to assist

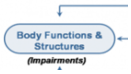
Flexibility for targeted muscles

Resistance training through full range to increase force output

Yoga, Tai Chi

Dance

Bracing for postural syndromes



Primary Motor Impairments[48-50]

Resting Tremor

- Does not have to be present for diagnosis
- Nearly 100% will experience tremor during their disease
- Severity needs to be noted and related to ADLs

Measure using: UPDRS motor exam

Resting Tremor[51]

Measurements to consider: 9 hole peg test, UPDRS motor ADL section (self report), Physical Performance Test

Frustration and increased dependence in ADLs

Handwriting

Grasping with accuracy

Reaching and Carrying (depending on weight)

Reaching and grasping during transfers, bed mobility

Can contribute to seated and standing balance deficits

Can contribute to gait impairments

Resting Tremor Intervention[52-57]

Proximal stability, keep arms by side or elbows on the table, quick set of isometrics

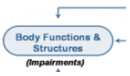
Utilize OT! UE strengthening, adaptive equipment such as button hooks, weighted utensils, weighted pens, wrist weights, rocker knives, non-skid materials underneath cutting boards, bowls, etc…

Dancing, forced exercise such as cycling or treadmill

Education on home and community management

Manage stress using deep breathing and relaxation techniques to reduce stress that will lead to increased tremor

Eliminate multi tasking (i.e. consider sitting while shaving, brushing teeth, cooking)



Primary Motor Impairments[58-64]

Postural Instability

Impairment in balance due to loss of postural reflexes and not related to primary visual, vestibular, cerebellar or proprioceptive dysfunction.

Early dysfunction in balance and frequent falling may be indicative of atypical Parkinsonism

Inappropriately elevated amounts of balance confidence as compared to balance capabilities can significantly increase one's risk for falls

Measure using: UPDRS motor exam pull test, push and release test with MiniBESTest

Postural Instability

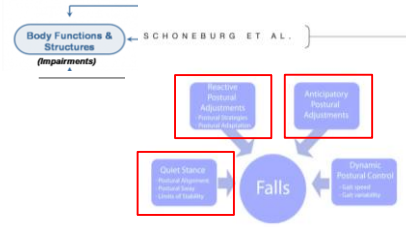


FIG. 1. Framework for balance dysfunction. Summarized here are the four domains that contribute to postural stability including quiet stance, reactive postural adjustments, anticipatory postural adjustments, and dynamic balance.

Schoneburg et al. 2013

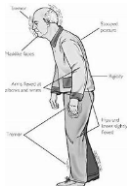
Quiet Stance

- Postural alignment
- Postural sway
- Sensory weighting
- Limits of Stability

FIG. 1. Framework for balance dysfunction. Summarized here are the four domains that contribute to postural stability including quiet stance, reactive postural adjustments, anticipatory postural adjustments, and dynamic balance.

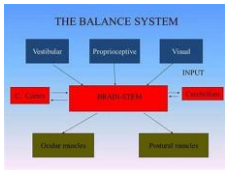
Adapted from Schoneburg et al. 2013

Quiet Stance[64-77]



Adapted from Schoneburg et al. 2013

Quiet Stance[64-77]



Reactive Postural Adjustments[78-81]

Movements made from an external perturbation to recover the CoM over the BoS

Postural Strategies

Postural Adaptations

SCHONEBURG ET AL.

FIG. 1. Framework for balance dysfunction. Summarized here are the four domains that contribute to postural stability including quiet stance, reactive postural adjustments, anticipatory postural adjustments, and dynamic balance.

Adapted from Schoneburg et al. 2013

Reactive Postural Adjustments[79,82]

Reactive Postural Adjustments[80,81]

Anticipatory Postural Adjustments

SCHONEBURG ET AL.

Postural adjustments that precede voluntary movement

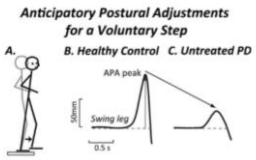
FIG. 1. Framework for balance dysfunction. Summarized here are the four domains that contribute to postural stability including quiet stance, reactive postural adjustments, anticipatory postural adjustments, and dynamic balance.

Adapted from Schoneburg et al. 2013

Anticipatory Postural Adjustments[82]

In gait APAs move off the CoM and forward to allow the leg to lift and step

In PD the magnitude of APAs are reduced making the time to lift the leg longer, thus the steps shorter so decreased step length



Adapted from Schoneburg et al. 2013

Postural Instability[83]

Measurements to consider: MiniBESTest, Berg or Tinetti as appropriate, consider ABC scale, Falls Efficacy Scale and Functional Reach, PDQ-39, PDQ-8

Capability, safety and confidence with ADLs

Bed mobility and Transfers: supine to sit to stand, sit < > stand

Navigation in the home – dual tasking makes it much worse

Navigation in the community – dual tasking makes it much worse

Falls and falls risk

Fear of falling and subsequent curtailment of physical activity will lead to further dysfunction, increased risk and worsening of secondary co-morbid conditions

Intervention - Postural Instability[84-95]

Multimodal Balance Intervention – Specificity of Training

Improve postural alignment

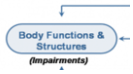
Quiet stance with varying foot positions on multiple surfaces, use perturbations, mirror

Rockerboards, Foam, BOSU, technology when available: Wii, virtual reality, Biodex Balance Systems

Challenge limits of stability and explosive return from limits with reaching exercises

FOCUS THEIR ATTENTION on the task at hand to maximize benefit

Don't be hesitant to start with sitting tasks if success is needed to build confidence, understand the task and be successful



Postural Instability – Gait and Turning[96-104]

Measure using: UPDRS motor exam

- Gait velocity is decreased, stride length is shortened, swing velocity and duration decreased, double support time is increased, cadence is unchanged and at times increased
- Asymmetrical and reduced UE swing, decreased trunk and pelvic mobility, fear of falling, decreased balance confidence all contribute to abnormalities in balance during dynamic movement
- Dual tasking and external attentional demands not on the movement task at hand decrease gait speed and increase gait variability
- Levadopa and DBS-STN decrease gait variability and increase gait speed
- Impairments in turning are seen in early PD, slowing of turns may be one the first signs of gait dysfunction in PD

Gait and Turning[96-104]

Measurements to consider: MiniBESTest, Dynamic Gait Index, Functional Gait Assessment, 6 minute walk test, 10 meter walk test, Timed up and go (with or without dual task), UPDRS motor ADL, PDQ-39 or PDQ-8

Increased falls risk, increased dependence on caregivers for ADLs

Bed mobility and transfers: increased falls risk particularly with sit <> stand transfers, tight transfers, car transfers

Navigation in the home: increased falls risk (bathrooms!), increased dependence

Navigation in the community: falls risk, curtailment of activities and outings, decreased socialization, isolation

Considerations: Ladders, dog walking, ditches at the mailbox, garbage cans

Intervention - Gait and Turning[89-95,105-109]

Prep with rhythmical aerobic training with focused attention or forced exercise

Prep with seated, supine, prone, quadruped activities and move to standing dynamic tasks

Prep for ambulatory gait training with impaired components of the task

Large amplitude gait training

Dual task gait training with parameters to maintain quality of gait

Treadmill training – Blindfolded? Multidirectional?

Intervention - Gait and Turning[89-95,105-109]

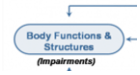
Maximize and maintain attention with "active rest breaks"

Simple to complex tasks, set up patient for success in proper environment

Strength training

Dance, Tai Chi, Yoga, Boxing

Use music for rhythm, repetitions, better success and fun!



Secondary Impairment: Freezing of Gait[110-114]

- Brief, episodic or marked reduction of forward progression despite the intention to walk
- Commonly associated with motor fluctuations
- Occurs commonly: approaching a chair or (object), turning, navigating tight spaces such as doorways, initiation of gait, straight walking, worse with anxiety and with dual tasking
- Scissoring gait, wide base of support and retro walking can be seen in patients avoiding FoG

Measure using: Accelerometer on the tibia (between 3-8 Hz), 360 turns, FoG score (for severity)

Freezing of Gait[111,115-119]

Measurements to consider: Freezing of gait questionnaire, MiniBESTest

Decreases independence and safety with ADLs

Bed mobility and Transfers

Ambulatory navigation in the home becomes frustrating, inefficient

Can severely limit or eliminate community ambulation and participation

Swimming

Freezing of Gait Intervention[120-123]

Rhythmic auditory cues: Music (humming a song), using a metronome, counting "1,2,3", action-relevant steps. Better when coupled with intentional movement.

Visual cues: laser lights, tape on the floor, steps, using visual markers for foot placement.

Keeping eyes on the horizon, looking past where you are going

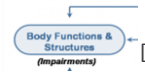
Tactile cueing: hitting your leg, clapping

Mental imagery, pre-planning of route, reduce anxiety

Aquatic therapy

Weight shifting, weight shifting, weight shifting, marching, agility drills, weight shifting

Specificity of training: Practice techniques at home when ON for success, combine compensatory methods with exercises and functional training where freezing occurs at home

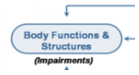


Secondary Impairments: Dystonia, Dyskinesia, Weakness[124]

Dystonia: Highly disabling. Dystonia is a painful, prolonged muscle contraction that cause abnormal postures and movement. It usually starts in one part of the body, mostly neck, face, vocal cords, eyelids, arm or leg. Almost 30% of PWP may get dystonia as a symptom or as a complication from when levodopa is wearing off (which is more common).

Dyskinesia: Uncontrolled, involuntary movements that can affect the head, arms, head, or trunk. It usually occurs with long term use of levodopa. Some prefer having dyskinesias over bradykinesia and rigidity.

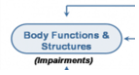
Weakness: Can be multifactorial, focus on extensors, endurance, explosive force generation



Non-motor Impairments

Nonmotor symptom complex of Parkinson's disease
Neuropsychiatric symptoms Depression, apathy, anxiety Anhedonia
Attention deficit Hallucinations Delusions Dementia Obsessional
behavior Sleep disorders Restless legs Periodic limb movements REM
behavior disorder Excessive daytime somnolence Vivid dreaming
Non-REM sleep-related movement disorders Insomnia Autonomic
symptoms Bladder disturbances Urgency Nocturia Frequency
Sweating Orthostatic hypotension (OH) Falls related to OH Coat
hanger pain Sexual dysfunction Hypersexuality Erectile impotence
Hypotestosterone state Gastrointestinal symptoms (also overlaps
with autonomic) Dribbling of saliva Ageusia Dysphagia/choking
Reflux Vomiting Nausea Constipation Unsatisfactory voiding of bowel
Fecal incontinence Sensory symptoms Pain Paraesthesia Olfactory
disturbance Other symptoms Fatigue Diplopia Blurred vision
Seborrhea Weight loss

Chaudhuri et al. Movement Disorders. 2006.



The Usual Suspects

OH / NOH

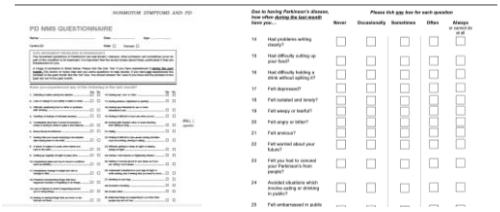
Depression

Anxiety

Apathy

Cognition

Measuring Non-motor impairments[125]


NONMOTOR SYMPTOMS AND PD

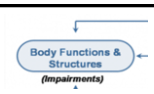
PD NMS QUESTIONNAIRE

Name: Date: Age:

Gender: Male ☐ Female ☐

Please tick one box for each question

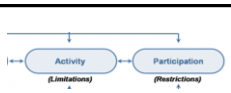
Due to having Parkinson's disease, how often during the last month have you ...	Never	Occasionally	Sometimes	Often	Always or cannot do at all
14 Had problems writing clearly?	☐	☐	☐	☐	☐
15 Had difficulty cutting up your food?	☐	☐	☐	☐	☐
16 Had difficulty holding a drink without spilling it?	☐	☐	☐	☐	☐
17 Felt depressed?	☐	☐	☐	☐	☐
18 Felt isolated and lonely?	☐	☐	☐	☐	☐
19 Felt weepy or tearful?	☐	☐	☐	☐	☐
20 Felt angry or bitter?	☐	☐	☐	☐	☐
21 Felt anxious?	☐	☐	☐	☐	☐
22 Felt worried about your future?	☐	☐	☐	☐	☐
23 Felt you had to conceal your Parkinson's from people?	☐	☐	☐	☐	☐
24 Avoided situations which involve eating or drinking in public?	☐	☐	☐	☐	☐
25 Felt embarrassed in public	☐	☐	☐	☐	☐



Cognitive Impairment[126-128]

- Primarily executive dysfunction resulting in deficits in planning, organization, steps to achieve a goal
- Set shifting: changing attention from one stimulus to another
- Internal control of attention, often distractible by external demands for attention
- Difficulty with control of inhibition
- Difficulty concentrating
- Retaining and using information
- Visuospatial deficits

Measure using: Montreal Cognitive Assessment



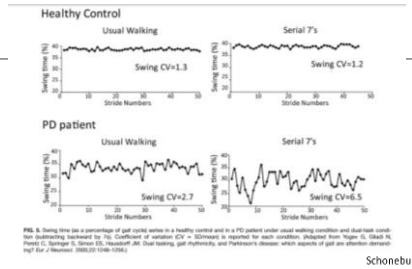
Non-motor symptoms - Cognition

ADLs: will start tasks and forget to finish or cannot maintain attention on 1 task to complete, difficulty planning the task so may not do the task because it seems monumental, decreased automaticity in dressing, bathing, toileting, grooming

Bed mobility and Transfers: impairs sequencing of movement, visuospatial difficulties, difficulty maintaining attention on tasks

Navigation in the home: difficulty with appropriate reaching, placing of objects, organizing, sitting placement on a chair or sofa, turning corners too sharp or too wide, judging a stair

Navigation in the community: can contribute to increased slowness due to increased attentional demands, increased time required for decision making



Schoneburg et al. 2013

Why multidisciplinary teams: Early Intervention[129]

"Support services – namely access to a multidisciplinary team – when used in conjunction with medical treatments in the early stages of the disease can help people with Parkinson's live a full life, work for a greater length of time and stay at home longer despite their symptoms (Vossius 2010)".

Decision Making for Intervention[8,130-132]

Remove the barriers – Encourage the facilitators

Encourage multidisciplinary/interdisciplinary care to share the load

Utilize existing guidelines to shape your decision making process:

- APTA PDEdge (Evidence Database to Guide Effectiveness)
- ParkinsonNet Guidelines (www.parkinsonnet.info/guidelines)
- Parkinson's UK Guidelines (https://www.parkinsons.org.uk/professionals/guidelines)
- World Health Organization ICF Model for individualized care

Break for Lunch

Return for Lab at 2:35 pm

Clothes you can move in

Facilitators: Keys to Success

Break Down the Barriers

Minimize non-PD related problems[14]

Diabetes

Chronic Pain

Arthritis

High Blood Pressure

"On average persons with disabilities report **4-13 secondary conditions**"

Osteoporosis

Weight Problems

Deconditioning

Muscle/Joint Pain

Minimize the Impact of Non-Motor Sx

Nonmotor symptom complex of Parkinson's disease
Neuropsychiatric symptoms Depression, apathy, anxiety Anhedonia Attention deficit Hallucinations Delusions Dementia Obsessional behavior Sleep disorders Restless legs Periodic limb movements REM behavior disorder Excessive daytime somnolence Vivid dreaming Non-REM sleep-related movement disorders Insomnia Autonomic symptoms Bladder disturbances Urgency Nocturia Frequency Sweating Orthostatic hypotension (OH) Falls related to OH Coat hanger pain Sexual dysfunction Hypersexuality Erectile impotence Hypotestosterone state Gastrointestinal symptoms (also overlaps with autonomic) Dribbling of saliva Ageusia Dysphagia/choking Reflux Vomiting Nausea Constipation Unsatisfactory voiding of bowel Fecal incontinence Sensory symptoms Pain Paraesthesia Olfactory disturbance Other symptoms Fatigue Diplopia Blurred vision Seborrhea Weight loss

Bradykinesia
Rigidity
Postural Instability
Resting Tremor

Chaudhuri et al. 2006

High(er) Self Efficacy[13-16,133-135]

Meaningful Goals

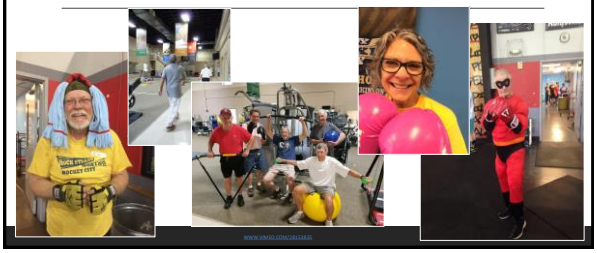
Having Active Choices

Exercise Buddy/Social Support

Fluidity and regular change in your plan

Early Success

Managing Expectations + Safety

Regular Positive Feedback[136]

People with PD are resilient, courageous, fun-loving!