

CASE: PD Outpatient

Mr. Mike (age 66) was recently discharged home from rehab and presents to the outpatient orthopedic clinic for continued rehab. Pt suffered a fall 6 weeks ago, resulting in a right femoral fracture. Patient underwent ORIF and is WBAT. PT orders for "PT Eval & RX" received by PT in this outpatient clinic.

Mr. Mike is currently listed as being a Hoehn & Yahr Stage 3. He was diagnosed with Parkinson's 2 years ago when he noticed his balance and gait were not the same, additionally, his wife noted some changes in memory. He is retired. Lives with his wife in a two-story condo with the bedroom on the second floor and has 4 steps to enter with right side handrail. His wife is physically capable of assisting, however, still works full-time as a county clerk at the courthouse. The wife reports patient has had 3 falls over the past 6 months, all while she was away at work, the circumstances, exactly, are unknown. The chart states his wife had expressed concern, at the time of admission to acute care, over his seemingly increased depression and limited motivation to participate in things that interest him. Additionally, he had stopped his normal walking and swimming routines and spent most of his day in his favorite chair watching TV. The wife has been approved for part-time fat work or one month following discharge of her husband so she can assist with care.

Rehab PT Summary: Mod I w/c mobility in home simulated environment, mod I squat pivot transfer basic home surfaces, ambulates with supervision for 100-150 feet with RW, 4 steps with min assist, ramp has been installed, patient is mod I with ramp management with assistance of handrails.

His medical history includes a-fib, gout and seasonal allergies.

Goal: To return to independent household negotiation, independent home access, return to community level participation in church and fitness center (swimming, weights and cardio machines)

PRELIMINARY HYPOTHESIS: (add or delete rows as needed)

Identify, from the case presented and your knowledge of motor control, motor learning, neuroscience and coursework thus far, how you THINK they should(would) present.

What impairments do you expect? Why? (state multi-system, then list the associated single system as a group and then identify why. This should link neuroscience, diagnosis and function)

Multi-System	Associated Single-System(s)	WHY?
Trunk	Rigidity Decreased AROM/PROM Decreased motor control, sequencing, and timing of truncal muscles Postural righting reactions	A common impairment of a parkinson's diagnosis is truncal rigidity and potential range of motion deficits. With Mr. Mike, he has experienced an increase in number of falls recently and has had a decrease in overall activity. Truncal rigidity can lead to falls because the body is not able to access the motion quick enough to create a righting reaction. The ROM limitations of the trunk include all 16 trunk motions. The neuroscience explaining these trunk limitations is the fact that at stage 3 PD, he has a significant loss of dopamine and as a result a decrease of movement. The truncal rigidity is due to the neurons of the basal ganglia being over stimulated. Also with Parkinson's, the difficulty initiating movements impairs the truncal righting reactions needed for reactive balance and postural control.
Range of Motion	Decreased PROM/ AROM in RLE secondary to surgery Rigidity in extremities (lead pipe/cogwheel)- decrease PROM in BUE/BLE	S/p ORIF it is expected to see ROM deficits due to inactivity with the affected limb, pain, and fear. Hip deficits are expected but the ipsilateral knee and ankle could also be affected due to inactivity/ decreased use of the RLE. PD diagnosis could affect the ROM in trunk mobility as stated above, viewed as separate impairment. Lead pipe and cogwheel rigidity is another common impairment in the PD population that could contribute to decreased ROM of peripheral joints.
Motor Function	Decreased muscular power and endurance Trouble with initiation Decreased motor control, sequencing, and timing of truncal muscles Rigidity Bradykinesia Stooped Posture	The motor function impairments are two fold with this patient. Surgical patients experience decreased strength, power, and endurance in the affected limb/entire body due to sedentary post-op phase. The parkinson diagnosis will also add difficulty with movement initiation due to decreased thalamus excitation, decreased ability to move and impaired motor planning. The rigidity, difficulty initiating, bradykinesia, decreased truncal movements, etc that occur with PD and the decrease in dopamine result in decreased ability to appropriately control the sequencing of muscle activation and decreased ability to modulate and terminate muscle activity. With stooped posture we would expect a long weak posterior chain, and tight

		weak anterior chain contributing to decreased motor function due to a length tension relationship that is not optimal.
Balance	All standing balance (double limb stance, single limb stance, reactive and anticipatory) Seated balance in wheelchair Increased anterior COP Increased M-L sway	He is still recovering from the surgery and as a result his balance is impacted; potentially resulting in decreased strength and altered somatosensation. He is using a RW while ambulating, and although he has likely been using it since D/C from the rehab center, he may still be struggling with negotiation/management of the RW. He continues to require SPV over less than community ambulatory distance, meaning his is unsafe with amb w/ AD. His sitting/standing balance (reactive and anticipatory) is impaired due to his trunk ROM impairments and rigidity discussed earlier (neuroscience also explained previously under trunk). Without sufficient dopamine and subsequent excitation of the motor cortex, he will have trouble planning his movements (i.e. weight shifting to climb stairs requires anticipatory SLS) and initiating movement to recover from a perturbation.

What activity limitations do you expect to see? Why? Based off the case, current level, outcome measure provided and time since injury, what do you anticipate will be a functional limitation and to what degree, why? (the why should link neuroscience and neuromuscular processes, disease progression/pathology NOT 'because it was in the case')

Activity Limitation	To What Degree (Level of assist)	WHY?
Gait	SPV with RW	Pt will likely have decreased weight shift onto RLE due to recent ORIF and will demonstrate compensatory patterns to avoid pain, manage his AD, and to avoid newly acquired mobility restrictions secondary to surgery. Stage 3 PD includes bilateral involvement as well as trunk issues. Without the dopamine and associated motor cortex activity, he is going to have difficulty initiating/terminating movement. Truncal rigidity discussed above as a single system impairment is likely leading to gait limitations. Lastly, the flexed posture and festinating steps are contributing to the need for supervision with a RW.

Stairs	Min A	Post surgical pt will likely have decreased power production and have difficulty with RLE unipedal stance and limb advancement due to decreased strength, ROM, and truncal rigidity. Additionally, with the PD diagnosis bilateral involvement and trunk issues will play a part in difficulty with stairs. Because of the decreased dopamine and associated motor cortex impairments there is expected difficulty initiating and terminating movements. Stairs require anticipatory balance to advance the limb that will be difficult due to the truncal rigidity.
Sit to stand	Min A	Pt. will have decreased type 2 muscle fibers in the posterior chain due to inactivity and aging. Pt has been recovering from surgery and will likely have reduced power output needed to perform a sit to stand. Pt is limited in anterior pelvic tilt (due to chronic flexed posture) which is necessary for initiation of lift off and will have issues translating the COM anteriorly over BOS. In stage 3 H&Y there will be difficulty initiating movement due to the decreased dopamine production and related motor cortex activity.

SUBJECTIVE QUESTIONS:

Based off of the case presented and your associated coursework knowledge, identify 8 questions that would be helpful in guiding your examination and assisting in ruling in/ruling out the need for screens versus examinations and selecting appropriate outcome measures. (Limit home set-up and prior activity questions to ONLY those that you need RIGHT now to do your examination and make choices)

1. To the wife: What breaks your heart? What breaks your back?
2. In order to be independent what two things do you need to be able to do in the community? To patient and wife: What do you/ he need to do in order to be as independent as possible at home?
3. What is causing you to fall? Trips, freezing, turning, etc? Have you been able to get back up after the fall? If not, why? If so, how?
4. Is your Parkinson's being controlled by medication? Describe your on/off schedule?
5. Describe your exercise routine before the fall injury.
6. For the Wife (not in front of pt) Has your husband shown any recent changes in mood/behavior/cognition? Have you joined any support group?
7. To patient and wife: Since you've been back HOME, have you experienced any falls/stumbles/trips?
8. To patient: How are you doing managing your RW/wheelchair? To wife: What is your perception of how he is doing with these things?

SCREENS: (add or delete rows as needed in the next four sections)

List the systems you will SCREEN (versus fully examine), identify what elements of the screen you will prioritize (or state "all" if the whole screen needs to be done) and why.

SYSTEM TO SCREEN	What will you screen (or write "all")	Why?
------------------	---------------------------------------	------

Sensory	Somatosensation, vestibular, vision, light touch	Sensory issues are a common secondary impairment seen in PD, but is more of paresthesia and pain due to medications and loss of central command from sensory areas of brain (rather than true sensory loss). A quick screen of all sensory systems including vision, vestibular and somatosensation will allow us to rule out the contribution of these systems to his falls. A screen of light touch is necessary to make sure sensation is intact post surgery.
Integumentary	Quick questioning/ inspection	It is important to make sure that the incision has healed properly and there are no signs of infection.
Cardiopulmonary	BP, HR, RPE(pre/post exercise)	Due to the decrease in physical activity over the past few months, age, PMH of a-fib and the surgical procedure, this patient most likely will be experiencing a change in cardiopulmonary function or health.
Cognition	ST/LT memory Depression Mood	This patient has shown a decline in function over the past 6 months. The patient's wife has also noted that his memory has started to decline and has showed a lack of interest in hobbies. PD patients commonly have secondary impairments of cognition/memory/depression.
CN	All	A cranial nerve screen is quick and can tell us information about the patient regarding his eyes, hearing, speech, and muscle activity. Sensory loss, dysphagia, vision and speech impairments are common secondary issues in PD patients (about 75%-95%), especially as the disease progresses.

EXAMINATIONS:

List the systems you will FULLY EXAMINE (versus screen) and identify why.

SYSTEM TO EXAMINE	What will you examine? (Or write "all")	WHY?
Motor Function	All (ROM, strength, functional movements, initiation, motor planning, termination)	It is necessary to exam the motor function of this patient because we need to know the full extent of his impairments. It is important to delineate parkinson's impairments from post surgical because it will dictate what interventions are selected. Essentially motor function is his chief complaint so it needs to be fully investigated to figure how what all is going on.
Balance	Sitting Balance (reactive and anticipatory) Standing balance -DLS -SLS -Reactive -Anticipatory -Dynamic	"Balance Matters" (Bohannon et al). His recent history of falls and subsequent fracture from most recent fall makes balance an essential component to the long term health of this pt. If his balance continues to decline more secondary injuries will occur which will accelerate his decline in function. (falls are the leading cause of injury and decline in independent mobility in the elderly). Considering his staging of disease progression, restoration can still occur which will be vital to his long term quality of life.
Trunk Motions	All (16) passive, active assist, and active	Truncal rigidity is a major impairment with parkinson's patients. Examining these and finding impairments will help dictate treatments and help know where and how to guard the patient. If the trunk mobility and activation is able to be preserved his function will be able to prolonged. Trunk is important for postural control, reactionary balance, sit to stand, and functional task such as wiping your rumpus and reaching into cabinets.

FUNCTIONAL TASKS:

List the Functional Tasks you feel are necessary to assess at this initial examination and state a reason why.

Functional Task you will assess	WHY?
Transfer (STS from various surfaces,W/c transfers, maybe not initial visit but further down the road - floor to stand)	It is important to see his quality of movement and strategy of transfers to get complete picture of motor function and how he functions at home. Examining functional tasks will help identify impairments to work on in treatments (difficulty of initiation, decreased power production, etc).
Gait (with/without AD) (LRAD assessment)	It is important to observe gait to see compensation strategies and potentially see new impairments. Assessing gait is

	important to get complete picture of motor function. Post-surgery it is important to make sure his gait is efficient, without significant deviation or compensation to help prevent future injuries. Therefore, this time is important for us to make stride toward achieving the least restrictive AD use for future. Align, Activate, Rehabilitate.
Stairs	To re-establish his independence in the home, he will need to be able to ascend and descend stairs on his own. There is no reason 6 weeks post-op that stair climbing should not be beyond minA 4 steps. He needs to be able to climb flights of stairs for independence.

OUTCOME MEASURES:

List Outcome Measures you feel are **most relevant** for this patient and why and identify level of ICF. Add or remove rows as needed. (consider setting and appropriateness. What are goals? These outcome measures should guide your treatment toward goals as well as give you a means of prognosis and/or showing progress)

Outcome Measure Chosen	Why?	ICF Level
MiniBEST	This OM incorporates many components of balance and has been validated in this population. In the OP setting we want to challenge all aspects of balance to find individual impairments that we can use in a blocked exercise treatment to improve patient's functional independence. It can also allow us to assess his gait and sit to stand while performing the test.	Body Structures/functions and activity
ABC	Want to get his perception of his abilities. We will have to ask him to rank it based on performance in the SNF. (pending patient cognition see below test results)	Activity
MoCa	Rapid screen for cognitive abilities that has been tested in PD population. Assess visuospatial, executive functions, naming, memory, attention. Language, abstraction, and orientation. Wife says memory issues but we want to see a variety of possibilities so we can narrow in on one thing if need be.	Body structure and function

EDUCATIONAL NEEDS: add or remove rows as needed

Person Being Educated	What education is needed?	Why is this education needed?
Patient and wife	Disease progression	Make sure wife and patient have realistic expectations of therapy, understand what is to come and importance of following HEP. Ask what questions they have and to continue to ask any questions they may have in the future.
Patient	Goals of therapy and how Parkinson's diagnosis will be considered	Patient needs to understand importance of therapy, how therapy will progress and how treatment will take PD diagnosis into consideration to accommodate patient needs.
Wife	Transfers w/c functions	Pt wife is taking part-time leave to assist her husband who currently still requires physical assistance during functional activities outside of the w/c. We need to educate her on how to properly and efficiently perform transfers in order to keep herself and her husband safe and injury free.

WHAT IS THE ROLE OF PT FOR THIS PATIENT? (clearly identify if this is a one time visit, suggest a timeframe for visits for the episode of care, is this for restorative, compensations, family training, equipment prescription, a combination (explain).

ROLE OF PT	Explain your plan related to the topic (if not part of plan put "not needed")	What resources will you or the patient need to accomplish this?
# of visits	2x/week	Transportation, insurance, payer source
Equipment	N/A	N/A
Community Resources	Gym Support group	Rock Steady Boxing (After complete healing of surgical site)
Home exercise program	TBD from examination want to work on deficits but guaranteed to include the following: AROM of trunk and LE, Power production, and endurance for muscles and cardiovascular system in order to return him to PLOF doing swimming and exercise.	N/A