CASE: Stroke Acute Rehab

Ms. Fiona is a 36 year-old pediatric clinic nurse admitted to acute care 10 days ago with acute onset of left side weakness with slurred speech, symptoms progressed over the next 24 hours to full left side paralysis, aphasia with -CT, MRI showed a large right MCA lenticulostriate infarct. Pt participated in acute therapy, able to tolerate 3 hours per day out of bed in bed side chair, transfers with mod assist x 2, gait with hemiwalker mod assist x 2 for 2 steps, progress limited by agitation, confusion, difficulty sustaining alertness. Patient has sitter in room due to repeatedly attempting to get out of bed. Patient has had three falls, no injuries, while in acute care.

Patient arrives to inpatient rehab for 4-6 week stay. Prior to admission, patient was fully independent at home. Home is one story, 4 steps right rail to enter. Patient is married, works full-time, has three kids ages 12, 9,4. Patient enjoys Netflix, "chillin'" and mentally stimulating games such as Candy Crush. Spouse is planning for one month of FMLA upon wife's discharge from rehab.

PMH includes hysterectomy, mitral valve prolapse, depression, anxiety, chronic low back pain, obesity, pre-diabetic state, non-compliance
Meds: metformin, Zoloft, estroven, vitamin c, multi-vitamin, probiotic

Goal: To return home with spouse

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?
Coordination	Dysdiadochokinesia, dysmetria, limb holding, rapid alternating movements	MCA supplies anterior limb of internal capsule where the corticopontine fibers lie

		and are the pathway to the cerebellum and are responsible for proper cerebellar function
Speech	Aphasia (expressive or receptive)	Large infarct size could affect cortex (thalamocortical pathway to temporal gyri); reported slurred speech
Cognition	Emotional expression, memory, language, alertness	Damage to frontal lobe and association cortex due to thalamocortical fiber pathway being effected will alter personality (emotional expression, memory, language, judgement, personality); report of irritability; history of depression and anxiety; medication (Zoloft) may be impacting ability to remain alert
Muscle Function	Left side whole body weakness (focus on face and UE)	Reported L weakness & multiple falls; face and UE are involved more because MCA supplies lateral portion of motor cortex and the face and arms are on that portion of the homunculus; unable to initiate movement due to interruption of pathway to BG from striatum as well as pathway of thalamocortical fibers to motor cortex; corticobulbar tract lies within the posterior limb of the internal capsule and controls muscular function of the face, head and neck.

ROM	Trunk, left side AROM	Weakness prevent active movement, paralysis of L side lead to difficulty stabilizing trunk for transfers, etc. R MCA causes left sided weakness due to the ischemia in the motor cortex and will most likely lead to poor initiation of active motion
Balance	Sitting balance, transfers, reactionary, anticipatory	Truncal weakness leading to decreased stability; report of falls; lack of motor and ROM will likely lead to poor recovery for reactionary balance; lack of cognition will likely affect planning for anticipatory movements as well as the interrupted BG pathways for initiation
Sensation	L side (focus on arm, head and trunk) light touch, pain, proprioception	Although not likely to be greatly affected, thalamocortical fibers also run in the anterior limb of the internal capsule and supply sensory information to the cortex (interruption of pathway to somatosensory cortex)
Cardiovascular	Endurance	Lenticulostriate infarcts commonly arise from embolism of cardiac origin; patient status of obese and pre-diabetic also suggests possibility of poor CV function; history of mitral valve prolapse; these strokes present with upper-motor hemiparesis which

		can be represented by low endurance
Vision	Visual field, gaze fixation, spatial neglect	Affected vision indicates cortical damage; potential left neglect due to damage of non-dominant association areas; possible damage to thalamocortical pathway to occipital lobe
Motor control	Dexterity, speed, accuracy	Upper motor symptom that is common feature of this stroke presentation; may affect job with fine motor activities such as giving shots

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?**
Stairs	Mod-max assist with use of rail on R	Patient has required hemiwalker and mod assist x2 for ambulating 2 steps on flat ground; L side paralysis will increase difficulty of propulsion up/control down stairs; BG damage may cause difficulty with initiation
Gait	Mod assist x2 and hemiwalker	Reported in previous note; strength deficits will likely affect gait mechanics of L side with limb clearance as well as trunk shortening and lengthening on L for proper weight shift

Sitting	Mod I with truncal support	Has tolerated 3 hours/day with full back & head support; strength deficits in trunk will increase difficulty of stability
Transfers (bed mobility, sit to stand/stand to sit, bed to chair)	Mod assist x2	Reported in previous note; decreased truncal mobility on L increases difficulty of transfer due to lack of shortening/lengthening; decreased cognition will increase difficulty with understanding of task

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)

****If able to answer questions. Otherwise ask family/staff from acute care.**

1. What did you work on with therapy in the hospital? Did they provide a HEP?
2. Do you remember what were you doing when you fell in the hospital? What caused you to fall?
3. What was a typical workday like for you? How physically demanding is your job?
4. What was a typical day like for you at home? How much care do your kids require?
5. How active were you on a weekly basis before your stroke?
6. How did you get off the floor when you fell at the hospital? How many people helped? Was any equipment needed
7. Which is your dominant hand?
8. No further questions.

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?
Coordination	L side dysdiadochokinesia, dysmetria, limb holding,	Screen because will only complete if patient has

	rapid alternating movements	appropriate ROM & strength to complete which is unexpected at this point in therapy; may be impaired due to damage in basal ganglia
CN	V, X, XI, XII	These CN are innervated by corticobulbar tract which is also supplied by the MCA, if any positive findings will examine further
Sensation	L side (focus on arm, head and trunk) light touch, pain, proprioception	Due to the size of the infarct, the motor/sensory cortex may have also been damaged; screen to rule out as an explanation for recent falls
ROM	PROM and AROM focus on L side	Move patient through PROM in order to determine available range; MCA impacts motor function and may make the L side flaccid limiting AROM; use AROM & PROM to obtain a comparison between paretic and nonparetic side availability of motion; assess further if deficits present limitation of function

EXAMINATIONS:

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

SYSTEM TO EXAMINE	**What will you examine? (Or write "all")**	**WHY?**
Cognition	All	Pt with altered mental status; assess ability to follow commands; assess understanding of current status; determine

		reliable yes/no due to aphasia to determine expressive or receptive; cognitive impairments may be due to medication (metformin/Zoloft-confusion) and/or effect of MCA on frontal lobe
Motor	L spasticity; L MMT UE & LE (if ROM is available); R MMT UE & LE; active trunk motions; spasticity	Assess for fully isolated movements; assess strength L body if ROM is available for insight on functional participation in activities; assess strength of R body due to it being the primary weight-bearer again to rule out reason for falls; assess trunk motions to determine limitations of movement that may impact weight shifting and trunk lengthening/shortening abilities
CN	Vision- all (II, III, IV, VI)	Homonymous hemianopsia is common sign of MCA stroke due to damage of non-dominant association areas; could also be reasoning behind falls in the hospital; need to assess L neglect
Balance	Sitting and standing anticipatory and reactionary balance	Need to see support in sitting and standing; reported falls- need to rule in/out reasoning behind the falls; will need SLS in order to improve gait as well as stair mobility for D/C home; will also show functional trunk mobility with reaching outside BOS

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?**

Gait	PLOF was independent and pt. is currently ambulating with hemiwalker; pt. has experienced multiple falls during acute care stay; will require less assistance with task in order to safely ambulate around home with help of husband; task is needed to return to work
Stairs	PLOF was independent and pt. currently requires mod A x2 for 2 steps on even terrain; to assess ability to enter/exit home for D/C home with help of husband
Transfers	PLOF was independent; pt. wishes to return home with minimal assistance and will need to be able to perform daily self-care routine (OOB, shower, toilet, etc.)

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**
Berg Balance	Assesses most functional tasks patient is lacking skill in such as sitting and standing balance as well as SLS and transfers; can also be used to assess trunk mobility with reaching and turning; is highly recommended for stroke in inpatient rehab	Activity
Orpington Prognostic Scale	Assess cognitive abilities, motor deficits in arm, proprioception in arm, and balance; pt. has had difficulty due to altered mental status; assess ability to participate in therapy; may also help determine type of aphasia with following commands and answering questions; highly recommended for acute strokes (<2 months) as well as inpatient rehab;	Impairment

	measure to predict D/C ability after inpatient rehab.	
S-Stream	Looks at transfer ability, gait, and stairs, all the functional activities she will need the most work on- will be good way to keep track of progress on these tasks; these tasks will be required for return to home with minimal assistance	Activity, impairment

EDUCATIONAL NEEDS: add or remove rows as needed

Person Being Educated	What education is needed?	Why is this education needed?
Patient & caregiver	Diagnosis, prognosis, POC	Recent stroke, pt./caregiver may not have received/understood information on diagnosis or may have questions that weren't answered; will need to know course of care in order to prepare for assistance at home as well as any accommodations needed for transfers or mobility in home
Patient & caregiver	Medication adherence; importance of asking pharmacist questions if they have any	Medication adherence is important to prevent prediabetes progressing to diabetes (metformin), and also to manage depression & anxiety (Zoloft)
Patient & caregiver	Stairs	Patient will require assistance on stairs to enter/exit home; need proper training on how to navigate stairs with AD
Patient & caregiver	Importance of physical activity	Physical activity can improve cardiovascular endurance, decrease

		weight- eliminating comorbidity of obesity, potentially eliminate comorbidity of pre-diabetes or at least reduce risk of disease progression, help reduce depression and anxiety, and help manage and reduce chronic low back pain; caregiver in need of education as well to help motivate pt. and in case pt. is unable to understand verbal commands due to aphasia

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	1x/day for 4 weeks pending RE; working on restoration, and family training	Brochures/information for family training to help ensure compliance and understanding; weights/resistance bands for strengthening and increased control of musculature for restorative function
Equipment	AD for ambulation/stairs; household equipment for increased independence in ADL	Hemiwalker, stairs; shower chair
Community Resources	Stroke support group	Meeting times and information for local stroke support group

Home exercise program	Sitting OOB at least 5hrs/days	Educate nursing staff/caregiver to transfer pt. to/from chair
Other:	Interaction with psychologist for depression/anxiety Interaction with speech therapist for aphasia Interaction with pharmacist for medication/adherence questions due to non-compliance, use of multiple multi-vitamins, and drug-drug interactions Interaction with OT for dexterity and UE progress	Psychologist SLP Pharmacist OT