**Title and Focus of Activity:** Application of Therapeutic Interventions for Individuals with Stroke in the Acute Setting (Simulation Lab Activity) *Intervention*

**Contributor(s)**: Kathleen G. Volkman, PT, MS, NCS kvolkman@unmc.edu; Lora Pieper, PT, MA LPieper@nebraskamed.com University of Nebraska Medical Center, Division of Physical Therapy Education (KGV); Nebraska Medicine (LP).

**Course Information:**  Neuromuscular Physical Therapy III; 3 credit course; Year 2, semester 2; 3rd in a series of three courses on Neuroanatomy/Neuromuscular PT practice. Lab follows presentation of stroke pathology content and written cases, neurological intervention labs, and cardiopulmonary content in the previous semester and acute care content in current semester. Students have received team training and patient safety content prior to this lab, so some team skills training is helpful. First full-time clinical internship follows the current semester.

**Learning Experience Description:** Context: this integrative, formative lab experience immediately follows lecture and lab presentation of acute care clinical decision-making and interventions in the context of neurological and complex medical patients. Students have a previous clinical experience with examination, but not intervention of a neurologically impaired patient. In this lab, pairs of students apply hands-on interventions with a standardized patient (SP) trained to be a patient with stroke. The lab occurs in the clinical simulation lab which is set up with a realistic acute care setting including vital sign monitor, tubes, and lines.

Purpose: students integrate knowledge of stroke, cardiopulmonary, neurological interventions to make clinical decisions and use team communication skills to achieve a clinical goal safely. Students collaborate in larger groups of 8 to develop a plan for a session and take turns delivering interventions in pairs with an emphasis on professional and clinical skills. During the lab, students in the large group are in the simulation room to observe peers together with a supervising faculty or clinician who provides coaching feedback as needed to correct errors or optimize performance and to encourage group discussion following the simulation. Appendix A lists simulation equipment and simulation markers for vital sign monitor

Instructions to students: In a group of 8, you will use the case information provided to design appropriate interventions to achieve the clinical goal below, given a 50 minute time period (use the lab assignment worksheet attached to the case). You will be paired with a peer to demonstrate part of an intervention (similar to lab practical) on a standardized patient (SP). At the start of the lab, each pair will draw a card with a number between 1 and 4 to determine the order of treatment. The #1 pair will begin the session. After 10-12 minutes, pair #2 will take over, building on the work done by the previous group, continuing until all groups have finished. Your group will have up to 50 minutes total intervention time with the SP. Some instructor coaching will occur during the lab if needed. The last 10 minutes of the lab will be for summary feedback and discussion. Prioritize what you can work on in the session, given the attached initial note from the previous PT visit. Be prepared to demonstrate on the SP in a hospital bed with a goal of mobilizing the patient and possibly transferring the patient to a chair bedside. The focus of this lab is on safe, appropriate mobilization of the patient based on the case and patient response.

PATIENT CASE: Acute Stroke, 60 y/o, status post R MCA CVA. Name will be given at lab.

Setting: acute hospital, telemetry floor. PT evaluation performed yesterday. This is day 5.

Background: Admitted through ED to the ICU with L hemiplegia, sensory loss, unable to speak for several hours after onset of symptoms. Time of “last known well” was previous bedtime approximately 11 p.m. Spouse found patient on floor by bed at 6 a.m. tPA not administered. PEG tube placed day 3. Moved to telemetry floor Day 4.

Systems review: Neuro: L hemiparesis, L sensory changes. Vision intact. Speech: Unable to pass swallow test; dysarthric. Nutrition: PEG tube in place. Bowel: continent; bladder: continent past 24 hr.

Medications: PICC line, IV electrolytes, insulin, metoprolol

Lab values: WNL

Precautions: PEG tube, abdominal binder, MD/DO orders for R wrist restraint due to pulling at tubes on evening of day 2 (orders continued through day 5).

Orders: PICC line, 2L O2 per NC. Maintain O2 sats above 90%. PT to see for mobilization and recommendations for d/c disposition. Nursing orders for L shoulder sling. Anticipate d/c to next level of care in 2-3 days. Case worker to see re: coordination of d/c planning.

PMH: COPD, past smoker, HTN controlled w/meds, diabetes controlled w/meds, knee arthritis.

SOAP note from PT examination on day 4:

S: Family present during exam and report previous level of function (PLOF) of patient was independent, lives w/spouse in single story home with 2 steps to enter/no handrails. Pt is semi-retired, works part-time as accountant, no longer smokes. Pt has PMH of COPD, HTN, DM, B knee arthritis and used a cane for outdoor ambulation for past 6 months. Patient was found by spouse lying on floor next to bed with weakness and unable to speak. Displays facial grimace with L shoulder range above 90 flex; no previous h/o L shoulder problems reported. Family states the goal is for the patient to return home with assistance as needed.

O: Expressive communication: dysarthric, mumbling. Answers orientation questions 2/3 for person/place, difficult to understand. Pt. follows 1-step commands 75% of time.

Motor- Weakness noted in L facial muscles. R side active movement appear to be normal. L UE: no active movement noted except for shoulder shrug. PROM: 75% shoulder range with scapular mobilization, painful endfeel. All other L and R UE joints are WNL. PROM in LE’s= WNL except for knees =75% knee flex, 2° to pain. L LE exhibits weak isolated movement in hip flexion supine partial range, knee flex in sitting partial range, ankle dflex palpated and plantar flex partial range in sitting. Clonus 2-3 beats in L ankle.

Sensory- Unreliable 2° to speech deficit and level of alertness. Appears to have moderate decreased awareness of L UE in all positions. Orients head toward R.

Functional mobility:-Supine resting BP 120/70. Performs bed scooting w/ mod A & manual cues to L LE, supine to sit with assist of 1: max A x1 for L LE, max A for UE mgt, mod assist at trunk; sat EOB feet supported 3 min, w/ max A x1 for balance and L UE mgt, and verbal cues for head position, BP 130/77; stood EOB max A x2 for balance and L knee instability 1 min, BP 115/70. O2 level decreased from 95% to 90% during session. Pt was fatigued and RR increased from 12 to 16 bpm.

Precautions of PEG tube, PICC line, nasal cannula observed. Lines and tubes were in place at end of session. R wrist restraint in place.

A: Patient presents with stable hemodynamics during exam; voluntary motor, sensory and speech deficits, painful L shoulder and B knees with limited ROM, fatigue, and body awareness deficit. Patient continues to occasionally attempt to pull at lines during session and requires multiple verbal and manual cues. Comorbidities which can impact rehabilitation include DM, COPD, and arthritis limiting mobility and endurance for activity. Patient has family support and spouse for assistance. Home may need modifications for access. Patient presents as a good candidate for inpatient rehab facility based on multiple impairments, age, and family support.

General goals: Patient to progress to bed mobility with min A; sit EOB with min A for trunk control and verbal cues for head control x 3 minutes, squat pivot transfer w/max A x1. Progress time sitting in bedside chair to 30 minutes to promote upright tolerance and interaction with the environment. Increase active weightbearing through L LE and improved trunk control during standing to mod A x1 for 2 minutes. Educate pt. and family about proper shoulder positioning to protect shoulder and encourage pt. scanning to L. Educate nursing regarding positioning of L shoulder when upright and proper transfer technique for safety. (Note: there are no SPs playing family members. This is provided as background information.)

P: Continue to see BID for a total of 4-6 sessions for progressive mobilization, increase tolerance for physical activity, and L UE self-management in preparation for discharge to next level of care. PT to instruct nursing on positioning and transfers, educate family on ROM and positioning, precautions with L shoulder and scanning to L side. Discuss recommendation with team and family for next level of care and rehabilitation.

(Complete the assignment worksheet which follows)

LAB ASSIGNMENT WORKSHEET

Prior to lab, type your answers to questions # 1-7 with your group. Be concise-use of bullets is recommended. Be prepared to turn in this worksheet at the end of lab (one sheet per large group). Given the details and goals of the case, the group should think about the interventions to be completed and how you might divide the work into parts for each pair of students. This assignment is worth 10 points for accuracy and completion.

1. Problem list/resources (list all potential problems or potential resources in this case, given the facts, and categorize them according to the ICF as affecting body structure/function level, activity level, or participation level i.e., L UE weakness – body structure/function impairment): 1 point

2. Based on the scenario, list at least six questions you have about this patient prior to seeing him/her. For each question, indicate where you would obtain the information (i.e. medical chart, other providers, your exam, etc). 2 points

3. Given that mobilizing the patient is the focus of the lab, what are your priorities for this session based on the goals and information given? List some specific things you must do versus what you would like to do in a 50-minute time frame. (Keep in mind each pair will have 10-12 minutes). 2 points

4. What equipment/lines are there to work around? What equipment will you need to obtain before beginning the session? (Some standard hospital equipment will be available in the room). 1 point

5. In what specific ways can you communicate with team members to improve the safety of the patient during the treatment? 1 point

6. What information will you verbally hand off about the patient at the end of the session that will be critical for safe, patient-centered care? 1 point

7. List the rationale for medical use of restraints on a patient and three safety issues to be aware of when using them. 2 points

Time for student to complete the activity: 1. preparation for activity outside of/before class: 2-3 hours 2. class time completion of the activity: 1 hour

Readings/other preparatory materials: Students review stroke, neurological intervention, and cardiopulmonary content as needed, review the patient case, and complete a group worksheet assignment to plan the interventions. Training of SP’s by faculty is done prior to the simulation. An instruction handout for SP is attached below.

Learning Objectives: 1. demonstrate acceptable techniques for safe handling of SPs (e.g., body mechanics, guarding, level of assistance, tubes, lines, equipment) throughout the lab experience. 2. demonstrate appropriate delivery of tactile and verbal cues to elicit the patient’s motor response during functional activities. (Note: Appropriate handling techniques [i.e., safe handling of the shoulder, transfers, task-based or PNF techniques to promote function] and verbal communication are based on previous educational labs and teamwork training.) 3. demonstrate the ability to modify an intervention immediately, based upon patient response. 4. demonstrate the ability to interpret pertinent patient case information and examination findings including cognitive status, to propose and perform appropriate, safe, functional interventions in a culturally competent manner. (Note: our SPs can vary in age, gender, and ethnicity from year to year.) 5. receive constructive feedback in a professional manner about the quality of task performance, teamwork, and clinical decision making from faculty and peers. 6. evaluate the performance of fellow team members in a professional manner through written feedback (peer assessment). (Note: written feedback is given immediately between the pair following the simulation-see Appendix E- and turned in to the instructor for review.)

Methods of evaluation of student learning:

1. The written planning assignment is scored for accuracy/completion per the point values on the assignment sheet above.
2. Students receive verbal coaching feedback in situ and verbal summative feedback from the supervising faculty/clinician using the assessment checklist (see Appendix C -supervisors planned this learning experience together and the checklist improves reliability of assessment).
3. Immediately following the simulation, students receive verbal feedback from the SP about their handling and professionalism (i.e., did the students make the SP feel safe?).
4. Pairs of students self-assess performance and provide written peer feedback to each other using guided questions immediately after the simulation (see Appendix D).
5. Students provide the instructor with written anonymous feedback about their satisfaction with the learning experience immediately after the simulation (see Appendix E).

Appendix A. Simulation equipment and simulation markers for vital sign monitor

List of equipment for 2 SP’s:

2 Abdominal binders

2 Shoulder slings (Note: one sling will be placed on each SP incorrectly which the students must identify and correct for the patient’s safety)

2 Wrist restraints for R wrists (Note: one wrist restraint will be placed on each SP correctly; students must determine how to untie and observe the patient for safety while unrestrained, then we practice retying the restraint correctly at the end during the summary and discussion. Legal use of restraints has been discussed in lecture and this lab experience reinforces appropriate use of restraints and alternatives.)

2 Stools

Clipboards and assessment checklists (1/group) for each faculty/clinician

Feedback survey (1/student)

Student self-assessment checklist (1/pair)

Clinical Skills Lab equipment for each room:

Gloves

Bedside chair

1 Chux pad in chair or 1 blanket in chair

Draw sheet in each bed

IV taped to R upper arm (PICC line)

Nasal cannula attached to wall O2 set to 2 L

Pulse oximeter on R finger

Simulation markers:

HR, O2, & BP monitor parameters showing on monitor in simulation room (these are put into a VS monitor software operated by simulation staff for each room to appear on the monitor with position changes; students may also request BP when they want one and it will appear on the monitor):

Resting BP 120/70, HR 70, O2 can be 95% or more, Resting RR 12

When patient sits edge of bed, BP changes to 130/77, HR 78.

When patient stands, BP changes to 115/70, HR 85, O2 level decreases from 95% gradually to 90% during moving from sit to stand and transfer to chair. RR gradually increases from 12 to 16 bpm during transfers.

Patient transfers back to bed and HR goes down to 75

Patient sits EOB and moves to supine. Return all to baseline gradually.

Appendix B. Training Instructions for the SP (1 hour to train and prep SP prior to simulation)

Please wear a sleeveless shirt and shorts. You will receive a patient gown to put over your clothes.

Diagnosis: You are a ~60 y/o patient with a stroke resulting in LEFT sided body dysfunction. Your right side still works. You are alert but somewhat confused about what has happened to you. You have an abdominal binder to cover a pretend PEG tube for feeding, and a nasal cannula in your nose for simulated oxygen. You have an IV (taped to arm). A wrist restraint is being used on your right wrist to prevent you from pulling your tubes/lines.

Background: You are married and live with spouse in a 1 story home in Omaha. You are an accountant and have children. You have diabetes and hypertension and knee arthritis.

Communication: mumbling, you can answer orientation questions 2/3 correct about your name, your city location, or date. Your speech is a little slow and garbled. Your right side works well, but you follow instructions slowly and require extra time for all responses on left or right side.

Sensation: You have decreased awareness of your left arm so you tend to leave it behind in awkward positions when being moved. You can feel your left arm when touched but “it doesn’t feel the same as the other one” if you are asked by the students. Your left shoulder hurts if the arm is moved above shoulder level. It gets better if someone helps move your shoulder blade along with moving the arm slowly.

Movements: Your right arm moves normally when not restrained. You can’t move the left arm yourself below the shoulder. When asked to move the arm you shrug your shoulder but nothing else. Your right leg moves normally. If instructed to move your legs in bed, you can draw your left knee half way up. Your left ankle can move only a little up and down and it is weak.

Decreased head, trunk control in sitting position: You tend to hold your head looking away from the left and looking toward your right shoulder. You have a “tired” head that wants to be forward and to the right unless prompted to hold it up; when you hold it up it only lasts about 10 sec. Your trunk is slumped and you need hands on assistance and cues from the students to straighten your posture--you can hold it for about 10 seconds on edge of bed before fatiguing. Your left arm just hangs awkwardly and you don’t try to reach for it with the other hand unless prompted by the students.

Bed mobility: You need verbal and hands-on assistance to guide you through scooting to the edge of the bed in sitting and to help lift your bottom off the bed when lying down because your trunk and L hip is weak and you are easily fatigued. You can do about 50% of the work yourself.

Standing and transfer to chair: You need a lot of help to stand up from the bed (2 people) because your hips are weak, your left knee is apt to collapse when you bear weight on it, and you lose your balance. If someone blocks your knee and stabilizes your trunk and hips, then you can take a small step with your good leg. You can move your left affected leg with difficulty because it is weak and the foot drags on the floor. You fatigue quickly and breathe a little faster with efforts like standing. You have difficulty sitting up straight in the chair and slump unless given support.

Lines, tubes, precautions:

You have an IV in your right upper arm (taped). You have a sling on your left arm which is falling off.

You have a nasal cannula to give you more oxygen because your saturation has been down and additional oxygen helps you be clearer mentally, and a pulse oximeter on your finger.

You have arthritis in both knees which you can respond with wincing or a moan if your knees are moved too quickly. If anyone pulls on your left arm or raises it above 90 degrees, you can respond with a wince. If you are *handled* too quickly while moving or feel unsafe, you can act frightened.

Appendix C. Application of Therapeutic Interventions for Individuals with Stroke in the Acute Setting - Instructor Lab Assessment Checklist

Group # Comments:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Students pairs: | 1 | 2 | 3 | 4 |
| Intro, orients pt, checks cognition, provides patient with concise instructions and checks for understanding, educates as needed |  |  |  |  |
| Scans the environment (check VS, lines, equipment)  |  |  |  |  |
| Breaks down goal into logical progression of tasks |  |  |  |  |
| Keeps the patient safe at all times (including sanitizing hands) Handles lines/tubes safely; appropriate use of equipment. |  |  |  |  |
| Guides or facilitates movement with manual/verbal cues as needed |  |  |  |  |
| Works as a team with PT and patient to meet tx goals (uses team communication tools w/partner) |  |  |  |  |
| Asks for/accepts verbal FB from the SP and faculty |  |  |  |  |
| Other specific FB or red flags  |  |  |  |  |

Appendix D. Application of Therapeutic Interventions for Individuals with Stroke in the Acute Setting - Self Assessment Checklist- one per pair and checklist is posted prior to simulation

Lab Pair Names:

Lab Hour: 1 pm 2pm 3 pm Pair Order: #1 2 3 4

|  |  |  |
| --- | --- | --- |
| Task (address the tasks your pair completed) | Task completion | Comments- What would I do *differently* next time to improve my team’s performance? |
| Did we sanitize our hands before and after our portion of the session? (all pairs) | Complete/partial/not done |  |
| Did we introduce ourselves as PTs (first pair), and explain what we are doing (all pairs)?  | Complete/partial/not done |  |
| Did we scan the environment and check the lines/tubes (all pairs)? | Complete/partial/not done |  |
| Did we prep the environment and make a plan before moving him/her (first pair)? | Complete/partial/not done |  |
| Were we appropriate in our assessment of cognition and communication throughout? (all pairs) | Complete/partial/not done |  |
| Did we share our plan for the intervention and review the risks? (all pairs) | Complete/partial/not done |  |
| Did we provide appropriate manual and verbal cues to elicit patient movements? (all pairs) | Complete/partial/not done |  |
| Did we use safe handling techniques when moving the patient? (all pairs) | Complete/partial/not done |  |
| Did we observe VS and the patient’s response to tx throughout? (all pairs) | Complete/partial/not done |  |
| Did we make the patient safe and comfortable before leaving? Did we note bed rails and tubes/lines/restraints are in place? (last pair) | Complete/partial/not done |  |

Provide your partner written feedback about his/her team performance: Note: the following behaviors are taught as part of the team training curriculum prior to this lab experience.

Lead PT: write at least 3 feedback statements to your assistant re: team behaviors such as situation monitoring, watching your back, task assistance, etc.

Assist PT: write at least 3 feedback statements to your partner re: leadership behaviors of delegating tasks, decision-making, communication style during the session, etc.

Appendix E. Application of Therapeutic Interventions for Individuals with Stroke in the Acute Setting - Feedback Survey- One per student.

Rate using 1 strongly agree, 2 agree, 3 neutral, 4 disagree, and 5 strongly disagree with the following statements:

1. Handling a live person is preferable to a manikin in this lab. 1 2 3 4 5

2. This lab is effective for practicing clinical decision making and interventions

 for patients in an acute care setting. 1 2 3 4 5

3. This lab increased my confidence with clinical reasoning in the

acute setting. 1 2 3 4 5

4. This lab increased my confidence in handling a patient with acute stroke. 1 2 3 4 5

5. This lab should be continued in the future. 1 2 3 4 5

Please comment about how to improve the lab experience for future classes: