**Title and Focus of Activity:** Spinal Cord Injury Lab Activity Outlines: Part 1 and Part 2 *Patient/Client Management*

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**Course Information**: Neurologic Clinical Management; 5 credits; Second year, winter term. Occurs after Neuroanatomy, Motor Control and Motor Learning, Fundamentals of Neurologic Rehab.

**Learning Activity Description:** There are two lab sessions that complement the lecture material. Students are provided with challenge questions that facilitate self-directed learning but also incorporate faculty-led demonstrations of skills to be practiced. Practicing skills with classmates of different body types and sizes to generalize skills is stressed. A case study is introduced after skill progressions to facilitate critical thinking and problem solving.

**Spinal Cord Injury Lab Outline: Day One**

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| **SCI LAB 1** | **Activities** | **Challenge Questions** |
| **Station 1** | **Respiratory Assessment*** Auscultation of all lung fields
* Rate/Rhythm/Effort
* Use of accessory muscles

**Respiratory Treatment*** Assisted coughing techniques
* Intercostal quick stretch
* Diaphragmatic strengthening-manual resistance/weights

**Rolling** * Lift and chop methods
* PNF – what patterns?
* Assistive devices- leg loops
* **Momentum**
* Practice strategies for individuals with complete lesions at C6 and T4
 | How would respiratory impairments likely differ in a patient with C6 tetraplegia and in a patient with T4 paraplegia?Are there any times you would encourage use of accessory muscles? What would that look like? How would you teach it?What therapeutic exercise could be used to improve rolling? What specific PNF patterns can be used to facilitate rolling?? |
| **Station 2** | **Skin Inspection*** How, where and why

**Pressure relief*** Lift method
* Forward weight shift
* Lateral weight shift
* Tilt in space w/c

**Prone on Elbows*** Assume the position
* PNF- what activities?
* Safety considerations

**Prone on Elbows to Sitting*** Assist with transition
* Practice as C6 and as T 4
 | How would you document a reddened area that does not blanch after pressure applied?Which pressure relief method would you teach to someone with T 2 paraplegia? Which would you use with C6 tetraplegia and how would you ensure safety? (think leverage)What movement components are necessary to complete this functional task?  |
| **Station 3** | **Supine on Elbows** * Therex/Act and PNF

**Supine on Elbows to Sitting*** Weight shift and momentum

**Long Sitting*** Stablity/PNF/Ther Activities
* UE positioning for C6
* Hand positioning (tenodesis)
* Push up blocks
* Lifting
* Scooting
* LE management for EOB sitting
 | Why is long sitting so critical for patients with SCI?What body type factors come into play in long sitting and transitioning to EOB?What key **muscle** dictates the UE position (elbow extension and external rotation) in long sitting in tetraplegia?What should the patient’s hand position be in patients with neurologic level above **C8** in order to preserve tenodesis grasp?What biomechanical principles would be useful to incorporate into the training and education of the patient and/or caregivers? |

**Spinal Cord Injury Lab Outline: Day Two**

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| **Activities for Practice** | **Completed (self-check-off)** |
| **Perform ASIA Exam** |  |
| **Transition from long sit to edge of mat sitting** Lower extremity management Physical assist: practice max assist level and less |  |
| **Sitting Balance** Positioning of UEs for C7 and above Typical sitting balance abilities at different levels of injury. Documentation of sitting balance measure. Goal writing for this activity. |  |
| **Transfers** Momentum is your friend! Head-hips relationship Think about LE positioning/safety Strategies to increase or decrease transfer challenges for your patient Documenting status and goal writing related to transfers |  |
| **Types of transfers : please practice all with different partners/body types** Slide board: two person assist Slide board: one person assist Squat pivot/depression: two person assist Squat pivot/depression: one person assist Supervision only-how would you instruct the patient? |  |
| **Wheelchair positioning and parts management**Hips back in chair, thighs supported, attention to trunk position Remove and replace foot/legrests, armrests, headrest Goals for w/c propulsion and parts management and patient education in the  area of mobility devices. |  |
| **Wheelchair skills:** propulsion, wheelie, doorways, reaching, etc |  |

**Case Challenge:** This patient with T2 ASIA A SCI was injured in a ski accident 4 weeks ago. He/she has no other major injuries, is very motivated and able to follow all commands. Current status: rolls with min A with rail, supine<>sit with mod Ax1 and transfers with slide board with CG/S. The patient’s goals are to be independent in bed mobility in a standard bed and transfer without a sliding board.

**Instructions:** Working in **PAIRS**, each student will take a turn being the patient and the therapist. So, there will be two “treatment” sessions. They need to be structured to simulate a real patient interaction including: set up of environment in a safe manner, introducing yourself, and going through your treatment. End your treatment by instructing your patient in one SAFE exercise/activity that you want them to do during down time to reinforce today’s treatment.

1. Plan and execute an intervention session focused on activities/therapeutic exercises to improve the ability to roll, move from supine<>sit and balance in long sitting.

2. Plan and execute an intervention session focused on activities/therapeutic exercises to improve the ability to sit at the edge of the bed and transfer via squat pivot/depression method.

Time for student to complete the activity: 1. preparation for activity outside of/before class: 5 hours of concurrent lecture material and 1-2 hours of preparation to review materials prior to class. 2. class time completion of the activity: two 2.5 hour lab sessions, total 5 hours.

Readings/other preparatory materials: O’Sullivan SB and Schmitz TJ. Physical Rehabilitation: Assessment and Treatment. 6th ed. FA Davis Co. Philadelphia PA. 2013 pp. 889-955 and O’Sullivan SB. Improving Functional Outcomes in Physical Therapy 1st ed. FA Davis Co. Philadelphia PA. 2010. pp. 274-277, 287-292.

Learning Objectives: 1. Demonstrate motor skill, proper body mechanics, and safety in performing therapeutic exercise, mobility training, gait training, balance/postural control training for individuals with neurological dysfunction, specifically spinal cord injury. 2. Students will demonstrate clinical reasoning and problem solving utilizing a case study approach focused on examination and treatment of individuals with spinal cord injury in both the acute and later rehabilitation stages of recovery.

Methods of evaluation of student learning: Learning is assessed via written assignments related to SCI that would indicate improvement in critical thinking skills; written examination questions and hands on practical exam which students are required to pass with a grade of 83% or better. We also stress in-class demonstrations done by the students with the class participating in giving feedback, adding ideas and brainstorming solutions.