**Title and Focus of Activity:** Self Directed Interactive Learning Module

*Patient/Client Management*

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**Course Information:** Neurological System I and II; 6 credits (each course); Neuro System I is in the year 2 Fall Semester; Neuro System II is in the Year 2 Spring Semester

**Learning Activity Description:**

Context: The learning modules are interactive self-directed assessment tools embedded within the 2 core neurologic systems courses. The modules consist of patient video, case information, and interactive questions that provide immediate feedback on correct and incorrect responses. These modules are provided to the student once didactic material has been instructed and lab based activities with patients have been completed.

Purpose: To promote clinical reasoning for the student using a case based format to enhance and assess the student’s application of didactic and lab based instruction of skills outlined in the APTA Neurologic Entry-Level Curricular Content Guidelines. These skills include but are not limited to pathophysiology and natural progression of a variety of neurologic disorders, analysis of movement, prognosis, exercise program design, the role of imaging, and outcome measure assessment and application.

Multiple learning style opportunities are included such as video for the visual learner, and audio voice over for the auditory learner. Previous student feedback that has been provided to the course instructor included requests from the students for more self-directed learning activities. While there are positive aspects to learning within a group, it can often be more difficult for a student to understand what aspects of the content they personally understand. These learning modules were created to provide a method of self-assessment with immediate feedback to further facilitate critical thinking and student learning.

1. A topic or diagnostic group is chosen and a patient that is available for video recording is secured. While the clinical presentation of any patient within a diagnostic group can be quite variable, care should be taken to choose a patient that can adequately participate in the full scope of the patient/client management model. A professional patient or actor can be used, but it is ideal if you have access to individuals with the actual diagnosis.
2. A patient case should be fully developed and video recorded starting with screening, and running through each step of the patient/client management model through Outcome Measurement.
3. The case is then broken down and placed within the module using Adobe Captivate. This software is compatible with most learning platforms such as Desire to Learn and Blackboard Learn. The platform has online tutorials to assist with usage. Slide progression is as follows: (number of slides can vary depending on individual case content and available video)
   1. Introduction to the module and basic instructions for navigation
   2. Introduce patient case
   3. Progress case through patient/client management model.
      1. This can include 1-2 slides of case information for each category (screening, examination, evaluation, diagnosis, prognosis, plan of care, intervention and outcome management);
      2. 1-2 slides of video for each category (examples can include patient interview, task analysis of movement, assessment of strength or other impairment, a video of patient performing components or all of an outcome measure etc);
      3. 1-2 questions for each category.
4. Questions can be designed to assess knowledge across domains from basic knowledge to the ability to synthesize and apply information. Each answer option is tied to specific feedback. For example an incorrect answer will send the student to an explanation of why the answer was incorrect, provide or reemphasize supporting information from the case, and then the student can be directed back to the question for another attempt to answer. The correct answer can also be tied to feedback, and then the student is directed forward in the module to the next step.
5. An example of a technical feature that can be added to enhance learning is the ability to roll over text to initiate an audio recording of the text. This is especially helpful for students who are auditory learners or have auditory accommodations for learning.

Time for student to complete the activity: Completion activity outside of class: Approximately 60-90 minutes; Class time: approximately 15 minutes for instruction on how to best navigate the module

Readings/other preparatory materials:

Each module is designed around a different diagnostic group. There are currently 6 active modules. The book pages and articles used for the spring and fall semesters are included (the articles listed are updated annually so are subject to change from one year to the next). Students are provided these readings to support a variety of learning activities and assessment related to these diagnostic groups, not just to support the learning module.

Stroke Module:

1. Shumway-Cook, A. Woollacott MH. Motor Control: Translating research into Clinical Practice. 4th ed. Wolters Kluwer Health/Lippincott Williams & Wilkins 2012. Pgs 3-41;104-140; 246-308; 381-471; 529-549; 552-594
2. O’Sullivan, SB. Schmitz, TJ. Fulk, G. Physical Rehabilitation. F.A. Davis Company; 6th edition. 2013. Pgs 3-10; 163-188; 217-220; 408-414; 448-458; 645-663; 667-674; 679-689;1230-1258; 1325-1354
3. Giuliani CA. The relationship between spasticity to movement and considerations for therapeutic interventions. Neurology Report. Vol 21:3. Pgs 78-84. 1997
4. Anthony B. Ward A literature review of the pathophysiology and onset of post-stroke spasticity. European Journal of Neurology. 2012, 19:21-27
5. Plummer P, Morris ME, Dunai J. Assessment of Unilateral Neglect. Physical Therapy. 2003. 83:732-740
6. Sarah Meyer, Auli H. Karttunen, Vincent Thijs, Hilde Feys and Geert Verheyden. How Do Somatosensory Deficits in the Arm and Hand Relate to Upper Limb Impairment, Activity, and Participation Problems After Stroke? A Systematic Review. Physical Therapy 2014; 94:1220-1231

Concussion module:

1. Alsalaheen BA. Whitney SL. Vestibular rehabilitation for dizziness and balance disorders after concussion. JNPT 2010;34: 87–93
2. Borich, MR. Cheung, KL. Jones, P. Khramova, V. Gavrailoff, L. Boyd, LA. Virji-Babul, N. Concussion: current concepts in diagnosis and management. JNPT 2013;37: 133–139

Multiple Sclerosis Module:

1. O’Sullivan, SB. Schmitz, TJ. Fulk, G. Physical Rehabilitation. F.A. Davis Company; 6th edition. 2013 pgs 721-737
2. MacAllister. Multiple Sclerosis Related Fatigue. Phys Med Rehabil Clin N Am 16 (2005) 483–502
3. Hebert JR. (2011) Effects of Vestibular Rehab on MS related fatigue and upright PC. A RCT.
4. Motl. RW. Benefits, safety, and prescription of Exercise in MS. Expert Rev. Neurother.2014.14(12), 1429–1436

Parkinson Disease Module:

1. Van Nimwegen, M. Speelman AD. Overeem S. van de Warrenburg, BP. Smulders, K. Dontje ML. Borm GF. Backx FJG. Bloem BR. Munneke M. Promotion of physical activity and fitness in sedentary patients with PD: RCT. BMJ 2013.346:1576
2. Nieuwboer A. Rochester L. Muncks L. Swinnen SP. Motor Learning in PD: limitations to potential for rehabilitation. Parkinson’s and Related Disorders. 15S3 (2009) S53-S58
3. Fernandez HH. Updates on the Medical management of PD. Cleveland Clinical Journal of Medicine. 79:1. 2012
4. Ellis T. Motl RW. Physical Activity Behaviour Change in Persons with Neurologic Disorders: Overview and Examples from PD and MS. JNPT 2013; 00:1-6

Spinal Cord Injury Module:

1. O’Sullivan, SB. Schmitz, TJ. Fulk, G. Physical Rehabilitation. F.A. Davis Company; 6th edition. 2013. Pgs 912-950
2. [Maynard FM, Bracken MB, Creasey G et al International Standards for Neurologic and Functional Classification of Spinal Cord Injury. Spinal Cord 1997;(35):266-274](http://www.nature.com.ezproxy.bu.edu/sc/journal/v35/n5)
3. [Behrman AL et al. (2005). Locomotor training progression and outcomes after incomplete spinal cord injury. Physical Therapy, 85, 1356-1371](http://www.ptjournal.org.ezproxy.bu.edu/cgi/reprint/85/12/1356)
4. SMulroy, Thompson L, Kemp B, et al; Strength and Optimal Movements for Painful Shoulders (STOMPS) in Chronic Spinal Cord Injury: A Randomized Controlled Trial. March 2011; Phys Ther. March 2011; 91(3):1-20
5. [Sisti SA. 2014. Activity and Fitness in SCI: Review and Update](https://learn.bu.edu/bbcswebdav/pid-2983885-dt-content-rid-9950594_1/xid-9950594_1?target=blank). Curr Phys Med Rehabil Rep. 2:147–157

Guillain-Barre Syndrome Module:

1. Bassile CC (1996). Guillain-Barre Syndrome and Exercise Guidelines. Neurology Report 20: 31-36

Learning Objectives:

1. Apply clinical reasoning skills using the ICF and patient/client management model to a variety of diagnostic groups.
2. Demonstrate clinical decision making skills though video analysis, case application, and interactive assessments.
3. Self-assess knowledge of the concepts of neurologic physical therapy practice to clarify areas of understanding or area’s that may need to be reinforced.

Methods of evaluation of student learning:

Each module contains 10-12 questions that need to be answered by the student. If the student answers incorrectly, immediate feedback is provided as to why that answer was incorrect, more supporting information is included to reinforce the concept being questioned, and then the student is redirected back to the question and provided another attempt to answer. When the student answers correctly, immediate feedback is provided supporting the correct response based on information specific to the case to further reinforce learning. The student is then directed to continue in the module.