Course: PTA 260 Clinical Neurology
Location/Hrs. Lecture and Lab: MWF 8:00-10:50 JGM 303

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Credit Hours: 4

Text/Materials:
Required:
Graves, Rebecca, Clinical Decision Making for the Physical Therapist Assistant Across the Continuum of Care, F.A. Davis, Philadelphia, 2013

Recommended:

Course Outline: This course is about the influence of the nervous system disorders on posture, movement and functional ability and how physical therapy treatment influences treatment of nervous system disorders. Prerequisite: Successful completion of previous required PTA coursework. Taken concurrently with PTA 280.

Course Questions: The following questions will guide this course:
1. How does the basic functioning of the nervous system influence movement and posture?
2. How is movement and posture affected by damage to the nervous system?
3. How are our functional abilities affected by changes to movement and posture?
4. What are the principles of motor learning and how does the PTA apply these principles to patient care?
5. How do we choose treatment options that will have the greatest treatment impact on movement, posture, and functional abilities?
6. How do we design and apply a treatment plan that will take your patient to the attainment of a functional goal?

Performance Objectives or Student Competencies

LECTURE
Upon completion of this course, the student will be able to:
1. Integrates seven core values of professional behaviors into classroom activities.
2. Identify the significant structures and describe the primary functions of structures within the nervous system.
3. Discuss the role of the PTA when working with adults or children with neurologic dysfunction.
4. Relate motor control theories and motor learning principles to therapeutic intervention.
5. Explain the sequence of normal development (motor, cognitive and postural) and the implications for therapeutic intervention.

6. Demonstrate knowledge of the pathophysiology, clinical manifestations, medical diagnosis and treatment, common complications of the following neurological disorders: cerebral vascular accident (CVA), traumatic brain injury (TBI), spinal cord injury (SCI), Parkinson Disease, vestibular disorders, selected pediatric disorders, other related neurological disorders.

7. Describe the therapeutic interventions for neurological disorders.

8. Describe the importance of functional training in treatment of neurologic disorders.


LAB
1. Integrate seven core values of professional behaviors into lab activities.
2. Demonstrate ability to observe and describe normal movement and posture.
3. Demonstrate ability to integrate a variety of therapeutic principles and activities into an appropriate treatment program for individuals with neurologic dysfunction.
4. Describe the basic components and methods of application of selected orthotics.
5. Administer a therapeutic program based on a physical therapy plan of care, appropriate for individuals with neurological conditions.

PERFORMANCE OBJECTIVES OR STUDENT COMPETENCIES

LECTURE
Upon completion of this course, the student shall be able to:

1. Integrates seven core values of professional behaviors into classroom activities.
   1.1 Demonstrate effective verbal and non-verbal communication during classroom activities.
   1.2 Demonstrate behaviors, conduct, actions, attitudes and values consistent with the roles, responsibilities, and tasks of the PTA.
   1.3 Consider social, emotional, cultural, psychological, environmental, and economic influences of the patient, adapting approach accordingly.
   1.4 Seek further education in the use and delivery of interventions based on evidence.
   1.5 Demonstrates ability to make adjustments to interventions, including stopping treatment, and asking for clarification before beginning, based on plan of care knowing when to communicate with supervising physical therapist.

2. Identify the significant structures and describe the primary functions of structures within the nervous system.
   2.1 Define central nervous system, peripheral nervous system, neurons, glia, myelin, white matter, grey matter and ganglia.
   2.2 Identify the basic function of structures in the CNS, including the following: lobes of the cerebral hemispheres, brainstem, cerebellum, basal ganglia, pyramidal tracts, extrapyramidal tracts, cerebrospinal fluid, ventricles, and spinal cord.
   2.3 Describe the function of various structures in the peripheral nervous system including the following: anterior horn cells, peripheral nerves (including the cranial nerves), gamma motor neurons, intrafusal fibers and extra-fusal fibers.
   2.4 Differentiate between an upper motor neuron lesion and a lower motor neuron lesion.
   2.5 Define clonus, fasciculation, fibrillation, chorea, spasticity and flaccidity.
   2.6 Describe the stretch reflex.
   2.7 Define synapse.
   2.8 Relate properties of the synapse (including summation and inhibition) to treatment techniques.
   2.9 Discuss the changes that occur within the nervous system through the lifespan and the functional implications.
   2.10 Relate life span changes in the nervous system to musculoskeletal system changes and discuss functional implications.

3. Discuss the role of the PTA when working with adults or children with neurologic dysfunction.
   3.1 Identify the factors that the physical therapist must consider prior to delegating a patient to the physical therapist assistant.
   3.2 Discuss the physical therapist assistant’s role as a member of a health care team.
   3.3 Recognize the importance of functional training for clients with neurological conditions.
4. Relate motor control theories and motor learning principles to therapeutic intervention.
   4.1. Define motor control and motor learning.
   4.2. Distinguish between the models of motor control.
   4.3. Discuss the current theories regarding the recovery of function in the nervous system.
   4.4. Discuss the application of motor learning principles to the recovery of function.

5. Explain the sequence of normal development (motor, cognitive and postural) and the implications for treatment of neurological disorders.
   5.1. Describe the general sequence of development including gross and fine motor milestones, and the development of postural control.
   5.2. Describe the relationship between motor and cognitive development.
   5.3. Describe the posture or position assumed with the primitive reflexes and developmental reactions.
   5.4. Describe the ways in which neurological impairment may interrupt motor development.
   5.5. Describe the effect of sensory conflict or loss on motor development.
   5.6. Describe the use of normal developmental sequence in the treatment of neurological disorders.

6. Demonstrate knowledge of the pathophysiology, clinical manifestations, medical diagnosis and treatment, common complications of the following neurological disorders: cerebral vascular accident (CVA), traumatic brain injury (TBI), Parkinson’s Disease, vestibular disorders, selected pediatric disorders, other related neurological disorders.
   6.1. Describe the pathophysiology and etiology of selected neurological disorders.
   6.2. Describe the motor, sensory, and integrative deficits which may be present with selected neurological disorders.
   6.3. Describe common diagnostic tests and medical treatments used in selected neurological disorders.
   6.4. Describe muscle tone changes that are characteristic of selected neurological disorders.
   6.5. Describe the medical, psychological, cognitive, and movement complications that accompany neurological disorders.
   6.6. Demonstrate understanding of assessment of the patient’s awareness levels using a variety of methods including the Glasgow Coma Scale and the Rancho Levels of Cognitive Functioning.
   6.7. Describe gait patterns that are associated with various neurological disorders.
   6.8. Research and complete an oral presentation to classmates on a case study of a selected neurological disorder that provides information about the disorder and physical therapy treatment for the disorder including a video simulation of treatment.

7. Describe the therapeutic interventions for neurological disorders.
   7.1. Recognize the differences between various neurological treatment approaches such as NDT, PNF, Sensory Integration, Constraint Induced Therapy.
   7.2. Describe the applications of a variety of treatment approaches to functional training activities such as: transfers, pressure relief, bed mobility, ROM, gait, ADLs and IADLs.
   7.3. Describe principles for positioning patients with abnormal tone, pain and sensory deficits, in sitting, sidelying, prone and supine.
   7.4. List relaxation/inhibition techniques used for patients with hypertonia, tactile defensiveness and combativeness.
   7.5. List facilitation techniques used for hypotonic patients.
   7.6. Discuss the basic principles in the use of lower extremity orthotics.
   7.6.1. Explain the basic principles of orthotics
   7.6.2. List the common indications for orthotics.
   7.6.3. Describe the precautions for orthotics.
   7.6.4. Identify common orthotic devices, key component parts and the primary purpose for which the orthotic would be used.
   7.6.5. Recognize skin condition changes that can occur with orthotic usage.
   7.7. Describe the adaptations that are made to treatments that address age differences.
   7.8. Describe the progression of a treatment program.
   7.9. Describe the appropriate use of adaptive equipment including: adaptive seating, balls, wedges, prone stander, tilt table, etc.
   7.10. Describe medical problems that may occur during treatment and actions that need to be taken including, how to monitor the patient, who to communicate the problem to, how to manage the patient.

8. Describe the importance of functional training in treatment of neurologic disorders.
8.1 Distinguish between physical function and psychological function.
8.2 Demonstrate understanding of functional assessment and impairment terminology.
8.3 Demonstrate ability to use a case study to apply clinical decision making skills when interpreting functional assessment data.

9. Demonstrate ability to use the Nagi model of disablement and the Guide to Physical Therapy to review a treatment plan.
9.1 Review a treatment plan for strategies that will address impairment, handicap and disability as needed.
9.2 Demonstrate the ability to use the Guide to Physical Therapy as a reference for assessment of a treatment plan.

LAB
1. Integrate professional behaviors into lab activities.
   1.1. Demonstrate professional behaviors including effective communication during lab activities and practicals.

2. Demonstrate ability to observe and describe normal movement and posture.
   2.1. Use appropriate terminology.
   2.2. Identify normal variations of movement.
   2.3. Describe normal posture and righting and equilibrium reactions in various positions and activities including:
       2.3.1. rolling
       2.3.2. supine-sitting
       2.3.3. sitting-standing
       2.3.4. walking

3. Demonstrate ability to integrate a variety of therapeutic principles and activities into an appropriate treatment program for individuals with neurologic dysfunction.
   3.1. Demonstrate ways to minimize abnormal postural reflexes and tone in a variety of positions.
   3.2. Demonstrate appropriate use of equipment including wedges, balls, bolsters, vestibular boards, scooters, etc.
   3.3. Demonstrate the use of functional activities and positions as therapeutic interventions.
   3.4. Demonstrate ability to modify intervention secondary to unrelated medical conditions and orthopedic principles.
   3.5. Demonstrate ability to adapt treatment program for related problems i.e., communication disorders, cognitive disorders, behavioral disorders, respiratory insufficiencies, and sensory disorders.
   3.6. Demonstrate and describe precautionary measures and contraindications to treatment.
   3.7. Demonstrate ability to progress a program from pre-function and pre-gait activities to various functional activities and gait.
   3.8 Demonstrate ability to assess balance using standardized test such as: Tinetti, Get Up and Go, Functional Reach Test, and Berg Balance Scale, then incorporate findings into treatment plan.

4. Describe the basic components and methods of application of selected orthotics.
   4.1. Identify the major components of and the methods of application of selected lower extremity and vertebral column braces.
   4.2. Differentiate between selected types of ankle joints, knee joints, locks, and upright attachments.
   4.3. Demonstrate ability to select and fit orthotics.
   4.4. Demonstrate ability to educate clients about care of orthotics.
   4.5. Demonstrate ability to educate clients about use of orthotics including safety concerns and skin care.
   4.6. Demonstrate ability to assess client understanding of instructions given.

5. Administer a therapeutic program based on a physical therapy plan of care, appropriate for individuals with neurological conditions.
   5.1. Identify areas of concern, precautions, etc.
   5.2. Identify and demonstrate a variety of appropriate treatment techniques.
   5.3. Demonstrate an understanding of safety factors as they relate to patient treatment.
   5.4 Demonstrate ability to gather data to develop a treatment program that will address plan of care.
   5.5. Demonstrate understanding of patient recovery and progression of exercises.
   5.6. Demonstrate ability to provide a variety of cueing that will facilitate patient learning.
   5.7. Discuss family and patient education as a part of treatment delivery.
   5.8. Demonstrate ability to assess client understanding of instructions.
   5.9. Demonstrate an ability to document interventions in SOAP format.
**COURSE POLICIES**

**Grading Procedure**
Tests – 60%
Quizzes – 5%
Lab Competencies/Practicals* – 20%
Case Presentations – 5%
Assignments – 5%
Professional Behavior** – 5%

Final grades will be determined as follows: A= 93-100, B= 85-92, C= 77-84, D and F below 77.

*A minimum score of 85% on each skill check is considered passing. You will be given three attempts to pass any skill check. On your second attempt, your assigned score will be .85 x your earned score. On third take, your assigned score will be .7225 x your earned score. You must pass every skill check to pass the course.

**This includes commitment to learning, interpersonal skills, communication skills, effective use of time and resources, use of constructive feedback, problem solving, professionalism, responsibility, critical thinking, and stress management and completion of portfolio requirements for the semester.

**Laboratory Classes**
Students are expected to keep lab clothes in a locker in the locker room adjacent to the lab. Students are expected to wear appropriate clothing for the activities planned. Refer to the dress code in the PTA Handbook. Not wearing lab clothes on lab days will affect the student’s participation grade. If there is a lecture prior to lab, students will be given time between lecture and lab to change clothes. If the class is meeting in the lab, students will be expected to be in lab clothes at the start of class. Failure to do so will affect the participation grade for the day.

**Skill Checks**
Skill checks will be completed after content is taught. Sign-up sheets will be posted. Deadlines for each skill check will also be posted. Failure to complete a skill check by the deadline will result in failure of the first attempt. The second attempt of any skill check must be arranged with the faculty member who teaches the class. Many skill checks require a partner. It is the student’s responsibility to arrange to have a partner available for the skill check.

**Academic Honesty Policy**
Academic honesty is required in all academic endeavors. Violations of academic honesty include any instance of plagiarism, cheating, seeking credit for another’s work, falsifying documents or academic records, or any other fraudulent classroom activity.

Violations of academic honesty may result in a failing grade on the assignment, failure in the course, or expulsion from the program or school. When a student’s grade has been affected, violations of academic honesty will be reported to the Provost or the designated representative.

**Violations of Academic Honesty**
Violations of academic honesty include, but are not limited to, the following activities:

1. Copying another person’s work and claiming it as your own;
2. Using the work of a group of students when the assignment requires individual work;
3. Looking at or attempting to look at an examination before it is administered;
4. Using materials during an examination that are not permitted;
5. Allowing another student to take a quiz/exam including a “clicker” quiz/exam for you;
6. Intentionally impeding the academic work of others;
7. Using any electronic device to transmit portions of questions or answers on an examination to other students
8. Using any electronic device to improperly store information for an exam;
9. Providing false attendance data including “clicker” attendance for another student;
10. Knowingly furnishing false information to the University or its representatives;
11. Operating another student’s clicker or allowing someone else to operate your clicker;
12. Assisting other student in any of the acts listed above.

Please see the Western Student Handbook and Calendar for a full description of the Western Academic Honesty policy and the student due process procedure. The handbook is available online at http://www.missouriwestern.edu/handbook/index.pdf

According to the policy of the PTA Program, if a student is found cheating, immediate dismissal from the program will result. See PTA Student Handbook for more information.

Make-up Exam/Assignment Policy
Exams are to be taken on the scheduled dates. A student having a valid reason for missing a scheduled exam and who notifies me before the test may arrange to take a make-up exam which may be in essay form. All make-up exams will be given in December, during the final exam period for this class. It is the student’s responsibility to make arrangements for make-up exams.

Assignments turned in after the class period on the date due will be graded down one letter grade per day late. Exams are to be taken on the scheduled dates. A student having a valid reason for missing a scheduled exam and who notifies me before the test may arrange to take the exam at a later date. The student will be required to take the missed exam and pass it with greater than 76%. Any student who does not notify me before the exam will be given a “0” for the exam.

A student having a valid reason for missing a scheduled skill check/lab practical and who notifies me and the tester before the scheduled time may arrange to take the skill check/lab practical at a later date. Failure to notify beforehand will result in a first attempt failure.

It is the student’s responsibility to reschedule any missed assessments.

Assignments turned in after the class period in which they are due will be graded down one letter grade for each day late.

Attendance policy is outlined in the PTA Student Handbook.

Accessibility Policy
If you have been diagnosed with a disability or if you suspect that you may have a disability that has never been diagnosed and would like to find out what services may be available, please visit the Office of Disability Services (ODS) in Eder Hall, room 203N or visit the ODS website at http://www.missouriwestern.edu/ds/ as soon as possible. This syllabus, as well as all other printed or electronic materials, can be made available in alternative/accessible formats if requested with sufficient prior notice. Missouri Western is an equal opportunity/affirmative action institution.