

NEUROLOGY SECTION

NEUROLOGIC ENTRY-LEVEL CURRICULAR CONTENT INTEGRATED WITH *A NORMATIVE MODEL OF PHYSICAL THERAPIST PROFESSIONAL EDUCATION*

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Introduction

As part of the strategic plan, the Neurology Section identified the need to define neurologic entry-level content for physical therapist graduates of professional education programs. Through an open nomination process within the Neurology section, 48 individuals with expertise across a variety of areas of neurologic education and practice were identified. The planning committee for this conference selected a representative group of 15 members (Appendix C) with broad geographic representation, years of experience in neurologic practice ranging from 1 to 30, and with and without ABPTS Board Certification in Neurology. Participants with teaching, practice, and research experience represented diverse areas of neurologic practice with patient populations across the lifespan focusing on patients with vestibular disorders, stroke, spinal cord injury, traumatic brain injury, and degenerative and developmental neurologic conditions.

A consensus conference was convened on October 10-12, 2008 in Alexandria, VA at APTA Headquarters. The purpose of this conference was to achieve agreement on entry-level neurologic content in physical therapist curriculum in the preparation of the physical therapist graduate, including:

- (1) expectations for neurologic knowledge and skills for the new graduate upon entry into clinical practice including full consideration of the current and emerging education and health care environment,
- (2) terminal behavioral objectives and sample learning objectives for the classroom and clinical practice as related to entry-level content, and
- (3) identification of any content that exceeds entry-level appropriate for post-professional education.

Key assumptions were identified for the conference to frame participants' discussion and to ensure a common context for the discussion. These assumptions included:

- Given that 92% of physical therapist programs are accredited to award the professional DPT degree, discussions about entry-level neurologic content will occur within the context of Vision 2020 and the DPT professional degree.
- The framework for the development of entry-level neurologic content will be consistent with and complement APTA's *Normative Model of Physical Therapist Professional Education* and *the Guide to Physical Therapist Practice as they provide the foundational guidelines for the profession and its educational preparation*.
- The identification of entry-level neurologic content must be framed within a 3-year curriculum where consideration is given to content that also addresses other systems including musculoskeletal, cardiovascular/pulmonary, and integumentary.
- The new graduate is prepared for general practice where neurologic physical therapy is one of the areas included as part of general practice.
- Entry-level neurologic content includes both didactic coursework and clinical practice performance expectations. Capabilities of current PT practitioners as related to neurologic content at entry-level should not minimize or compromise the expectations of future physical therapist practitioners.

- Consensus on the neurologic curricular content for new graduates will require a 90% level of agreement among member participants.

The conference was facilitated by APTA staff, and participants' work was accurately documented throughout the discussion process by staff recorders. As a part of the conference decision-making process, participants accessed key resource documents within the profession to frame their discussion. These core documents included: *A Normative Model of Physical Therapist Professional Education: Version 2004*, *Minimum Required Skills of Physical Therapist Graduates at Entry-Level*, *Guide to Physical Therapist Practice*, *Vision 2020 and the Framing Scenario*, *Neurology Specialist Description of Specialty Practice (DSP)*, *Neurologic Physical Therapy Clinical Specialist Practice Analysis Survey (October 2002)*, research data on PT Member Demographic Profile (1999-2006), Reported Productivity Expectations of PTs (1999-2005), and Patient Types and Time Management By Facility from the 2006 Practice Profile Survey. In addition, the Neurology Section Practice Committee conducted a survey of academicians and clinicians with neurologic expertise to identify for specified content areas found in the PT Normative Model, curricular content with relevant evidence believed to be essential for DPT entry-level practice for both general and neurologic specialty practice. Areas addressed by this survey included 1) foundational and clinical sciences, 2) screening tools, 3) tests and measures, 4) interventions, and 5) prevention/wellness.

Using a structured and systematic decision-making process, participants identified specific and all-inclusive entry-level neurologic content, examples of terminal behavioral objectives for that specific content, examples of instructional objectives to be achieved in the classroom, and examples of instructional objectives to be achieved in clinical practice. Additionally, where available, references have been provided in support of the evidence for adding specific neurologic content. A glossary (Appendix A) is available at the end of the document that defines terminology.

The outcomes resulting from this conference were shared with the members of the Neurology Section and the physical therapist education community to achieve a broader consensus on standards for entry-level doctor of physical therapy education and Vision 2020.

- The guidelines were shared with Neurology Section Leadership (Neurology Section Board of Directors, Committee Chairs, and SIG Chairs) in 2009. Suggestions for further feedback were received and implemented.
 - The draft document was posted on the Neurology Section Website www.neuropt.org for review and comment.
 - Feedback sessions were held at CSM 2009 (Las Vegas) at the Practice Issues Forum, and at the National Meeting and Exposition in Baltimore, 2009.
 - Conference calls were held for any interested party to discuss different sections of the document.
 - Foundation and Clinical Sciences
 - Core Values, Screening, Prevention and Wellness, Management of Health Care Delivery, and Practice management
 - Examination, Evaluation, Diagnosis, and Prognosis

- Intervention

Results from the evidence-based Neurology Section Stroke EDGE task force also led to reassessment and revision of the examination section of the document specific to current test and measures to assess stroke specific issues by the two co-chairpersons. The revised document which incorporated the feedback discussed above was made available for review and comment to the original Consensus group via the use of a survey which sought percent agreement of the final draft product. The final draft product was then offered for approval by the task force to the neurology Section Board of Directors and the APTA Board Document Review Group. Following the Board's review and approval, the document will be made available to academic and clinical educators through the Neurology Section dissemination plan.

This product is produced in a format that parallels and supports the PT Normative Model to facilitate faculty's ability to integrate essential neurologic content within the current physical therapist professional curriculum. Within the document, items included in *italics* indicate the additional content added as a result of this conference. Although the PT Normative Model includes additional content beyond what appears in this document, the outcomes from the conference were intended to *address only those unique and specific areas targeting neurologic content specifically* relevant to the PT Normative Model. Figure 1 is provided for reviewing the neurology content additions in isolation from the full Normative Model document. Please remember, however, that these additions are *not all inclusive of full* neurology content recommended for entry-level Physical Therapist education, since the normative level originally contained many items that are pertinent to neurology education. Table 1 is provided for ease in reviewing the Entry-Level Neurologic Content Guidelines Tests and Measures by ICF Category. In the Neurologic Entry-Level Curricular Content presented below, guidelines are provided as to whether "students should learn to administer" or "should have knowledge of (be exposed to)" of specific tests and measures. Finally, examples of Terminal Behavioral Objectives and Instructional Objectives to be achieved in the classroom, and Instructional Objectives to be achieved in clinical practice are provided to promote clarity regarding how one might integrate this information into their curriculum plan.

NEUROLOGIC ENTRY-LEVEL CURRICULAR CONTENT
APTA Neurology Section

Primary Content	Examples of Terminal Behavioral Objective After the completion of the content, the student will be able to...	Examples of Instructional Objectives to Be Achieved in the Classroom	Examples of Instructional Objectives to Be Achieved in Clinical Practice
FOUNDATION SCIENCES			
Biology/Anatomy, Cellular Histology, Physiology			
Systems Nervous (central nervous system [CNS], peripheral nervous system [PNS], and autonomic nervous system [ANS]) Gross anatomy Surface anatomy <i>Molecular, Cellular, and Tissue Biology</i> Embryology <i>Physiology across life span</i> <i>Imaging (magnetic resonance imaging [MRI], fMRI, CT scan, PET scan)</i> Circulatory (neurovascular, cardiovascular, lymphatic, and immune) Gross anatomy Surface anatomy Cellular Biology Embryology Physiology <i>Imaging (Angiogram)</i>	<ul style="list-style-type: none"> • <i>Describe and discuss the function of cells and cellular components of the autonomic nervous system structures.</i> • <i>Identify a key anatomical nervous system structure on a CT scan.</i> 	<ul style="list-style-type: none"> • <i>Predict alterations in body structure and function given an abnormal CT scan of the brainstem.</i> • <i>Identify the clinical syndrome associated with an abnormal MRI of the cervical spinal cord.</i> 	<ul style="list-style-type: none"> • <i>Given a patient with right middle cerebral artery cerebrovascular accident (CVA):</i> <ul style="list-style-type: none"> • <i>predict the likely alterations in body structure and function.</i> • <i>locate the lesion on an MRI.</i>
Exercise Physiology			
Physiological responses based on the influence of <i>neuropathology</i> , age, genetics, and culture on resting measurements and responses to activity.	<ul style="list-style-type: none"> • <i>Compare the neuromuscular adaptations to exercise training between individuals with and without Multiple Sclerosis (MS).</i> 	<ul style="list-style-type: none"> • <i>Describe the potential benefits of an exercise program on the nervous system in the aging population.</i> 	<ul style="list-style-type: none"> • <i>Create a safe and effective exercise program for an individual with post-polio syndrome.</i> • <i>Determine which patients with neurological conditions would be appropriate for an aquatic exercise program.</i>

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Primary Content	Examples of Terminal Behavioral Objective After the completion of the content, the student will be able to...	Examples of Instructional Objectives to Be Achieved in the Classroom	Examples of Instructional Objectives to Be Achieved in Clinical Practice
Adaptations to regular exercise of various types (aerobic or endurance training, interval or anaerobic training, muscle strengthening programs) Exercise specificity Effects on cardiovascular and pulmonary systems, metabolism, blood lipid levels, skeletal, connective tissue, hormonal systems, <i>and nervous system</i> Hormonal changes with exercise and aging			
Principles of exercise prescription to improve cardiovascular fitness To improve health (decrease risk of selected diseases) To increase muscle strength and <i>muscle</i> endurance <i>To improve activity and participation</i>			
Exercise			
Strength training (<i>overload weakness related to denervated muscle</i>)	<ul style="list-style-type: none"> Analyze and prescribe exercise parameters to build or maintain strength for an individual with post-polio syndrome. 	<ul style="list-style-type: none"> Differentiate the use of various form of exercise (isometric, concentric, eccentric) for building strength in patients with neurological conditions. 	<ul style="list-style-type: none"> Design a home exercise program to build strength in a patient with early stage Parkinson disease (PD).
Aerobic/anaerobic conditioning (<i>central fatigue</i>)	<ul style="list-style-type: none"> Analyze and implement aerobic/anaerobic conditioning program for a patient with brain injury with central fatigue. 	<ul style="list-style-type: none"> Describe factors that contribute to complaints of fatigue in a patient with MS. 	<ul style="list-style-type: none"> Monitor the response to exercise of a patient with central fatigue.

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<i>Coordination (timing, sequencing, grading, individuation)</i>	<ul style="list-style-type: none"> List the functional outcomes of coordination deficits in functional activities, such as sit to stand. 	<ul style="list-style-type: none"> Identify tasks that require movement out of abnormal synergies commonly seen in patients with stroke. 	<ul style="list-style-type: none"> Design a program to improve eye-head coordination in a patient with gaze instability.
<i>Balance (postural control, motor and sensory organization, central processing, anticipatory and reactive responses)</i>	<ul style="list-style-type: none"> Compare and contrast anticipatory and reactive balance responses. Describe strategies to examine dual task performance during walking. 	<ul style="list-style-type: none"> Identify activities that promote motor strategy retraining. 	<ul style="list-style-type: none"> Conduct a group exercise class for older adults at risk for falls. Design a sensory organization training program for a patient with unilateral vestibular hypofunction.
<i>Flexibility (contracture due to mechanical or neural issues)</i>	<ul style="list-style-type: none"> Describe the effects of serial casting on muscle length. 	<ul style="list-style-type: none"> Design a program to improve axial mobility in a patient with PD. 	<ul style="list-style-type: none"> Teach a patient with a lower extremity spasticity and contracture self-stretching exercise.
Biomechanics			
<i>Technology-assisted analysis Types available Information provided Interpretation of data</i>	<ul style="list-style-type: none"> Compare and contrast healthy performance versus impaired gait of patients with neurologic conditions. Discuss different forms of motion analysis for patients with neurologic conditions. Explain the usefulness of vestibular function tests in a patient with a vestibular disorder (ENG, caloric). Describe the indication for posturographic testing in a neurologic patient with balance 	<ul style="list-style-type: none"> Interpret the data from a posturographic analysis. 	<ul style="list-style-type: none"> Identify the appropriate technology options available for the assessment and treatment of balance disorders.

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Primary Content	Examples of Terminal Behavioral Objective After the completion of the content, the student will be able to...	Examples of Instructional Objectives to Be Achieved in the Classroom	Examples of Instructional Objectives to Be Achieved in Clinical Practice
	<i>disorder.</i>		
Kinesiology			
Analysis of functional activities and tasks Description of movement <i>Posture</i> <i>Initiation</i> <i>Execution</i> <i>Termination</i> Factors affecting motion Observation Technology-assisted <i>analysis</i> Types available Information provided Interpretation of data	<ul style="list-style-type: none"> Analyze the sequence of movements associated with the following functional tasks: stair climbing, bed mobility, transfers, reaching, and scooting. 	<ul style="list-style-type: none"> List the appropriate sequence of movements for sit to stand task. 	<ul style="list-style-type: none"> Analyze the rolling pattern of a patient with acute hemiplegia and identify deficits in posture, initiation, execution, and termination.
Neuroscience			
Neurophysiology (PNS, CNS, ANS) Membrane properties Processing of information at neuronal level including long-term potentiation Neurotransmission (electrical and chemical neurotransmitters, <i>Electromyography EMG, nerve conduction</i>) Alterations due to injury and disease across the lifespan	<ul style="list-style-type: none"> Explain the neurophysiological basis for phantom limb sensation. 	<ul style="list-style-type: none"> Describe principles of behavioral training that drive neuroplastic changes in the nervous system and across the lifespan. 	<ul style="list-style-type: none"> Recognize a patient that may benefit from an EMG or nerve conduction study to assist with your evaluation.
<i>Mechanisms underlying plasticity</i> <i>Cellular through behavioral levels</i> <i>Across the lifespan</i> Status post injury or disease During learning <i>In response to activity including</i>	<ul style="list-style-type: none"> Design an exercise program that applies key factors to maximize plasticity in a patient 6 weeks post Traumatic Brain Injury (TBI). 	<ul style="list-style-type: none"> Explain the mechanism underlying habituation exercises for a patient with vertigo. List the key factors that have 	<ul style="list-style-type: none"> Apply evidence for constraint induced movement therapy in a patient with chronic stroke.

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<i>exercise</i>		<i>been supported by evidence to promote exercise-induced plasticity.</i>	
Neuroanatomy (CNS, ANS, PNS) Classification and functional purpose of neurons Ascending pathways, descending pathways and interconnections Composition and functions of regions or systems (e.g., brain, brainstem, cranial nerves, spinal cord, <i>peripheral nerves, and neuromuscular junction</i>) Blood supply of brain, brainstem, and spinal cord Ventricular system/ cerebrospinal fluid Meninges and meningeal spaces Plasticity Changes in structure across the lifespan Imaging (e.g., MRI, fMRI, CT Scan, PET Scan, angiogram)	<ul style="list-style-type: none"> • <i>Discuss the role of imaging in the management of a patient with neurologic conditions.</i> 	<ul style="list-style-type: none"> • <i>Describe the neuroanatomical changes that underlie the symptoms associated with myasthenia gravis.</i> 	<ul style="list-style-type: none"> • <i>Explain the effects of Botox injection in a child with spastic diplegia to the caregiver.</i> • <i>Compare and contrast the pattern of sensory loss in a patient with upper extremity diabetic neuropathy and a patient with carpal tunnel syndrome.</i> • <i>Identify evidence of diffuse axonal injury on magnetic resonance imaging (MRI) in a patient with severe TBI.</i>
Neurological function Motor control Theories and models of motor control (e.g., <i>dynamical systems, reflex, hierarchical</i>) Theories and models of functional movement (e.g., <i>posture, locomotion, and reaching</i>) Feedback and feed-forward control mechanisms Motor learning (<i>implicit and explicit</i>),	<ul style="list-style-type: none"> • <i>Compare and contrast explicit and implicit memory/learning.</i> • <i>Compare and contrast location of the lesions that underlie upper versus lower motor neuron syndromes.</i> • <i>Describe the motor control processes underlying models of functional movement for posture, locomotion, and reaching.</i> 	<ul style="list-style-type: none"> • <i>Describe the differences between short term, long term, and working memory.</i> 	<ul style="list-style-type: none"> • <i>Justify a practice schedule used in intervention for a patient with cerebellar disorder.</i> • <i>Demonstrate the use of appropriate feedback to promote optimal leaning in patients with PD.</i> • <i>Apply the theories of motor control in designing a locomotor training program</i>

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<p>Theories and models of <i>normal and impaired</i> motor learning Practice and feedback effects Cognition Memory, arousal, <i>orientation</i>, attention, and <i>executive function</i> (reasoning, problem solving) categorization, and memory <i>Language and communication</i> (e.g., <i>aphasia</i>) Sensation and perception Sensory and <i>motor</i> systems: neuroanatomy and physiology of sensory and motor systems <i>across the lifespan</i> (vision, auditory, olfaction, vestibular, <i>reflexes, cerebellum, basal ganglia</i>) Neuroimmunology Antigens acting on neural tissue <i>Neuroendocrinology</i> <i>Effects of chronic stress</i> Affective control Limbic system</p>	<ul style="list-style-type: none"> • <i>Discuss the neurological implications between acute and chronic stress.</i> 		<p><i>for a patient with incomplete spinal cord injury (SCI).</i></p>
Pathology			
<p><i>Natural course of commonly seen primary neurologic, musculoskeletal, and other system disorders/diseases</i></p>			
<p>Specific systems pathology Circulatory (cardiovascular, lymphatic, and immune) Endocrine Gastrointestinal</p>	<ul style="list-style-type: none"> • <i>Describe the natural course of commonly seen nervous system disorders as found in the primary content list.</i> • <i>Explain the differences in</i> 	<ul style="list-style-type: none"> • <i>Predict the symptoms you would see in a patient with left anterior cerebral artery occlusion.</i> • <i>Outline the signs and</i> 	<ul style="list-style-type: none"> • <i>Describe the common cognitive deficits associated with pre-frontal cortex injury, and the potential participation</i>

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Genitourinary Integumentary Metabolic Muscular Nervous Stroke syndrome Traumatic brain injury (TBI) Spinal cord injury (SCI) Vestibular disorders Cerebellar disorders Peripheral nerve disorders Degenerative disorders (Parkinson's disease [PD], Amyotrophic lateral sclerosis [ALS], Huntington disease, dementias) Congenital disorders (Cerebral palsy [CP], Down syndrome, Spinal bifida) Demyelinating disorders (Multiple Sclerosis [MS], Guillain-Barré syndrome [GBS]) Tumors Muscular dystrophy (MD) Complex regional pain syndromes (CRPS) Post-polio syndrome (PPS) Respiratory Skeletal	<i>prognosis related to neurodegenerative and acquired neurologic disorders.</i>	<i>symptoms of Guillain Barre syndrome.</i> <ul style="list-style-type: none"> Outline the abnormal response to exercise that may occur in a patient with complex regional pain syndrome. 	<i>limitations.</i> <ul style="list-style-type: none"> Design an intervention that considers attention deficits with neurological patients.
BEHAVIORAL SCIENCES			
Communication			
Verbal communication Active/effective listening Empathetic responding Interview skills	<ul style="list-style-type: none"> Discuss the optimal environmental conditions for communicating with a patient with communication and attention 	<ul style="list-style-type: none"> Demonstrate, through role-play, the adjustments to communication style for a patient with language or 	<ul style="list-style-type: none"> Demonstrate effective nonverbal communication strategies for a patient with aphasia.

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Language skills Communication in language other than English or impaired communication ability (<i>aphasia, dysarthria, alaryngeal speech</i>)	<i>deficits.</i>	<i>cognitive deficits.</i>	
Social and Psychologic Factors			
Psychological/emotional responses to illnesses and disability Anxiety (<i>fear of falling</i>) Malingering Aphysiologic responses (<i>e.g., amplification, conversion</i>) Substance abuse Suicide Stress (<i>e.g., Post traumatic stress disorder (PTSD)</i>) Grief and loss (<i>end of life and chronic disability</i>) Coping Lack of awareness of deficit Depression Emotional lability Sexuality		<ul style="list-style-type: none"> • <i>Describe characteristics associated with fear of falling.</i> • <i>Identify the impact of end-of-life issues and chronic disability on normal behavior.</i> • <i>Identify sexual problems associated with specific neurologic diagnoses and make plans of care for intervention, referral, and/or consultation.</i> • <i>Differentiate physiologic and aphysiologic responses on balance testing on a patient after mild concussion.</i> 	<ul style="list-style-type: none"> • <i>Design a balance retraining program that addresses the factors that contribute to the fear of falling.</i> • <i>Explain the role of a physical therapist in managing patients across the lifespan with a terminal or progressive illness.</i> • <i>Adapt an intervention for a patient with a left sided sensorimotor neglect.</i> • <i>Explain the benefits of using a power wheelchair to a marginally ambulatory patient with multiple sclerosis.</i>
Ethics and Values			
Patent/client rights Competence related to cognitive impairment	<ul style="list-style-type: none"> • <i>Identify circumstances where patients' cognitive status may impact their decision-making.</i> 		<ul style="list-style-type: none"> • <i>Select appropriate strategies to manage patients with compromised decision-making abilities.</i>
Advocacy Access to care Funding for long-term and	<ul style="list-style-type: none"> • <i>Participate in advocacy related to patient access to rehabilitation services and assistive technology.</i> 	<ul style="list-style-type: none"> • <i>Write a letter of medical necessity advocating for denied services and/or</i> 	<ul style="list-style-type: none"> • <i>Appraise situations where insurance will not cover the needs of a neurologic</i>

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<p><i>catastrophic care</i> Resource allocation for least restrictive environment (at home, workplace, community integration)</p>		<p><i>assistive technology.</i></p>	<p><i>patient and advocate for alternative funding sources in collaboration with other team members or community organizations.</i></p>
Teaching and Learning			
<p>Learning theory <i>across the lifespan</i> Teaching methods for various audiences (patients, peers, community, caregivers, family, other health professionals, policymakers)</p>	<ul style="list-style-type: none"> • <i>Discuss different philosophical orientations that guide the design of learning experiences for various audiences.</i> • <i>Discuss factors that have an impact on the success of learning, including socioeconomic status, language differences, age, disease processes, culture, and emotions.</i> 	<ul style="list-style-type: none"> • <i>Conduct a transfer training session for a patient with SCI that incorporates his or her learning style and needs.</i> 	
Clinical reasoning			
<p>Models of clinical reasoning Patient care management (e.g., Hypothesis-oriented algorithm for clinicians II [HOAC II]) <i>Fell decision-making model for progression</i> <i>Enablement/disablement</i>, <i>International Classification of Functioning, Disability, and Health (ICF)</i>, and knowledge of <i>Nagi Model</i>, <i>Top Down Model (Gordon & Quinn)</i></p>	<ul style="list-style-type: none"> • <i>Weigh the advantages and disadvantages of various models of clinical reasoning for a patient with a neurological disorder.</i> 	<ul style="list-style-type: none"> • <i>Identify the components of various clinical reasoning models used with patients with neurological disorders.</i> 	<ul style="list-style-type: none"> • <i>Use a clinical reasoning model to select appropriate tests and measures for a patient with TBI.</i> • <i>Synthesize patient examination data to identify hypotheses underlying the design of a plan of care for a patient with a neurologic disorder.</i>
Evidence-Based Practice			

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<p>Critically analyze evidence <i>Legal and ethical standards for conducting research (e.g., IRB)</i> Research design Experimental Nonexperimental Quantitative Qualitative Quasiexperimental Observational <i>(CPI) Clinical Practice Improvement Studies</i> Measurement science Definitions Requirements Data types Reliability and validity of data Sensitivity, specificity, likelihood ratios <i>Responsiveness (e.g., effect size)</i> <i>Minimal Clinical Importance Difference</i> Applied statistics Sampling population Sampling techniques Probability sampling Nonprobability sampling Reference populations Dependent variables Independent variables Common statistical tests Parametric statistics Nonparametric statistics <i>Power analysis</i> <i>Sensitivity analysis</i></p>	<ul style="list-style-type: none"> • <i>Analyze the evidence to justify selection of outcome measures for stroke.</i> • <i>Outline the basic requirements of measurement data type, reliability, validity, sensitivity, specificity, likelihood ratios, reference norms, calibrations, standardization, and responsiveness.</i> • <i>Explain legal and ethical standards for conducting research, including informed consent, institutional review board (IRB) process, and ethical use of data.</i> • <i>Outline the advantages and disadvantages of different types of research designs.</i> 	<ul style="list-style-type: none"> • <i>Interpret Functional Independence Measure (FIM) scores in relation to a patient's level of functional independence.</i> • <i>Examine the validity and reliability of the OPTIMAL.</i> 	<ul style="list-style-type: none"> • <i>Determine if the changes in patient performance made on the Berg balance scale represent clinically important change for a patient with a stroke.</i>

**NEUROLOGIC ENTRY-LEVEL CURRICULAR CONTENT
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Primary Content	Examples of Terminal Behavioral Objective After the completion of the content, the student will be able to...	Examples of Instructional Objectives to Be Achieved in the Classroom	Examples of Instructional Objectives to Be Achieved in Clinical Practice
<i>Clinical prediction rules</i>			
CLINICAL SCIENCES			
Neuromuscular			
Diseases, injuries, or conditions of the neuromuscular (CNS, PNS, ANS) system for which physical therapy management is indicated to manage the primary (e.g., gait and balance training post hemiparesis) and/or secondary effects (e.g., contractures, pressure sores), and/or co-morbidities (osteoarthritis, congestive heart failure, diabetes)			<ul style="list-style-type: none"> • <i>Design a balance treatment program for a patient with COPD and peripheral neuropathy.</i> • <i>Include prevention strategies to prevent secondary complications in neurological patients (e.g., heel pressure sores in a patient with diabetes and SCI, painful shoulder after stroke, contractures in a pediatric patient with decerebrate posturing after TBI.</i>
PRACTICE EXPECTATIONS			
PE #1: Accountability			
<p><i>Specific to patients with cognitive and or behavioral impairments</i></p> <p>Foundational and clinical sciences</p> <p>Peer and self-assessment tools</p> <p>Codes of Ethics, including disciplinary process</p> <p>External accrediting agencies (e.g., Joint Commission on Accreditation of Healthcare Organizations,</p>	<ul style="list-style-type: none"> • Identify the patient /client ability to understand the consequences of their behaviors and adjust accordingly. • Weigh and balance sources of accountability to determine actions. • Incorporate concepts of intentional change into the components of home exercise programs. • Incorporate concepts of 	<ul style="list-style-type: none"> • Identify sources of accountability. • Given a case study, analyze the effectiveness of interpersonal strategies to enhance professional interactions. • Identify types of self-assessment mechanisms. • Ensure, through appropriate direction and supervision of support personnel, the safety, 	<ul style="list-style-type: none"> • Demonstrate accountability for actions and decisions by admitting mistakes/errors and taking steps to ameliorate any negative effects of a poor decision. • Recognize and appreciate the consequences of a course of action when making decisions. • Identify and discuss

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<p>Commission on Accreditation of Rehabilitation Facilities)</p> <p>Federal and state rules and regulations, including Centers for Medicare and Medicaid Services, Health Insurance Portability and Accountability Act, Occupational Safety and Health Administration, Americans with Disabilities Act, and federal/state health department</p> <p>Mechanisms for self-improvement Legal structure of organizations</p> <p>Organizational structure and behavior</p> <p>Systems theory</p> <p>Communication theory</p> <p>Theory and components of intentional change and learning styles</p> <p>Dynamics of interpersonal exchange</p> <p>Organizations associated with health Initiatives</p> <p>Standards of practice</p>	<p>intentional change into the self-assessment process.</p> <ul style="list-style-type: none"> • Apply the laws and regulations governing physical therapy practice to specific scenarios. • Discuss practice standards as they affect the practice of physical therapy. • Recognize conflict between ethical and legal principles and assume responsibility for the selected course of action. • Exhibit behaviors consistent with clinical facility and professional policy and procedures. • Discuss the legal and ethical boundaries of confidentiality. • Discuss the impact of ownership of a physical therapy practice on the fiduciary relationship owed to all patients/clients. • Determine when employment in a given setting must be terminated because of ethical conflict. • Identify inappropriate sexual behavior directed by patients/clients and others at physical therapists in the workplace and describe strategies used to stop such behaviors. 	<p>security, and best care of patients/clients.</p> <ul style="list-style-type: none"> • Perform self-assessment of personal and professional development needs. • Demonstrate an ability to analyze cost-effectiveness of patient/client interventions. • Identify types of service assessment mechanisms (e.g., patient/client surveys, etc). • Identify common ownership models (both public and private ownership models). • Identify differences between publicly traded for-profit corporations and other corporations that have ownership of physical therapy practices. • Identify the professional and legal responsibilities of a physical therapist that discovers another physical therapist sexually harassing patients/clients or others. • Discuss codes of professional behavior, including APTA's Code of Ethics and Guide for Professional Conduct, and Standards of Practice for Physical Therapy. • Engage in oral and written 	<p>potential conflict of interest actions inherent in all professional practice.</p> <ul style="list-style-type: none"> • Demonstrate appropriate professional behavior when carrying out clinical responsibilities. • Manage challenging ethical dilemmas. • Establish an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services.

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		reflection on ethical and legal issues. <ul style="list-style-type: none"> • Discuss the rules and regulations governing the practice of physical therapy within the jurisdiction in which the individual practices. • Develop a plan of action for a difficult ethical situation. • Identify circumstances requiring a report of abuse or neglect. • Write a protocol for physical therapists to use to respond to inappropriate sexual behaviors directed toward them. • Identify sources of emotional support and guidance for physical therapists that have been the targets of inappropriate sexual behavior from their patients/clients. 	
PE #6: Communication			
<p><i>Specific to individuals with neurological deficits, resulting in communication disorders, cognitive and or behavioral impairments.</i></p> <p>Foundational and clinical sciences</p> <p>Verbal communication</p> <ul style="list-style-type: none"> • Active/effective listening 	<ul style="list-style-type: none"> • <i>Alters communication methods to meet the unique needs of patients/clients with disabilities affecting communication or interactions (e.g., aphasia, perceptual deficits, and altered cognition).</i> • Communicate clearly with sensitivity and with 	<ul style="list-style-type: none"> • Engage in communication role-play, with feedback provided from peers in the health care and larger communities. • <i>Engage in role-play simulating communication with a patient/client with disability impacting ability to</i> 	<ul style="list-style-type: none"> • <i>Demonstrate effective communication with a patient who presents with altered cognition.</i> • Communicate effectively with all individuals involved in the care of the patient/client. • Communicate effectively

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<ul style="list-style-type: none"> • Empathetic responding • Interview skills • Language skills <p>Communication in language other than English or impaired communication ability</p> <p>Nonverbal communication Professional communication Principles of oral and written communication</p> <p>Use of media</p> <p>Relationships with others</p> <p>Therapeutic presence</p> <p>Motivational strategies (behavior modification, etc)</p> <p>Conflict resolution</p> <p>Assertiveness</p> <p>Empowerment</p>	<p>responsiveness with the patient's/client's family members, colleagues, and other professionals within the patient/client care setting.</p> <ul style="list-style-type: none"> • Initiate and respond to communication with sensitivity to differences in race/ethnicity, religion, gender, age, national origin, sexual orientation, and disability or health status. • Respond with sensitivity to differences in race/ethnicity, religion, gender, age, national origin, sexual orientation, and disability or health status. • Communicate with all participants in the care of the patient/client and consider their roles and contributions to care. • Select individual versus group format for communication. • Demonstrate professional and technically correct oral and written communication skills. • Communicate using body language consistent with the intended message and recognize, interpret, and respond to the body language of others consistently with professional guidelines and the educational level of the individual. 	<p><i>communicate.</i></p> <ul style="list-style-type: none"> • <i>Role-play a conversation with other health care professionals to resolve disagreement regarding patient management for a patient with a neurologic condition (e.g., MS, PD, CVA, and ALS).</i> 	<p>with supervisors to meet your needs for clinical success.</p> <ul style="list-style-type: none"> • Communicate confidently in a variety of clinical forums. • Document clinical encounters effectively. • Demonstrate skill in providing feedback to clinical educators and professional colleagues. • Communicate with patients/clients using terminology relevant to the situation. • Assess the effectiveness of communication with patients/clients, family, caregivers, and other health care providers. • Recognize the need to utilize interpreter resources to enhance patient/client communication

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PE #8: Clinical reasoning			
Foundational and clinical sciences Clinical reasoning Models of clinical reasoning Knowledge of Patient care management models (e.g., Hypothesis-oriented algorithm for clinicians II, <i>(HOAC II)</i> , and <i>Progressing Therapy Intervention</i>) <i>Enablement/disablement models (ICF, also knowledge of Nagi, Top Down models)</i> <i>Movement and tasks analysis models</i> Theory of clinical reasoning History of patients/clients	<ul style="list-style-type: none"> • Describe and discuss the application of clinical reasoning processes to clinical practice. • Select a clinical decision making (CDM) model that best fits the patient/client and the practice setting. • Apply a CDM model to guide and justify patient/client management decisions. • Evaluate the effectiveness of the CDM model used in patient/client management and revise as necessary. 	<ul style="list-style-type: none"> • <i>Compare and contrast CDM models that may be applied in treating patients with neurology conditions.</i> • <i>Apply CDM to a case patient who presents with cerebrovascular accident (CVA).</i> • Review literature on CDM models. • Apply CDM within context of patient/client, and family needs, ethical values, and resources. • Prepare a thorough description of the process of diagnosing a patient/client. • Debate theoretical concepts underlying physical therapy practice. 	<ul style="list-style-type: none"> • <i>Analyze functional movement of a patient post-stroke and determine barriers to community locomotion.</i> • Provide rationale for CDM. • Analyze errors in clinical practice. • Describe variables that create complex clinical cases. • Analyze and integrate patient/client feedback into the CDM and case management processes. • Integrate research on CDM in clinical practice during clinical education experiences. • Explicitly identify elements of the clinical decision-making model used with a patient/client. • Provide two to three possible diagnoses to correspond with a patient's/client's presenting signs and symptoms. • Regularly and independently, take responsibility for finding information to improve knowledge.

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PE #9: Evidence-Based Practice			
Foundational and clinical sciences Evidence-based practice • Formulate clinical questions • Identify appropriate information sources • Critically analyze evidence • Summarize evidence History of patients/clients	<ul style="list-style-type: none"> • Access professional literature databases. • Conduct a critical appraisal of current literature (Review, analyze, and critique) and determine how the literature affects the practice of physical therapy. • Apply the results of clinical research to clinical practice. • Collaborate in collecting clinical data with accuracy and reliability. • Apply professional literature to decisions made managing patients/clients. • Demonstrate appropriate skepticism in adopting evidence that guides professional action. • Regularly seek disconfirming evidence to challenge initial hypothesis. 	<ul style="list-style-type: none"> • Assess intrarater and interrater reliability of selected clinical measurements. • Revise a patient/client care protocol based on a review of research literature. • Prepare a response to a clinically relevant question based on an investigative information search. • Prepare a critical appraisal of a topic. • Critically assess a published peer reviewed article. • Compile multiple sources of evidence in conducting case analyses. 	<ul style="list-style-type: none"> • Participate in a critical research publication review. • Provide critical review of case studies based on knowledge of the literature. • Provide critical review of clinical in-services based on knowledge of the literature. • Gather evidence in support of a new intervention. • Conduct and analyze the results of appropriate patient/client Tests and measures to substantiate or refute possible hypotheses. • Regularly and independently, take responsibility for finding information to improve knowledge. • Seek knowledge toward the achievement of excellence. • Establish a journal club in a practice environment.
PE #10: Education			
<i>Teaching methods for various audiences</i>	• <i>Apply traditional and alternative</i>	• <i>Role-play a conversation with</i>	• <i>Assess effective</i>

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<p><i>(patients, peers, community, caregivers, family, policymakers, and other health professionals</i></p> <p>Foundational and clinical sciences</p> <ul style="list-style-type: none"> • Learning theory • Teaching theory <p>Verbal communication</p> <ul style="list-style-type: none"> • Active/effective listening • Empathic responding • Language skills <p>Nonverbal communication</p> <ul style="list-style-type: none"> • Professional communication <p>Principles of oral and written communication</p> <p>Use of media</p> <p>Motivational strategies</p>	<p><i>teaching strategies to facilitate learning.</i></p> <ul style="list-style-type: none"> • Assess educational needs of varied audiences (e.g., other professionals, clinical educators, community, policy makers, payers, and peers). • Apply traditional and alternative teaching strategies to facilitate learning. • Describe the differences in learning styles and apply this information to education/training of a variety of learners. • Organize educational experiences in clinical and community settings. • Differentiate between pedagogical versus andragogical approaches to teaching. • Incorporate adult learning principles into educational interventions. • Measure educationally relevant outcomes with communities and students. 	<p><i>a third party payer justifying the need for additional clinical services and equipment for a patient with a neurologic diagnosis (e.g., MS, PD, and CVA).</i></p> <ul style="list-style-type: none"> • <i>Design a presentation for a patient/family/caregiver support group (e.g., MS, ALS, SCI, and CVA)</i> • Formulate behavioral objectives for group and individual education for the classroom. • Design, organize, and deliver a public presentation (e.g., inter-professional, intra-professional, community, and nonprofessional). • Discuss the influence of learning style preferences and computer-assisted instruction. 	<p><i>communication/instruction with family/caregivers of a patient with altered cognition.</i></p> <ul style="list-style-type: none"> • Formulate behavioral objectives for group and individual education for clinic and community settings. • Plan, provide, and evaluate education of personnel at various levels. • Present in-services during clinical experiences. • Demonstrate and document effective in-service education of practitioners. • Incorporate adult learning principles into educational interventions. • Employ patient/client-specific instructional strategies. • Develop expertise in the use of technology available for patient/client or clinical staff education and consultation.
PE #11: Screening			
<p>Foundational and clinical sciences (ie, epidemiology, pathology)</p>	<ul style="list-style-type: none"> • <i>Conduct a systems review for screening the neuromuscular system including general</i> 	<ul style="list-style-type: none"> • <i>Conduct posture, balance, strength, and vital signs screening (including blood</i> 	<ul style="list-style-type: none"> • <i>Conduct posture, balance, strength, and vital signs screening (including blood</i>

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<p>Screening tools</p> <p><i>Red Flags</i></p> <p><i>Acute onset of:</i></p> <ul style="list-style-type: none"> ▪ weakness ▪ change in speech ▪ change in vision ▪ severe headache ▪ dizziness ▪ loss of balance ▪ in-coordination ▪ seizure activity ▪ acute infection with neurologic signs ▪ spinal column instability ▪ non-responsive autonomic dysreflexia ▪ changes in bowel and bladder ▪ changes in sensation <p><i>Screening for each of the following :</i></p> <p><i>Balance/Falls Risk screens</i></p> <ul style="list-style-type: none"> ▪ e.g., <i>Timed Up and Go (TUG), sit to stand, standing</i> ▪ <i>Knowledge of Romberg and Stops walking when talking tests</i> <p><i>Developmental Delay</i></p> <ul style="list-style-type: none"> ▪ <i>Knowledge of developmental milestone achievement</i> <p><i>Safety issues</i></p> <ul style="list-style-type: none"> ▪ <i>Observation/insight</i> <p><i>Changes in mental status</i></p>	<p><i>assessment of gross coordinated movement (e.g., balance, gait, locomotion, transfers and transitions) and motor function (motor control and motor learning)</i></p> <ul style="list-style-type: none"> • <i>Determine the need for further neurologic examination and referral.</i> • <i>Assess health needs and risk factors of different individuals, groups, and communities.</i> • <i>Select screening tests and measures, taking into account the cost-benefit ratio.</i> • <i>Set priorities for needs and risks.</i> • <i>Recognize clusters of symptoms that denote medical emergency.</i> • <i>Determine the need for further physical therapy examination and consultation.</i> • <i>Determine need for referral to other health care practitioners.</i> • <i>Understand the role of the Certified Clinical Specialist as a referral resource.</i> • <i>Analyze and interpret the results and determine whether there is a need for further examination or referral.</i> • <i>Analyze patients/clients in their community/work/leisure setting and determine whether there is need for further examination or referral.</i> 	<p><i>pressure).</i></p> <ul style="list-style-type: none"> • <i>Formulate a list of red flags used in screening a patient with a neurologic condition.</i> • <i>Examine an infant for developmental delay.</i> • <i>Examine nursing home residents for risk of falling.</i> • <i>Describe domestic violence cases that should be referred to community resources and/or other professionals.</i> • <i>Describe how to document, report, and refer an incident of elder abuse, child abuse, or spousal abuse.</i> • <i>Understand how to ask screening questions and define risk factors of domestic violence in a clinical setting.</i> • <i>Discuss the effects of genetic predisposition and risk factors on health screening for breast or prostate cancer.</i> 	<p><i>pressure) at community sites (nursing homes, high schools, etc).</i></p> <ul style="list-style-type: none"> • <i>Conduct screening with an awareness of questions that need to be posed if risk factors or evidence are present to suspect neurologic insult/injury</i> • <i>Determine the need for further physical therapy examination based on data obtained from a screening.</i> • <i>Conduct posture, balance, strength, and physical activity screening at community sites (nursing homes, high schools, etc).</i> • <i>Conduct screening with an awareness of questions that need to be posed if risk factors or evidence are present to suspect domestic violence.</i> • <i>Determine the need for referral to other health care providers.</i>

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<ul style="list-style-type: none"> ▪ <i>Alert and oriented (x3)</i> ▪ <i>Concussion</i> <p><i>Knowledge of changes in behavior</i></p> <ul style="list-style-type: none"> ▪ <i>Anxiety</i> ▪ <i>Depression</i> 	<ul style="list-style-type: none"> • Understand the definition of domestic violence, the incidence of it, and the population at risk. • Determine and use available community resources for victims of domestic violence. 		
PE #12: Examination			
<p><i>Please refer to Table 1 for a complete list of Tests and Measures recommended specifically for the neurologic population, including whether the student should be able to know the test, or to apply the test as well.</i></p> <p><i>Inclusion of the Minimum Skills of the PT Graduate at Entry-Level with the following additional specific neurologic Tests and measures:</i></p> <p>3. Perform posture tests and measures of postural alignment and positioning in sitting and standing.</p> <p>4. Perform gait, locomotion and balance tests including quantitative and qualitative measures such as:</p> <p>A. Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment using the <i>Timed Up and Go (TUG)</i> or <i>Berg</i> tests.</p> <p>B. Balance (dynamic and static) with or without the use of</p>	<ul style="list-style-type: none"> • <i>Select and perform tests for patients with decreased arousal, attention or cognition.</i> • <i>Describe the ICF framework as it applies to the neurologic patient.</i> • <i>Analyze abnormal gait in patients with neurological disorders.</i> • <i>Perform and interpret tests and measures related to balance used in the neurologic population.</i> • <i>Perform and interpret examination of patients with vestibular disorders.</i> • <i>Perform and interpret tests and measures related to motor control in patients with neurological disorder.</i> 	<ul style="list-style-type: none"> • <i>Discuss literature describing validity and reliability of Glasgow Coma Scale (GCS), JFK, and Mini Mental Status Examination (MMSE), Rancho Los Amigos Levels of Cognitive Functioning (Rancho levels).</i> • <i>Select tests and measures to evaluate decreased arousal, attention and cognition in a patient videotaped with TBI.</i> • <i>Choose tests and measures using ICF framework for a case with patients with neurologic disorders.</i> • <i>Analyze and discuss videotaped presentation of gait deviations in patients with neurologic disorders (e.g., TBI, CVA, PD, MS)Discuss literature assessing the validity and reliability of balance tests and measures in the neurologic population (Berg, Timed up and go</i> 	<ul style="list-style-type: none"> • <i>Demonstrate accurate selection and performance of tests and measures related to arousal, attention and cognition in a patient with a neurologic disease.</i> • <i>Perform accurate evaluation of gait utilizing terminology of Rancho Los Amigos observational gait analysis in a patient with a stroke.</i> • <i>Select and accurately interpret appropriate tests and measures for a patient with balance deficits.</i> • <i>Perform an examination using tests and measures; one test from each category of the ICF framework in a patient with PD.</i> • <i>Describe motor control performance of reaching tasks in a patient with a CVA.</i>

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<p>assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment <i>using the Multi-directional Reach and Modified Functional Reach (seated), CTSIB, and timed sitting test.</i></p> <p>C. Gait and locomotion during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment <i>using Dynamic Gait Index (DGI) or Functional Gait Assessment (FGA), Postural Assessment Scale for Stroke (PASS), High Level Mobility Assessment Tool (HIMAT), Wheelchair Skills Test and other tests to include:</i></p> <ol style="list-style-type: none"> (1) Bed mobility (2) Transfers (level surfaces and floor) (3) Wheelchair management and mobility (4) Uneven surfaces (5) Safety during gait, locomotion, and balance <p>D. Perform gait assessment including <i>spatio-temporal characteristics of gait (e.g., step length, speed), and abnormal gait patterns</i></p> <ol style="list-style-type: none"> (1) <i>Rancho Los Amigos Observational Gait Analysis.</i> 		<p><i>(TUG), Multi-Directional Reach Test (MDRT), Modified functional reach; [MFR], and Dynamic gait index-Functional gait assessment [DGI-FGA]).</i></p> <ul style="list-style-type: none"> • <i>Perform and interpret tests and measures accurately related to vestibular testing on a student (e.g., Dix Hallpike, and Head thrust).</i> • <i>Examine and discuss movement patterns of videotaped examples of patients with motor control disorders secondary to stroke.</i> • <i>Provide and discuss the rationale for the selection of Quality of Life (QOL) tests and measures.</i> 	<ul style="list-style-type: none"> • <i>Select quality of life measure appropriate to a patient with complaints of dizziness.</i>

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<p>5. Characterize or quantify body mechanics during self-care, home management, work, community, tasks, or leisure activities.</p> <p>6. Characterize or quantify ergonomic performance during work (job/school/play):</p> <ul style="list-style-type: none"> A. Dexterity and coordination during work B. Safety in work environment C. Specific work conditions or activities D. Tools, devices, equipment, and workstations related to work actions, tasks, or activities. <p>7. Characterize or quantify environmental home and work (job/school/play) barriers using <i>tools such as Craig Handicap Assessment & Reporting Technique (CHART), Participation Objective, Participation Subjective (POPS), Stroke Impact Scale (SIS), Short-Form (SF)-36, Dizziness Handicap Inventory (DHI), other quality of life measures.</i></p> <ul style="list-style-type: none"> A. Current and potential barriers B. Physical space and environment C. Community access <p>8. Observe self-care and home management (including ADL and IADL) using the <i>FIM, FIM/FAM, and for falls efficacy using the Tinetti Falls</i></p>			

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<p><i>Efficacy Scale (FES).</i> (a) <i>Barthel Index and the Activities-specific Balance Confidence Scale (ABC)</i></p> <p><u>Neurological System</u></p> <p>1. Perform arousal, attention and cognition tests and measures to characterize or quantify (including standardized tests and measures that include <i>the Glasgow Coma Scale (GCS), JFK Coma Recovery Scale - Revised, Rancho Los Amigos Levels of Cognitive Functioning (Rancho levels), Mini Mental Status Examination (MMSE), and Timed up and Go (TUG) cognitive</i>):</p> <ul style="list-style-type: none"> A. Arousal B. Attention C. Orientation D. Processing and registration of information E. Retention and recall F. Communication/language <p>2. Perform cranial and peripheral nerve integrity Tests and measures:</p> <ul style="list-style-type: none"> A. Motor distribution of the cranial nerves (e.g., muscle tests, observations) B. Motor distribution of the peripheral nerves (e.g., dynamometry, muscle tests, observations, thoracic outlet tests) 			

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<p>C. Response to neural provocation (e.g. tension test, vertebral artery compression tests)</p> <p>D. Response to stimuli, including auditory, gustatory, olfactory, pharyngeal, vestibular, and visual (e.g., observations, provocation tests)</p> <p>E. Sensory distribution of the cranial nerves</p> <p>F. Sensory distribution of the peripheral nerves</p> <p>G. <i>Screen for Vestibular dysfunction using the Dix-Hallpike including modifications, smooth pursuits and saccades, and head thrust</i></p> <p>3. Perform motor function Tests and measures</p> <p>A. Dexterity, coordination, and agility (e.g., <i>Finger-to-Nose, Heel-to-Shin, Rapid Alternating Movements, Finger opposition</i>)</p> <p>B. Initiation, execution, modulation and termination of movement patterns and voluntary postures and reflexes (e.g. <i>ASIA, Modified Ashworth, Tardieu</i>)</p> <p>4. <i>Motor function Tests and measures [e.g., Chedoke-McMaster or Fugl-Meyer Motor, Wolf Motor Function Test, Action Research Arm Test, Unified Parkinson's Disease Rating scale (UPDRS), and Modified Fatigue</i></p>			

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<p><i>Impact Scale (MFIS)]</i></p> <p>5. Perform neuromotor development, sensory integration, and perception tests and measures:</p> <p>A. Acquisition and evolution of motor skills, including age-appropriate development</p> <p>B. Sensorimotor integration, including postural responses, equilibrium, and righting reactions</p> <p>C. Perception tests: <i>Extinction, Clock drawing, Line Bi-Section, and Cancellation</i></p>			
PE #13: Evaluation			
<p>Clinical reasoning</p> <p>Clinical decision making</p> <p><i>Synthesize neurological data</i></p>	<ul style="list-style-type: none"> • <i>Synthesize the examination data for common neurologic and neuromuscular conditions.</i> • Synthesize available data on a patient/client expressed in terms of the disablement model to include impairment, functional limitation, and disability participation restrictions. • Use available evidence in interpreting the examination findings. • Verbalize possible alternatives when interpreting the examination findings. • Cite the evidence (patient/client history, lab diagnostics, and Tests 	<ul style="list-style-type: none"> • Develop evaluation statements based on patient examination data for patients with neurological diagnoses. 	<ul style="list-style-type: none"> • Evaluate and establish a diagnosis, prognosis, and plan of care for a patient with Traumatic Brain Injury (TBI) within the time constraints of the facility. • <i>Evaluate and communicate the clinical rationale for a seating and mobility system for a patient with tetraplegia.</i>

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	and measures and scientific literature) to support a clinical decision.		
PE #14: Diagnosis			
Foundational and clinical sciences Diagnostic process Clinical decision making • Screening data • Examination data • <i>Knowledge of the Guide to Physical Therapist Practice</i> <ul style="list-style-type: none"> ▪ <i>Neurologic preferred practice patterns</i> 	<ul style="list-style-type: none"> • Identify the symptom clusters that lead to the determination of suspecting, confirming, or ruling out the most common problems seen by physical therapists. • Use a clinical decision-making process to establish a diagnosis. • Based on the data generated in a physical therapy examination and within the physical therapist's scope of practice, diagnose the patient's/client's pathology, level of impairment, functional limitation, and disability. • Integrate data from the examination to formulate a clinical judgment that leads to a diagnosis, prognosis, and intervention plan consistent with findings and the literature. • Identify the reasons for why and when reexamination would be needed. • Assume responsibility for consulting with and/or referral to other professionals. 	<ul style="list-style-type: none"> • Using patient/client cases, discuss modification of decision-making based on pharmacological history and patient/client response to processes. • Consider the health care financing of divergent patient/client groups relative to the diagnostic process. • <i>Differentiate signs and symptoms for a person with a cerebrovascular accident (CVA) and shoulder subluxation.</i> • Diagnose sample patients/clients in the laboratory setting. • Review literature on patient/client diagnosis and clinical reasoning. • <i>Describe, analyze, illustrate, and engage in diagnostic reasoning for patients/clients with neurologic conditions who have typical problems through the lifespan.</i> • Recognize diagnoses appropriate to the practice of 	<ul style="list-style-type: none"> • Make an impairment-based diagnosis for a patient with an acquired nonprogressive disorder of the central nervous system. • <i>Present a case report for a patient with a neurologic condition at physical therapy grand rounds.</i> • Discuss modification of decision-making based on patient/client response to examinations.

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Primary Content	Examples of Terminal Behavioral Objective After the completion of the content, the student will be able to...	Examples of Instructional Objectives to Be Achieved in the Classroom	Examples of Instructional Objectives to Be Achieved in Clinical Practice
		physical therapy. <ul style="list-style-type: none"> Recognize those clusters of symptoms that denote medical emergencies. 	
PE #15: Prognosis			
Foundational and clinical sciences Contribution of preexisting health status, disease, comorbidity, genetic predisposition, adherence, and disability on the effectiveness of interventions Research in prognostic indicators (natural history, efficacy of treatment) <i>Knowledge of the Orpington Prognostic Scale (OPS), and the National Institute of Health Stroke Scale (NIHSS)</i>	<ul style="list-style-type: none"> Identify and discuss prognostic indicators for various neurologic conditions. Estimate the effect of preexisting health status, lifestyle, disease, comorbidity, and disability on the effectiveness of the benefit of interventions. Estimate the contributions of race/ethnicity, religion, gender, age, and socioeconomic status to the effectiveness of intervention. Examine health behavior and risk factors that influence prognosis. Estimate the maximum level of improvement that might be obtained through intervention within a given amount of time. Apply knowledge regarding natural history of disease and of efficacy of the treatment to predict improvement. Examine moderators that predict patient/client prognosis and the effect of moderators on the variables included in the disablement model (e.g., impairments, functional 	<ul style="list-style-type: none"> Select and discuss a prognostic indicator for a patient with a neurologic condition. Analyze research results about physical therapy outcomes and prognostic indicators in courses throughout the curriculum. Use current literature to consider relationships of health condition and impairments in body structure and function with prognosis for recovery in functional activities and participation. 	<ul style="list-style-type: none"> At initial examination, recommend discharge destination for a patient with an acquired nonprogressive disorder of the central nervous system. Identify reasons that a patient/client has not met the outcomes for care within the predicted time period. Request and obtain authorization for clinically necessary reimbursable visits beyond the originally negotiated plan of care. Assess patient/client prognoses through clinical experiences that follow the patient/client from initial examinations through discharge status. Establish prognoses based on differences between interpretive findings and anticipated performance given the individual

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	limitations, disability).		characteristics and diagnosis of the patient/client (e.g., differences between findings and norms, patient/client and therapist goals, and health care system regulations).
PE #16: Plan of care			
Foundational and clinical sciences Structure of the health environment Discharge options, including community resources and placement alternatives	<ul style="list-style-type: none"> • Identify discharge options and incorporate into plan of care. • Design a plan of care based on impairment and the patient's/client's goals and with input from family members and other principal caregivers. • Identify to the patient/client and family the reimbursement provided by the payer available for the plan of care. • Design and manage a plan of care that complies with the standards of practice and is evidence-based. • Establish goals and functional outcomes that specify expected time duration. • Design, monitor, and adjust the plan of care in response to patient/client status, compliance, need for supervision, time available, and plan for discharge. • Advocate with payers on behalf of 	<ul style="list-style-type: none"> • Adapt to changing environments, including responding to organizational, social, and environmental change. • Incorporate cultural considerations in the delivery of physical therapy interventions. • Develop skills in planning, organizing, and managing patient/client, and family care through case studies and simulations, patient/client presentations, and patient rounds. • Implement and periodically reevaluate a plan of care and discharge planning (case studies, in service education, patient rounds). • Demonstrate an ability to meet the legal requirements for an individualized 	<ul style="list-style-type: none"> • Progress and modify a plan of care and discharge planning based on patient/client responses, environmental contingencies, and changes in outcome expectations. • Identify the resources needed to achieve the goals included in the plan of care. • Incorporate the family's values and resources in setting long-term goals for a child with a progressive disorder of the neuromusculoskeletal system. • Select goal-directed intervention strategies and guidelines for those strategies, considering family input and resources

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	<p>patients/clients when additional services are required to meet expected goals and functional outcomes.</p> <ul style="list-style-type: none"> • Identify the importance of a regular system for follow up with patients/clients. • Design, implement, and plan for systematic follow up of patients/clients. • Refer patients/clients appropriately to others (in and outside of profession) when needed care is outside personal expertise. 	<p>educational plan (IEP) with regard to due process in the educational environment.</p> <ul style="list-style-type: none"> • Identify those patients/clients who would benefit from long-term follow up. • Identify the negative consequences of failure to follow up with patients/clients. • Discuss the negative and positive influences of the Prospective Payment System (PPS) in various settings on patient/client outcome. 	<p>and the personnel and financial resources available to provide the intervention.</p> <ul style="list-style-type: none"> • Develop skills in planning, organizing, and managing patient/client, and family care through patient/client presentations, guided clinical practice, and patient rounds. • Implement and periodically reevaluate a plan of care and discharge planning (e.g., guided clinical practice, in-service education, patient rounds). • Modify a fitness program based on the patient's/client's use of vitamins and dietary supplements. • Discuss the risks and benefits of the use of alternative interventions with the patient/client. • Identify patients/clients who would benefit from long-term follow up. • Identify the negative consequences of failure to follow up with patients/clients. • Discuss the negative and

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			positive influences of the Prospective Payment System (PPS) in various settings on patient/client outcome. <ul style="list-style-type: none"> Plan a fitness program considering a neurologic patient/client's use of prescription drugs.
PE #17: Intervention			
Foundational and clinical sciences <i>Guide to Physical Therapist Practice</i> Therapeutic presence Emergency response techniques in various practice settings <ul style="list-style-type: none"> Safety, Emergency Care, CPR and First Aid <ul style="list-style-type: none"> Seizure precautions, intracranial pressure precautions; shunt precautions, behavior management and self protection; craniotomy precautions, halo precautions, SCI precautions for unstable fractures and post-surgical patients, autonomic dysreflexia Standard Precautions <ul style="list-style-type: none"> Demonstrate appropriate sequencing of events related to universal precautions. 	<ul style="list-style-type: none"> Anticipate and respond effectively to changes in the complex neurologic patient. Apply biomechanical principles of safe practice to a neurologic patient Demonstrate strategies for instruction in patients with deficits resulting in communication disorders and cognitive and/or behavioral impairments. Select and perform interventions for aerobic capacity/endurance reconditioning for patients with neurologic disorder. Describe vestibular rehabilitation interventions in patients diagnosed with vestibular deficit. Describe interventions for upper extremity retraining in patients with hemiparesis. Compare and contrast locomotive training techniques. 	<ul style="list-style-type: none"> Delineate a specific patient population with high incidence of autonomic dysreflexia and discuss the appropriate management. Identify the neurologic population that would best benefit from transfers using a mechanical lift. Determine the equipment needs of a patient with a neurologic condition and write a letter of medical necessity. Determine different modes of instruction for a patient with cognitive deficit. Discuss how to modify aerobic interventions in a patient with a neurologic disorder compared to a healthy population. Compare and contrast uses of habituation, adaptation, 	<ul style="list-style-type: none"> Describe the precautions related to managing a specific neurologic patient. Discuss strategies to minimize risk to staff and patient during transfer using a mechanical lift. Instruct a patient with Multiple Sclerosis (MS) where to find community resources to assist with equipment procurement. Instruct patient with "Pusher syndrome" in a transfer strategy using verbal, tactile, and visual instruction. Adjust strategies in response to exercise in a patient with a stroke. Instruct a patient in motor reorganization (ankle/hip/stepping)

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<ul style="list-style-type: none"> • Use Universal Precautions. • Determine equipment to be used and assemble all sterile and non-sterile materials. • Use transmission-based precautions. • Demonstrate aseptic techniques. • Apply sterile procedures. • Properly discard soiled items. <ul style="list-style-type: none"> ▪ Body Mechanics and Positioning <ul style="list-style-type: none"> • Apply proper body mechanics (utilize, teach, reinforce, and observe). • Properly position, drape, and stabilize a patient/client when providing physical therapy. • <i>Mechanical lift</i> ▪ <i>Interventions</i> <ol style="list-style-type: none"> 1. Coordination, communication, and documentation may include: <ol style="list-style-type: none"> A. Addressing required functions: <ol style="list-style-type: none"> (1) Establish and maintain an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services. (2) Discern the need to perform mandatory communication and reporting (e.g., incident reports, patient advocacy and abuse reporting). 	<ul style="list-style-type: none"> • <i>Select and perform interventions for specific neurologic patient populations.</i> • <i>Describe the guidelines for upper limb preservation for SCI.</i> • <i>Select effective functional skill training activities for patients with complex neurologic diagnoses.</i> • <i>Explain how to teach power mobility training and manual wheelchair skills training.</i> • <i>Describe available adaptive communication devices.</i> • <i>Describe wheelchair seating systems available for patients with neurologic disorders.</i> • <i>Identify the parameters required for serial casting to reduce contracture.</i> • <i>Demonstrate techniques to maximize ventilation.</i> • <i>Demonstrate skin inspection and pressure relief strategies in subjects with neurologic disorders.</i> • <i>Discuss emerging interventions for neurologic conditions (e.g., yoga, Tai chi, mental imagery, virtual reality, and robotics).</i> 	<p><i>and substitution in a patient case with unilateral vestibular loss.</i></p> <ul style="list-style-type: none"> • <i>Design an intervention strategy for a patient with hemiparesis using Constraint Induced Therapy (CIT).</i> • <i>Discuss various locomotor training paradigms for a patient with spinal cord injury.</i> • <i>Design a strengthening program for the patient with MS.</i> • <i>Identify potential problems with upper extremity overuse due to primary wheelchair use.</i> • <i>Design functional training programs from patient cases for persons with mobility deficits secondary to neurological diagnosis.</i> • <i>List equipment features of a power wheelchair for a patient with C6 complete SCI.</i> • <i>List types of communication devices available for a patient with expressive aphasia.</i> • <i>Compare and contrast different wheelchair cushions available for a patient with sacral decubitus ulcer.</i> • <i>Construct a cast for the patient with significant ankle</i> 	<p><i>strategies.</i></p> <ul style="list-style-type: none"> • <i>Determine if the patient will qualify for participation in a Constraint Induced Therapy (CIT) program based on evidence.</i> • <i>Implement effective locomotive training paradigms for persons with neurological diagnosis.</i> • <i>Implement a plan of care for a patient with a stroke with appropriate feedback.</i> • <i>Instruct a patient using wheelchair for primary locomotion in secondary prevention for overuse of the upper extremity using Paralyzed Veterans of America (PVA) guidelines.</i> • <i>Develop a plan of care that includes functional skill training with and without manual handling skills in a patient with a stroke.</i> • <i>Determine patient population that would benefit from use of a power wheelchair.</i> • <i>Determine community resources for referral to supply adaptive communication devices for a patient with expressive</i>

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<p>(3) Follow advance directives.</p> <p>B. Admission and discharge planning.</p> <p>C. Case management. <i>(1) Procuring equipment</i></p> <p>D. Collaboration and coordination with agencies, including: (1) Home care agencies (2) Equipment suppliers (3) Schools (4) Transportation agencies (5) Payer groups (6) Obtaining funding/community resources</p> <p>E. Communication across settings, including: (1) Case conferences (2) Documentation (3) Education plans</p> <p>F. Cost-effective resource utilization.</p> <p>G. Data collection, analysis, and reporting of: (1) Outcome data (2) Peer review findings (3) Record reviews</p> <p>H. Documentation across settings, following APTA's Guidelines for Physical Therapy Documentation, including: (1) Elements of examination, evaluation, diagnosis, prognosis, and intervention (2) Changes in impairments,</p>		<p><i>plantarflexion contracture.</i></p> <ul style="list-style-type: none"> • <i>Determine several methods for inspiratory muscle training in a patient with incomplete C5 spinal cord injury.</i> • <i>Design intervention strategy for pressure relief in a patient with weak triceps function.</i> • <i>Critically appraise the literature regarding complementary and alternative (CAM) therapies.</i> • <i>Critically appraise the literature regarding traditional neurotherapeutic techniques.</i> 	<p><i>aphasia.</i></p> <ul style="list-style-type: none"> • <i>Determine the most appropriate cushion for a patient with an ischial decubitus ulcer.</i> • <i>Identify which patients with neurologic disorders would be appropriate for serial casting interventions.</i> • <i>Given a patient with SCI, set up the patient using an inspiratory training device.</i> • <i>Instruct a patient using wheelchair for primary locomotion in pressure relief strategy.</i> • <i>Provide a clinical presentation or in-service regarding an emerging intervention in neurologic rehabilitation.</i>

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<p>functional limitations, and disabilities (3) Changes in interventions (4) Outcomes of intervention (5) <i>Letters of medical necessity</i></p> <p>I. Interdisciplinary teamwork: (1) Patient/client family meetings (2) Patient care rounds (3) Case conferences (4) <i>Discharge planning</i></p> <p>J. Referrals to other professionals or resources.</p> <p>2. Patient/client-related instruction may include:</p> <p>A. Instruction, education, and training of patients/clients and caregivers to accommodate a patient with deficits resulting in communication disorders, cognitive and/or behavioral impairments regarding: (1) Current condition (pathology/pathophysiology [disease, disorder, or condition], impairments, functional limitations, or disabilities) (2) Enhancement of performance (3) Plan of care: a. Risk factors for pathology/pathophysiology (disease, disorder, or</p>			

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<p>condition), impairments, functional limitations, or disabilities</p> <p>b. Preferred interventions, alternative interventions, and alternative modes of delivery</p> <p>c. Expected outcomes</p> <p>(4) Health, wellness, and fitness programs (management of risk factors)</p> <p>(5) Transitions across settings</p> <p>3. Therapeutic exercise may include performing:</p> <p>A. Aerobic capacity/endurance conditioning or reconditioning:</p> <p>(1) Gait and locomotor training</p> <p>(2) Increased workload over time (modify workload progression)</p> <p>(3) Movement efficiency and energy conservation training</p> <p>(4) Walking and wheelchair propulsion programs</p> <p>(5) Cardiovascular conditioning programs</p> <p>(6) <i>Considerations for neurologic diagnosis Stroke syndrome, TBI SCI, Vestibular, Cerebellar, Peripheral nerve disorders, Degenerative disorders (PD, ALS, Huntington disease, dementia), Congenital disorders (CP, Down's syndrome, Spinal</i></p>			

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<p><i>bifida</i>), <i>Demyelinating disorders (MS, Guillain-barré syndrome [GBS]), Post-polio syndrome</i></p> <p>B. Balance, coordination, and agility training:</p> <p>(1) <i>Developmental activities/transitional positions</i></p> <p>(2) Motor function (motor control and motor learning) training or retraining</p> <p>(3) Neuromuscular education or reeducation</p> <p>(4) Perceptual training</p> <p>(5) Posture awareness training</p> <p>(6) Sensory training or retraining</p> <p>(7) Standardized, programmatic approaches</p> <p>(8) Task-specific performance training</p> <p>(9) <i>Habituation, adaptation, substitution exercises</i></p> <p>(10) <i>Strategy training: hip and ankle and stepping strategies</i></p> <p>(11) <i>Canalith Repositioning (modified Epley), gaze stabilization</i></p> <p>(12) <i>Exercises specific to results from sensory motor reorganization testing</i></p> <p>C. Body mechanics and postural stabilization:</p> <p>(1) Body mechanics training</p> <p>(2) Postural control training</p> <p>(3) Postural stabilization</p>			

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<p>activities (4) Posture awareness training D. Flexibility exercises: (1) Muscle lengthening (2) Range of motion (3) Stretching (4) <i>Passive joint mobilization</i> E. Gait and locomotion training: (1) Developmental activities training (2) Gait training (3) Device training (4) Perceptual training (5) Basic wheelchair skills training F. Neuromotor development training: (1) Developmental activities training (2) Motor training (3) Movement pattern training (4) Neuromuscular education or reeducation G. Relaxation: (1) Breathing strategies (2) Movement strategies (3) Relaxation techniques H. Strength, power, and endurance training for head, neck, limb, and trunk: (1) Active assistive, active, and resistive exercises (including concentric, dynamic/isotonic, eccentric, isokinetic, isometric, and plyometric exercises)</p>			

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<p>(2) Aquatic programs (3) Task-specific performance training 4. Functional training in self-care and home management may include: A. Activities of daily living (ADL) training: (1) Bed mobility and transfer training (2) Age appropriate functional skills B. Barrier accommodations or modifications C. Device and equipment use and training: (1) Assistive and adaptive device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing) (2) Orthotic, protective, or supportive device or equipment training during self-care and home management (3) Prosthetic device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing) D. Functional training programs: (1) Simulated environments and tasks (2) Task adaptation (3) <i>Task Specific Training/Task</i></p>			

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<p><i>Oriented Approach including issues related to intensity, frequency, duration, task selection, practice, feedback, environment factors</i> <i>(4) Knowledge of CIMT) and Locomotive training (Body weight supported treadmill training - BWSTT)</i></p> <p>E. Injury prevention or reduction: (1) Safety awareness training during self-care and home management (2) Injury prevention education during self-care and home management (<i>e.g., knowledge of fall risk reduction</i>) (3) Injury prevention or reduction with use of devices and equipment (4) <i>Secondary prevention of overuse of the upper extremity dysfunction and skin integrity in patients with SCI</i></p> <p>5. Functional training in work (job/school/play), community, and leisure integration or reintegration may include: A. Barrier accommodations or modifications B. Device and equipment use and training: (1) Assistive and adaptive device or equipment training</p>			

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<p>during instrumental activities of daily living (IADL) (2) Orthotic, protective, or supportive device or equipment training during IADL for work (3) Prosthetic device or equipment training during IADL (4) <i>Power Mobility Training (knowledge of only) and Manual Wheelchair skills training</i></p> <p>C. Functional training programs: (1) Simulated environments and tasks (2) Task adaptation (3) Task training (4) <i>Functional training using Manual Handling Skills (e.g., NDT, PNF, constraint induced movement therapy)</i></p> <p>D. Injury prevention or reduction: (1) Injury prevention education during work (job/school/play), community, and leisure integration or reintegration (e.g., <i>fall risk reduction</i>) (2) Injury prevention education with use of devices and equipment (3) Safety awareness training during work (job/school/play), community, and leisure integration or reintegration (4) Training for leisure and play activities</p>			

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<p>7. Prescription, application, and, as appropriate, fabrication of devices and equipment may include:</p> <p style="padding-left: 20px;">A. Adaptive devices: (1) Hospital beds (2) Raised toilet seats (3) Seating systems – prefabricated <i>or custom fabricated</i> (4) <i>Knowledge of adaptive communications. Alternative access, EADL</i></p> <p style="padding-left: 20px;">B. Assistive devices: (1) Canes (2) Crutches (3) Long-handled reachers (4) Static and dynamic splints – prefabricated (5) Walkers, <i>rollators, gait trainers</i> (6) <i>Wheelchairs and wheelchair seating systems</i> (7) <i>Standers</i> (8) <i>Positioners (e.g. sidelyers, corner seats, feeding seats, car seats, etc.)</i></p> <p style="padding-left: 20px;">C. Orthotic devices: (1) Prefabricated braces (2) Prefabricated shoe inserts (3) Prefabricated splints</p> <p style="padding-left: 20px;">D. Prosthetic devices (lower-extremity)</p> <p style="padding-left: 20px;">E. Protective devices: (1) Braces</p>			

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<p>(2) Cushions (3) Helmets (4) Protective taping F. Supportive devices: (1) Prefabricated compression garments (2) Corsets (3) Elastic wraps (4) Neck collars (5) Slings (6) Supplemental oxygen - apply and adjust (7) Supportive taping (8) <i>Serial casting</i></p> <p>8. Airway clearance techniques may include: A. Breathing strategies: (1) Active cycle of breathing or forced expiratory techniques (2) Assisted cough/huff techniques (3) Paced breathing (4) Pursed lip breathing (5) Techniques to maximize ventilation (e.g., maximum inspiratory hold, stair case breathing, manual hyperinflation) (6) <i>Knowledge of inspiratory muscle trainers</i> B. Manual/mechanical techniques: (1) Assistive devices C. Positioning: (1) Positioning to alter work of</p>			

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<p>breathing (2) Positioning to maximize ventilation and perfusion</p> <p>9. Integumentary repair and protection techniques may include:</p> <p>A. Debridement—nonselective:</p> <p>(1) Enzymatic debridement (2) Wet dressings (3) Wet-to-dry dressings (4) Wet-to-moist dressings</p> <p>B. Dressings:</p> <p>(1) Hydrogels (2) Wound coverings</p> <p>C. Topical agents:</p> <p>(1) Cleansers (2) Creams (3) Moisturizers (4) Ointments (5) Sealants</p> <p>D. Pressure relief (1) Skin inspection</p> <p>10. Electrotherapeutic modalities may include:</p> <p>A. Biofeedback B. Electrotherapeutic delivery of medications (e.g., iontophoresis) C. Electrical stimulation:</p> <p>(1) Electrical muscle stimulation (EMS) (2) Functional electrical stimulation (FES) (3) High voltage pulsed current (HVPC) (4) Neuromuscular electrical</p>			

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<p>stimulation (NMES) (5) Transcutaneous electrical nerve stimulation (TENS)</p> <p>11. Physical agents and mechanical modalities may include:</p> <p><i>Physical agents:</i></p> <p>A. Cryotherapy: (1) Cold packs (2) Ice massage (3) Vapocoolant spray</p> <p>B. Hydrotherapy: (1) Contrast bath (2) Pools (3) Whirlpool tanks</p> <p>C. Sound agents: (1) Phonophoresis (2) Ultrasound</p> <p>D. Thermotherapy: (1) Dry heat (2) Hot packs (3) Paraffin baths</p> <p><i>Mechanical modalities:</i></p> <p>A. Compression therapies (prefabricated) (1) Compression garments (2) Vasopneumatic compression devices (3) Taping (4) Compression bandaging (excluding lymphedema)</p> <p>B. Gravity-assisted compression devices:</p>			

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<p>(1) Standing frame (2) Tilt table C. Mechanical motion devices: (1) Continuous passive motion (CPM) D. Traction devices: (1) Intermittent (2) Positional (3) Sustained</p> <p><i>Awareness of emerging Interventions for neurologic conditions to include yoga, Tai chi, mental imagery, virtual reality, and robotics</i></p>			
PE #18: Outcomes Assessment			
<p><i>Activity and Participation tests and measures listed under Examination</i></p> <p>Foundational and clinical sciences</p> <p>Research on efficacy and effectiveness of interventions</p> <p>Measurements of patient/client satisfaction</p> <p>Quality-of-life assessments</p> <p>Measurement of educationally relevant outcomes</p> <p>Disablement frameworks</p> <p>Reliability and validity of measurement</p>	<ul style="list-style-type: none"> • <i>Appraise reliable and valid tests and measures that can be applied as outcome measures for a patient with a neurologic condition.</i> • Apply, interpret, and report results of standardized assessments throughout a patient's/client's episode of care. • Assess and respond to patient/client and family satisfaction with delivery of physical therapy care. • Evaluate and use published studies related to outcomes effectiveness. • Select, administer, and evaluate outcome measures for 	<ul style="list-style-type: none"> • <i>Select an outcome measurement/assessment for a patient with CVA. Describe the use of health status measures for particular patient/client populations.</i> • Develop a measure of patient/client group satisfaction in particular clinical settings. • Analyze literature used to determine outcomes for a patient/client population. • Identify factors that would determine why a particular patient/client might not meet the outcomes expected for a patient/client population. 	<ul style="list-style-type: none"> • Participate in clinical outcome assessment under supervision of clinical faculty, including but not limited to cost-benefit analysis, functional outcomes, and patient/client satisfaction. • Collect, enter, and analyze clinical outcomes data. • Define a patient/client outcome measurement that you could monitor in an orthopedic clinic.

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Primary Content	Examples of Terminal Behavioral Objective After the completion of the content, the student will be able to...	Examples of Instructional Objectives to Be Achieved in the Classroom	Examples of Instructional Objectives to Be Achieved in Clinical Practice
<p>Cost-effectiveness/cost-benefit ratio</p> <p>Knowledge of standard outcome measurement tools.</p>	<p>patient/client groups.</p> <ul style="list-style-type: none"> • Assess the patient's/client's response to intervention in terms of functional outcomes. • Evaluate whether objectives for the plan of care have been met. 	<ul style="list-style-type: none"> • Differentiate how outcome measures can be used in health care versus how practitioners use measures to examine the results of interventions on individual patients/clients. • Describe why generalized outcome measures (designed for groups) should not be used in the patient/client management model and the potential deleterious effects of such uses. 	
PE #19: Prevention, Health promotion, Fitness And Wellness			
<p><i>Long term fitness for people with neurologic impairments in body structure and function, leading to accessibility and prevention issues.</i></p> <p>Foundational and clinical sciences</p> <p>Cost-benefit analyses</p> <p>Community information health and wellness</p> <p>Public-sector and private-sector service resources, including those of community, public health, and industry</p> <p>Prevention, health promotion, fitness and wellness programs</p>	<ul style="list-style-type: none"> • <i>Identify characteristics of accessible community exercise facility.</i> • <i>Describe contents of a fitness wellness program for individuals with a lifelong disability secondary to a progressive or a non-progressive neurologic disorder.</i> • Consider the effect of group and community values. • Analyze epidemiological data for purposes of prevention and wellness program planning. • Value health promotion, fitness, and wellness activities as part of a physical therapy practice. • Interpret the data collected and determine cost-effective 	<ul style="list-style-type: none"> • <i>List structural requirements for wheelchair accessibility.</i> • Screen infants for developmental delay. • Outline the criteria that should be used for screening adolescents with idiopathic scoliosis. • Develop and monitor the success of a personal wellness plan. • Develop materials for community health fairs. • Discuss strategies/models to change health behaviors. • Compare and contrast theories of wellness. • Develop a fitness program for 	<ul style="list-style-type: none"> • <i>Educate the patient/family/caregiver regarding long-term community fitness programs.</i> • Provide prevention, wellness, and health promotion clinical services. • Participate in the development and implementation of collaborative community-based health screening programs and evaluate their efficiency and effectiveness. • Apply health, exercise, fitness and wellness to all

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Theories of behavior change	<p>measures consistent with the individual, group, and community needs.</p> <ul style="list-style-type: none"> Justify implementation of health promotion and wellness programs based on cost-effectiveness, activity, available resources, treatment efficacy, and prevalence and incidence in populations. Use the results of the screening to determine whether a referral is necessary and to whom a referral should be made. Respect a patient's/client's involvement in decision-making. Demonstrate a program evaluation for wellness intervention. Implement fitness program in a senior citizen center. 	<p>an 8-year-old girl with asthma.</p> <ul style="list-style-type: none"> Establish a program for strength, power, endurance, flexibility, agility, coordination, and balance for elderly persons. Develop exercise, health, fitness and wellness programs with consideration to special populations including women (e.g., pregnant or diagnosed with osteoporosis), children and adolescents, elderly, recreational, and elite athletes, individuals with obesity, and people of different race and ethnicities. 	<p>populations, including those with a disease or condition that may lead to impairments, functional limitations, or disabilities.</p>
PE #20: Management Of Care Delivery			
<p><i>Reimbursement and knowledge of National Coverage Determination (NCD) for Mobility Assistive Equipment (MAE) and Local Coverage Determinations (LCDs)</i></p> <p>Foundational and clinical sciences</p> <p>Service-delivery models and reimbursement</p>	<ul style="list-style-type: none"> <i>Locate and interpret pertinent coverage policies that describe eligibility, coverage, and documentation requirements for a patient with a neurologic condition.</i> Determine which health care needs can be met through physical therapy. Collaborate within and outside the institution to provide cost-effective 	<ul style="list-style-type: none"> <i>Select equipment, anticipating future needs of a patient with a degenerative/changing neurologic condition (e.g., ALS, MS, or muscular dystrophy MD).</i> <i>Advocate for a case patient who requires equipment/assistive technology that is not initially</i> 	<ul style="list-style-type: none"> <i>Provide information to patient/client with neurologic disorder to facilitate informed decision making regarding procurement of the most appropriate equipment/assistive technology (e.g. need, cost, coverage, eligibility).</i> Include discharge planning

NEUROLOGIC ENTRY-LEVEL CURRICULAR CONTENT
APTA Neurology Section

Primary Content	Examples of Terminal Behavioral Objective After the completion of the content, the student will be able to...	Examples of Instructional Objectives to Be Achieved in the Classroom	Examples of Instructional Objectives to Be Achieved in Clinical Practice
<p>Care provided in first-contact, clinical, and tertiary-care settings</p> <p>Patient/client care management model</p> <p>Practice guidelines</p> <p>Legal and economic factors affecting service delivery</p> <p>Referral process</p> <p>Physical therapy in the context of the whole health care enterprise</p>	<p>services.</p> <ul style="list-style-type: none"> • Use community resources to meet patient/client needs. • Demonstrate sensitivity for role ambiguity, interrelatedness, and overlap among professions. • Understand and analyze organizational behavior and conceptual models of patient/client service delivery. • Describe necessary leadership skills for coordinating and managing care. • Describe a process that leads to successful management of care. • Analyze factors that contribute to efforts to coordinate care that are both successful and unsuccessful. • Compare and contrast the role of clinicians contributing to the care of a client with the role of the person coordinating care. • Value and weigh the contributions of self and others to the provision of effective and efficient care. 	<p><i>covered by their third party payer.</i></p> <ul style="list-style-type: none"> • Identify factors (e.g., equipment, environmental, social) that contribute to a patient/client being unable to achieve his or her goals in physical therapy. • Identify circumstances that support referring a patient/client to another physical therapist or another health care provider. • Distinguish between being a team member and being someone who coordinates the care of a patient/client. • Present a plan for coordinating the care of a specified patient/client. • Identify roles and responsibilities of the physical therapist in a variety of practice environments to include being a practitioner of choice to whom consumers have direct access. 	<p>in the plan of care.</p> <ul style="list-style-type: none"> • Apply knowledge of changes in the health care system to the design and implementation of the plan of care. • Progressively increase patient/client volume, variety, and complexity. • Manage a patient/client care schedule to accommodate multiple variables. • Assess outcome of directing components of the plan of care to others. • Manage a difference of opinion between providers about a physical therapy intervention.
PE #21: Practice management			
<p><i>Knowledge of unique management considerations for addressing the complexity of neurologic diagnoses (important for productivity measures, scheduling, etc)</i></p>	<ul style="list-style-type: none"> • <i>Recognize factors that would influence scheduling and or productivity measures in a neurologic caseload.</i> • Describe basic principles of 	<ul style="list-style-type: none"> • <i>Clearly articulate the rationale for performance expectations, including scheduling and productivity measures for a neurologic caseload.</i> 	<ul style="list-style-type: none"> • Recognize that the clinical site is a business with business objectives. • Contribute to the success of the business mission of

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Primary Content	Examples of Terminal Behavioral Objective After the completion of the content, the student will be able to...	Examples of Instructional Objectives to Be Achieved in the Classroom	Examples of Instructional Objectives to Be Achieved in Clinical Practice
Foundational and clinical sciences Regulatory, professional, and facility policies Reimbursement schemes • Coding issues • ICD-9 codes Business management	direction and supervision of human resources. • Assess the malpractice ramifications of direction and supervision. • Describe major reimbursement guidelines and practices, including coding issues and the application of ICD-9 codes. • Participate in billing and reimbursement activities. • Identify accepted accountancy and financial techniques to determine and manage administrative aspects of practice. • Describe principles of Negotiation. • Recognize gender differences in Negotiation styles. • Determine referral base and patient/client mix and analyze profit margin and cost-to-benefit ratio needs for regulating contracts on behalf of practice. • Participate in developing justification for expansion or reduction of budgets. • Determine staffing patterns considering mission, client mix, available resources, and fluctuations in supply and demand. • Participate in the assessment of continued competency of	• Describe the educational preparation of physical therapist assistants, physical therapy aides, and others involved in physical therapy services. • Describe the role of licensing in determining direction and supervision patterns to personnel. • Identify relationships among physical therapists, physical therapist assistants, physical therapy aides, and others to whom tasks are directed that provide efficient patient/client care of necessary quality. • Identify sources of institutional and professional policy on the physical therapist assistant. • Analyze the expenses, revenue, and productivity of a physical therapy provider (e.g., develop a balance sheet, interpret a profit and loss statement). • Establish staffing patterns based on full-time equivalency (FTE) concepts. • Analyze need for and type of equipment required to maximize efficiency, quality, and cost effectiveness of	the clinical site. • Assess the impact of decisions to direct others on patient/client care quality. • Assess the impact of direction and supervision decisions on the facility. • Direct others within the constraints of legal regulation, professional standards, and institutional policy. • Report all reimbursable patient/client care activities (including time) in billing. • Adapt marketing and public relations plans to target audiences. • Market services to customers (e.g., physicians, corporate clients, general public).

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	<p>personnel.</p> <ul style="list-style-type: none"> • Identify administrative and supportive organizational structures necessary to promote optimal use of resources. • Describe measures of productivity. • Describe the process of developing, implementing, and evaluating a marketing plan and public relations plan. • Develop a mission statement that guides business strategy and practices. • Perform a needs analysis to identify customers, location options, and business niches. • Establish personnel management policies considering legal constraints and ethical issues. • Discuss the role of the physical therapist as a practitioner of choice to whom consumers have direct access. • Design quality management applied in health service delivery. • Discuss strategic financial planning for a successful business using theories of basic accounting. • Determine priorities for managing multiple tasks within an environment. • Employ risk management 	<p>service delivery.</p> <ul style="list-style-type: none"> • Design a program for ongoing assessment of quality indicators. • Develop a business plan for a program. • Create a marketing plan in support of fitness, wellness, and prevention of injury. • Design space that reflects a business plan for health promotion, fitness, and wellness. • Participate in planning and conducting a health fair. • Critically evaluate consumer brochures, program descriptions, and advertisements. • Plan and participate in activities in support of APTA's annual National Physical Therapy Month. • Identify differences between Medicare Part A and Part B reimbursement patterns. • Discuss ICD-9 codes for billing. • Discuss differences in reimbursement entities (e.g., workers' compensation, RBRVS, CPT© codes). • Identify regulations that require monitoring for 	

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	strategies in business operations.	compliance (e.g., HIPAA, Blood Borne Pathogens). <ul style="list-style-type: none"> • Develop waiver of liability form. • Establish a mechanism for determining the exercise compliance in an adolescent fitness program. 	
PE #22: Consultation			
Foundational and clinical sciences Standards of practice (physical therapist and physical therapist assistant) Relevant federal, state, and local laws Documentation standards Analysis of need for physical therapy services Business plans and their development Organizational structure and behavior Negotiating principles Public policy development Epidemiology	<ul style="list-style-type: none"> • Describe common consultation models and the role of the consultant in each. • Describe qualifications that describe a successful consultant. • Apply documentation standards used to communicate consultative comments. • Profile an organization and identify consultative recommendations that address its needs. • Identify the basis from which consultative recommendations are derived. • Identify practice patterns that lend themselves to specified organizations. • Describe factors that contribute to consultative recommendations being ignored. 	<ul style="list-style-type: none"> • Identify desirable personal characteristics of an effective consultant. • Compare and contrast a practice pattern(s) under consideration for recommendation to a specific organization. • Describe business principles that influence the acceptance or rejection of consultative recommendations. • Apply principles of analysis to a work site with large numbers of employees with cumulative trauma syndromes. • Describe principles for the development of public health policy that affects the practice of physical therapy. 	<ul style="list-style-type: none"> • Participate in the development of an integrated service at an early intervention site.

APPENDIX A

GLOSSARY

Accountability: Active acceptance of responsibility for the diverse roles, obligations, and actions of the physical therapist including self-regulation and other behaviors that positively influence patient/client outcomes, the profession, and the health needs of society. (*Professionalism in Physical Therapy: Core Values*, August 2003.)

Adaptive devices: A variety of implements or equipment used to aid patients/clients in performing movements, tasks, or activities. Adaptive devices include raised toilet seats, grab bars, modified utensils, reachers and other devices.

Assistive Technology: Assistive technology (AT) is any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of individuals with disabilities. (29 U.S.C. Sec 2202(2).)

Assessment: The measurement or quantification of a variable or the placement of a value on something. Assessment should not be confused with *examination* or *evaluation*.

Caregiver: One who provides care, often used to describe a person other than a health care professional.

Case management: The coordination of patient care or client activities.

Client: An individual who is not necessarily sick or injured but who can benefit from a physical therapist's consultation, professional advice, or services. A client also is a business, a school system, or other entity that may benefit from specific recommendations from a physical therapist.

Clinical decision making (CDM): Interactive model in which hypotheses are generated early in an encounter based on initial cues drawn from observation of the patient or client, a letter of referral, the medical record, or other resources.

Clinical education experiences: These experiences comprise all of the formal and practical "real-life" learning experiences provided for students to apply classroom knowledge and skills in the clinical environment. Experiences would include those of short and long duration (e.g., part-time, full-time, internships) and those that provide a variety of learning experiences (e.g., rotations on different units within the same practice setting, rotations between different practice settings within the same health care system) to include comprehensive care of patients across the life span and related activities.

Clinical reasoning: A systematic process used to assist students and practitioners in inferring or drawing conclusions about patient/client care under various situations and conditions.

Cognitive: Characterized by awareness, reasoning, and judgment.

Communication: A process by which information is exchanged between individuals through a common system of symbols, signs, or behavior.

Competence: The possession, application, and evaluation of requisite professional knowledge, skills, and abilities to meet or exceed the performance standards, based on the physical therapist's roles and responsibilities, within the context of public health, welfare, and safety.

Competency: A significant, skillful, work-related activity that is performed efficiently, effectively, fluidly, and in a coordinated manner.

Complexity: Multiple requirements of the tasks or environment (e.g., simple, complex), or patient (see Complex patient). The complexity of the tasks or environment can be altered by controlling the number and types of elements to be considered in the performance, including patients, equipment, issues, etc. As a student progresses through clinical education experiences, the complexity of tasks/environment should increase, with fewer elements controlled by the CI.

Consultation: The rendering of professional or expert opinion or advice by a physical therapist. The consulting physical therapist applies highly specialized knowledge and skills to identify problems, recommend solutions, or produce a specified outcome or product in a given amount of time. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Consumer: One who acquires, uses, or purchases goods or services; any actual or potential recipient of health care.

Cost-effectiveness: Economically worthwhile in terms of what is achieved for the amount of money spent; tangible benefits in relation to expenditures.

Critical inquiry: The process of applying the principles of scientific methods to read and interpret professional literature, participate in research activities, and analyze patient care outcomes, new concepts, and findings.

Diagnosis: Diagnosis is both a process and a label. The diagnostic process performed by the physical therapist includes integrating and evaluating data that are obtained during the examination to describe the patient/client condition in terms that will guide the prognosis, the plan of care, and intervention strategies. Physical therapists use diagnostic labels that identify the impact of a condition on function at the level of the system (especially the movement system) and at the level of the whole person. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Diagnostic process: The evaluation of information obtained from the patient examination organized into clusters, syndromes, or categories.

Direct access: Practice mode in which physical therapists examine, evaluate, diagnose, and provide interventions to patients/clients without a referral from a gatekeeper, usually the physician.

Disability: The inability to perform or a limitation in the performance of actions, tasks, and activities usually expected in specific social roles that are customary for the individual or expected for the person's status or role in a specific sociocultural context and physical environment. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Disease: A pathological condition or abnormal entity with a characteristic group of signs and symptoms affecting the body and with known or unknown etiology. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Discharge: The process of ending physical therapy services that have been provided during a single episode of care, when the anticipated goals and expected outcomes have been achieved. Discharge does not occur with a transfer (that is, when the patient is moved from one site to another site within the same setting or across setting during a single episode of care). ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Documentation: All written forms of communication provided related to the delivery of patient care, to include written correspondence, electronic record keeping, and word processing.

Education: Knowledge or skill obtained or developed by a learning process; a process designed to change behavior by formal instruction and/or supervised practice, which includes teaching, training, information sharing, and specific instructions.

Efficiency: The ability to perform in a cost-effective and timely manner (e.g., inefficient/slow, efficient/timely). As the student progresses through clinical education experiences, efficiency should progress from a high expenditure of time and effort to economical and timely.

Evaluation: A dynamic process in which the physical therapist makes clinical judgments based on data gathered during the

examination. No defined number or range of number of visits is established for this type of episode. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Evidenced-based practice: Integration of the best possible research evidence with clinical expertise and patient values, to optimize patient/client outcomes and quality of life to achieve the highest level of excellence in clinical practice. (Sackett DL, Haynes RB, Guyatt GH, Tugwell P. *Clinical Epidemiology: A Basic Science for Clinical Medicine*. 2nd ed. Boston: Little, Brown and Company; 1991:1.) Evidence includes randomized or nonrandomized controlled trials, testimony or theory, meta-analysis, case reports and anecdotes, observational studies, narrative review articles, case series in decision making for clinical practice and policy, effectiveness research for guidelines development, patient outcomes research, and coverage decisions by health care plans.

Examination: A comprehensive and specific testing process performed by a physical therapist that leads to diagnostic classification or, as appropriate, to a referral to another practitioner. The examination has three components: the patient/client history, the systems reviews, and Tests and measures. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Excellence: Excellence is physical therapy practice that consistently uses current knowledge and theory while understanding personal limits, integrates judgment and the patient/client perspective, embraces advancement, challenges mediocrity, and works toward development of new knowledge. (*Professionalism in Physical Therapy: Core Values*, August 2003.)

Fitness: A dynamic physical state—comprising cardiovascular/pulmonary endurance; muscle strength, power, endurance, and flexibility; relaxation; and body composition—that allows optimal and efficient performance of daily and leisure activities. ([Guide to Physical therapist](#)

[Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Function: The special, normal, or proper action of any part or organ; an activity identified by an individual as essential to support physical and psychological well-being as well as to create a personal sense of meaningful living; the action specifically for which a person or thing is fitted or employed; an act, process, or series of processes that serve a purpose; to perform an activity or to work properly or normally.

Functional limitation: A restriction of the ability to perform a physical action, activity, or task in a typically expected, efficient, or competent manner. ([Guide to Physical therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Functional outcomes: The desired result of an act, process, or intervention that serves a purpose (e.g., improvement in a patient's ability to engage in activities identified by the individual as essential to support physical or psychological well-being).

Goals: The intended results of patient/client management. Goals indicate changes in impairment, functional limitations, and disabilities and changes in health, wellness, and fitness needs that are expected as a result of implementing the plan of care. Goals should be measurable and time limited (if required, goals may be expressed as short-term and long-term goals.) (*Guide to Physical Therapist Practice*. Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Guide to Physical Therapist Practice: Document that describes the scope of practice of physical therapy and assists physical therapists in patient/client management. Specifically, the *Guide* is designed to help physical therapists: 1) enhance quality of care, 2) improve patient/client satisfaction, 3) promote appropriate utilization of health care services, 4) increase efficiency and reduce unwarranted variation in the provision of services, and 5) promote cost reduction through prevention and wellness initiatives.

The *Guide* also provides a framework for physical therapist clinicians and researchers as they refine outcomes data collection and analysis and develop questions for clinical research. (*Guide to Physical Therapist Practice*. Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Health care provider: A person or organization offering health services directly to patients or clients.

Health promotion: The combination of educational and environmental supports for actions and conditions of living conducive to health. The purpose of health promotion is to enable people to gain greater control over the determinants of their own health. (Green LW, Kreuter MW. *Health promotion Planning*. 2nd ed. Mountain View, CA: Mayfield Publishers; 1991:4.)

Health status: The level of an individual's physical, mental, affective, and social function: health status is an element of well-being.

History: An account of past and present health status that includes the identification of complaints and provides the initial source of information about the patient. The history also suggests the patient's ability to benefit from physical therapy services.

ICF: The ICF, with a focus on *human functioning*, provides a system to enable the description of the components of functioning that are impacted by a health condition. In other words, it is a tool that enables the collection of data as to *how* people with a health condition function in their daily life and not only their diagnosis or the presence or absence of disease. It is a biopsychosocial model of disability in which disability and functioning are viewed as outcomes of interactions between health conditions (diseases, disorders, and injuries) and contextual factors (environmental factors and personal factors).

1. The ICF focuses on the components of health rather than the consequences of disease. ICF takes a neutral stand with regard to etiology.

2. The ICF organizes information in 2 parts: Part 1 deals with components of functioning and disability, and Part 2 covers contextual factors. Each part has two components.
3. Each ICF component can be expressed in positive and negative terms. Positive or non-problematic aspects of health are included under the umbrella term 'functioning', whereas impairments, activity limitations, and participation restrictions are included under the 'disability' umbrella term.
4. Each component consists of various domains – within each domain, categories, which are the units of classification

In 2001, the 191 Member States of the World Health Organization agreed to adopt the ICF as the basis for the scientific standardization of data on health and disability worldwide. In 2008, the APTA endorsed the ICF. This was the first time that APTA acknowledged an official endorsement of a conceptual framework describing health and functioning.

http://www.apta.org/AM/Template.cfm?Section=Info_for_Clinicians&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=51425

Impairment: A loss or abnormality of physiological, psychological, or anatomical structure or function. (*Guide to Physical Therapist Practice*. Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Intervention: The purposeful interaction of the physical therapist with the patient/client, and, when appropriate, with other individuals involved in patient/client care, using various physical therapy procedures and techniques to produce changes in the condition. (*Guide to Physical Therapist Practice*. Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

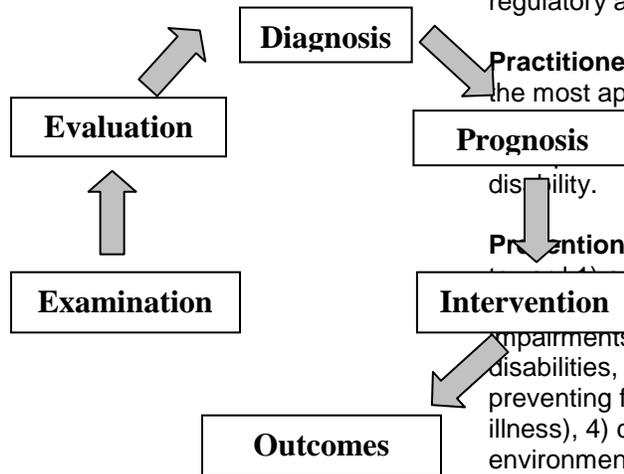
Negotiation: The act or procedure of treating another or others in order to come to terms or reach an agreement.

Objective: A measurable behavioral statement of an expected response or

outcome; something worked toward or striven for; a statement of direction or desired achievement that guides actions and activities.

Patients: Individuals who are the recipients of physical therapy and direct interventions.

Patient/client management model:



(Adapted from the [Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Performance criterion: A description of outcome knowledge, skills, and behaviors that define the expected performance of students. When criteria are taken in aggregate, they describe the expected performance of the graduate upon entry into the practice of physical therapy.

Personnel management: Selection, training, supervision, and deployment of appropriately qualified persons for specific tasks/functions.

Physical therapist: A licensed health care professional who offers services designed to preserve, develop, and restore maximum physical function.

Plan of care: (Statements that specify the anticipated goals and the expected outcomes, predicted level of optimal improvement, specific interventions to be used, and proposed duration and frequency

of the interventions that are required to reach the goals and outcomes. The plan of care includes the anticipated discharge plans. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Practice management: The coordination, promotion, and resource (financial and human) management of practice that follows regulatory and legal guidelines.

Practitioner of choice: Consumers choose the most appropriate health care provider for diagnosis, intervention, or prevention of injury, functional limitation, or disability.

Prevention: Activities that are directed at achieving and restoring optimal capacity, 2) minimizing impairments, functional limitations, and disabilities, 3) maintaining health (thereby preventing further deterioration or future illness), 4) creating appropriate environmental adaptations to enhance independent function. *Primary prevention:* Prevention of disease in a susceptible or potentially susceptible population through such specific measures as general health promotion efforts. *Secondary prevention:* Efforts to decrease the duration of illness, severity of diseases, and sequelae through early diagnosis and prompt intervention. *Tertiary prevention:* Efforts to limit the degree of disability and promote rehabilitation and restoration of function in patients/clients with chronic and irreversible diseases. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Prognosis: The determination by the physical therapist of the predicted optimal level of improvement in function and the amount of time needed to reach that level. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Quality: The degree of skill or competence demonstrated (e.g., limited skill, high skill), the relative effectiveness of the performance (e.g., ineffective, highly effective), and the extent to which outcomes meet the desired

goals. A continuum of quality might range from demonstration of limited skill and effectiveness to a highly skilled and highly effective performance.

Reexamination: The process of performing selected Tests and measures after the initial examination to evaluate progress and to modify or redirect interventions. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Screening: Determining the need for further examination or consultation by a physical therapist or for referral to another health professional. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.) (See also: *Cognitive screening*.)

Standard: Something established by authority, custom, general consent as a model or example; set up and established by authority as a rule for the measure of quantity, weight, extent, value, or quality; having recognized and permanent value and wide acceptance

Tests and measures: Specific standardized methods and techniques used to gather data about the patient/client after the history and systems review have been performed. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Treatment: The sum of all interventions provided by the physical therapist to a patient/client during an episode of care. ([Guide to Physical Therapist Practice](#). Rev 2nd Ed. Alexandria, VA: American Physical Therapy Association; 2003.)

Wellness: An active process of becoming aware of and making choices toward a more successful existence. (National Wellness Organization. *A Definition of Wellness*. Stevens Point, WI: National Wellness Institute Inc; 2003.)

APPENDIX B

References

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<http://www.wheelchairskillsprogram.ca/eng/overview.htm>

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http://www.pva.org/site/DocServer/Upper_Limb_Consumer_Guide.pdf?docID=6401

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APPENDIX D
NEUROLOGIC ENTRY-LEVEL CURRICULAR CONTENT
INTEGRATED WITH
A NORMATIVE MODEL OF PHYSICAL THERAPIST PROFESSIONAL EDUCATION

FAQ Sheet

Listed below are several key points to remember and resources that will provide support as you integrate the concept presented in the neurologic entry-level curricular content.

Key points

- Given the ongoing development of the breathe and depth of the material that informs our practice this documents should be looked upon as a living documents reflecting today's evidence
- Tests and measures presented are based upon current evidence and should be revisited as new tests and measures emerge and further data is presented in the literature on the present utility of the these tests

Resources

[Guide to Physical Therapist Practice.](#)

www.neuropt.org

APTA. *Minimum Required Skills of Physical Therapist Graduates at Entry-Level*, American Physical Therapy Association. Alexandria; VA: 2005.
<http://www.apta.org/AM/Template.cfm?Section=Clinical&CONTENTID=27559&TEMPLATE=/CM/ContentDisplay.cfm>

**Table 1. Tests and Measures by ICF Category
Entry-Level Neurologic Content Guidelines**

Name of Measure, by ICF category (some tests may overlap categories) * Also recommended by Stroke EDGE group for curricula	Neuro Population	Knowledge Only, or Application of Test Recommended
Participation measures		
Activities and Balance Confidence Scale (ABC)*	Multiple	Know
Craig Handicap Assessment & Reporting Technique (CHART)	Brain Injury	Know
Dizziness Handicap Inventory (DHI)	Vestibular	Know
Modified Fatigue Impact Scale (MFIS)*	Multiple Sclerosis	Know
Participation Objective, Participation Subjective (POPS)	Brain Injury	Know
SF-36*	Multiple	Know
Stroke Impact Scale (SIS)*	Stroke	Apply
Tinetti Falls Efficacy Scale (FES)	Balance and Falls	Know
Activity Measures		
10 M Walk velocity*	Multiple	Apply
6 minute walk *	Multiple	Apply
Barthel Index	Multiple	Know
Berg Balance Scale (Berg)*	Multiple	Apply
Functional Reach*	Multiple	Apply
Clinical Test for Sensory Integration and Balance (CTSIB)	Multiple	Know
Dynamic Gait Index (DGI)	Multiple	Apply
FIM/FAM (Functional Independence/Assessment Measure)	Brain Injury	Know
Functional Gait Assessment (FGA)	Multiple	Apply
Functional Independence Measure (FIM)*	Multiple	Apply
High level mobility assessment tool (HiMAT)	Brain Injury	Know
Limits of Stability/Sensory Org	Balance and Fall	Know
Multidirectional Reach	Multiple	Apply
Modified Functional Reach (seated)	Multiple	Apply
Observational gait analysis (Rancho)	Multiple	Apply
Spatio-temporal characteristics of gait (e.g., step length, speed)	Multiple	Apply
Stops Walking when Talking test	Multiple	Know
Timed sitting test	Multiple	Apply
Timed Up & Go (TUG)*	Multiple	Apply
Wheelchair Skills test	Spinal Cord Injury	Know
Body Structure and Function Measures		
Action Reach Arm Test (ARAT)*	Stroke	Apply
ASIA	Spinal Cord Injury	Apply
Coordination tests (finger → nose, heel → shin, rapid alternating movements, etc...)	Multiple	Apply
Glasgow Coma Scale (GCS)	Brain Injury	Know
Fugl-Meyer* or the Chedoke-McMaster Stroke Assess Scale*	Stroke	Apply
Hallpike-Dix and modifications	Vestibular	Apply
Head thrust test	Vestibular	Apply
JFK Coma Recovery Scale Revised	Brain Injury	Know
Manual Muscle Test (MMT)	Multiple	Apply
Mini Mental State Exam (MMSE)	Multiple	Know
Modified Ashworth (MAS)*	Multiple	Apply
Perception tests (Extinction, Clock drawing, Line Bi-section, Cancellation)	Multiple	Know
Postural Assessment Scale for Stroke (PASS)*	Stroke	Apply
Rancho Levels of Cognitive Function	Brain Injury	Know
Romberg, Sharpened Romberg	Multiple	Apply

Smooth pursuit and saccades	Vestibular	Apply
Tardieu Spasticity Scale*	Multiple	Apply
Timed Up and Go - Cognitive dual task condition (TUG-dual)	Multiple	Know
Unified Parkinson's Disease Rating Scale (UPDRS)	Parkinson's Disease	Know
Wolf Motor Function Test (WMFT)*	Stroke	Know
Predictive Outcome Measures		
National Institute of Health Stroke Scale (NIHSS)*	Stroke	Know
Orpington Prognostic Scale*	Stroke	Know

Figure 1. Neurology content additions to the Normative Model document

Foundation Sciences

Systems

Molecular, Cellular, and Tissue Biology

Physiology across life span

Imaging (magnetic resonance imaging [MRI], fMRI, CT scan, PET scan)

Imaging (Angiogram)

Exercise

Strength training (overload weakness related to denervated muscle)

Aerobic/anaerobic conditioning (central fatigue)

Coordination (timing, sequencing, grading, individuation)

Balance (postural control, motor and sensory organization, central processing, anticipatory and reactive responses)

Flexibility (contracture with spasticity)

Biomechanics

Technology-assisted analysis

Types available

Information provided

Interpretation of data

Kinesiology

Description of movement

Posture

Initiation

Execution

Termination

Technology-assisted analysis

Neuroscience

Neurophysiology (PNS, CNS, ANS)

Neurotransmission (electrical and chemical neurotransmitters, Electromyography EMG, nerve conduction)

Alterations due to injury and disease across the lifespan

Mechanisms underlying plasticity

Cellular through behavioral levels

Across the lifespan

In response to activity including exercise

Neuroanatomy (CNS, ANS, PNS)

Classification and functional purpose of neurons

Composition and functions of regions or systems (e.g., brain, brainstem, cranial nerves, spinal cord, *peripheral nerves, and neuromuscular junction*)

Changes in structure across the lifespan

Imaging (e.g.,MRI, fMRI, CT Scan, PET Scan, angiogram)

Neurological function

Motor control

Theories and models of motor control (e.g., *dynamical systems, reflex, hierarchical*)

Theories and models of functional movement (eg posture, locomotion, and reaching)

Practice and feedback effects

Cognition

Memory (*implicit and explicit*), arousal, *orientation*, attention, and *executive function*(reasoning, problem solving) categorization, and memory

Language and communication (eg, aphasia)

Sensation and perception

Sensory and *motor* systems: neuroanatomy and physiology of sensory and motor systems *across the lifespan (vision, auditory, olfaction, vestibular, reflexes, cerebellum, basal ganglia)*

Neuroimmunology

Neuroendocrinology

Effects of chronic stress

Pathology

Natural course of commonly seen primary neurologic, musculoskeletal, and other system disorders/diseases

Nervous

Stroke syndrome

Traumatic Brain Injury (TBI)

Spinal cord injury (SCI)

Vestibular disorders

Cerebellar disorders

Peripheral nerve disorders

Degenerative disorders (Parkinson disease [PD], Amyotrophic lateral sclerosis [ALS], Huntington disease, dementia)

Congenital disorders (Cerebral palsy [CP], Downs syndrome, Spinal bifida)

Demyelinating disorders (Multiple Sclerosis [MS], Guillian-Barré syndrome [GBS])

Tumors

Muscular dystrophy [MD]

Complex regional pain syndromes[CRPS]

Post-polio syndrome [PPS]

Behavioral Sciences

Communication

Verbal communication

English or impaired communication ability (*aphasia, dysarthria, alaryngeal speech*)

Social and Psychologic Factors

Psychological/emotional responses to illnesses and disability

Anxiety (*fear of falling*)

Aphysiologic responses (eg, amplification, conversion)

Stress (*eg, PTSD*)

Grief and loss (*end of life and chronic disability*)

Lack of awareness of deficit

Emotional lability

Sexuality

Ethics and Values

Patent/client rights

Competence related to cognitive impairment

Advocacy

Access to care

Funding for long-term and catastrophic care

Resource allocation for least restrictive environment (at home, workplace, community integration)

Teaching and Learning

Learning theory *across the lifespan*

Teaching methods for various audiences (*patients, peers, community, caregivers, family, other health professionals, policymakers*)

Clinical reasoning

Models of Clinical reasoning

HOAC II and Integrated Framework for Decision Making in Neurologic PT

Fell decision-making model for Progression

Enablement/disablement (eg, ICF Model, Nagi Model, Top Down Model (Gordon & Quinn

)

Evidence-Based Practice

Critically analyze evidence

Legal and ethical standards for conducting research (eg, IRB)

Research design

Nonexperimental

Quasiexperimental *Observational*

- (*CPI*) *Clinical Practice Improvement Studies (ie, Horn)*

Measurement science

Responsiveness (eg, effect size)
Minimal Clinical Importance Difference
Common statistical tests
Parametric statistics
Nonparametric statistics
Power analysis
Sensitivity analysis
Clinical prediction rules

Clinical Sciences

Neuromuscular

Diseases, injuries, or conditions of the neuromuscular (CNS, PNS, ANS) system *for which physical therapy management is indicated to manage the primary (eg, gait and balance training post hemiparesis) and/or secondary effects (eg, contractures, pressure sores), and/or co-morbidities (Osteoarthritis, Congestive Heart Failure, Diabetes)*

Practice Expectations (PE's)

PE #1: Accountability

Specific to patients with cognitive and or behavioral impairments

PE #6: Communication

Specific to individuals with neurological deficits, resulting in communication disorders, cognitive and or behavioral impairments.

PE #8: Clinical reasoning

Models of Clinical reasoning

- *(HOAC II and Integrated Framework for Decision Making in Neurologic PT, and Progressing Therapy Intervention)*
- *Enablement/disablement Models (e.g., ICF, Nagi, Top Down)*
- *Movement and tasks analysis models*

PE #10: Education

Teaching methods for various audiences (patients, peers, community, caregivers family, policymakers, and other health professionals)

PE #11: Screening

Screening tools

Red Flags

Acute onset of:

- *weakness*
- *change in speech*
- *change in vision*
- *severe headache*

- *dizziness*
- *loss of balance*
- *in-coordination*
- *seizure activity*
- *acute infection with neurologic signs*
- *spinal column instability*
- *non-responsive autonomic dysreflexia*
- *changes in bowel and bladder*
- *changes in sensation*

Screening for each of the following:

Balance/Falls

- *Timed up and go (TUG)*
 - *Timed sit to stand,*
 - *Standing balance/Romberg*
 - *Stops walking when talking*

Developmental Delay

- *Developmental milestone achievement*

Safety issues

- *Observation/insight*

Changes in mental status

- *Alert and oriented (x3)*
- *Concussion*

Changes in behavior

- *Anxiety*
- *Depression*

P12: Examination

[Inclusion of the Minimum Skills of the PT Graduate at Entry-Level with the following additional specific neurologic Tests and measures:](#)

3. Perform gait, locomotion and balance tests including quantitative and qualitative measures such as:

A. Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment *using the Timed up and go (TUG) or Berg tests.*

B. Balance (dynamic and static) with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment *using:*

multi-directional reach and modified functional reach (seated)

CTSIB

timed sitting test

C. Gait and locomotion during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment *using:*

Dynamic Gait Index (DGI), Functional Gait Assessment (FGA),

High Level Mobility Assessment Tool (HIMAT)

Wheelchair skills test

PASS test

D. Perform gait assessment including *spatio-temporal characteristics of gait such as:*

step length, speed

abnormal gait patterns using Rancho Los Amigos Observational Gait Analysis.

7. Characterize or quantify environmental home and work (job/school/play) barriers using tools such as

Craig Handicap Assessment & Reporting Technique (CHART)

Participation Objective, Participation Subjective (POPS)

Stroke Impact Scale (SIS)

Short-form (SF)-36

Dizziness handicap inventory (DHI)

8. Observe self-care and home management (including ADL and IADL) *using the:*

Functional Independence Measure (FIM)

FIM/FAM (Traumatic Brain Injury (TBI)

Barthel Index

and for falls efficacy using

the Activities-specific Balance Confidence Scale (ABC)

and Tinetti Falls Efficacy Scale (FES).

Neurological System

1. Perform arousal, attention and cognition tests and measures to characterize or quantify (including standardized tests and measures that include:

Glasgow Coma Scale (GCS)

JFK Coma Recovery Scale - Revised

Rancho Los Amigos Levels of Cognitive Functioning (Rancho levels)

Mini Mental Status Examination (MMSE)

Timed up and Go (TUG) cognitive)

2. Perform cranial and peripheral nerve integrity Tests and measures:

A. *Dix-Hallpike including modifications, smooth pursuits and saccades, and head thrust*

3. Perform motor function Tests and measures

- A. Dexterity, coordination, and agility (e.g., *Finger-to-Nose, Heel-to-Shin, Rapid Alternating Movements, Finger opposition*)
- B. Initiation, execution, modulation and termination of movement patterns and voluntary postures and reflexes such as:
 - Chedoke-McMaster or Fugl-Meyer motor*
 - ASIA*
 - WMFT*
 - Modified Ashworth or Tardieu Spasticity scales*
- 4. Knowledge of motor function Tests and measures such as:
 - Unified Parkinson's Disease Rating scale (UPDRS)*
 - Modified Fatigue Impact Scale (MFIS)*
- 5. Perform neuromotor development, sensory integration, and perception tests and measures:
 - A. Perception: *Test of extinction, Clock drawing line Bi-Section, and Cancellation test*

PE #13: Evaluation

Synthesize neurological data

PE #14: Diagnosis

Clinical decision making

- *Guide to Physical Therapist Practice*
 - *Neurologic preferred practice patterns*

PE #15: Prognosis

Orpington Prognostic Scale (OPS)

National Institute of Health Stroke Scale (NIHSS)

PE #17: Intervention

- Safety, Emergency Care, CPR and First Aid
 - Seizure precautions*
 - intracranial pressure precautions*
 - behavior management and self-protection*
 - craniotomy precautions*
 - halo precautions*
 - SCI precautions for unstable fractures and post-surgical patients*
 - autonomic dysreflexia*
 - Body Mechanics and Positioning
 - Mechanical lift*
- 1. Coordination, communication, and documentation may include:**
- C. Case management
 - (1) *Procuring equipment*
 - H. Documentation across settings including:

(5) *Letters of medical necessity*

I. Interdisciplinary teamwork:

(4) *Discharge planning*

3. Therapeutic exercise may include performing:

A. Aerobic capacity/endurance conditioning or reconditioning:

(6) *Considerations for neurologic diagnosis Stroke syndrome, TBI, SCI, Vestibular, Cerebellar, Peripheral nerve disorders, Degenerative disorders (PD, ALS, Huntington disease, dementia), Congenital disorders (CP, Downs syndrome, Spinal bifida), Demyelinating disorders (MS, GBS), Post-polio syndrome*

B. Balance, coordination, and agility training:

(1) Developmental activities training to include

Canalith Repositioning (modified Epley)

gaze stabilization

habituation, adaptation, substitution

motor (training hip and ankle and stepping strategies)

sensory motor reorganization

D. Flexibility exercises:

(4) *Passive joint mobilization*

4. Functional training in self-care and home management may include:

D. Functional training programs:

(3) *Constraint Induced Therapy (CIT)*

(3) *Locomotive training (Body weight supported treadmill training - BWSTT)*

(3) *Task Specific Training/Task Oriented Approach including issues related to intensity, frequency, duration, task selection, practice, feedback, environment factors*

E. Injury prevention or reduction:

(2) Injury prevention education during self-care and home management (e.g., fall risk reduction)

(4) *Secondary prevention of overuse of the upper extremity dysfunction and skin integrity in patients with Spinal Cord Injury (SCI)*

5. Functional training in work (job/school/play), community, and leisure integration or reintegration may include:

B. Device and equipment use and training:

(4) *Power Mobility Training and Manual Wheelchair skills training*

C. Functional training programs:

(4) *Functional training using Manual Handling Skills (eg NDT, PNF, constraint induced therapy)*

D. Injury prevention or reduction:

(1) Injury prevention education during work (job/school/play), community, and leisure integration or reintegration (e.g., fall risk reduction)

7. Prescription, application, and, as appropriate, fabrication of devices and equipment may include:

A. Adaptive devices:

- (3) Seating systems – prefabricated or custom fabricated
- (4) Adaptive communications. Alternative access, EADL

B. Assistive devices:

- (5) Walkers, rollators, gait trainers
- (6) Wheelchairs and wheelchair seating systems
- (7) Stenders
- (8) Positioners (e.g. sidelyers, corner seats, feeding seats, car seats, etc.)

F. Supportive devices:

- (8) Serial casting

8. Airway clearance techniques may include:

A. Breathing strategies:

- (6) Inspiratory muscle trainers

9. Integumentary repair and protection techniques may include:

D. Pressure relief

- (1) Skin inspection

Emerging Interventions to include yoga, Tai chi, mental imagery, virtual reality, and robotics

PE #18: Outcomes Assessment

Activity and participation tests and measures listed under Examination

PE #19: Prevention, Health promotion, Fitness And Wellness

Long term fitness for people with neurologic impairment including accessibility and prevention issues.

PE #20: Management Of Care Delivery

Reimbursement and knowledge of National Coverage Determination (NCD) for Mobility Assistive Equipment (MAE) and Local Coverage Determinations (LCDs)

PE #21: Practice management

Considerations for complexity of neurologic diagnoses (important for productivity measures, scheduling, etc)