

Neurologic

Physical Therapy

Description of Specialty Practice

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Specialty Council on Neurologic Physical Therapy



American Board of Physical Therapy Specialties

Acknowledgements

The *Neurologic Physical Therapy Description of Specialty Practice* was prepared by the members of the Neurology Specialty Council and members of a subject matter expert group in neurologic physical therapy, in collaboration with a consultant. All participants below are ABPTS-certified clinical specialists in neurologic physical therapy.

Specialty Council in Neurologic Physical Therapy

Joni Barry, PT, DPT

Kristine Legters, PT, DSc

Sandra McCombe-Waller, PT, PhD

Robin Myers, PT, DPT

Subject Matter Experts

Kathy Brown, PT, DPT

Cathleen Harro, PT, MS*

Sue Perry PT, DPT

Diane Wrisley, PT, PhD

***Project Coordinator**

Consultant

Donald Straube, PT, PhD

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INTRODUCTION

Specialist certification was established to provide formal recognition for physical therapists with advanced clinical knowledge, experience, and skills in a defined area of practice. Certification is achieved through the successful completion of a standardized application and examination process.

History of Specialization in Physical Therapy

In 1975, the House of Delegates (House) of the American Physical Therapy Association (APTA) approved the concept of specialization and created the Task Force on Clinical Specialization. The task force was charged with identifying and defining physical therapy specialty practice areas, and with developing the structure for and function of a board-certified process. Specialist certification was established to provide formal recognition for physical therapists with advanced clinical knowledge, experience, and skills in a defined area of practice. Certification is achieved through the successful completion of a standardized application and examination process.

The document developed by the task force, *Essentials for Certification of Advanced Clinical Competence in Physical Therapy*, was adopted by the House of Delegates in 1978. At that time, the House recognized 4 specialty areas: cardiovascular/pulmonary, neurology, orthopaedics, and pediatrics. In 1979, the House appointed the Commission for Certification of Advanced Clinical Competence. Specialty councils for each of the 4 specialty areas were appointed and charged with the development of competencies unique to each area of advanced clinical practice.

In 1980, the commission became the Board of Certification of Advanced Clinical Competencies (BCACC). The House of Delegates recognized 2 additional specialty areas in the same year: sports and clinical electrophysiology. The House of Delegates revised *Essentials for Certification of Advanced Clinical Competence in Physical Therapy* in 1985, and the name was changed to *Essentials for Certification of Physical Therapist Specialists*. The BCACC was renamed the American Board of Physical Therapy Specialists (ABPTS), and the first specialty examination was administered in cardiovascular/pulmonary physical therapy that same year. The specialty area of geriatrics was approved in 1989. In June 2006, the House of Delegates approved women's health as the newest area of physical therapist specialist practice.

History of Specialization in Neurologic Physical Therapy

In 1980, the original Neurology Section (now Academy of Neurologic Physical Therapy) Task Force on Clinical Specialization was established. This task force surveyed section members, health professionals, and consumer groups to validate advanced level clinical competencies in neurologic physical therapy. The task force developed the *Petition for Establishment of a Specialty Area in Neurology*,¹ which provided support for the need and identified advanced knowledge, skills, and competencies in neurologic physical therapy, and it was approved by BCACC. The first Specialty Council on Neurologic Physical therapy, a 3-member group, was appointed and charged with developing the standards for certification of advanced competencies. The council developed 18 competencies in the following general areas: assessment and treatment of patients with developmental, systemic, and traumatic disorders affecting the neuromuscular system; communication; consultation; education; administration; and scientific inquiry. *Physical Therapy Advanced Clinical Competencies—Neurologic*² was published in 1985, and the first group of board-certified clinical specialists in neurologic physical therapy was recognized in 1987.

Per ABPTS policy, the nature and scope of neurologic specialty practice and current advanced competencies must be revalidated every 10 years. In 1993, a subject matter expert panel developed and piloted a revalidation survey and then mailed it to 585 Neurology Section members and 45 board-certified neurologic clinical specialists. The response rate was 23%, and based on responses from this survey data, 7 competencies of neurologic specialist practice were identified: assessment, including screening and evaluation; therapeutic interventions; communication; development of educational experiences; consultation; scientific inquiry; and administration. The competencies identified in each of these areas were to be applied to the prevention and treatment of neurologic dysfunction resulting from trauma, disease, or genetic disorders that affect individuals throughout the lifespan. In 1994, the revised *Description of Advanced Clinical Practice: Neurologic Physical Therapy*^{3,4} was published, which outlined lists of knowledge statements and clinical skills considered to be current best practice at the time in neurologic specialist practice.

The second revalidation practice analysis was conducted in 2002; 590 board-certified neurologic clinical specialists (NCS) and nonspecialist members of the Neurology Section were surveyed to revalidate advanced-level clinical competency areas.⁵ The response rate was 34% (120 NCS and 67 non-NCS responded), and from this survey

data a revised *Description of Specialty Practice (DSP) in Neurologic Physical Therapy*⁶ (2004) was developed by the subject matter expert group and approved by ABPTS. This document described current knowledge areas, professional responsibilities, practice expectations, and competencies of a neurologic clinical specialist. Practice competencies were outlined in the following categories of patient and client management: examination; evaluation, diagnosis, and prognosis; intervention; and outcomes. Besides updated competency statements, this DSP also reflected the terminology and concepts of the *Guide to Physical Therapist Practice*.⁷ Case study examples of how the neurologic clinical specialist applies advanced knowledge and skills in clinical decision-making and practice were included in this revised DSP.

In 2014, the Neurologic Specialty Council and a subject matter expert group conducted the most recent practice analysis. Board-certified neurologic clinical specialists and nonspecialist members of the Neurology Section were surveyed to validate advanced-level clinical competency areas. The practice analysis survey and this latest revision of the *Description of Specialty Practice in Neurology* reflects current specialists' competencies and are based on the terminology and concepts contained in *Guide to Physical Therapist Practice 3.0*.⁸ This DSP outlines the process used to conduct the practice analysis, the updated competencies, and case study examples of application of advanced knowledge areas, skills, and competencies in patient and client management.

References

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4. *Description of Advanced Clinical Practice: Neurologic Physical Therapy*. Neurologic Specialty Council, American Board of Physical Therapy Specialties; 1994.
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6. *Neurologic Physical Therapy Description of Specialty Practice*. Neurology Specialty Council, American Board of Physical Therapy Specialties; 2004.
7. *Guide to Physical Therapist Practice*. 2nd ed. *Phys Ther*. 2001; 81:9-744.
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CHAPTER 1: DESCRIPTION OF BOARD-CERTIFIED SPECIALISTS IN NEUROLOGIC PHYSICAL THERAPY

The following demographic information is based on the 131 survey respondents who were neurologic clinical specialists. While ABPTS collects similar data on all newly board-certified specialists or recertified specialists, these data represent the most current descriptive information on neurologic clinical specialists.

Figure 1. Age

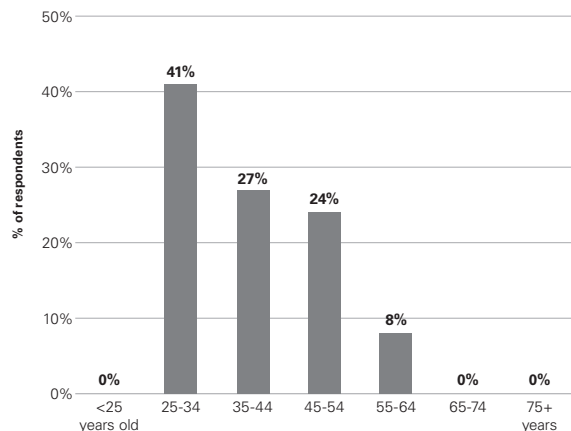


Figure 2. Sex

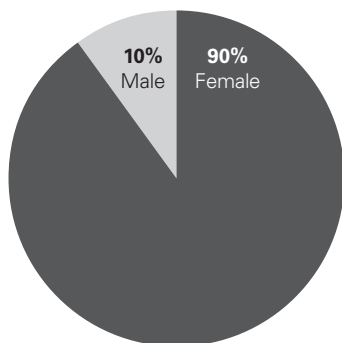


Figure 3. Ethnicity

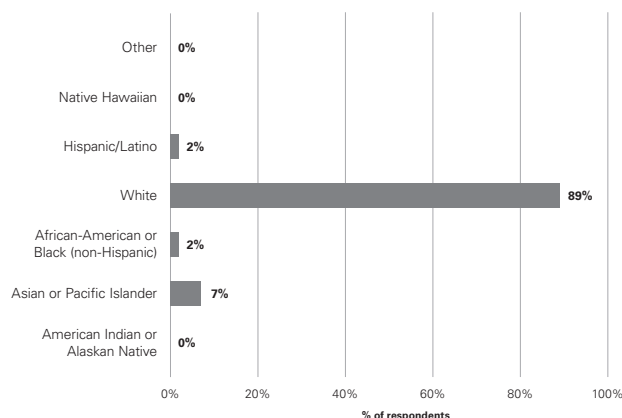


Figure 4. Practice Location by Geographic Region

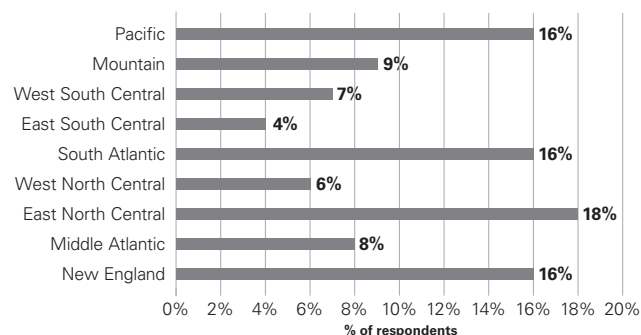


Figure 5. Entry-Level Education Program Completed

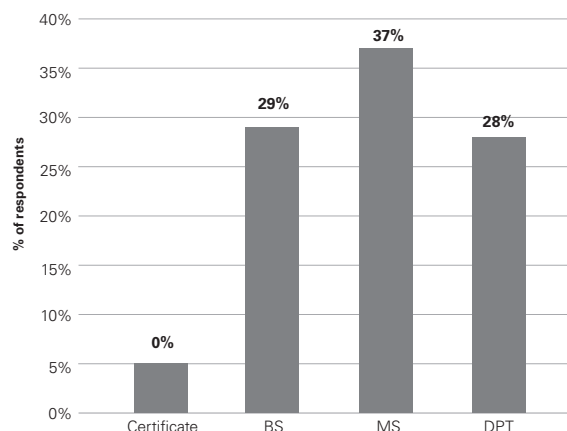


Figure 6. Highest Earned Academic Degree

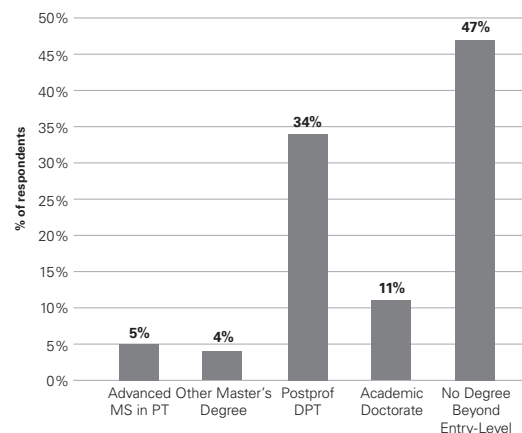


Figure 7. Years Practicing as a Physical Therapist

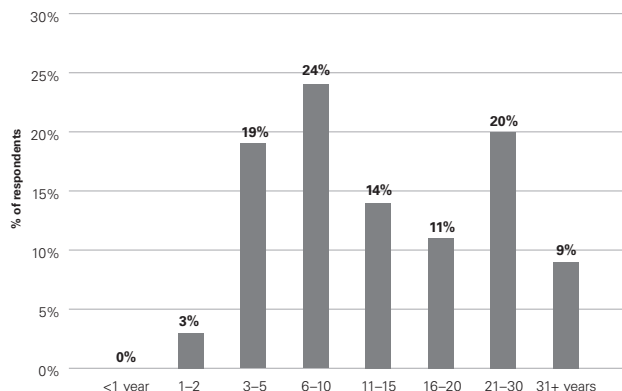


Figure 8. Years Practicing in Neurologic Physical Therapy

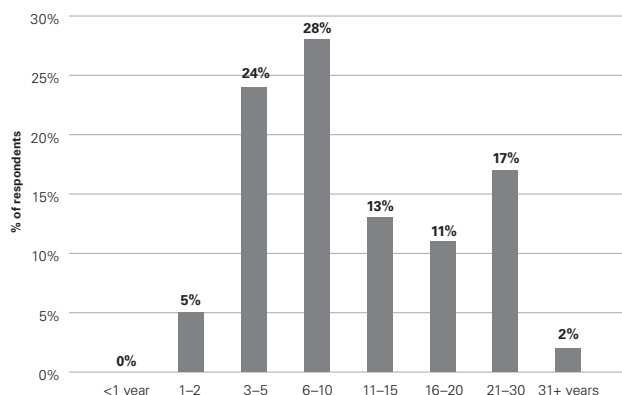


Figure 9. Completed a Credentialed Neurologic Residency Program

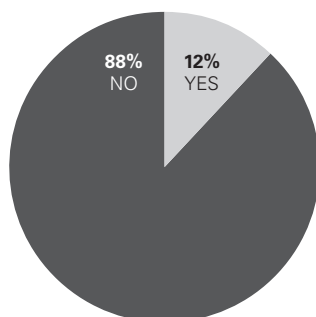


Figure 10. Have Recertified as a Neurologic Clinical Specialist

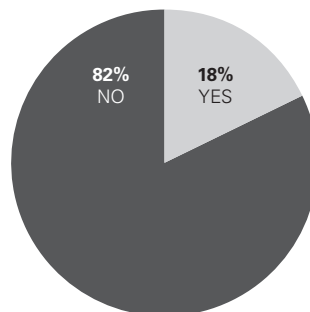


Figure 11. Education Method That Most Influenced Development of Current Clinical Skills

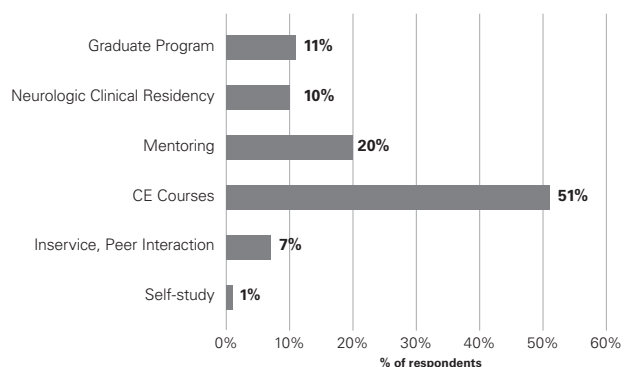


Figure 12. Type of Practice Facility

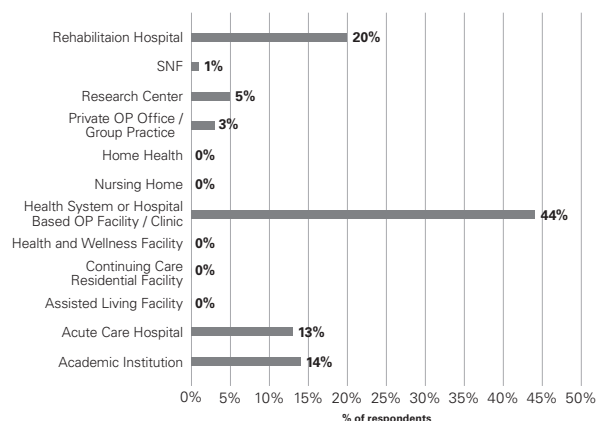
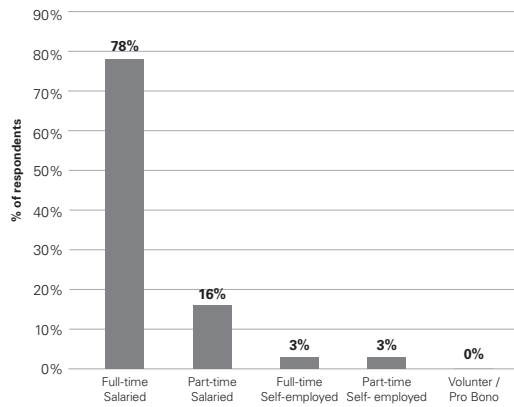
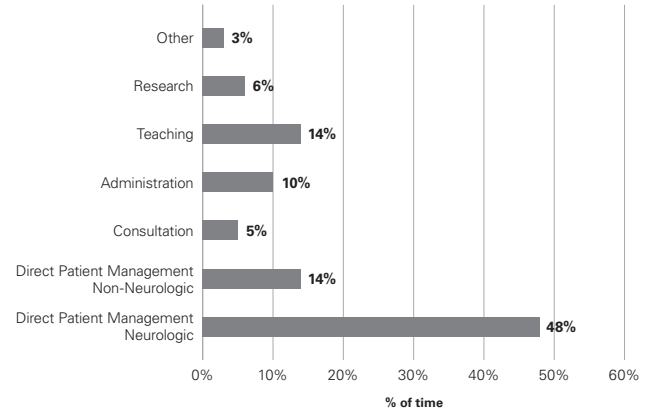
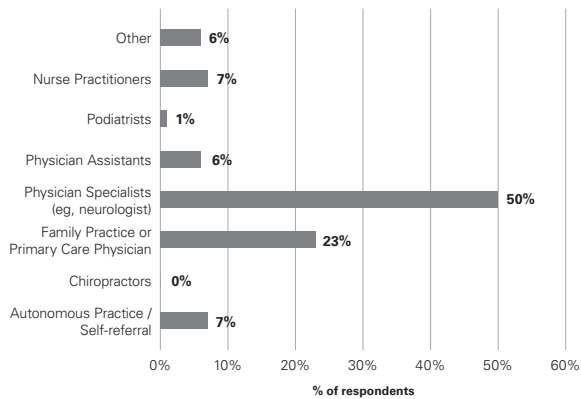
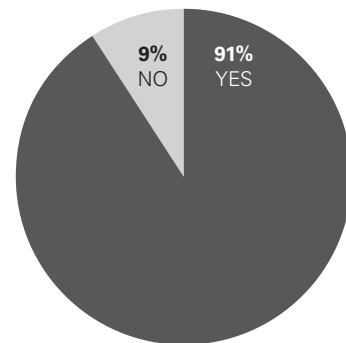
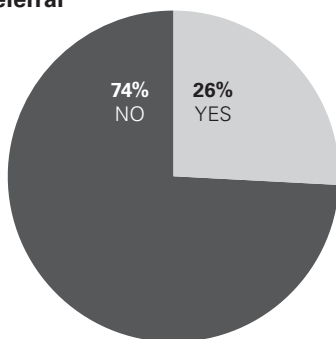
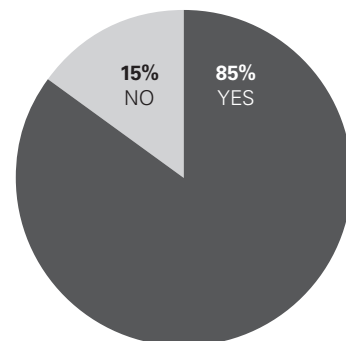


Figure 13. Employment Status**Figure 16. Time Spent in Professional Activities****Figure 14. Referral Sources****Figure 17. Member of APTA****Figure 15. Evaluate and Treat Without a Physician Referral****Figure 18. Member of Academy of Neurologic Physical Therapy**

CHAPTER 2: DESCRIPTION OF SPECIALTY PRACTICE IN NEUROLOGIC PHYSICAL THERAPY

The Description of Specialty Practice (DSP) describes the contemporary practice of neurologic clinical specialists. The DSP is revalidated every 8–10 years to best reflect current practice. Development of this DSP was based on expert consensus, key guiding reference documents, and practice analysis survey results conducted in 2014. Early in the revalidation process, consensus discussion among clinical experts focused on attributes, knowledge, and practices that might distinguish a specialist practitioner from a generalist in neurologic physical therapy. Subject matter experts and Neurology Specialty Council members, all Board-certified specialists, reflected upon behaviors that might typify a commitment to excellence in patient and client care. Rooted in concepts related to expert practice, evidence-based practice, and the *Guide to Physical Therapist Practice*, a survey instrument was developed. This survey was used to collect data on the *usage frequency* and *importance* of knowledge areas and practice expectations. The revision and revalidation of the following document was based on responses from 131 neurologic clinical specialists. The consensus panel analyzed these responses in aggregate to capture the nature of neurologic clinical specialty practice. This process culminated in the DSP that is outlined below.

The content of the practice analysis survey included the *Guide to Physical Therapist Practice*¹ patient/client management model categories of examination, evaluation, diagnosis and prognosis, intervention, and outcomes.

The Professional Roles, Responsibilities, and Values section was influenced by *Professionalism in Physical Therapy: Core Values*² as well as the 2004 version of the *Description of Advanced Clinical Practice* (DACP) for neurologic physical therapy.³ The Knowledge Areas section was based on the DACP and *A Normative Model of Physical Therapist Professional Education: Version 2004*.⁴

This DSP includes competency statements about knowledge-based areas and clinical practice expectations. The clinical practice expectations comprise competency in the areas of professional roles, responsibilities, and values, and competency in patient and client management for the neurologic clinical specialist. The competency statements generally reflect the wording used on the survey instrument. Following is the DSP for specialist clinical practice in neurologic physical therapy.

I. Knowledge Areas of Neurologic Clinical Specialty Practice

A. Foundation Sciences

- Human anatomy and physiology in healthy and neurologic populations, including:
 - Musculoskeletal system
 - Cardiovascular and pulmonary systems
 - Integumentary system
 - Exercise physiology
 - Electrophysiology
- Neuroanatomy and neurophysiology, including knowledge of central, peripheral, and autonomic nervous systems in populations with and without neurologic conditions:
 - Anatomical organization and functional specialization
 - Age-related changes across the life span, including developmental neuroanatomy
 - Neural growth and plasticity, such as cortical remodeling, activity-dependent changes
 - Neurotransmission and neurotransmitters
 - Perception and sensory systems
 - Motor systems
 - Neural control of locomotion, such as central pattern generators
 - Neural control of balance and postural control
 - Regulation and modulation of reflexes
 - Regulation and modulation of autonomic function
 - Pain, including neurogenic and nonneurogenic

- Movement sciences in populations with and without neurologic conditions, including the following:
 - Biomechanics and kinesiology of movement systems
 - Kinematic and kinetic analysis of functional movements, postural control, and gait
 - Pathokinesiology of functional movement, such as gait, posture, and reaching
 - Theories and principles of motor control
 - Theories and principles of skill acquisition and motor learning
 - Theories and principles of motor development
 - Interrelationship among social, cognitive, and movement systems
 - Effects of movement dysfunctions on multiple body systems, including immediate and long-term

B. Behavioral Sciences

- Psychology and neuropsychology, including knowledge of:
 - Cognitive processes (attention, memory, and executive dysfunction)
 - Cognitive, language, and learning disorders
 - Affective and behavioral disorders
 - Expected emotional and behavioral responses, and individualized coping strategies to illness and recovery
 - Influence of motivational factors and adherence strategies to facilitate behavioral change on illness and recovery
 - Impact of cultural and social systems on illness and recovery
- Psychiatry including knowledge of:
 - Common psychiatric symptoms, syndromes, and classifications
 - Effect of psychiatric disease and treatment on cognition, learning, and function
 - Aphysiologic presentation, such as conversion disorder
- Teaching and learning theory
 - Principles of teaching and learning
 - Development and implementation of educational planning process

C. Clinical Sciences

(Signs and symptoms, management, and epidemiology of injuries and diseases)

- Pathology, including congenital and acquired pathology/pathophysiology of:
 - Neuromuscular system
 - Musculoskeletal system
 - Cardiovascular and pulmonary systems
 - Physiologic response to trauma and stress
 - Impact of neurologic conditions on other body systems
- Epidemiology, including knowledge of:
 - Incidence and prevalence
 - Prognostic indicators
 - Risk factors relevant to health status across the lifespan
 - Natural history, morbidity, and mortality
- Medical management, including knowledge of:
 - Imaging, such as MRI, f-MRI, CT Scans, and PET scans
 - Clinical diagnostic procedures, such as EMG, NCV, and evoked potential exam
 - Laboratory tests, including normal and abnormal findings
 - Surgical and nonsurgical interventions performed for neurologic conditions
 - Assessment, monitoring, and activity modifications related to medical procedures

- Pharmacology, including knowledge of:
 - Pharmacokinetics and pharmacodynamics
 - Abnormal drug reactions, interactions, and adverse dosage effects
 - Effects on the body systems, including common short- and long-term effects

D. Clinical Reasoning and Critical Inquiry

- Application of decision-making algorithms and models to clinical practice
- Integration of the International Classification of Functioning, Disability, and Health (ICF) framework to inform clinical decisions and prioritize plan of care
- Clinical research methodology appraisal
- Critical evaluation of test psychometrics and application of principles of measurement in clinical practice
- Judicious evaluation of components and merit of published evidence

II. Professional Roles, Responsibilities, and Values of Neurologic Clinical Specialists

A. Communication

- Employs effective communication strategies in individuals with neurologic conditions, including verbal, nonverbal, and assistive technologies
- Empowers individuals in the management of their own health
- Facilitates collaborative team management and transitions of care for individuals with neurologic conditions
- Addresses cultural or social issues that affect the plan of care

B. Education

- Performs a needs assessment, including determining the educational needs and unique characteristics of the learners and group of learners
- Develops educational objectives based on the learning needs of individuals and their families, significant others, and caregivers; colleagues; and/or the public with consideration of learning domains and level of expected outcomes for learners and groups of learners
- Develops and customizes appropriate teaching strategies and methods based on learning objectives and identified learning style preferences of individuals and their families, significant others, and caregivers
- Implements an educational plan that includes explanation, demonstration, practice, and effective use of feedback as appropriate
- Accurately and objectively assesses learning outcomes of teaching strategies and modifies strategies based on outcomes
- Educates physical therapy students and colleagues to enhance knowledge and skills in neurologic physical therapy
- Educates health care professionals outside of physical therapy and outside agencies about neurologic physical therapy
- Educates community groups in primary, secondary, and tertiary prevention

C. Consultation

- Synthesizes information from a wide variety of sources when providing consultative services to colleagues
- Effectively contributes to multidisciplinary team decision-making to maximize patient and client outcomes
- Renders specialist opinion about patients and clients with neurological dysfunction to other health professionals and external organizations
- Provides peer and utilization review

D. Evidence-Based Practice

- Evaluates the efficacy and effectiveness of new and established examination tools, interventions, and technologies
- Critically appraises peer-reviewed evidence and judiciously translates evidence into practice

- Participates in conducting and disseminating clinical research following ethical guidelines
- Participates in collecting and interpreting patient and client outcomes data, such as programmatic assessment
- Synthesizes information from a variety of sources, such as clinical practice guidelines, to develop evidence-based clinical practice

E. Prevention, Wellness, and Health Promotion

- Develops and implements programs to promote health and fitness at the individual and societal level
- Promotes health and quality of life for individuals with and without neurologic conditions
- Establishes screening programs for neurologic problems and uses screening programs to identify at-risk populations

F. Social Responsibility and Advocacy

- Seeks unique solutions to challenging problems for the individual patient or client, such as access to health services, equipment, and community resources
- Advocates for neurologically impaired individuals with policy- and lawmaking bodies
- Promotes advanced neurologic practice at the local, regional, national, and/or international levels
- Represents neurologic physical therapy to other professionals and professional organizations

G. Leadership

- Models and facilitates ethical principles in decision-making and interpersonal interactions
- Pursues opportunities to mentor others and seeks mentors to expand own knowledge, skills and abilities
- Resolves conflicts or challenging situations using multiple strategies
- Models and facilitates the translation of evidence into clinical practice
- Facilitates the use of evidence to shape system policies and procedural change

H. Professional Development

- Practices active reflection and self-evaluation
- Models and facilitates a continued pursuit of additional and advanced knowledge, skills, and competencies
- Maintains current knowledge of regional, national, and international developments that impact neurologic physical therapist practice

III. Patient and Client Management

A. Patient and Client Examination

1. History

- Performs an interview that is patient- or client-centered and that includes information relevant to health restoration, promotion, and prevention
- Integrates knowledge of disease with history taking, such as medical, surgical, pharmacological history

2. Systems Review

- Prioritizes relevant screening procedures based on identified health condition, previous tests and interventions, patient history, and observation
- Recognizes signs and symptoms that require urgent referral to physician or emergency medical care

3. Examination Procedures

- Prioritizes important tests and measures based on history and systems review
- Prioritizes test selection based on scientific merit and clinical utility
- Incorporates risk-benefit analysis, such as physiologic cost to the patient or client, in selection of tests and measures

- Selects measures that help assess the patient or client across the *ICF* domains of body function and structures, activity limitations, and participation restrictions
- Performs measures such that data are accurate and precise, considering communication, cognition, affect, and learning styles of the patient or client

4. Tests and Measures

- Performs tests and measures, using self-report, quantitative, and functional performance tools, with standardized, valid, reliable, and population-appropriate methodologies
- Performs test and measures, including:
 - a. Aerobic capacity/endurance
 - b. Assistive Technology, including orthotic, prosthetic, protective and supportive devices, and including indications, use, effectiveness, and safety
 - c. Balance during static, dynamic, and functional activities with or without the use of devices or equipment
 - Static posture, structure, and alignment
 - Impairment-based measures to delineate body function and structure
 - Functional performance measures, including measures used for classification, prognosis, and to examine activities and participation
 - d. Circulation abnormalities, auscultation, and activity tolerance
 - e. Community, social, and civic life integration and reintegration
 - f. Cranial nerve integrity
 - g. Disease-specific scales for classification and prognosis
 - h. Environmental factors (domestic, educational, work, community, social, and civic life)
 - i. Ergonomics and return-to-work assessments
 - j. Gait and locomotion, ambulatory and nonambulatory mobility (biomechanical, kinematic, kinetic, temporal-spatial characteristics)
 - Analysis of safety, strategy, with and without devices and equipment, in various terrains, and in different environments
 - Observational analysis
 - Functional performance measures of ambulation and wheelchair mobility used for classification, prognosis, and to examine activities and participation
 - k. Integumentary integrity
 - l. Joint integrity and mobility
 - m. Mental functions
 - Consciousness
 - Orientation
 - Attention
 - Cognition
 - Dual-task
 - n. Motor function of peripheral and central nervous system
 - Motor control measures to assess and classify movement control and performance
 - Dexterity and coordination
 - Task and motion analysis considering kinematic, kinetic, behavioral, and environmental factors
 - o. Muscle performance, including strength, power, and endurance
 - p. Pain assessment (multidimensional, pain scales)
 - q. Perception of sensory input, including vertical orientation, body schema, depth perception, neglect, and motion sensitivity

- r. Quality-of-life measures, including disease- and nondisease-specific measures
- s. Range of motion, including muscle extensibility and flexibility
- t. Reflex integrity, including normal and pathological
- u. Self-care and domestic life
- v. Self-efficacy scales
- w. Sensory integrity of peripheral and central systems
- x. Specialized sensory and motor tests (Dix Hallpike maneuver, positional testing)
- y. Ventilation and respiration, including pulmonary function, auscultation, and cough assessment

5. Evaluation

- Skillfully interprets observed movement and function, particularly when objective measures are not available or cannot be applied
- Differentiates examination findings across ICF domains that require remediation versus compensatory strategies
- Links examination findings, personal modifiers, and environmental factors, with the individual's and caregiver's expressed goal(s)
- Integrates examination findings obtained by other health care professionals
- Develops sound clinical judgments based on data collected from the examination

6. Diagnosis

- Differentially diagnoses emergent versus nonemergent neurologic signs and symptoms
- Differentially diagnoses body function, body structures, and functional performance findings consistent or inconsistent with health condition, and if amenable to intervention
- Confers with other professionals regarding examination needs that are beyond the scope of physical therapy and refers as appropriate

7. Prognosis

- Analyzes barriers, such as resources and psychosocial barriers, that limit the individual in achieving optimal outcomes based on neurologic condition
- Predicts potential for recovery and time to achieve optimal level of improvement across the ICF domains
- Collaborates with individuals and their families, significant others, and caregivers in setting goals
- Develops a plan of care that prioritizes interventions related to the recovery process, patient and client goals, and resources
- Develops a plan of care that prioritizes interventions related to all levels of prevention, health, and wellness.

B. Intervention

1. Clinical Decision Making and Prioritization of Interventions

- Selects and, if needed, modifies interventions based on potential short-term impact and secondary prevention benefits with consideration of the individual's body function and structure, activity limitations, and participation restrictions
- Selects and, if needed, modifies interventions based on physiological or behavioral changes across the lifespan
- Prioritizes optimal interventions based on type and severity of impairments in body function and structures, activity limitations, and participation restrictions
- Analyzes risk versus benefit when selecting interventions
- Negotiates interventions with the patient or client and family, significant others, and caregivers
- Modifies or continues intervention based on ongoing evaluation

2. Coordination, Communication, Documentation

- Adapts communication to meet the diverse needs of the patient or client and family, significant others, and

caregivers, such as cultural, age-specific, educational, and cognitive needs.

- Adapts communication to meet the health literacy needs of the patient or client and family, significant others, and caregivers.
- Asks questions which help to determine an in-depth understanding of the patient's or client's problems.
- Coordinates patient and client management across care settings, disciplines, and community and funding resources.

3. Patient and Client Instruction

- Educates patient or client and family, significant others, and caregivers on diagnosis, prognosis, treatment, responsibility, and self-management within the plan of care
- Provides instruction aimed at risk reduction, prevention, and health promotion
- Provides instruction using advances in technology, such as web-based resources

4. Procedural Interventions

- Performs skilled and effective procedural interventions, including:
 - a. Therapeutic exercise
 - Designs and implements a customized exercise program related to activity limitations
 - Prescribes an exercise program with appropriate timing, intensity, and dosage to maximize outcomes
 - Analyzes the relationship between exercise biomechanics and the intended functional outcome at the task level
 - Effectively addresses multi-system impairments when designing and implementing an exercise program
 - Adapts aerobic conditioning programs for patients and clients with neurologic dysfunction
 - Skillfully designs and implements customized balance training programs based on body structure/function, activity limitations and participation restrictions
 - Skillfully designs and implements gait and locomotion training strategies customized to body structure/function, activity limitations and participation restrictions
 - Integrates physiological findings and behavioral response(s), including pain behaviors in the modification and progression of therapeutic exercise programs
 - b. Functional training in self-care and in domestic, education, work, community, social, and civic life
 - Analyzes the interaction between multiple body system impairments, activity limitations, and participation restrictions, and the environment
 - Determines which problems related to chronic disability are amenable to training
 - Selects and implements training that enhances the ability to participate in domestic, education, work, community, social, and civic activities
 - Makes recommendations for environmental modifications in domestic, education, work, community, social, and civic environments to optimize functional independence and participation
 - Performs task-specific training, considering appropriate timing, intensity, and dosage to maximize outcomes, such as early mobilization and locomotor training
 - Provides customized assistance, cues, and feedback to facilitate skill acquisition
 - Interprets observed movements and function during intervention and adjusts intervention accordingly, including the interrelationship between body segments and movement phases
 - Anticipates and addresses the impact of faulty biomechanics on short- and long-term health
 - Adapts training techniques and environment to maximize safety, prevent injury, and address risk reduction, such as falls prevention
 - Judiciously applies available or emerging technologies that promote skill training and acquisition, such as virtual reality, robotics, and assistive technology
 - Interprets motion analysis findings and applies to interventions

- c. Manual therapy techniques
 - Integrates manual therapy into the management of patients and clients with neurologic conditions, such as joint and soft tissue mobilization
- d. Prescription, application, and, as appropriate, fabrication of devices and equipment, including assistive, adaptive, orthotic, protective, supportive, or prosthetic
 - Skillfully prescribes and adapts devices and equipment for the complex patient in collaboration with the patient or client and family, significant others, and caregivers
 - Predicts the impact of devices and equipment on the biomechanics and efficiency of movement
 - Analyzes the impact of the devices and equipment across a wide range of functional activities and participation in social and environmental contexts
 - Prescribes or recommends assistive technology that optimizes activity and participation, such as environmental control units and powered mobility
 - Prescribes devices and equipment, considering the financial implications for the individual and society
 - Selects or recommends appropriate orthotics for use in a neurologic population, including electro-orthotics
- e. Airway clearance techniques
 - Skillfully adapts airway clearance techniques for the unique needs of the neurologic population
 - Applies a variety of interventions, such as seating and functional activities, to maximize pulmonary function for complex patients and clients
 - Integrates knowledge of the interrelationship between pulmonary status, and swallowing function and vocalization
 - Designs and modifies interventions considering the impact of mechanical ventilation on the patient's or client's function
- f. Integumentary repair and protective techniques
 - Prevents and manages integumentary impairment through the use of equipment, such as pressure mapping, seating systems, and cushion and orthotic prescriptions
 - Prevents and manages integumentary impairment through education, exercise, positioning, and mobility and activity prescription
- g. Electrotherapeutic modalities
 - Integrates motor learning and motor control concepts into the application of electrotherapeutic modalities, such as biofeedback and NMES
 - Applies electrotherapeutic modalities with knowledge of plasticity, neurologic pathology, and recovery patterns

C. Outcomes Assessment

- Selects appropriate outcome measures, such as sensitive and responsive, across the ICF domains, based on patient or client acuity, diagnosis, prognosis, and practice setting
- Adjusts the plan of care within and across episodes based on interpretation of outcome measure results
- Analyzes and interprets patient and client outcomes to modify own future practice and perform programmatic assessments

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CHAPTER 3: ORGANIZATION AND APPLICATION OF ADVANCED SPECIALTY KNOWLEDGE AND SKILLS TO PRACTICE

This chapter uses 3 case scenarios to link practice expectations to knowledge areas. Each scenario explains how a neurologic clinical specialist might use specific knowledge, skills, and experience to manage the patient or client case. The cases and references are presented as examples only, and they are not intended to be all-inclusive. Sample exam questions with a rationale for the correct answers follow each case. The questions were not written to emphasize specific content but rather to provide guidance regarding the integration of knowledge, clinical experience, and scientific evidence expected of the neurologic clinical specialist. The terminology used in the scenarios includes the patient/client management model in *Guide to Physical Therapist Practice 3.0* and the International Classification of Functioning, Disability, and Health (ICF) model. Familiarity with these models will be helpful when reading each of the cases.

Case Scenario 1: **CVA Inpatient Rehabilitation**

A 76-year-old male is admitted to an inpatient rehabilitation hospital 20 days after a left middle cerebral artery ischemic cerebrovascular accident (CVA). He underwent tissue plasminogen activator (TPA) treatment, but his hospital course was complicated by the emergence of shingles on his left flank, and MRSA in his urine. His past medical history includes atrial fibrillation, degenerative joint disease, osteoporosis, coronary artery disease, hypertension, myocardial infarction, peripheral vascular disease (PVD), coronary artery bypass graft x 2, abdominal aortic aneurysm repair, and a history of smoking 1 pack per day for many years. He currently has a 2-cm unstageable ulcer on his right heel. He lives with his wife in a 2-story home and has 2 sons who live in a neighboring town. He is a retired police officer. Prior to his stroke, he walked with a cane and was able to walk 10-15 minutes before tiring. He enjoys puzzles of any kind—crossword, word search, jigsaw, etc. His wife is 10 years younger than he is, works part-time at a discount store, and is in good health.

Examination

The neurologic clinical specialist uses **foundation and clinical sciences** to anticipate the potential impact of the location and type of stroke on multiple body systems,¹ as well as the rationale and projected effect of TPA.² Importantly, the specialist plans an examination that integrates this individual's large number of comorbidities (especially cardiovascular and pulmonary), current complications (such as pain, infection, and ulceration),

premorbid activity level, and the potential impact of the time lapse from the stroke to inpatient admission.³ The specialist performs an examination that is safe, incorporating medical precautions, yet one that yields an accurate picture of the patient's current abilities.

History. The specialist asks questions of the patient and family that elucidates information gained from the chart review, **integrating knowledge of disease with medical history taking.** Such questioning is aimed at developing an in-depth understanding of the patient's problems. A complete history for this patient would include social and living environment details, general health status, and previous level of function. In particular, details about cardiac history, symptoms and limitations associated with PVD and smoking history, endurance for activity, cane usage, and previous skin breakdown would be important. Through chart review and/or questioning, the specialist gains information about medications and medication compliance. The specialist **uses effective communication strategies** that ensure valid information from the patient and family. The specialist uses all of this data to further inform exam planning and selecting tests and measures that are safe, feasible, prioritized, objective, and predictive.

Systems Review. The systems review is a brief **screen of relevant major body systems, communication ability, affect, cognition, and learning style of the individual.** The specialist performs this primarily through questioning and observation. The specialist anticipates complaints, signs, and symptoms that are consistent with the individual's history and presentation (eg, flat affect). The specialist can also **discern signs that require more in-depth examination, such as no apparent movement in the right arm; those that require urgent referral, such as sudden onset of unintelligible speech; and those that require nonurgent referral, such as for pressure-relieving AFO (PRAFO).**⁴

Tests and Measures. The specialist **prioritizes tests and measures based on the history and systems review, and selects tests based on scientific merit and clinical utility.** The specialist conducts the tests in a manner that the individual can understand and perform safely, regardless of cognitive and communication ability. This patient would benefit from examination of the following:

- Aerobic capacity/endurance
- Assistive technology, including prior use of cane and protective device such as PRAFO for right ankle
- Balance

- Cardiovascular integrity (vital signs, extremity edema, response to activity)
- Disease-specific scales for classification and prognosis, such as STREAM and Fugl-Meyer Assessment
- Gait and locomotion (including wheelchair propulsion)
- Integumentary integrity
- Joint integrity and mobility
- Mental functions
- Motor function, motor control and performance, task and motion analysis
- Muscle performance, including strength
- Pain assessment
- Perception of sensory input, vertical orientation, neglect
- Posture and positioning (specifically wheelchair positioning)
- Reflex integrity (pathological)
- Range of motion, including muscle extensibility and flexibility
- Sensory integrity, light touch, and proprioception⁷⁸
- Ventilation and respiration, including pulmonary function and activity tolerance

Evaluation and Diagnosis

The specialist skillfully analyzes and interprets data gained from multiple sources to **differentially diagnose body function and structures and functional performance findings**, and hypothesizes interrelationships among these. **Observation of movement and function** assists with this interpretation, as does an **understanding of personal modifiers and environmental factors**. The specialist uses **sound clinical judgment** to determine the individual's need for comprehensive, skilled care, and articulates this need in a clear and concise manner, **consistent with the individual's and caregiver's expressed goals**.

Prognosis

The specialist is aware of prognostic indicators for stroke^{9,10} and uses this information, in combination with patient data, to **predict the patient's potential for recovery and optimal level of improvement across ICF domains**.¹¹ This includes the predicted timeframe, probable outcomes for the length of stay in the inpatient rehabilitation hospital, and the need for further rehabilitation at discharge. The specialist **develops a plan of care with prioritized interventions that are evidence-based, customized to patient needs and goals, and include prevention, health, and wellness**. The **goals** for the duration of care are measurable, realistic, functional, and meaningful, and **are set in collaboration with the patient and caregiver and other health care team members**.

Intervention

Regarding intervention, the specialist communicates with the patient and caregiver in an effective manner, **adapting to their diverse needs, such as cultural, age-specific, educational, language, and cognitive needs**. The specialist is able to provide a rationale for each intervention that is meaningful to the patient and caregiver. **Intervention is planned and coordinated among other disciplines,¹² with consideration of hospital and funding resources** and the patient's future health and wellness, such as access to outpatient services and community programs following discharge from the rehabilitation setting. For this patient, coordination among occupational therapy, neuropsychology, speech and language therapy, nursing, and the medical team (internist, physiatrist, physician assistant) is critical.

Patient- and Client-Related Instruction. The specialist **educates the patient and caregiver about the diagnosis and prognosis** for his particular type of stroke in conjunction with modifying variables, such as his prior level of function, using clear language and at a time at which the patient and caregiver can process such information. Such instruction includes methods to **reduce his risk** for another stroke, such as medication compliance and exercise^{13,14} and identifying the signs and symptoms of a stroke in progress to expedite treatment and potentially reduce stroke-related impairments. The specialist **instructs the patient and caregiver on web-based resources** as appropriate and provides a customized home exercise program that promotes patient adherence, such as being engaging and applicable to patient and caregiver goals.

Procedural Intervention. The specialist is skillful at **prioritizing interventions that will optimize recovery and at the same time** be meaningful to the patient. Activities are performed at the optimal challenge point, with an **intensity and dosage appropriate to influence motor behavior and maximize outcomes^{15,16}** yet provide a positive and rewarding experience with the rehabilitation process. In other words, it is difficult enough to challenge the patient but within his current capabilities so he may experience success with a given task. In light of such intensity, the specialist is also aware of **exercise guidelines¹⁴** during the subacute period and monitors the patient, such as heart rate and rating of perceived exertion, so that he is safe, given his potential cardiac, pulmonary, and integumentary limitations. The specialist **selects interventions** that are based on evidence and¹⁰ her own experience with similar patients, and are **customized to address multisystem impairments**. For example, if the patient demonstrates cognitive impairment, the specialist introduces a cognitive element to

a functional task when the functional task is performed reasonably well, such as following directions to walk to the office of the occupational therapist. Similarly, given this patient's premorbid cardiovascular and pulmonary impairments, the specialist may incorporate endurance activities designed to improve cardiovascular and pulmonary status and at the same time promote function, such as body-weight-supported treadmill training (BWSTT).¹⁷ The specialist **collaborates with nursing** to manage the patient's heel ulcer¹⁸ in a way that will promote healing yet allow function. **Interventions are modified daily**, or even within the hour, **to respond to both positive and negative changes in the patient's status**. The specialist helps the patient adapt to function in a variety of environments and contexts, such as the hospital cafeteria and physical therapy gym, and busy and quiet hallways. The specialist **analyzes the impact of equipment to benefit the patient**; for example, the need for a well-fitting wheelchair with a cushion to prevent secondary complications and the least-restrictive assistive device to encourage further motor recovery yet allow safe ambulation.

Outcomes

Selected outcome measures reflect change across all dimensions of the ICF model,¹⁹ taking into consideration the clinical utility and psychometric properties, such as the length of time to complete the measure, the appropriateness for this specific diagnosis, and the minimal clinically important difference (MCID). The specialist streamlines the outcome measures to accurately measure change and minimize time spent in data collection. This will help maximize the patient's participation in procedural interventions aimed at promoting functional recovery.

Professional Roles and Responsibilities

The specialist models professionalism in several ways already mentioned, such as **promoting the health and quality of life** of this patient through risk reduction; **using evidence-based practice**; and **advocating for the patient and caregiver** by sharing information and resources. In addition, the specialist **actively evaluates her own practice** and outcomes on a regular basis, and **continually pursues advanced knowledge, skills, and competencies** related to neurologic physical therapy.

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Question 1 for Case Scenario 1

An initial examination of this patient's ambulation reveals the following:

- assistance required: minimal
- HR changes: 72–96bpm after 100'
- distance at which motor components of gait begin to deteriorate: 100'
- walking speed: 0.3 m/s
- qualitative analysis: lack of R push-off and reduced R foot clearance during R swing phase; R hip flexion and mild knee hyperextension during R stance phase; asymmetrical step length R > L

Impairment in which muscle group is the most likely contributor to this patient's slow walking speed?

- a. tight right plantarflexors
 - b. tight right quadriceps
 - c. weak right plantarflexors
 - d. weak right quadriceps
- **The correct answer is c.**

The neurologic clinical specialist is expected to be familiar with common gait deviations and their causes post-stroke, as well as musculoskeletal contributions to slow vs faster walking speed. Ankle plantarflexors are important for forward propulsion,¹ and paretic leg weakness in these muscles is a common occurrence after stroke.² This patient exhibits decreased push-off, consistent with such weakness. Further, plantarflexor weakness is associated with slow walking in both healthy individuals and those poststroke.^{3,4} The quadriceps do contribute to forward progression during gait in healthy individuals,¹ but these do not appear to be significantly weak in this patient since the knee is stable in stance phase. Muscle tightness represents a passive restriction rather than an active muscle contraction and, therefore, would not be a likely contributor to reduced walking speed.

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Question 2 for Case Scenario 1

A physical therapist measures this patient's gait velocity using the 10-meter walk test on a regular basis throughout his length of stay. Which of the following would represent the most clinically meaningful change in his gait velocity (all measured in meters per second)?

- a. 0.31 to 0.36
- b. 0.5 to 0.65
- c. 0.78 to 0.96
- d. 1.20 to 1.38

- **The correct answer is c.**

To correctly answer this question, the specialist must be aware of the evidence on the relationship between gait velocity and function in individuals with subacute stroke. A minimal clinically important difference (MCID) in gait velocity of 0.16m/s has been established in this population,¹ so a change of at least this magnitude would be desirable. Answers a and b do not meet this criterion. Further, a change from one functional ambulation category (household ambulation < 0.4 m/s, limited community ambulation 0.4–0.8 m/s, full community ambulation > 0.8m/s²) is associated with improved function and quality of life in the subacute phase after stroke.³ Answer c represents a progression from one category to the next, and meets the MCID. Answer d meets the MCID and may improve an individual's function in the community; however, both speeds are in the same functional ambulation category.

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Question 3 for Case Scenario 1

Upon discharge from the inpatient rehabilitation hospital, the patient is able to ambulate with a single-point cane without physical assistance. This patient's primary goal for outpatient physical therapy is to walk in the community with his wife, such as to a restaurant entrance from a parking lot. Which of the following tests and measures

would most accurately predict this patient's ability to ambulate in the community?

- a. 6-Minute Walk Test
- b. 10-Meter Walk Test
- c. Berg Balance Scale
- d. Stroke Impact Scale

• **The correct answer is a.**

The neurologic specialist prioritizes tests and measures based on the history and systems review, and on scientific merit and clinical utility. In this case the patient's comorbidities (specifically cardiovascular and pulmonary) and premorbid activity level (able to walk 10-15 minutes before tiring) indicate a preexisting aerobic capacity/endurance impairment. Walking endurance has been found to be a predictor of community walking activity in higher-functioning individuals with stroke and is highly reliable in this population.^{1,2} Gait speed alone is not an accurate predictor of community ambulation due to the complexity of the environment and its inability to replicate the level of community ambulation that an individual with stroke needs to attain.³ Both c and d would also be incorrect. Although balance is related to community walking, it has not been found to predict community ambulation.^{4,5} The Stroke Impact Scale does not have a significant relationship to community ambulation in this population.¹

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Case Scenario 2: Multiple Sclerosis Home Care

A 74-year-old white female diagnosed with relapsing remitting multiple sclerosis (MS) 24 years ago is referred for assessment in the home setting following hospitalization for a urinary tract infection (UTI). Motor system symptoms have been present since she was 50 years of age with a decline in mobility that has occurred over the last 15 years. Past medical history includes: recur-

rent UTI, hypothyroidism, high cholesterol, HTN, bilateral popliteal, and pulmonary emboli. She is in a hospital bed at home and is dependent on a manual tilt-in-space wheelchair for mobility. She is motivated to improve her mobility status and desires greater independence propelling her wheelchair to move through the house, and to travel outside of the house for medical visits and social outings. Cognitive decline, poor trunk control, joint ROM limitations in the lower extremities, and UE weakness, together with a need for improved seating in her chair, contribute to her dependence. She has not received physical therapy intervention for over 3 years but has nursing care visits once each week and daily assistance from nursing aides 4 hours in the morning and 4 hours in the evening.

Examination

The neurologic clinical specialist uses his knowledge of **foundation, behavioral, and clinical sciences** to determine the appropriate examination procedures in the home care setting. The specialist considers the examination needs of the patient, including a review of the many systems that MS directly impacts (neuromuscular, cardiovascular, pulmonary),¹⁻⁷ and secondary comorbidities (vascular, musculoskeletal, urogenital),^{8,9} keeping in mind the functional goals of the patient. The clinical specialist includes examination of the family and caregiver knowledge and learning needs.⁹⁻¹³ **The specialist's decision-making process** in this case requires knowledge of the disease and disease progression, the patient's functional status, current resources in the home setting, and the nature and effectiveness of the patient's current support system.^{11,14}

History. The specialist **performs an interview that is patient-centered**, integrating knowledge of MS and its medical, surgical, and pharmacological management, and **seeks information relevant to health restoration, promotion, and prevention**. In the home care setting this would include information from the patient, family, and caregiver. The specialist will use the triangulated information from these sources to develop a clear understanding of the problems faced in the home setting. A complete history of this patient would include information about symptom progression over time in light of the primary diagnosis (strength, motor control),^{7,14,15} as well as secondary events and complications (joint/skin integrity, emboli, UTI), and the impact on function and independence. The specialist will use information about available equipment and knowledge of its use in the home setting to prioritize assessment needs to address functional concerns.

Systems Review. Given the nature of the diagnosis of MS, multiple systems can be affected.⁸ The specialist **prioritizes relevant screening procedures based on**

the identified health condition, previous tests and interventions, patient history, and observation. This systems review could include assessment of primary, secondary, and tertiary sequela of MS with system involvement of the neuromuscular, musculoskeletal, cardiorespiratory, gastrointestinal, urogenital, integumentary, and immune systems. In the home care setting, where medical professional follow-up may be less regular, it is of particular importance to assess secondary and tertiary problems, such as emboli, joint contracture, and UTI risk from immobility, with an emphasis on patient and caregiver knowledge and educational needs. The specialist is able to **recognize the signs and symptoms that require urgent referral**, such as deep vein thrombosis or pulmonary embolus, versus those that do not, such as joint contracture.

Tests and Measures. The neurologic clinical specialist recognizes the importance of **completing examination procedures that encompass the domains of the ICF model and uses sound clinical reasoning to choose relevant measures of body structure and function, and activities with the patient's goals related to participation in mind.** The specialist is able to recognize key environmental and personal factors that may influence care and the response of the patient to intervention. The examination would include the patient, family, and caregiver communication, cognition, affect, and learning styles.

The specialist **prioritizes tests and measures based on information collected in the history and systems review and on scientific merit and clinical utility.** The specialist conducts **measures in a manner in which data will be accurate and precise.** She considers risk vs **benefits in the selection of tests and measures in order to avoid excessive fatigue or physiological cost to the patient.**

This patient could benefit from the following tests and measures:

- Aerobic capacity/endurance, including assessment of fatigue (perceived exertion, Fatigue Scale for Motor and Cognitive Functions, Visual Analog Scale (fatigue), Modified Fatigue Impact Scale)
- Assistive Technology, including protective and supportive devices, such as wheelchair and seating assessment
- Balance during static, dynamic, and functional activities (Trunk Impairment Scale, Function in Sitting Test)
- Bowel and bladder function
- Disease-specific scales for classification and prognosis (Expanded Disability Status Scale)
- Environmental factors, such as home barriers assessment

- Functional performance measures (bed mobility, transfers, Rivermeade Mobility Index, Functional assessment of MS, Multiple Sclerosis Functional Composite)
- Integumentary integrity
- Joint integrity and mobility
- Mental function, specifically cognition with emphasis on memory
- Motor function, including motor control and task analysis
- Muscle performance, including strength, power, and endurance
- Quality of life (MS Quality of Life MS-QOL 54, SF-36, MS Impact Scale, MS International Quality of Life Questionnaire)
- Range of motion, including muscle extensibility and flexibility
- Reflex integrity, including normal and pathological (Modified Ashworth or Modified Tardieu)
- Self-care and domestic life skills
- Self-efficacy (goal attainment)
- Sensory integrity
- Screening for potential abuse

Evaluation and Diagnosis

The specialist **skillfully interprets observed movement and function, in addition to objective tests and measures, to predict impairments across the ICF domains on potential recovery, remedial, and/or compensatory intervention strategies.** The specialist **uses sound clinical judgment, integrating findings from the examination** with findings from the nursing professionals involved with this patient, and **will link test results** to psychosocial factors of the patient, family, and caregivers and their expressed goals. With a knowledge of medications and other interventions from team members, the specialist **differentially diagnoses those impairments of body function and structures** that are consistent with primary, secondary, and tertiary sequela of MS.

Prognosis

The specialist uses his knowledge of the disease process and classification to recognize the progressive nature of relapsing or remitting MS and uses clinical reasoning to develop interventions that address the patient's goals for improved mobility and independence. These interventions may include prescribing and fitting equipment, providing direct procedural interventions for the patient, providing education for the patient, family, and caregivers, and consulting with physicians and nursing providers. The specialist **analyzes resources and potential barriers** in light of the progressive nature of the disease, and predicts the optimal level and time to achieve improve-

ments across the ICF domains. In **collaboration with the patient, family, and caregivers the specialist sets goals and develops a realistic plan of care**. The specialist determines the patient's functional deficits that are amenable to remediation and equipment needs, and that if addressed could improve the patient's participation in bed mobility and transfers, ability to sit with proper alignment in the wheelchair, independence in home wheelchair mobility and pressure relief.

Interventions

The specialist **selects evidence to develop a comprehensive plan of care that considers risk-benefit analyses and is prioritized for optimal management of the impairments of body function and structure, activity limitation, and participation restrictions for both immediate benefit and secondary prevention**. Interventions are negotiated with the patient, family, and caregivers and are modified based on ongoing evaluation of physiological or behavioral changes that will determine effectiveness.

Procedural Intervention. The specialist **prioritizes the procedural interventions based on type and severity of impairments in body function and structures, activity limitations, and participation restrictions**. In this case this includes prescription, fitting, and training of necessary equipment to achieve the functional goals for the patient, including an appropriate seating system for the motorized wheelchair and training in transfers, pressure relief, and propulsion. The specialist refers to **current evidence to design a therapeutic exercise program** with appropriate timing, intensity, and dosing for exercise prescription based on patient diagnosis, stage of disease, and current physical abilities. Training addresses muscle strength and endurance, joint integrity and muscle length, motor control for functional activities, aerobic function, activity tolerance, and fatigue.¹⁶⁻²¹ In collaboration with the family and caregivers, the specialist includes functional training in self-care and home management that is task specific and includes strategies and adaptive equipment to optimize patient independence, active participation, and safety. **The specialist considers modifications to the intervention plan based on ongoing evaluation of outcomes.**

Patient-Related Instruction. In this home care setting, the intervention may include education of the patient, family, and caregivers in home modification, nutrition, injury prevention, health, and wellness, and strategies to provide appropriate assistance while encouraging maximal independence in mobility skills. The specialist performs a **needs assessment to determine the educational needs of the patient, family, and caregivers** and based on that **develops educational objectives and a customized**

teaching strategy. The **educational plan includes not only explanation and demonstration but also practice** in targeted mobility-oriented skills, equipment needs and skills in use of obtained equipment, methods to overcome environmental barriers, and **areas of health promotion, wellness, and secondary prevention**.

Consultation

The neurologic specialist uses clinical judgment to collaborate with other health care providers to **ensure multidisciplinary decision-making and care that is well coordinated** across other services. This patient's case would include collaboration and coordination with the neurologist, urologist, podiatrist, primary care nurse practitioner, and home care services with nursing, occupational therapy, and physical therapy. The specialist **synthesizes information from colleagues, contributes to team decision making to maximize patient, family, and caregiver outcomes, and renders his professional assessment to the other team members**.¹¹ The specialist provides family and caregivers resources to facilitate access to transportation options and addresses the environmental barrier(s) limiting the patient's ability to attend appointments outside of the home. The specialist considers the potential use of telemedicine options for ongoing follow-up and tracking of the patient's progress and management.¹⁶

Outcomes

The specialist selects **outcomes measures relevant to the patient in terms of diagnosis, prognosis, and practice setting that cross the domains of the ICF model**. In selecting the measures, the specialist considers the psychometric properties of the available tools, time to complete, recommendations from current guidelines and databases, and appropriateness for the diagnosis and the home care setting. In analyzing data collected from outcomes measures, the specialist considers sensitivity to change and minimal clinical important differences, and uses clinical judgment to determine the effectiveness of procedural interventions and educational efforts. **The specialists modifies or progresses the plan of care based on the patient's response and the specialist's interpretation of the outcome measure results.**

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Question 1 for Case Scenario 2

Given the examination findings, recent history, and the patient's goals, powered mobility is received with joystick control for power tilt, power recline, power elevating leg rests, and static right lateral support built into the seating system. Which of the following is the most appropriate and highest priority short-term (2-week) goal for her?

- a. Patient will independently self-manage pressure relief schedule to maintain intact skin integrity.
- b. Patient will independently transfer to wheelchair to promote more time out of bed.
- c. Patient will independently maneuver power wheelchair in community to board accessible public transportation for medical appointment.
- d. Patient will independently complete monitoring log for wheelchair position changes made to manage skin and fatigue in sitting.

• **The correct answer is a.**

While all 4 answers could be appropriate goals for this patient, self-management of pressure relief is the most applicable given the new wheelchair functions, her cognitive ability, and level of dependence in her recent history. This goal could reduce future cost of skin ulcers and nursing or medical care. Answer b would be appropriate to improve her knee contractures and decrease likelihood of DVT but ideally should be combined with active muscle contraction for improved effectiveness. Answer c would also be an appropriate goal; however, the 2-week time frame is unrealistic. Answer d is also appropriate but less important given what is perceived as a low level of activity.

Reference

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Question 2 for Case Scenario 2

Examination findings reveal bilateral anterior deltoid = 3/5, bilateral middle deltoid = 3-/5, bilateral biceps = 3/5, bilateral triceps = 3-/5; grip strength: R = 12 pounds; L = 9 pounds. An Expanded Disability Status Scale score of 8.5/10 is reported. Which of the following exercise prescriptions is best for an initial strengthening program for this patient?

- a. Light rubber tubing resisted shoulder motions, 5 repetitions each motion, 4 sets, 3 times per day
- b. PNF diagonals with no resistance, 10 repetitions each motion, 2 sets, 3 times per day
- c. 1-pound wrist weight for resisted shoulder motions, 5 repetitions each motion, 3 sets, 4 times per day

- d. Shoulder closed-chain exercise in all planes, 3 repetitions, 2 sets, 5 times per day

• **The correct answer is d.**

This test item requires synthesis of the examination strength findings, understanding of strengthening exercise principles for degenerative diseases such as MS, and the EDSS score. The EDSS score suggests late-stage MS. Closed-chain exercises are recommended, with short duration and higher frequency. The patient's fatigue level will impact all of these exercise programs, and answers a, b, and c are written with repetitions that are too high.

Reference

1. Rietberg, MB, et al. Exercise therapy for multiple sclerosis (review). Cochrane Database of Systematic Reviews 2004, Issue 3. Art. No.: CD003980. DOI: 10.1002/14651858.CD003980.pub2.

Question 3 for Case Scenario 2

Based on the patient's physical abilities, cognitive limitations, and goals, which of the following is the best method to improve her adherence to the exercise prescription in the home setting?

- a. Self-completion of daily activity log to document exercise completion
- b. Therapist follow-up with telephone call to reinforce completion of exercises
- c. Alert system on computer to remind patient to complete and track exercises
- d. Increased frequency of home visits to monitor compliance with exercises

• **The correct answer is c.**

Patient adherence is improved with creating simple habits that are easy to follow through. As the patient is able to use a computer, alerts could be programmed to assist her STM deficits, both with when to complete exercise, but also to record exercise completion. Answers a, b, and d rely on either her memory or another individual to complete, thus are less likely to be successful.

Reference

1. Atreja A, Bellam N, Levy SR. Strategies to enhance patient adherence: making it simple. *Medscape General Medicine*. 2005;7(1):4.

Case Scenario 3: Vestibular Dysfunction Outpatient Setting

A 66-year-old female presents to the outpatient clinic with vertigo, especially when rolling over in bed. Her symptoms are worse when she rolls to the right, which she indicates started 2 weeks ago. Past medical history includes hypothyroidism, treated with Synthroid, as well as diagnosed left vestibular neuritis. Chart review includes vestibular laboratory examination results from 5 years ago, which indicated a 75% left reduced vestibular response (RVR) on caloric testing and absent Vestibular Evoked Myogenic Potentials (VEMPs). Since the recent vertigo began, the client is more lightheaded and off-balance, and has noted an increase in symptoms of nausea. The vertigo lasts less than 60 seconds and is only present when she is rolling in bed or turning her head quickly to either the left or right side.

This individual is a self-employed lawyer who has continued to work but has been limited secondary to the above symptoms. She reports that she is afraid she might lose her balance and fall when walking to and from the witness stand and jury box in the courtroom. She also reports difficulty focusing on her computer and paperwork, limiting her ability to complete necessary research and documentation in preparation for current court cases. She does not have other staff in her office to assist her with these tasks.

Examination

The neurologic clinical specialist uses an understanding of **foundation, behavioral, and clinical sciences** to guide the examination. The specialist **uses decision-making processes** to determine the impact of a previous unilateral vestibular hypofunction (UVH) that has decompensated on a probable new diagnosis of benign paroxysmal positional vertigo (BPPV).^{1,3} The specialist **uses information related to the patient's body function and structure** with the natural history of her condition, as well as the increased risk of falling due to the client's age, prognostic indicators, risk factors, **activity limitations, and participation restrictions**. The specialist recognizes **issues related to culture and the need to explore current resources and support systems**.

History. Using **knowledge of the disease**, the specialist **performs a client-centered interview** and review of pertinent data from any records, including vestibular laboratory test results from the original UVH. The history includes the client's social history, living environment, employment/work, current health status, medical and surgical history, current conditions and chief complains, functional status and activity level, medications, and other clinical tests.⁴ The specialist uses all the data obtained

from resources to develop a hypothesis about the diagnoses, existence and origin of impairments, activity limitations, and participation restrictions that are commonly related to the client's diagnoses, while considering the sociodemographic factors and personal characteristics. The hypotheses direct the tests and measures chosen for the examination.

Systems Review. A systems review provides data that may affect further examination and informs the evaluation process. The specialist uses clinical reasoning and critical inquiry during the review. The specialist **prioritizes which systems to review based on the client's needs, age, past medical history, and diagnoses.**^{4,5} Recognizing the impact of a decompensated unilateral loss with new diagnosis of BPPV on the neuromuscular and musculoskeletal systems, as well as falls risk, cognition, and communication abilities are required of the specialist. The specialist **uses the systems review to screen for signs and symptoms of vestibular impairments and falls risk, and to identify possible problems that require consultation with or referral to another provider.**

Tests and Measures. Throughout the examination, the specialist uses knowledge of anatomy, physiology, neuroscience, neurological function, and pathology. Critical inquiry skills allow the specialist to **prioritize measures that are sensitive, reliable, and valid.** The client may benefit from the following tests and measures (not all inclusive):

- Balance during static, dynamic, and functional activities with or without the use of devices or equipment (Posture, Clinical Test of Sensory Interaction on Balance,⁶ Computerized Dynamic Posturography,^{7,9} Mini-Balance Evaluation Systems Test¹⁰)
- Cranial nerve integrity (visual acuity, ocular motor function,^{9,11} audition, facial nerve function, face and head sensation^{4,5,11})
- Environmental, home, and work barriers
- Gait and Locomotion (Timed Up & Go,¹² Dynamic Gait Index,¹³ or Functional Gait Assessment,^{14,15})
- Joint Integrity and Mobility (cervical, extremities)
- Muscle Performance, including strength, power, and endurance (Five times or 30 second sit to stand^{16,17})
- Perception of sensory input, including vertical orientation, body schema, depth perception, neglect, and motion sensitivity: motion sensitivity (Motion Sensitivity Quotient¹⁸), perception of verticality (Subjective Visual Vertical^{9,19})
- Quality of life or perceived levels of disability with self-assessment tools (Activities-specific Balance Confidence Test,^{20,21} Dizziness Handicap Inventory,²² Vestibular Activities of Daily Living Scale,²³⁻²⁵ Vestibular Activities and Participation Scale²⁶)
- Sensory integrity of peripheral nervous system (monofilament testing, vibration)
- Specialized sensory and motor tests: Dix-Hallpike,^{5,9,11,27,28} Vestibular Ocular Reflex (head impulse test, head shaking, dynamic visual acuity)^{4,9,11}
- Self-care and home management

Evaluation/Diagnosis

The specialist **synthesizes examination data from the history, systems review, and selected tests and measures to identify which impairments contribute to the client's activity limitations and participation restrictions.** Knowledge of the predictive validity of specific measures helps in the interpretation. The specialist skillfully interprets observed examination results. For example, the specialist is familiar with the common problems associated with BPPV, as well as the most effective interventions for BPPV, based on the evidence.²⁷⁻³⁵ The information gained from the exam and tests helps to determine the effect of the vertigo on the client's postural control and fall risk.

Prognosis

The specialist is familiar with the typical course of BPPV and decompensating UVH,³⁴ and integrates this information with the client's current status. The specialist **differentiates the primary and secondary impairments, activity limitations, and participation restrictions, and, using appropriate evidence, projects which ones are able to be treated and which may require compensatory (or in the vestibular literature) habituation strategies.** The specialist develops a **plan of care from an analysis of current research findings and considers the impact of other diagnoses, medications, and comorbidities on the type and effectiveness of the potential interventions.** The specialist **collaborates with the client when setting goals. Communication and coordination with other disciplines** is essential in order to meet the client's goals, specifically with the client's otolaryngologist, who originally diagnosed the unilateral vestibular hypofunction, and the primary care practitioner, who referred the client to the specialist.

Intervention

The specialist **employs effective communication strategies to meet the educational and cognitive level of the client and family members** and communicates the exam findings, plan of care, and the client's progress in physical therapy with the physician. The specialist **educates the client on diagnosis, prognosis, interventions, responsibility, and self-management within the plan of care.** The specialist is **aware of the socio-economic and cultural aspects of the instruction** with the client, such as the need for her to maintain her work

schedule and the possible anxiety that is common when individuals cannot fulfill their societal roles, as well as the relationship between anxiety and vestibular diagnoses.³⁶⁻³⁸ The client will benefit from a complete understanding of the anatomy, physiology, mechanism of recovery, and prognosis of these disease processes.^{1,5}

Procedural Interventions. The neurologic specialist plans interventions while considering the diagnosis and prognosis, and incorporates neuromuscular reeducation and therapeutic exercises, such as canalith repositioning maneuvers, gaze stabilization, balance activities, and gait training, that are task specific.^{1,5} The specialist interprets, integrates, and applies research findings for specific interventions. The specialist **selects, prioritizes, and modifies neuromuscular reeducation and therapeutic exercise prescription that are specifically related to body function and structure, activity limitations, and participation restrictions. Interventions are modified based on ongoing client evaluation.** The specialist analyzes the interaction between the impairments and the patient's environment and determines the relationship between postural control and falls risk, applies current research appropriately, selecting and implementing interventions that enhance the patient's abilities and provide appropriate levels of challenge. The specialist monitors the patient's response to intervention and adjusts the intervention, including the home exercise program, as appropriate.

Outcomes

The specialist selects outcomes measures that reflect change in impairments, function, activity limitations and participation restrictions, taking into consideration the clinical utility and psychometric properties, such as the length of time to complete the measure, the appropriateness for this specific diagnosis, and the minimal clinically important difference (MCID). The specialist streamlines the outcome measures to accurately measure change and minimize time spent in data collection. This efficiency will maximize the client's participation in procedural interventions aimed at promoting recovery.

Professional Roles and Responsibilities

The specialist models professionalism in the approach to the client by **promoting health and quality of life, using evidence-based practice,** and **advocating for the client** by sharing information and resources. Furthermore, the specialist **actively evaluates her own practice** and outcomes on a regular basis, and **continually seeks out advanced knowledge, skills, and competencies** related to neurologic physical therapy.

Question 1 for Case Scenario 3

The patient demonstrated horizontal nystagmus that was nonfatiguing during the Dix-Hallpike maneuver. What is the differential diagnosis, given this sign?

- a. Horizontal Canal BPPV or Posterior canal BPPV
- b. Posterior Canal BPPV or anterior canal BPPV
- c. Unilateral vestibular hypofunction or Horizontal canal BPPV
- d. Unilateral vestibular hypofunction or Posterior canal BPPV

• **The correct answer is c.**

To correctly answer this question, the neurological clinical specialist would need to understand the Dix-Hallpike measures and the physiology of nystagmus during the positional movement. Unilateral vestibular hypofunction can result in horizontal nystagmus during positional changes due to the asymmetry of the firing of the vestibular nerve. Horizontal canal BPPV will produce horizontal nystagmus that may be nonfatigueable if it is due to cupulolithiasis, even during the Dix-Hallpike maneuver. Posterior canal BPPV will produce torsional upbeating nystagmus, and anterior canal BPPV will produce torsional downbeating nystagmus.⁵

Question 2 for Case Scenario 3

Which additional test would provide the best information to distinguish between causes of the nonfatiguing horizontal nystagmus?

- a. Canalith repositioning maneuver
- b. Functional gait assessment
- c. Head thrust test
- d. VOR cancellation

• **The correct answer is c.**

The specialist should have knowledge of available tests and measures to differentially diagnose a vestibular problem. The head thrust test is abnormal with decreased vestibular function and would be positive with a unilateral vestibular hypofunction.^{9,11} The canalith repositioning maneuver is the treatment for anterior or posterior canal BPPV.^{27,28} The functional gait assessment is an activity measure of gait and will not provide information on the cause of vertigo or nystagmus.^{14,15,39} VOR cancellation is a measure of the central connections from the vestibular nucleus.¹¹

Question 3 for Case Scenario 3

Upon assessing for horizontal canal BPPV, bilateral horizontal geotropic nystagmus is present during the supine roll test, with stronger signs and symptoms to

the right. Which of the following interventions is best to treat these symptoms?

- a. Liberatory or Semont maneuver for the left ear
- b. Canalith repositioning maneuver for the right ear
- c. Gufoni maneuver for the right ear
- d. Roll maneuver for the left ear

• **The correct answer is c.**

The specialist should have knowledge of the best available intervention based on the client's signs and symptoms. This information should include best supporting evidence. The liberatory maneuver⁴⁰ is an intervention for posterior or anterior canal BPPV, not lateral canal BPPV. The canalith repositioning maneuver is for the treatment of posterior or anterior canal BPPV.^{27,28} The patient has right-sided BPPV in the posterior arm of the horizontal canal. The treatment of choice is the Gufoni maneuver for the right ear.^{30,32} Although the log roll maneuver is a treatment for lateral canal BPPV,^{41,42} current evidence demonstrates that the Gufoni is more efficacious.³⁰ Answer c also addresses the correct ear.

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CHAPTER 4: EXAMINATION CONTENT

The following is an outline summarizing the key components of the Neurologic Physical Therapy Description of Specialty Practice. Examination percentages reflect the approximate weighting of specialty board examination for each content domain. Examination questions can reflect knowledge areas or practice expectations, or both combined, to test the application of knowledge areas to clinical practice.

Examination Content Domains

	% of Exam	
I. Knowledge Areas		20%
A. Foundation Sciences		
B. Behavioral Sciences		
C. Clinical Sciences		
D. Clinical Reasoning & Critical Inquiry		
II. Professional Roles, Responsibilities, and Values		15%
A. Communication		
B. Education		
C. Consultation		
D. Evidence-based Practice		
E. Prevention, Wellness, & Health Promotion		
F. Social Responsibility		
G. Leadership		
H. Professional Development		
III. Patient/Client Management Model		65%
A. Patient/client Examination	30%	
1. History & Systems Review		
2. Examination Procedures (Tests & Measures)		
3. Evaluation/Diagnosis/Prognosis		
B. Intervention	30%	
1. Clinical Decision-making regarding plan of care		
2. Coordination, Communication, and Documentation		
3. Patient/client-related Instruction		
4. Procedural Interventions		
C. Outcomes	5%	
TOTAL		100%

Medical Conditions

The medical conditions that may be represented on the examination include (but are not limited to) the following:

1. Primary prevention of diseases, injuries, or functional decline of the neuromuscular system across the lifespan
2. Promotion of health and wellness in populations with lifelong disability from neurologic conditions
3. Prevention and management of body function and structure, activity limitations, and participation restrictions in individuals with conditions of the neuromuscular system, including:
 - Cerebral vascular accident
 - Traumatic brain injury
 - CNS tumors
 - Spinal cord injury
 - Cerebral palsy
 - Multiple sclerosis
 - Basal ganglia disorders (eg, Parkinson disease, Huntington disease, dystonias)
 - Cerebellar disorders
 - Dementia/Alzheimer's disease
 - Vestibular disorders
 - Falls and balance disorders
 - Peripheral neuropathy
 - Acute poliomyelitis and postpoliomyelitis syndrome
 - Amyotrophic lateral sclerosis (ALS)
 - Guillain-Barré syndrome and polyneuropathies
 - Muscle disease
 - Amputations in individuals with neurologic disorders
 - Psychiatric disorders and aphysiologic disorders
 - General medical disorders affecting the neuromuscular system
 - Cardiovascular and pulmonary disorders in individuals with neurologic conditions
 - Musculoskeletal disorders in individuals with neurologic conditions
 - Integumentary dysfunction in individuals with neurologic conditions

CHAPTER 5: EXECUTIVE SUMMARY OF THE NEUROLOGIC CLINICAL SPECIALIST PRACTICE ANALYSIS

I. Introduction

A practice analysis is a systematic study of the knowledge, skills, and abilities that constitute specialty practice. The purpose of a practice analysis is to collect data that supports and describes what neurologic clinical specialists do, and what skills and knowledge bases enable them to perform at a specialist level. The data are used to describe specialty practice in clinical neurologic physical therapy resulting in a Description of Specialty Practice (DSP). This chapter summarizes the methods utilized during the conduction of a practice analysis study for neurologic specialty practice.

In 2013 and 2014, a nationwide analysis of clinical neurologic specialty practice was conducted to determine the nature and scope of contemporary practice. The focus of this practice analysis was to identify changes in neurologic specialty practice over the past 10 years, and to align the DSP with the most recent *Guide to Physical Therapist Practice* (edition 3.0) including the incorporation of the International Classification of Functioning, Disability, and Health (ICF) model, as well as current evidence. This analysis was based partially on the 2003 document describing specialty practice, and input from a 7-member team of subject matter experts (SME), and was the first revalidation performed since 2003.

II. Methods

Survey Instrument

In Spring 2013, 4 members of the Specialty Council on Neurologic Physical Therapy developed the survey instrument in collaboration with a panel of 4 additional subject matter experts (SME) and a psychometric consultant. Care was taken to ensure that the pool of SME represented diversity in geographic regions, practice settings, patient care experiences, and clinical expertise representative of neurologic practice. Documents that were reviewed in the process included the *Guide to Physical Therapist Practice 3.0* (2013), the 2003 *Neurologic Physical Therapy Description of Specialty Practice* manual, as well as DSPs from peer (ABPTS) specializations, documents describing curricula for neurologic residency programs, and entry-level neurologic curriculum content (eg, *Neurologic Entry-Level Curricular Content Integrated with A Normative Model of Physical Therapist Professional Education* (2011)), and recent research on novice–expert physical therapist practice.

The survey consisted of 7 sections: (1) the patient/client management model, (2) other professional roles, (3) tests and measures, and interventions, (4) knowledge

areas, (5) recommendations for examination content, (6) percentile rankings of neurologic conditions treated, and (7) demographic information. For each task statement, the participants were asked to determine the frequency of the knowledge and skill used for specialty practice, importance of the knowledge and skill to specialty practice, and level of judgment related to the task for specialty practice. Frequency was rated on a 5-point ordinal scale (0=never to 4=daily), importance was rated on a 4-point ordinal scale (0=not important to specialty practice to 3=very important to specialty practice), and level of judgment was rated on a 4-point ordinal scale (0=do not use in their work to 4=analysis, or requires ability to analyze information, to put information together to arrive at a solution, and/or to evaluate the usefulness of the solution). Please see the Table.

Table. Ratings Used to Assess Inclusion of Items as Part of Specialty Practice

Frequency: How frequently does the neurologic clinical specialist use this knowledge area?	
0	Never
1	Less than once a month
2	Monthly
3	Weekly
4	Daily
Importance: Regardless of the frequency of occurrence or prevalence, how important is the knowledge to practice as a neurologic clinical specialist?	
0	Not important
1	Of little importance
2	Moderately important
3	Very important
Level of Judgment: Which of the following statements best describes the level of judgment neurologic clinical specialists exercise when they use information from this knowledge area?	
0	Do not use in their work
1	Recall: requires ability to recall or recognize specific information only
2	Application: requires ability to comprehend, interpret, or apply knowledge to new or changing situations
3	Analysis: requires ability to analyze information, to put information together to arrive at a solution, and/or evaluate the usefulness of the solution

Pilot Survey

A pilot survey was conducted in fall 2014 with 23 ABPTS certified neurologic specialists representing diverse geographic regions, practice settings, and clinical and patient care experiences. The purposes of the pilot survey were to test the survey instrument, clarify current competencies in neurologic specialty practice, and identify any new competencies. Twenty-one specialists (91% return rate) completed the entire survey. The feedback from the respondents indicated that the survey was long, identified typographical errors when the survey was transposed from a written format to the online format, and provided minor suggestions on clarification for a few task statements. No new competencies were identified. The task force (Neurologic Specialty Council and the SME members) and the consultant reviewed the pilot survey results, incorporated the suggested typographical corrections, and clarified the few identified task statements. The task force determined that this survey would be divided into 3 portions for final administration to address the survey burden. Because there were no demonstrable changes in the survey content, the data from the 21 specialists were incorporated into the final data analysis.

Final Survey Administration

The final survey was divided into 3 sections (all respondents were provided the demographic portion of the survey) and administered online with the assistance of APTA's Research Department to a sample of all 995 board-certified neurologic clinical specialists and an equal number of randomly selected nonspecialists who were members of the APTA Neurology Section (now Academy of Neurologic Physical Therapy). An online link to the survey was sent via email to these 2 groups. The survey contained a cover letter requesting the respondents to complete the survey in 4 weeks. A reminder (via email) was sent to both groups after 2 and 4 weeks. As an incentive, 20 randomly selected respondents who completed the survey were eligible for 1 year of free membership in the APTA Neurology Section.

III. Data Analysis

Participant demographics were summarized using frequency charts and graphs presented in Chapter 1. This information included: sex, age, ethnicity, geographic region, level of entry-level physical therapy education, highest earned academic degree, years in physical therapist practice, years in neurologic physical therapist practice, had the respondent recertified or completed a neurologic physical therapy clinical residency program, held another board certification, the specialist's current employment status and type of practice facility, percentage of time spent in professional activities, referral

sources and if the specialist practiced in a state or facility without a physician referral, the educational method that most influenced current clinical skills, and if the specialist was a member of APTA or the APTA Neurology Section.

For survey sections 1-4, the data from each task statement were summarized using frequency distributions, means, standard deviations, and skewness. Correlational analyses were used to evaluate the relationship between importance and judgment, as these 2 constructs might be highly correlated, and the data supported this supposition.

The data were reviewed by the consultant and the task force members. Consensus building was used to determine the decision rules for the survey competencies in order to determine the final competencies describing current neurologic physical therapy specialist practice. Due to the skewness of the data, the task force agreed that the frequency distributions were most appropriate for the basis of the decision rules. The decision rule process was discussed at length with various rules and outcomes considered until consensus was reached. The first decision rule applied was to include task statements scored as a 2 or 3 for importance or judgment by at least 70% or more of the respondents (see Table). For task statements identified for inclusion based on importance or judgment, a reported frequency greater than 0 (> than never) by at least 70% of the respondents was the second criterion applied for inclusion. The task force members then reviewed each section of the survey for both the included and excluded task statements to further assess inclusion or exclusion for the DSP. Group consensus was achieved with reliance on the survey data and in-depth discussion on the task statements, particularly for statements that were excluded. The rationale for removal of task statements was primarily limited use of the knowledge and skill in clinical practice, and that the skills and knowledge are more reflective of expectations of entry-level practice versus neurologic clinical specialist practice.

IV. Results

Survey results from the pilot and final survey administration to certified specialists were combined for statistical analysis. The final N was 131, or a 13% response rate for this specialist group. The response rate for noncertified therapists was extremely low (N=11, or 1%). Due to this low response rate, the comparison data of noncertified therapists were not included in any analysis or decision-making. Data from the first 4 sections of the survey are the basis for the description of board-certified specialty practice in neurology described in Chapter 2.

The survey data were analyzed by the task force and the consultant, and the decision rules were applied to determine which items would be incorporated into the

neurologic DSP and which would be excluded. Items in Sections 1 and 2 of the survey met the inclusion criteria, and the task force agreed with keeping the items. For Section 3, items that were excluded in Tests and Measures were related to kinetic and kinematic computerized gait analysis, neuromotor development, and sensory integration. For Section 4, Foundational Sciences, anatomy, physiology and pathology of gastrointestinal, genitourinary, and endocrine systems were excluded, as well as physiologic response to substance abuse, models of behavioral change, and research methods (qualitative and quantitative methods) and statistical models of data analysis. Again, the task force believed many of these statements were reflective of entry-level educational requirements, and not of changes in knowledge and skills used by the neurologic clinical specialist over the past 10 years.

Finally, the task force engaged in a process to translate the remaining survey content into the DSP organizational structure using Guide 3.0 as the organizational framework. This involved analyzing both the content and process-based specifications of neurologic clinical practice. Thus, content was organized by the patient management processes, such as screening, examination, evaluation, intervention, documentation, etc. The task force reviewed the survey content regarding knowledge and skills reflected in the task statements, and content from the various sections of the survey that were redundant or similar were synthesized and incorporated into the patient/client management model. For example, under Section 4, knowledge related to common psychiatric conditions was combined with the task statement on the effects of psychiatric conditions and/or treatments on cognition, learning, and function. This process was repeated until consensus was reached by the task force to achieve the final organization found in Chapter 2.

To illustrate the linkage between foundational knowledge and the practice competencies, the SME prepared 3 case scenarios, which are described in Chapter 3. These cases are based on contemporary information and evidence supportive of specialist clinical decision-making. They are intended to help candidates prepare for the examination by presenting examples of cases and question types in different competency areas.

Once the updated knowledge areas, professional practice expectations, and patient and client management sections of the DSP were finalized, the task force determined the NCS examination content outline for the NCS board examination in a consensus decision-making process. The percentage weighting for each section of the DSP was discussed thoroughly using information from the survey data, the 2003 neurologic DSP, and DSPs

from peer (ABPTS) specialties. Final decisions were agreed upon by the task force and are outlined in Chapter 4 along with a summary of medical conditions seen by neurologic clinical specialists.

V. Conclusion

The demographic information in Chapter 1 is the most current description of board-certified neurologic clinical specialists and summarizes characteristics of the survey respondents for this updated description of neurologic specialty practice. The Neurologic Physical Therapy Description of Specialty Practice in Chapter 2 is based on the *Guide to Physical Therapist Practice* and reflects the knowledge, skills, and abilities of specialists with emphasis on patient and client management, professional practice expectations, tests and measures, and interventions skills. This description was validated through a practice analysis and survey of neurologic certified specialists. Chapter 2 also outlines the foundational knowledge-based areas germane to neurologic specialist practice. This chapter will also be useful as a self-assessment tool and framework for future candidates preparing for the NCS examination. The case scenarios in Chapter 3 provide examples of linkages between the DSP and practice expectations reflective of specialist practice, as well as familiarize future candidates with cases and question formats of the NCS board examination. Chapter 4 presents the NCS examination content outline and a list of medical conditions seen by neurologic clinical specialists and represented on the NCS board examination. Finally, Chapter 5 presents the technical data regarding the practice analysis and development of the DSP. This document will be periodically updated reflecting changes in neurologic specialist practice over time.

Self-Assessment Tool *for Physical Therapists*

APPENDIX

Neurologic



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Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Assessment Tool for Physical Therapy: Neurologic is based on the *Neurologic Physical Therapy Description of Specialty Practice* (2015) prepared by the members of a subject matter expert group and members of the Specialty Council on Neurologic Physical Therapy. The DSP was approved by and used with permission of the American Board of Physical Therapy Specialties (ABPTS).

ABPTS states that: “Individuals who are considering applying for specialist certification may find use of assessment tools a valuable way of determining readiness for specialist certification. Use of the assessment tool does not guarantee success on the specialist certification examination.”

Assessment Tool for Physical Therapy: Neurologic will help physical therapists (and their clinical supervisors or mentors) evaluate their current level of knowledge and skills in the practice of Neurologic physical therapy against a set of nationally accepted advanced clinical competencies.

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic
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How to Use the Assessment Tool

Directions:

1. Read each competency statement.
2. Assess the performance of the clinician being assessed for each competency by placing an (X) in the box that BEST describes the behavior (unsatisfactory, satisfactory, or superior performance) on this aspect of the competency.
3. After marking each item associated with the competency, calculate the cumulative rating for each knowledge-based area or clinical practice expectation and record in the provided summary box: 1 point for each “Unsatisfactory Performance” rating, 2 points for each “Satisfactory Performance” rating, and 3 points for each “Superior Performance” rating. **Please note, the maximum number of possible rating points is provided in each knowledge area/clinical practice expectation summary box.**
4. Once you have completed the entire assessment tool, copy each rating into the Summary Form on page 26. You will then have a global perspective for each competency and the description of specialty practice.

Here is a sample of how to use this assessment tool:

<i>Assessment Tool for Physical Therapists</i> Description of Specialty Practice: Neurologic SAMPLE ASSESSMENT				
Directions: Place an “X” in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
1. Ability to identify the educational needs of the learner/client.				
a) Identifies what the learner needs to know.		X		2
b) Identifies what the learner needs to be able to do.			X	3
Calculate the cumulative rating for this section and record here →				5 6

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

The Guide to Physical Therapist Practice (Guide) describes the Patient/Client Management Model, which includes patient/client examination (history, systems review, tests, and measures), evaluation, diagnosis, prognosis, intervention, and outcomes. Based on the development of the Guide and previous specialty practice surveys, the elements of this Patient/Client Management Model are the accepted standard for *all* physical therapist practice, including specialty practice. A Description of Specialty Practice (DSP) does not include all the items covered in the Guide, but rather highlights those elements of practice that clinical specialists utilize or perform at an advanced level compared with nonspecialists.

This DSP includes competency statements about knowledge-based areas and clinical practice expectations related to neurologic physical therapy. The clinical practice expectations consist of competency in the area of professional roles, responsibilities and values, and competency in patient/client management. The competency statements reflect the wording used on the survey instrument.

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.

Unsatisfactory
Performance
1

Satisfactory
Performance
2

Superior
Performance
3

Rating

I. Knowledge Areas of Neurologic Clinical Specialty Practice

A. Foundation Sciences

1. Is knowledgeable about the human anatomy and physiology in healthy and neurologic populations, including:

a) Musculoskeletal system

b) Cardiovascular and pulmonary systems

c) Integumentary system

d) Exercise physiology

e) Electrophysiology

Calculate the cumulative rating for this section and record here →

15

2. Is knowledgeable about neuroanatomy and neurophysiology, including knowledge of central, peripheral, and autonomic nervous systems in populations with and without neurologic conditions:

a) Anatomical organization and functional specialization

b) Age-related changes across the life span, including developmental neuroanatomy

c) Neural growth and plasticity, such as cortical remodeling, activity-dependent changes

d) Neurotransmission and neurotransmitters

e) Perception and sensory systems

f) Motor systems

<i>Assessment Tool for Physical Therapists</i> Description of Specialty Practice: Neurologic				
Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
A. Foundation Sciences (cont'd)				
2. Is knowledgeable about neuroanatomy and neurophysiology, including knowledge of central, peripheral, and autonomic nervous systems in populations with and without neurologic conditions: (cont'd)				
g) Neural control of locomotion, such as central pattern generators				
h) Neural control of balance and postural control				
i) Regulation and modulation of reflexes				
j) Regulation and modulation of autonomic function				
k) Pain, including neurogenic and nonneurogenic				
Calculate the cumulative rating for this section and record here →				33
3. Is knowledgeable about movement sciences in populations with and without neurologic conditions, including the following:				
a) Biomechanics and kinesiology of movement systems				
b) Kinematic and kinetic analysis of functional movements, postural control, and gait				
c) Pathokinesiology of functional movement, such as gait, posture, and reaching				
d) Theories and principles of motor control				
e) Theories and principles of skill acquisition and motor learning				
f) Theories and principles of motor development				
g) Interrelationship among social, cognitive, and movement systems				
h) Effects of movement dysfunctions on multiple body systems, including immediate and long-term				
Calculate the cumulative rating for this section and record here →				24

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
B. Behavioral Sciences				
1. Is knowledgeable about psychology and neuropsychology, including knowledge of:				
a) Cognitive processes (attention, memory, and executive dysfunction)				
b) Cognitive, language, and learning disorders				
c) Affective and behavioral disorders				
d) Expected emotional and behavioral responses, and individualized coping strategies to illness and recovery				
e) Influence of motivational factors and adherence strategies to facilitate behavioral change on illness and recovery				
f) Impact of cultural and social systems on illness and recovery				
Calculate the cumulative rating for this section and record here →				18
2. Is knowledgeable about psychiatry, including knowledge of:				
a) Common psychiatric symptoms, syndromes, and classifications				
b) Effect of psychiatric disease and treatment on cognition, learning, and function				
c) Aphysiologic presentation, such as conversion disorder				
Calculate the cumulative rating for this section and record here →				9
3. Is knowledgeable about teaching and learning theory, including knowledge of:				
a) Principles of teaching and learning				
b) Development and implementation of educational planning process				
Calculate the cumulative rating for this section and record here →				6

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
C. Clinical Sciences (Signs and symptoms, management, and epidemiology of injuries and diseases)				
1. Is knowledgeable about pathology, including congenital and acquired pathology/pathophysiology of:				
a) Neuromuscular system				
b) Musculoskeletal system				
c) Cardiovascular and pulmonary systems				
d) Physiologic response to trauma and stress				
e) Impact of neurologic conditions on other body systems				
Calculate the cumulative rating for this section and record here →				15
2. Is knowledgeable about epidemiology, including knowledge of:				
a) Incidence and prevalence				
b) Prognostic indicators				
c) Risk factors relevant to health status across the lifespan				
d) Natural history, morbidity, and mortality				
Calculate the cumulative rating for this section and record here →				12
3. Is knowledgeable about medical management, including knowledge of:				
a) Imaging, such as MRI, f-MRI, CT scans, and PET scans				
b) Clinical diagnostic procedures, such as EMG, NCV, and evoked potential exam				
c) Laboratory tests, including normal and abnormal findings				
d) Surgical and nonsurgical interventions performed for neurologic conditions				

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
C. Clinical Sciences (Signs and symptoms, management, and epidemiology of injuries and diseases) (cont'd)				
3. Is knowledgeable about medical management, including knowledge of: (cont'd)				
e) Assessment, monitoring, and activity modifications related to medical procedures				
Calculate the cumulative rating for this section and record here →				15
4. Is knowledgeable about pharmacology, including knowledge of:				
a) Pharmacokinetics and pharmacodynamics				
b) Abnormal drug reactions, interactions, and adverse dosage effects				
c) Effects on the body systems, including common short- and long-term effects				
Calculate the cumulative rating for this section and record here →				9
D. Clinical Reasoning and Critical Inquiry				
1. Is knowledgeable about application of decision-making algorithms and models to clinical practice.				
2. Is knowledgeable about integration of the International Classification of Functioning, Disability, and Health (ICF) framework to inform clinical decisions and prioritize plan of care.				
3. Is knowledgeable about clinical research methodology appraisal.				
4. Is knowledgeable about critical evaluation of test psychometrics and application of principles of measurement in clinical practice.				
5. Is knowledgeable about judicious evaluation of components and merit of published evidence.				
Calculate the cumulative rating for this section and record here →				15

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
II. Professional Roles, Responsibilities, and Values of Neurologic Clinical Specialists				
A. Communication				
1. Is able to employ effective communication strategies in individuals with neurologic conditions, including verbal, nonverbal, and assistive technologies.				
2. Is able to empower individuals in the management of their own health.				
3. Is able to facilitate collaborative team management and transitions of care for individuals with neurologic conditions.				
4. Is able to address cultural or social issues that affect the plan of care.				
Calculate the cumulative rating for this section and record here →				12
B. Education				
1. Is able to perform a needs assessment, including determining the educational needs and unique characteristics of the learners and group of learners.				
2. Is able to develop educational objectives based on the learning needs of individuals and their families, significant others, and caregivers; colleagues; and/or the public with consideration of learning domains and level of expected outcomes for learners and groups of learners.				
3. Is able to develop and customize appropriate teaching strategies and methods based on learning objectives and identified learning style preferences of individuals and their families, significant others, and caregivers.				
4. Is able to implement an educational plan that includes explanation, demonstration, practice, and effective use of feedback as appropriate.				

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
B. Education (cont'd)				
5. Is able to accurately and objectively assess learning outcomes of teaching strategies and modifies strategies based on outcomes.				
6. Is able to educate physical therapy students and colleagues to enhance knowledge and skills in neurologic physical therapy.				
7. Is able to educate health care professionals outside of physical therapy and outside agencies about neurologic physical therapy.				
8. Is able to educate community groups in primary, secondary, and tertiary prevention.				
Calculate the cumulative rating for this section and record here →				24
C. Consultation				
1. Is able to synthesize information from a wide variety of sources when providing consultative services to colleagues.				
2. Is able to effectively contribute to multidisciplinary team decision-making to maximize patient and client outcomes.				
3. Is able to render specialist opinion about patients and clients with neurological dysfunction to other health professionals and external organizations.				
4. Is able to provide peer and utilization review.				
Calculate the cumulative rating for this section and record here →				12

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
D. Evidence-Based Practice				
1. Is able to evaluate the efficacy and effectiveness of new and established examination tools, interventions, and technologies.				
2. Is able to critically appraise peer-reviewed evidence and judiciously translate evidence into practice.				
3. Is able to participate in conducting and disseminating clinical research following ethical guidelines.				
4. Is able to participate in collecting and interpreting patient and client outcomes data, such as programmatic assessment.				
5. Is able to synthesize information from a variety of sources, such as clinical practice guidelines, to develop evidence-based clinical practice.				
Calculate the cumulative rating for this section and record here →				15
E. Prevention, Wellness, and Health Promotion				
1. Is able to develop and implement programs to promote health and fitness at the individual and societal level.				
2. Is able to promote health and quality of life for individuals with and without neurologic conditions.				
3. Is able to establish screening programs for neurologic problems and uses screening programs to identify at-risk populations.				
Calculate the cumulative rating for this section and record here →				9

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
F. Social Responsibility and Advocacy				
1. Is able to seek unique solutions to challenging problems for the individual patient or client, such as access to health services, equipment, and community resources.				
2. Is able to advocate for neurologically impaired individuals with policy- and lawmaking bodies.				
3. Is able to promote advanced neurologic practice at the local, regional, national, and/or international levels.				
4. Is able to represent neurologic physical therapy to other professionals and professional organizations.				
Calculate the cumulative rating for this section and record here →				12
G. Leadership				
1. Is able to model and facilitate ethical principles in decision-making and interpersonal interactions.				
2. Is able to pursue opportunities to mentor others and seek mentors to expand own knowledge, skills, and abilities.				
3. Is able to resolve conflicts or challenging situations using multiple strategies.				
4. Is able to model and facilitate the translation of evidence into clinical practice.				
5. Is able to facilitate the use of evidence to shape system policies and procedural change.				
Calculate the cumulative rating for this section and record here →				15

<i>Assessment Tool for Physical Therapists</i> Description of Specialty Practice: Neurologic				
Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
H. Professional Development				
1. Is able to practice active reflection and self-evaluation.				
2. Is able to model and facilitate a continued pursuit of additional and advanced knowledge, skills, and competencies.				
3. Is able to maintain current knowledge of regional, national, and international developments that impact neurologic physical therapist practice.				
Calculate the cumulative rating for this section and record here →				9
III. Patient and Client Management				
A. Patient and Client Examination				
1. History				
a) Is able to perform an interview that is patient- or client-centered and that includes information relevant to health restoration, promotion, and prevention.				
b) Is able to integrate knowledge of disease with history taking, such as medical, surgical, pharmacological history.				
Calculate the cumulative rating for this section and record here →				6
2. Systems Review				
a) Is able to prioritize relevant screening procedures based on identified health condition, previous tests and interventions, patient history, and observation.				
b) Is able to recognize signs and symptoms that require urgent referral to physician or emergency care.				
Calculate the cumulative rating for this section and record here →				6

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
A. Patient and Client Examination (cont'd)				
3. Examination Procedures				
a) Is able to prioritize important tests and measures based on history and systems review.				
b) Is able to prioritize test selection based on scientific merit and clinical utility.				
c) Is able to incorporate risk-benefit analysis, such as physiologic cost to the patient or client, in selection of tests and measures.				
d) Is able to select measures that help assess the patient or client across the ICF domains of body function and structures, activity limitations, and participation restrictions.				
e) Is able to perform measures such that data are accurate and precise, considering communication, cognition, affect, and learning styles of the patient or client.				
Calculate the cumulative rating for this section and record here →				15
4. Tests and Measures				
a) Is able to perform tests and measures, using self-report, quantitative, and functional performance tools, with standardized, valid, reliable, and population-appropriate methodologies.				
b) Is able to perform tests and measures, including:				
1) Aerobic capacity/endurance				
2) Assistive technology, including orthotic, prosthetic, protective and supportive devices, and including indications, use, effectiveness, and safety				

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
4. Tests and Measures (cont'd)				
3) Balance during static, dynamic, and functional activities with or without the use of devices or equipment, to include: ▪ Static posture, structure, and alignment ▪ Impairment-based measures to delineate body function and structure ▪ Functional performance measures, including measures used for classification, prognosis, and to examine activities and participation				
4) Circulation abnormalities, auscultation, and activity tolerance				
5) Community, social, and civic life integration and reintegration				
6) Cranial nerve integrity				
7) Disease-specific scales for classification and prognosis				
8) Environmental factors (domestic, educational, work, community, social, and civic life)				
9) Ergonomics and return-to-work assessments				
10) Gait and locomotion, ambulatory and nonambulatory mobility (biomechanical, kinematic, kinetic, temporal-spatial characteristics), to include: ▪ Analysis of safety, strategy, with and without devices and equipment, in various terrains, and in different environments ▪ Observational analysis ▪ Functional performance measures of ambulation and wheelchair mobility used for classification, prognosis, and to examine activities and participation				

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
4. Tests and Measures (cont'd)				
11) Integumentary integrity				
12) Joint integrity and mobility				
13) Mental functions, to include: ▪ Consciousness ▪ Orientation ▪ Attention ▪ Cognition ▪ Dual-task				
14) Motor function of peripheral and central nervous system, to include: ▪ Motor control measures to assess and classify movement control and performance ▪ Dexterity and coordination ▪ Task and motion analysis considering kinematic, kinetic, behavioral, and environmental factors				
15) Muscle performance, including strength, power, and endurance				
16) Pain assessment (multidimensional, pain scales)				
17) Perception of sensory input, including vertical orientation, body schema, depth perception, neglect, and motion sensitivity				
18) Quality-of-life measures, including disease- and nondisease-specific measures				
19) Range of motion, including muscle extensibility and flexibility				
20) Reflex integrity, including normal and pathological				
21) Self-care and domestic life				
22) Self-efficacy scales				

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
4. Tests and Measures (cont'd)				
23) Sensory integrity of peripheral and central systems				
24) Specialized sensory and motor tests (Dix Hallpike maneuver, positional testing)				
25) Ventilation and respiration, including pulmonary function, auscultation, and cough assessment				
Calculate the cumulative rating for this section and record here →				78
5. Evaluation				
a) Is able to skillfully interpret observed movement and function, particularly when objective measures are not available or cannot be applied.				
b) Is able to differentiate examination findings across ICF domains that require remediation versus compensatory strategies.				
c) Is able to link examination findings, personal modifiers, and environmental factors, with the individual's and caregiver's expressed goal(s).				
d) Is able to integrate examination findings obtained by other health care professionals.				
e) Is able to develop sound clinical judgements based on data collected from the examination.				
Calculate the cumulative rating for this section and record here →				15
6. Diagnosis				
a) Is able to differentially diagnose emergent versus nonemergent neurologic signs and symptoms.				

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
6. Diagnosis (cont'd)				
a) Is able to differentially diagnose body function, body structures, and functional performance findings consistent or inconsistent with health condition, and if amenable to intervention.				
b) Is able to confer with other professionals regarding examination needs that are beyond the scope of physical therapy and refers as appropriate.				
Calculate the cumulative rating for this section and record here →				9
7. Prognosis				
a) Is able to analyze barriers, such as resources and psychosocial barriers that limit the individual in achieving optimal outcomes based on neurologic condition.				
b) Is able to predict potential for recovery and time to achieve optimal level of improvement across the ICF domains.				
c) Is able to collaborate with individuals and their families, significant others, and caregivers in setting goals.				
d) Is able to develop a plan of care that prioritizes interventions related to the recovery process, patient and client goals, and resources.				
e) Is able to develop a plan of care that prioritizes interventions related to all levels of prevention, health, and wellness.				
Calculate the cumulative rating for this section and record here →				15

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
B. Intervention				
1. Clinical Decision Making and Prioritization of Interventions				
a) Is able to select and, if needed, modify interventions based on potential short-term impact and secondary prevention benefits with consideration of the individual's body function and structure, activity limitations, and participation restrictions.				
b) Is able to select and, if needed, modify interventions based on physiological or behavioral changes across the lifespan.				
c) Is able to prioritize optimal interventions based on type and severity of impairments in body function and structures, activity limitations, and participation restrictions.				
d) Is able to analyze risk versus benefit when selecting interventions.				
e) Is able to negotiate interventions with the patient or client and family, significant others, and caregivers.				
f) Is able to modify or continue intervention based on ongoing evaluation.				
Calculate the cumulative rating for this section and record here →				18
2. Coordination, Communication, Documentation				
a) Is able to adapt communication to meet the diverse needs of the patient or client and family, significant others, and caregivers, such as cultural, age-specific, educational, and cognitive needs.				
b) Is able to adapt communication to meet the health literacy needs of the patient or client and family, significant others, and caregivers.				

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
2. Coordination, Communication, Documentation (cont'd)				
c) Is able to ask questions which help to determine an in-depth understanding of the patient's or client's problems.				
d) Is able to coordinate patient and client management across care settings, disciplines, and community and funding resources.				
Calculate the cumulative rating for this section and record here →				12
3. Patient and Client Instruction				
a) Is able to educate patients or clients and family, significant others, and caregivers on diagnosis, prognosis, treatment, responsibility, and self-management within the plan of care.				
b) Is able to provide instruction aimed at risk reduction, prevention, and health promotion.				
c) Is able to provide instruction using advances in technology, such as web-based resources.				
Calculate the cumulative rating for this section and record here →				9

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
4. Procedural Interventions				
Is able to perform skilled and effective procedural interventions, including: a) Therapeutic exercise: Is able to design and implement a customized exercise program related to activity limitations.				
Is able to prescribe an exercise program with appropriate timing, intensity, and dosage to maximize outcomes.				
Is able to analyze the relationship between exercise biomechanics and the intended functional outcome at the task level.				
Is able to effectively address multi-system impairments when designing and implementing an exercise program.				
Is able to adapt aerobic conditioning programs for patients and clients with neurologic dysfunction.				
Is able to skillfully design and implement customized balance training programs based on body structure/function, activity limitations and participation restrictions.				
Is able to skillfully design and implement gait and locomotion training strategies customized to body structure/function, activity limitations and participation restrictions.				
Is able to integrate physiological findings and behavioral response(s), including pain behaviors in the modification and progression of therapeutic exercise programs.				

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
4. Procedural Interventions (cont'd)				
b) Functional training in self-care and in domestic, education, work, community, social, and civic life: Is able to analyze the interaction between multiple body system impairments, activity limitations, and participation restrictions, and the environment.				
Is able to determine which problems related to chronic disability are amenable to training.				
Is able to select and implement training that enhances the ability to participate in domestic, education, work, community, social, and civic activities.				
Is able to make recommendations for environmental modifications in domestic, education, work, community, social, and civic environments to optimize functional independence and participation.				
Is able to perform task-specific training, considering appropriate timing, intensity, and dosage to maximize outcomes, such as early mobilization and locomotor training.				
Is able to provide customized assistance, cues, and feedback to facilitate skill acquisition.				
Is able to interpret observed movements and function during intervention and adjusts intervention accordingly, including the interrelationship between body segments and movement phases.				
Is able to anticipate and address the impact of faulty biomechanics on short- and long-term health.				

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
4. Procedural Interventions (cont'd)				
b) Functional training in self-care and in domestic, education, work, community, social, and civic life: (cont'd) ▪ Is able to judiciously apply available or emerging technologies that promote skill training and acquisition, such as virtual reality, robotics, and assistive technology.				
▪ Is able to interpret motion analysis findings and applies to interventions.				
c) Manual therapy techniques: ▪ Is able to integrate manual therapy into the management of patients and clients with neurologic conditions, such as joint and soft tissue mobilization.				
d) Prescription, application, and, as appropriate, fabrication of devices and equipment, including assistive, adaptive, orthotic, protective, supportive, or prosthetic: ▪ Is able to skillfully prescribe and adapt devices and equipment for the complex patient in collaboration with the patient or client and family, significant others, and caregivers.				
▪ Is able to predict the impact of devices and equipment on the biomechanics and efficiency of movement.				
▪ Is able to analyze the impact of the devices and equipment across a wide range of functional activities and participation in social and environmental contexts.				
▪ Is able to prescribe or recommend assistive technology that optimizes activity and participation, such as environmental control units and powered mobility.				

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
4. Procedural Interventions (cont'd)				
d) Prescription, application, and, as appropriate, fabrication of devices and equipment, including assistive, adaptive, orthotic, protective, supportive, or prosthetic: (cont'd) Is able to prescribe devices and equipment, considering the financial implications for the individual and society.				
Is able to select or recommend appropriate orthotics for use in a neurologic population, including electro-orthotics.				
e) Airway clearance techniques: Is able to skillfully adapt airway clearance techniques for the unique needs of the neurologic population.				
Is able to apply a variety of interventions, such as seating and functional activities, to maximize pulmonary function for complex patients and clients.				
Is able to integrate knowledge of the interrelationship between pulmonary status, and swallowing function and vocalization.				
Is able to design and modify interventions considering the impact of mechanical ventilation on the patient's or client's function.				
f) Integumentary repair and protective techniques: Is able to prevent and manage integumentary impairment through the use of equipment, such as pressure mapping, seating systems, and cushion and orthotic prescriptions.				

<i>Assessment Tool for Physical Therapists</i> Description of Specialty Practice: Neurologic				
Directions: Place an "X" in the box that BEST describes behavior observed for aspect of the competency.	Unsatisfactory Performance 1	Satisfactory Performance 2	Superior Performance 3	Rating
4. Procedural Interventions (cont'd)				
f) Integumentary repair and protective techniques: (cont'd) Is able to prevent and manage integumentary impairment through education, exercise, positioning, and mobility and activity prescription.				
g) Electrotherapeutic modalities: Is able to integrate motor learning and motor control concepts into the application of electrotherapeutic modalities, such as biofeedback and NMES.				
Is able to apply electrotherapeutic modalities with knowledge of plasticity, neurologic pathology, and recovery patterns.				
Calculate the cumulative rating for this section and record here →				99
C. Outcomes Assessment				
1. Is able to select appropriate outcome measures, such as sensitive and responsive, across the ICF domains, based on patient or client acuity, diagnosis, prognosis, and practice setting.				
2. Is able to adjust the plan of care within and across episodes based on interpretation of outcome measure results.				
3. Is able to analyze and interpret patient and client outcomes to modify own future practice and perform programmatic assessments.				
Calculate the cumulative rating for this section and record here →				9

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

SUMMARY FORM

Use this summary to gain an overview of the ratings you recorded for each behavior. Copy each rating you recorded to this page. You will then have a global perspective for each competency.

I. Knowledge Areas of Neurologic Clinical Specialty Practice	Score	Summary Score
A. Foundation Sciences		
1. Anatomy and Physiology	15	
2. Neuroanatomy and Neurophysiology	33	
3. Movement Sciences	24	
B. Behavioral Sciences		
1. Psychology and Neurophysiology	18	
2. Psychiatry	9	
3. Teaching and Learning Theory	6	
C. Clinical Sciences		
1. Pathology	15	
2. Epidemiology	12	
3. Medical Management	15	
4. Pharmacology	9	
D. Clinical Reasoning and Critical Inquiry	15	
Cumulative Rating for Section I		171

II. Professional Roles, Responsibilities, and Values of Neurologic Clinical Specialists		
A. Communication	12	
B. Education	24	
C. Consultation	12	
D. Evidence-Based Practice	15	
E. Prevention, Wellness, and Health Promotion	9	
F. Social Responsibility and Advocacy	12	
G. Leadership	15	
H. Professional Development	9	
Cumulative Rating for Section II		108
III. Patient and Client Management		Score Summary Score
A. Patient and Client Examination		
1. History	6	
2. Systems Review	6	
3. Examination Procedures	15	
4. Tests and Measures	78	
5. Evaluation	15	
6. Diagnosis	9	
7. Prognosis	15	
B. Intervention		
1. Clinical Decision Making and Prioritization of Interventions	18	
2. Coordination, Communication, Documentation	12	
3. Patient and Client Instruction	9	
4. Procedural Interventions	99	
C. Outcomes Assessment	9	
Cumulative Rating for Section III		291
Total Cumulative Rating		570

Assessment Tool for Physical Therapists

Description of Specialty Practice: Neurologic

ACTION PLAN

After you have reviewed the summary form, identify (by highlighting) the competency aspects that you scored the weakest. These are the competency aspects that may need to be improved. An action plan may be developed to increase knowledge and/or skills for each of the competency aspects that have been highlighted. An action plan can help to organize and prioritize professional development needs.

It is simple to develop an action plan.

1. Identify the **competency aspect** that needs to be improved.
2. Assign a professional development **priority** to the competency aspect using a scale of 1 to 5 with 1 being the lowest priority and 5 the highest priority.
3. Identify **when** (timeframe for implementation of the action item) each professional development need can be satisfied.
4. Indicate **how** (eg, continuing education course, college/university class, mentor, clinical residency, supervised clinical practice) each professional development need will be satisfied.
5. Identify **what** resources (eg, time off, registration fee, contact with possible mentors, application for clinical residency, etc.) are needed.
6. Choose the **method** that will be used to demonstrate that each professional development need has successfully been met (eg, certificate of completion, passing grade, mentor feedback, satisfactory completion of residency, etc.)

Here is a sample action plan to consider:

BEHAVIOR	PRIORITY 1 = lowest 5 = highest	WHEN	HOW	WHAT	METHOD
Is able to identify the educational needs of the learner/client.	4	by 6/18	CE course	1. time off 2. registration fee 3. travel funds 4. shift coverage	1. certificate of completion 2. peer review
Is able to reevaluate treatment or goals	2	by 12/18	Mentor	1. agreement with department director	1. mentor feedback 2. peer review

For additional professional development information, visit www.apta.org.

Assessment Tool for Physical Therapists
Description of Specialty Practice: Neurologic

EVALUATION FORM

Please take a few minutes to give us feedback on the *Assessment Tool for Physical Therapists: Neurologic*. Fill in this evaluation form (use back for additional comments), and return it by mail to APTA, Residency/Fellowship and Specialist Certification Program, 1111 North Fairfax Street, Alexandria, VA 22314-1488, Attn: Performance Evaluation, or scan and return by email to: spec-cert@apta.org.

(Please print)

I. Name _____
First Last

II. APTA Membership APTA member number _____ () nonmember

Circle your response 5=excellent 4=good 3=average 2=fair 1=poor

III. Clarity

1. The *Assessment Tool for Physical Therapists: Neurologic* met my needs.
5 4 3 2 1 N/A

COMMENTS _____

2. The *Assessment Tool for Physical Therapists: Neurologic* was clearly presented and easily understandable.
5 4 3 2 1 N/A

COMMENTS _____

3. The instructions for completion of the *Assessment Tool for Physical Therapists: Neurologic* were clear and precise.
5 4 3 2 1 N/A

COMMENTS _____

IV. Format

4. The *Assessment Tool for Physical Therapists: Neurologic* was easy to follow.
5 4 3 2 1 N/A

COMMENTS _____

5. The format was appropriate for the assessment of clinical practice.
5 4 3 2 1 N/A

COMMENTS _____

V. User Friendly

6. The *Assessment Tool for Physical Therapists: Neurologic* was user-friendly.
5 4 3 2 1 N/A

COMMENTS _____

Thank You!