

AMERICAN BOARD OF PHYSICAL THERAPY RESIDENCY AND FELLOWSHIP EDUCATION

Description of Residency Practice
Neurology
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American Physical Therapy Association
1111 North Fairfax Street • Alexandria, VA 22314-1488
resfel@apta.org • 703/706-3152 • www.abptrfe.org

Preamble

The American Board of Physical Therapy Residency and Fellowship Education (ABPTRFE), a board-appointed group of the American Physical Therapy Association (APTA), has created the following Description of Residency Practice (DRP) to reduced unwarranted curriculum variability; provide residents minimum consistency in learning experiences for that area of practice; and streamline the accreditation process for reporting.

This DRP is the product of collaborative work by ABPTRFE and the APTA Physical Therapy Outcomes Registry staff, and is based on feedback received from members of the American Board of Physical Therapist Specialties (ABPTS) and directors of residency programs. Feedback was analyzed and incorporated into the DRP as ABPTRFE refined the document.

While all programs are required to meet the comprehensive curriculum and program requirements as outlined within the *ABPTRFE Quality Standards for Clinical Physical Therapist Residency and Fellowship Programs*, the purpose of the DRP is to: (1) establish a consistent curriculum expectation for residency programs within the same specialty area, and (2) provide consistency in program reporting for accreditation processes. The DRP allows flexibility for programs to incorporate additional learning experiences unique to the program's environment that are beyond the minimum standard expectations.

The DRP for each residency area will undergo revalidation at least once every 10 years. The process for revalidation will be a collaborative process with ABPTS, for specialty areas recognized by ABPTS, and will occur as part of the revalidation of that specialty area by ABPTS.

I. Type of Program

Neurology is a clinical area of practice.

II. Learning Domain Expectations

A residency program must have a curriculum inclusive of the learning domains identified within that area's current validated analysis of practice.

The following information is extracted directly from chapter 2 of the *Neurologic Description of Specialty Practice*.¹

A. Knowledge Areas of Neurologic Practice

Foundation Sciences

- Human anatomy and physiology in health 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

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

¹*Neurologic Physical Therapy Description of Specialty Practice*. 3rd ed. Alexandria, VA: American Physical Therapy Association; 2016. Reproduced with permission. © 2016 American Physical Therapy Association. All rights reserved.

- Teaching and learning theory
 - Principles of teaching and learning
 - Development and implementation of educational planning process

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

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

B. Professional Competencies of Neurologic Physical Therapists

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

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

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- 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

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

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

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

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

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

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

C. Psychomotor Skills of Neurologic Physical Therapists in the Patient/Client Management Model

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:
 - Aerobic capacity/endurance
 - Assistive Technology, including orthotic, prosthetic, protective and supportive devices, and including indications, use, effectiveness, and safety
 - 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
 - Circulation abnormalities, auscultation, and activity tolerance
 - Community, social, and civic life integration and reintegration
 - Cranial nerve integrity
 - Disease-specific scales for classification and prognosis
 - Environmental factors (domestic, educational, work, community, social, and civic life)
 - Ergonomics and return-to-work assessments
 - 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
 - Integumentary integrity
 - Joint integrity and mobility

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- Mental functions
 - Consciousness
 - Orientation
 - Attention
 - Cognition
 - Dual-task
- Motor functions 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
- Muscle performance, including strength, power, and endurance
- Pain assessment (multidimensional, pain scales)
- Perception of sensory input, including vertical orientation, body schema, depth perception, neglect, and motion sensitivity
- Quality of life measures, including disease and nondisease specific measures
- Range of motion, including muscle extensibility and flexibility
- Reflex integrity, including normal and pathological
- Self-care and domestic life
- Self-efficacy scales
- Sensory integrity of peripheral and central systems
- Specialized sensory and motor tests (Dix Hallpike maneuver, positional testing)
- Ventilation and respiration, including pulmonary function, auscultation, and cough assessment

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

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

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

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:

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

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

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- 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
- 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

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

Manual therapy techniques

- Integrates manual therapy into the management of patients and clients with neurologic conditions, such as joint and soft tissue mobilization

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

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

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

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

III. Practice Settings

The clinical curriculum of all accredited residency programs must include a variety of practice settings, as noted below. A resident should experience a minimum of 5% of their time in each setting, as required by the ABPTRFE Quality Standards for Clinical Physical Therapist Residency and Fellowship Programs.

If a residency program is unable to provide each participant with an opportunity to engage in patient care activities within these settings, the program must provide additional learning opportunities (eg, observation, didactic, journal club, research) related to patient care within these settings for the minimum required hours noted above.

The minimum required practice settings for neurologic residency programs are:

- Acute care facility
- Inpatient rehabilitation facility or Skilled nursing facility
- Outpatient facility

IV. Patient Populations

The clinical curriculum of all accredited residency programs must include a variety of patient populations, specific to sex and age group as listed below, for a minimum of 5% of the program hours required by the ABPTRFE Quality Standards for Clinical Physical Therapist Residency and Fellowship Programs.

If a residency program is unable to provide each resident with an opportunity to engage in patient care activities within these populations, the program must provide additional learning opportunities (eg, observation, didactic, journal club, research) related to patient care within these populations for the minimum required hours noted above.

The minimum required patient populations for neurologic residency programs are:

Age:

- Adults (22-59 years of age)
- Geriatrics (60 years of age to end of life)

Sex:

- Female
- Male

V. Primary Health Conditions

The clinical curriculum of all accredited residency programs must include a variety of primary health conditions associated with the program's area of practice (see below list).

If a residency program is unable to provide each resident with an opportunity to engage in patient care activities within the majority of these populations, the program must provide additional learning opportunities (eg, observation, didactic, journal club, research) related to patient care within these conditions.

The following template must be used when logging resident-patient encounters as part of the residency curriculum. Patients evaluated, treated, or managed by the resident as part of the resident's education throughout the course of the residency program should be included within the template. The patient's primary health condition is only counted during the first patient encounter. **Patient encounters beyond the initial visit should not be included in the frequency count.**

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Name of Resident:	
Primary Health Conditions Neurology	Number of Patients Evaluated, Treated, or Manage by the Resident as Part of the Program's Curriculum
PULMONARY SYSTEM	
Anoxia (eg, near drowning, drug induced)	
NERVOUS SYSTEM	
Acquired brain injury (eg, closed head injury, Brain injury, Traumatic brain injury)	
Central nervous system infections (eg, viral infections of the CNS - meningitis, encephalitis)	
Central nervous system neoplasms (eg, glioma, lymphoma, meningioma, craniopharyngioma, pituitary tumor)	
Cerebellar disorders (eg, degenerative cerebellar disorder, cerebellar stroke)	
Cerebral palsy	
Cerebrovascular accident (eg, hemorrhagic, embolic/ thrombotic, anteriorvenous malformation, brainstem stroke, basal ganglia stroke, thalamic stroke)	
Concussion (post-concussion syndrome)	
Dementia (eg, vascular, dementia with Lewy Body, mixed, frontotemporal, Huntington disease, Wernicke-Korsakoff Syndrome, Creutzfeldt-Jakob Disease, Alzheimer's disease)	
Multiple sclerosis	
Normal pressure hydrocephalus	
Other neuromuscular disorders (eg, Huntington disease, Myasthenia gravis)	
Parkinson's disease/parkinsonism syndromes	
Peripheral neuropathy (metabolic disease/idiopathic)	
Polyneuropathy (eg, acute inflammatory demyelinating polyneuropathy- Guillain-Barre Syndrome/chronic inflammatory demyelinating polyneuropathy)	
Spinal cord injury	
Vestibular disorders (eg, peripheral, central, vestibular pathology associated with disease process, acoustic neuroma)	
OTHER	