

**ABPTRFE**

American Board of Physical Therapy  
Residency & Fellowship Education

# Description of Residency Practice: Clinical Electrophysiology

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# DRP Clinical Electrophysiology Physical Therapy

## Preamble

The American Board of Physical Therapy Residency & Fellowship Education, a board-appointed group of the American Physical Therapy Association, has created the following “Description of Residency Practice” to reduce 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 American Board of Physical Therapist Specialties through the practice analysis for specialty revalidation.

While all programs are required to meet the comprehensive curriculum and program requirements as outlined within “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 area of practice. 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.

## I. Type of Program

Clinical Electrophysiology 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 Clinical Electrophysiology Physical Therapy “Description of Specialty Practice.”<sup>1</sup>

### A. Knowledge Areas of Clinical Electrophysiologic Practice

- **Foundation Sciences**
  - Anatomy (gross and microscopic) of the following systems (terminology consistent with International Anatomical Nomenclature Committee, *Nomina Anatomica*, 1998):
    - Neuromuscular (including surface/cross sectional anatomy).
    - Musculoskeletal.
    - Peripheral vascular.
    - Integumentary.

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<sup>1</sup> “Clinical Electrophysiology 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.

- Neuroscience:
  - Central nervous system function:
    - Nuclei associated with nervous system.
    - Ganglia associated with nervous system.
    - Somatosensory spinal track.
    - Motor or pyramidal track.
    - Pathological reflexes.
  - Peripheral nervous system function:
    - Somatic sensory/motor.
    - Autonomic – sympathetic and parasympathetic.
    - Ganglia associated with the nervous system.
    - Cranial nerve.
- Physiology (systems and cellular) of the following systems:
  - Nervous.
  - Muscular.
  - Endocrine.
  - Cardiovascular and pulmonary.
  - Integumentary.
  - Gastrointestinal/Genitourinary.
- Kinesiology:
  - Movement science.
  - Clinical biomechanics.
- **Clinical Sciences**

Recognition of signs, symptoms, etiology, course, and manifestations of dysfunction of the musculoskeletal, neuromuscular, cardiovascular and pulmonary, renal, and integumentary systems, to include the following underlying sciences:

  - Pathology.
  - Pathophysiology.
  - Pathokinesiology.
  - Pharmacology/pharmacokinetics (drug actions, interactions, and side effects).
  - Specialized electrophysiologic testing techniques (e.g., advanced neuro-recovery, grafting, cellular, postsurgical alternate testing methods).
- **Biomedical Instrumentation**

Instrumentation used for monitoring, recording, and measuring electrophysiologic properties, including the following:

  - Electromyographic equipment.
  - Interface between electrophysiologic equipment and human tissue (e.g., Henneman's size principle vs. electrically evoked action potential).
- **Ancillary Tests**
  - Imaging procedures (e.g., MRI, CT scan, radiographs, ultrasound imaging).
  - Laboratory tests.
- **Critical Inquiry**
  - Assessment of research design and methods to include statistical concepts.
  - Appraisal of research findings specific to clinical electrophysiologic practice.
  - Application of research findings to clinical electrophysiologic practice.
  - Application of principles of evidence-based practice in clinical electrophysiologic specialty practice (examination, evaluation, prognosis, and intervention).
  - Dissemination of research findings.

## B. Professional Competencies of Clinical Electrophysiologic Physical Therapists

- **Professional Behaviors (to include participation in professional roles and responsibilities)**
  - Has membership or other involvement in professional organizations (e.g., committee service, political advocacy, journal reviewer, authorship).
  - Mentors prospective specialists.
  - Pursues continuing professional development (e.g., continuing education courses, journal clubs, college courses related to specialty, professional presentations, authorship).
  - Participates in clinical supervision of students and peers.
  - Participates in continuous quality improvement process for clinical electrophysiologic practice.
  - Participates in Maintenance of Specialist Competency.
  - Practices clinical electrophysiologic physical therapy within the scope and confines of licensure and regulatory process.
  - Complies with Health Insurance Portability and Accountability Act requirements.
  - Risk awareness (obtain informed consent; recognize that some electromyography procedures are higher risk, such as needle examination of rhomboids or levator scapula muscles; and use additional safety measures as needed.)
  - Evidence-based practice (awareness of current evidence-based practice patterns and research-based approaches, and the interplay between electrophysiologic testing and other aspects of the examination, including appropriate history and physical examination, or complimentary procedures, such as MRI, CT scan, x-ray, and ultrasound).
- **Education to include contributing special knowledge or expert opinion in client-based, community, medical, and academic areas**
  - Educates physical therapy students to become knowledgeable and skillful in clinical electrophysiologic physical therapy.
  - Educates physical therapists to enhance knowledge in clinical electrophysiologic physical therapy.
  - Educates other health care professionals and outside agencies about clinical electrophysiologic physical therapy.
  - Educates other health care professionals on appropriate patients and clients for referral for clinical electrophysiologic testing.
- **Consultation to include advising referring practitioners or employers, serving as an expert witness, or peer review authorship.**

## C. Psychomotor Skills of Clinical Electrophysiologic Physical Therapists in the Patient/Client Management Model

- **Examination**

For the clinical electrophysiologic specialist, the examination process includes history, systems review, tests and measures for both a neuromusculoskeletal exam and the electrophysiologic examination, and reexamination as indicated:

  - History:
    - Engages in a systematic gathering of data from both the past and the present related to why the patient or client is seeking the services of the clinical electrophysiologic specialist.
    - Interprets the referral and information from the patient's or client's medical record.
    - Obtains a history from the patient or client specific to the major complaint(s) with regard to severity, chronicity, impairment or disability, level of present functioning, other therapeutic interventions, and emotional response to the current clinical situation.
    - Reviews current medications.
    - Reviews previous surgeries.
    - Reviews allergies, such as latex, topical anesthetics and sprays, and adhesive.
  - Systems review:

- Performs a systems review to include the anatomical and physiological status of the cardiovascular and pulmonary, integumentary, musculoskeletal, and neuromuscular systems, and the communication, affect, cognition, language, and learning style of the patient or client. At the clinical electrophysiologic specialist practice level, baseline information is not simply collected and reported. The specialist practitioner synthesizes the information and considers differential sites of pathology, signs, and symptoms as part of the critical clinical decision-making process.
- Physical examination:
 

The specialist plans and performs a physical examination prior to beginning the clinical electrophysiologic testing. This clarifying physical examination has many functions, chief among them to guide the clinical electrophysiologic examination. The physical examination may lead to extending the clinical electrophysiologic testing beyond what was indicated in the referral.

  - Motor testing.
  - Sensory testing.
  - Muscle stretch reflexes.
  - Functional observation and/or testing.
  - Pertinent range of motion testing.
  - Pathological reflexes (if present).
  - Upper motor neuron signs (if present).
  - Palpitation (as appropriate).
  - Observation (as appropriate, e.g., atrophy, deformities, integument).
  - Cranial nerve screen (as appropriate).
  - Gait (as appropriate).
  - Special tests (as appropriate).
- Use of tests and measures:
 

The examiner possesses knowledge of indications and rationale for clinical electrophysiologic examination:

  - Draws upon knowledge of pathological conditions for which given clinical electrophysiologic examination procedures may provide contributory information.
  - Synthesizes findings of selected procedures with possible pathology.
- Planning of the electrophysiologic examination:
  - Selects tests and procedures that are supported with evidence (appropriate odds-ratios and other statistical methods that are used to validate testing methodology, such as sensitivity and specificity).
  - Selects methods of eliciting, detecting, recording, monitoring, and measuring nerve and muscle electrical activity.
  - Obtains informed consent from the patient (or parent/guardian when the patient is a minor) to proceed with the electrophysiologic tests.
  - Ensures appropriate methods for interpretation are utilized when quantifying EMG activity (surface, wire, needle) to specific events (e.g., kinesiology, pathology).
  - Adjusts testing plan based on factors influencing recording, monitoring, and measuring of electrophysiologic data.
  - Based on the NMS examination findings, formulates the clinical electrophysiologic examination plan on the necessary anatomical areas, using appropriate electrophysiologic tests sequenced for maximum efficiency.
  - Based on emerging clinical electrophysiologic examination findings, adjusts the examination plan for further electrophysiologic tests as needed.
- Performance of the clinical electrophysiologic examination, using tests and measures including:
  - Clinical needle electromyography.
  - Electronic reflex studies (e.g., blink, bulbocavernosus, H-reflex).
  - Kinesiological EMG (surface/fine wire).
  - Motor-evoked potential testing.
  - Nerve conduction velocity testing sensory/motor (surface and needle techniques).
  - Repetitive nerve stimulation.
  - Stimulated muscle assessment for functional electrical stimulation systems (e.g., spinal cord stimulation approaches, prosthetic advances).



- Patient and client-related instruction:
  - Provides instruction to educate the patient or client about individual medical conditions, based upon specific electrophysiologic findings.
  - Provides instruction to the patient or client to increase their understanding of individual impairments, functional limitations, or disabilities.
  - Provides instruction to the patient or client aimed at risk reduction and prevention as well as health, wellness, and fitness prognosis and intervention.
- Documentation:
  - Documents a complete report of the clinical electrophysiologic examination and patient or client interaction, to include:
    - Referral source and referring diagnosis/reason for referral.
    - History.
    - Systems review.
    - Physical examination.
    - Patient's informed consent to include, at a minimum, verbal review of the purpose, procedure to be conducted, and risks, with documentation of verbal consent.
    - Electrophysiologic examination:
      - NCS (e.g., motor, sensory, repetitive nerve stimulation, late responses, reflex studies).
      - Needle EMG.
      - Tables of data collected during the exam, to include:
        - Normal NCS values.
        - Distances (e.g., distal latencies, conduction segments).
        - Temperature of the limb being tested.
    - Summary of abnormal findings.
    - Electrophysiologic impression/conclusion:
      - If appropriate, any other factors affecting the examination (height for late responses, obesity, patient tolerance to testing).
      - Written report that reflects current anatomical terminology consistent with the International Anatomical Nomenclature Committee's "Nomina Anatomica" (1998).
      - Based on documentation in the written report, the study should be reproducible by an outside source.

### 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 patient-care practice hours within each setting based on the minimum patient-care practice hours outlined within "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 (e.g., 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 clinical electrophysiology residency programs are:

- No required settings.

### IV. Patient Populations

The clinical curriculum of all accredited residency programs must include a variety of patient populations, as noted below, specific to sex and age. A resident should experience a minimum of 5% of time in each patient population

based on the minimum patient-care practice hours outlined within “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 (e.g., 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 clinical electrophysiologic residency programs are:

**Age**

- No required ages.

**Sex**

- No required sex.

**V. Medical Conditions**

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

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

Programs must use the ABPTRFE template when submitting documentation to ABPTRFE. Medical Condition Form templates are in the [Residency/Fellowship Education HUB](#).

<b>Medical Conditions</b>
<b>Clinical Electrophysiology</b>
<b>Nervous System</b>
Entrapment Neuropathy (carpal tunnel syndrome, cubital tunnel syndrome)
Motor neuron disease
Neuromuscular junction defect (myasthenia gravis, botulism)
Polyneuropathy (demyelinating, axonal, hereditary)
Radiculopathy
<b>Musculoskeletal System</b>
Myopathy (muscular dystrophy, myositis)

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