description of residency practice
clinical electrophysiology
june 2017
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
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 Description of Specialty Practice*.1

A. Knowledge Areas of Clinical Electrophysiology Practice

Foundation Sciences

1. Anatomy
   - Gross anatomy
     - Surface
     - Cross sectional
   - Peripheral vascular anatomy
   - Neuromuscular system
   - Musculoskeletal system
   - Histology
   - Integumentary system

2. Neuroscience
   - Central nervous system function
     - Nuclei associated with nervous system
     - Ganglia associated with nervous system
     - Somatosensory spinal tract
     - Motor or pyramidal tract
   - Peripheral nervous system function
     - Somatic sensory/motor
     - Autonomic
     - Cranial nerves
     - Ganglia associated with the nervous system
   - Pathological reflexes

3. Physiology
   - Nerve
   - Muscle
   - Endocrine

4. Kinesiology
   - Movement sciences
   - Gait
   - Clinical biomechanics

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

- Pathology
- Pathophysiology
- Pathokinesiology
- Pharmacology/pharmacokinetics (drug actions and interactions)

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

- Electromyographic equipment
- Interface between electrophysiological equipment and human tissue (e.g., Henneman’s size principle vs electrically evoked action potential)

Ancillary Tests
- Imaging procedures (e.g., MRI, CT, radiographs)
- 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

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Clinical Electrophysiology Description of Residency Practice (2017)
B. Professional Competencies of Clinical Electrophysiology Physical Therapists

Professional Behaviors, Participating in professional roles and responsibilities to include:

- Membership/involvement in professional organizations (e.g., committee service, political advocacy, journal reviewer, authorship)
- Mentoring prospective specialists
- Continuing professional development (e.g., continuing education courses, journal clubs, college courses related to specialty, professional presentations, or authorship)
- Clinical supervision of students/peers
- Continuous quality improvement process for clinical electrophysiologic practice

Education to include contributing special knowledge or expert opinion in client-based, community, medical, or academic areas

- Educate physical therapy students to become knowledgeable and skillful in clinical electrophysiologic physical therapy.
- Educate physical therapists to enhance knowledge in clinical electrophysiologic physical therapy.
- Educate other health care professionals and outside agencies about clinical electrophysiologic physical therapy.
- Educate other health care professionals on appropriate patients/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 Electrophysiology 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 (NMS) exam and the electrophysiologic examination, and reexamination as indicated:

1. History

- Engage in a systematic gathering of data from both the past and the present related to why the patient/client is seeking the services of the clinical electrophysiologic specialist.
- Interpret the referral and information from the patient’s/client’s medical record.
- Obtain a history from the patient/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.

2. Systems Review

- Perform a systems review to include the anatomical and physiological status of the cardiovascular/pulmonary, integumentary, musculoskeletal, and neuromuscular systems, and the communication, affect, cognition, language, and learning style of the patient/client.

At the clinical electrophysiologic specialist practice level, baseline information is not simply collected and reported. The advanced practitioner synthesizes the information, considering the pathology, signs, and symptoms as part of the critical clinical decision-making process.

3. Test and Measures

Indications and rational for clinical electrophysiologic examination:

- Identify pathological conditions for which given clinical electrophysiologic examination procedures may provide contributory information.
Instrumentation and procedures

- Select methods of eliciting, detecting, recording, monitoring, and measuring nerve and muscle electrical activity.
- Relate methods of quantifying clinical needle EMG activity to specific events (e.g., kinesiology, pathology).
- Adjust testing plan based on factors influencing recording, monitoring, and measuring electrophysiologic data.

Planning the exam

- Based on the history and systems review data, plan the clinical neuromusculoskeletal (NMS) examination.
- Based on the NMS examination findings, formulate 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, adjust the examination plan for further electrophysiologic tests as needed.

For the NMS examination, perform tests and measures including:

- Conventional neurological examination (MMT, sensory testing, MSR).
- Provocative testing for the upper and lower quarter (e.g., Tinel’s sign, Phalen’s test, upper limb tension tests).
- Cranial nerve testing.

For the clinical electrophysiologic examination, perform electrophysiologic procedures including:

- Clinical needle electromyography (EMG).
- Motor evoked potentials (MEP).
- Nerve conduction studies (NCS).
- Somatosensory evoked potentials (SSEP).

Evaluation

Normal and abnormal electrophysiologic characteristics of nerve and muscle that would be detected by the clinical electrophysiologic examination:

- Differentiate normal and abnormal characteristics of motor and sensory nerve impulses as measured in clinical electrophysiologic examination procedures under varying conditions (e.g., with submaximal and supramaximal stimulus, with antidromic and orthodromic conduction).
- Differentiate normal and abnormal characteristics of clinical needle EMG potentials under varying conditions (e.g., at rest, with minimum contraction).

Interpretation of abnormal findings from the clinical electrophysiologic examination:

- Interpret the findings of the NMS and the clinical electrophysiological examination.
- Analyze and correlate data from the clinical electrophysiologic examination.
- Assess sources of potentially unreliable data.
- Rule out noncontributory data.

Diagnosis

The performance and interpretation of needle electromyography, nerve conduction studies, or evoked potential studies does not constitute the practice of medicine. Findings of the clinical electrophysiologic examination are not pathognomonic of any particular disease entity. The referring health care provider responsible for the correlation of all clinical findings and test results (including clinical electrophysiologic examination test results) is obliged to make the final diagnosis. Findings of neural and muscle membrane impairment from the electrophysiologic examination should always be summarized and reported in electrophysiologic terms. However, it is appropriate for the clinician who performed both the clinical...
electrophysiologic examination and NMS examination that preceded it to report the diagnostic entities most consistent with the integrated findings.

- Correlate the NMS and clinical electrophysiologic examination findings with clinical impression.
- Describe findings in electrophysiologic terms.
- Formulate a clinical impression using electrophysiologic terms.
- Formulate a clinical impression consistent with disease, disorder, condition, or impairment.

**Prognosis**
- Construct a plan of care as indicated by the situation or setting in which the referral was made.
- When appropriate, quantify the electrophysiologic data and make a prognosis for potential improvement.

**Interventions**
- Coordination, communication, and documentation.
  - Determine the need for consultation or referral to another health care provider with the appropriate expertise.
  - Determine the need for follow-up examination (eg, SSEP, repeat electrophysiologic examination).
  - Identify tests, which would further clarify and differentiate the patient’s/client’s status (eg, repetitive nerve study, kinesiological EMG).
  - Document the complete report of the clinical electrophysiologic evaluation and patient/client interaction.
- Patient/client-related instruction.
  - Provide instruction to educate the patient/client about individual medical conditions, based on specific electrophysiologic findings.
  - Provide patient/client-related instruction to increase patient/client understanding of individual impairments, functional limitations, or disabilities.
  - Provide patient/client-related instruction aimed at risk reduction/prevention as well as health, wellness and fitness prognosis and intervention.

**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 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, 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 clinical electrophysiology residency programs are:

**Age:**
- No required ages
Sex:
- No required sex

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 (e.g., 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.

<table>
<thead>
<tr>
<th>Primary Health Conditions</th>
<th>Number of Patients Evaluated, Treated, or Managed by the Resident as Part of the Program’s Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NERVOUS SYSTEM</strong></td>
<td></td>
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<tr>
<td>Mononeuropathies (atraumatic) of the upper extremity (e.g., median, ulnar, radial, axillary, musculocutaneous, suprascapular)</td>
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<tr>
<td>Mononeuropathies (atraumatic) of the lower extremity (e.g., tibial, fibular, and sural)</td>
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<tr>
<td>Mononeuropathies (traumatic)</td>
<td></td>
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<tr>
<td>Motor neuron disease</td>
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<tr>
<td>Nerve plexus disorder (plexopathies)</td>
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<tr>
<td>Neuromuscular junction disorders (e.g., Myasthenia Gravis &amp; Lambert Eaton Syndrome)</td>
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</tr>
<tr>
<td>Polynucleartherapies</td>
<td></td>
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<tr>
<td>Radiculopathies - cervical</td>
<td></td>
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<tr>
<td>Radiculopathies - lumbosacral</td>
<td></td>
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<tr>
<td><strong>MUSCULOSKELETAL SYSTEM</strong></td>
<td></td>
</tr>
<tr>
<td>Myopathies</td>
<td></td>
</tr>
<tr>
<td><strong>OTHER</strong></td>
<td></td>
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