The Body Electric
“Pathway to Profitability”

Michael C. Lescallette, DPT, ECS, R.NCS.T #630
Scott McCauley, DPT
Roger Nelson, PT, PhD, FAPTA

The purpose of this three-hour seminar is to provide an overview of EMG/NCV testing and how the attendee can expand his or her own PT skills to include this profitable niche practice area into their business plan.

<table>
<thead>
<tr>
<th>Introductory Comments</th>
<th>10:00 – 10:10</th>
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<tr>
<td><strong>Dr. Roger Nelson</strong></td>
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Electrophysiologic Primer

“The Body Electric”

- Action potentials produced by examiner
- Clinical electrophysiologic testing
- Nerve conduction studies
- Results are measured by waveforms
  - Speed of conduction – Myelin structure
  - Amplitude of waveform – Axon structure
  - Motor nerve fiber assessment
  - Sensory nerve fiber assessment
- Needle Electromyography
  - Needle electrode inserted into muscle tissue
  - Considered “gold standard” for assessing axon damage

<table>
<thead>
<tr>
<th>Theory of Motor Nerve Conduction</th>
<th>10:40-10:50</th>
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CPTA Annual Conference                                                                        September 21, 2013
<table>
<thead>
<tr>
<th>Activity</th>
<th>Time</th>
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<tbody>
<tr>
<td>Lab Activity – Median motor nerve conduction study</td>
<td>10:50-11:05</td>
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<tr>
<td>• Terminal objective – Observe a faculty member perform a median motor nerve study.</td>
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<tr>
<td>Theory of Sensory Nerve Conduction</td>
<td>11:05-11:15</td>
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<tr>
<td>• Sensory axon characteristics</td>
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<td>• Heavy myelination allows for fast conduction</td>
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<td>• Differences between motor and sensory nerve testing</td>
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<tr>
<td>Lab Activity – Test for carpal tunnel syndrome</td>
<td>11:15-11:30</td>
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<tr>
<td>• Terminal objective – Perform a median sensory nerve conduction on a lab partner</td>
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<tr>
<td>Introduction to needle EMG + case history of patient with low back pain</td>
<td>11:30-11:50</td>
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<tr>
<td>• Needle EMG used to record electrical activity inside of muscle tissue</td>
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<tr>
<td>• Detect abnormalities within specific myotomes</td>
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<td>• Can be used to establish timing of injury, i.e., acute vs. chronic</td>
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<tr>
<td>Lab Activity – Demo needle EMG</td>
<td>11:50-12:05</td>
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<tr>
<td>• Observe a faculty member perform a needle EMG test on the anterior tibialis muscle.</td>
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<tr>
<td>Addition of Electrophysiologic (EMG/NCV) Testing</td>
<td>12:05-12:15</td>
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<tr>
<td>• Referral sources - Expansion</td>
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<tr>
<td>• Service Lines - Expanded</td>
<td></td>
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<tr>
<td>• Revenue collected per patient encounter</td>
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<tr>
<td>• Compare to revenue from standard patient case</td>
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<tr>
<td>• Sustainability over time</td>
<td></td>
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<tr>
<td>• Add to list of constant referral sources</td>
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<tr>
<td>• Patients seen before and after surgery</td>
<td></td>
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<tr>
<td>• More patient contact, additional PT services in future</td>
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<tr>
<td>Current PT Practice Business Model</td>
<td>12:15-12:20</td>
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<tr>
<td>• Referral sources</td>
<td></td>
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<tr>
<td>• Service Lines</td>
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<tr>
<td>• Revenue collected per patient encounter</td>
<td></td>
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<tr>
<td>• Sustainability over time</td>
<td></td>
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<tr>
<td>• Maintain list of constant referral sources</td>
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<tr>
<td>• Patients seen after surgery for therapy</td>
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<td>Educational Requirements to Become an Electromyographer in California</td>
<td>12:20-12:30</td>
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<tr>
<td>• Become certified</td>
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<td>• CA has additional requirements</td>
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<td>• ECS Certification</td>
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<td>• Residency trained</td>
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<td>• Services to assist transition to new product line</td>
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<td>• Advisement from experienced electromyographers</td>
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<tr>
<td>• Where and how to market EMG/NCS services</td>
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<td>• Billing assistance from credentialing to collections</td>
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Questions: aaceemg@gmail.com

Presentation Learning Objectives:

1) Describe the basic components of an electrophysiologic evaluation
2) List the typical symptoms of patients who would be appropriate for electrophysiologic testing
3) Relate EMG/NCS data to nerve structure, i.e., myelin vs. axon
4) List the components of a peripheral nerve
5) List the typical symptoms of a patient with nerve impairment
6) Name at least three types of diagnosis typically revealed during electrophysiologic testing
7) Discuss advantages of adding electrophysiologic testing to current business model
8) Compare and contrast existing weekly schedule and income to a schedule that includes time for electrophysiologic testing
9) Compare and contrast revenue from PT vs. electrophysiologic testing
10) Describe the process a PT in California has to go through to be able to perform electrophysiologic testing on patients
11) List services that are available to assist PTs in the implementation of electrophysiologic business
12) Demonstrates a patient-centered and ethical approach in planning and conducting the NCS and EMG examinations
13) Explain the electrophysiologic basis for electrical NCS and EMG testing.
14) Identify the applications and limitations for NCS and EMG testing.
15) Demonstrate knowledge and application of instrumentation used for monitoring, recording, and measuring electrophysiologic properties of nerve and muscle.
16) Identify safety considerations in the practice of clinical electrophysiology to include: precautions and contraindications, electrical safety, and infection control procedures.
17) Identify and describe common pathologic conditions for which NCS/EMG evaluation is indicated and recognize the need for referral for testing.
18) Given unexpected or unusual findings, demonstrate the ability to trouble shoot, explain sources of error, and differentiate technical errors from pathology.
19) Recognize normal and abnormal potentials, explain their significance, and correlate results of NCS/EMG with clinical findings.
20) Demonstrate the ability to modify the NCS/EMG exam based upon on-going findings during the exam.
Appendix

A.
Department of Consumer Affairs – Legal Affairs Division
State of California

July 19, 2010

CONCLUSION
“A physical therapist certified to perform electroneuromyographical evaluations may conduct electroneuromyographical examinations using needles and electrodes, collect data by measuring the electrical waveforms generated during the examination, use his or her professional physical therapy expertise to analyze and interpret such data and develop findings or conclusions regarding the functioning of the patient's nerves or muscles. In other words, the physical therapist is authorized to provide a "professional" component of an ENMG study, exercising substantive judgment to interpret or read the significance of data collected and convey an opinion about the performance and functioning of the muscles and nerves to the referring physician.”

B.
September 10, 2012
Physical Therapy Board of California

“The Physical Therapy Board of California has determined that the course, Certificate in Electrophysiologic Evaluation as approved by the California Physical Therapy Association (CPTA #12-04), in conjunction with the American Academy of Clinical Electrodiagnosis Residency in Clinical Electrophysiology Program as approved by the American Board of Physical Therapy Residency and Fellowship Education, meets the education experience requirements for electroneuromyography authorization, pursuant to the California Code of Regulations Title 16, Division 13.2 Article 11, 1399.64.(b)(1)and 1399.64(c) Requirements for Electroneuromyography Authorization.”

C.
ARTICLE 11. ELECTROMYOGRAPHY CERTIFICATION

1399.60. Definitions.
As used in these regulations:
(a) "Electroneuromyography" means the performance of tissue penetration for the purpose of evaluating neuromuscular performance, and includes the evaluation of specific abnormal potentials and evoked responses.
(b) "Kinesiological electromyography" means the study, including tissue penetration, of the phasic activity of individual or multiple muscles in relation to another physical or physiological event or exercise and does not include the evaluation of specific abnormal potentials or evoked responses.


History:
(1.) New Article 11 (Sections 1399.60-1399.69, not consecutive) filed 11-17-78;Register 78, No. 46.
(2.) Amendment of NOTE filed 4-16-79; Register 79, No. 16.
1399.61. Certification Required.
(a) No physical therapist shall perform tissue penetration for the purpose of making an electromyographical evaluation unless he or she is certified by the board to perform such tests or such practice is appropriately supervised pursuant to Sections 1399.63 or 1399.64 in order to meet the experience requirements for examination by the board for certification.
(b) No physical therapist who is certified to perform kinesiological electromyography shall perform electromyographical evaluations without additional authorization from the board as indicated on his or her certification.
(c) No physical therapist who is certified to perform electromyographical evaluations shall perform kinesiological electromyography without additional authorization from the board as indicated on his or her certification.
History:
(1.) Amendment filed 12-17-80; Register 80, No. 51.
(2.) New subsection (c) filed 8-29-94; Register 94, No. 35.
(3.) Change without regulatory effect amending section filed 9-11-97 pursuant to section 100, title 1, California Code of Regulations; Register 97, No. 37.

1399.62. Application Required.
All applications for certification by the board in electromyography shall be on a form provided by the board which is accompanied by whatever documentation is required therein and the certification fee required in Section 1399.54 of these regulations.
History:
(1.) Amendment filed 12-17-80; Register 80, No. 51.
(2.) Amendment filed 6-29-83; Register 83, No. 27.
(3.) Change without regulatory effect amending section filed 9-11-97 pursuant to section 100, title 1, California Code of Regulations; Register 97, No. 37.

1399.64. Requirements for Electroneuromyography Authorization.
In order to be examined by the board for additional authorization to perform electromyographical examinations an applicant shall meet the following requirements:
(a) Comply with Section 1399.63, subsections (a) and (b).
(b) Education. Provide evidence of one of the following education requirements:
(1) In addition to that course work required in Section 1399.63, subsection (c)(1), completion of the following additional course work which meets the requirements of that section in the following subject areas:
   (A) Neuroanatomy which also emphasizes the course of peripheral nerves and patterns of innervation.
   (B) Clinical neurology, myology and pathology -identification of clinical characteristics of neurogenic and myogenic disorders.
   (C) Physical science of electroneuromyography -basic electrophysiology and the identification and recording of bioelectric signals.
   (D) Clinical science of electroneuromyography -knowledge and procedures of patient evaluation and examination, including electromyographic and nerve conduction velocity studies, and training in tissue penetration.
(2) Completion of a period of self-study which prepares the applicant to pass a supplemental examination for additional certification to perform electroneuromyographical examination. Evidence and documentation shall include a summarization of what matters were contained in the self-study including the applicant’s clinical exposure to electroneuromyography and any materials studied on that subject and the name and statements, of any proctors who may have supervised the applicant in electroneuromyography.
(3) Authorization to perform electroneuromyographical examinations issued by another state with similar requirements.

(c) Experience. Provide evidence of the following experience requirements:

(1) Completion of not less than 400 clock hours in electroneuromyography, satisfactory to the board which provides a progressive level of training under (A) a physical therapist authorized to perform electroneuromyography, in this state or, (B) under a licensed physical therapist in another state which has similar requirements for certification, who is authorized to perform electroneuromyography or who is certified by the American Board of Physical Therapy Specialists as an electrophysiological clinical specialist, or (C) under a licensed physician who is similarly qualified to perform and who performs electroneuromyography, as part of his or her practice of medicine.

(2) Documentation of completion of 200 electroneuromyographic examinations.


History:

(1.) Repealer and new section filed 12-17-80; Register 80, No. 51.

(2.) Amendment of subsections (b)(2) and (c)(2) filed 12-31-81; Register 82, No. 1.

(3.) Amendment of subsection (c)(1) filed 6-29-83; Register 83, No. 27.

(4.) Amendment of subsections (b)(2) and (c)(2) filed 5-20-85; Register 85, No. 21.

(5.) Amendment of subsections (c)(1)- (c)(1), repealer of designation of subsections (c)(1)(A)-(B) with textual amendments, repealer of designation of subsection (d)(2)(A) with textual amendment and repealer of subsection (d)(2)(B) filed 8-29-94; Register 94, No. 35.

(6.) Change without regulatory effect amending first paragraph and subsection (c)(1) filed 9-11-97 pursuant to section 100, title 1, California Code of Regulations; Register 97, No. 37.

1399.65. Examination Required.

(a) All physical therapists applying for certification to perform kinesiological electromyography shall take and pass the examination referred in Section 1399.66, which will be administered by the board.

(b) All physical therapists applying for certification to perform electroneuromyography shall take and pass the examination referred in Section 1399.67, which will be administered by the board.


History:

(1.) Amendment filed 12-17-80; Register 80, No. 51.

(2.) Amendment of subsection (a) filed 6-29-83; Register 83, No. 27.

(3.) Repealer and new subsections (a) and (b) filed 8-29-94; Register 94, No. 35.

(4.) Change without regulatory effect amending section filed 9-11-97 pursuant to section 100, title 1, California Code of Regulations; Register 97, No. 37.

(5.) Amendment filed 3-8-2000, Register 2000, No. 10.

1399.67. Examination Subject Areas - Electroneuromyography.

The examination for certification in electroneuromyography shall test applicants in the following subject areas:

(a) Basic science as related to electroneuromyography:

(1) Anatomy

(2) Electrophysiology

(3) Neuromuscular pathology.

(b) Clinical science as related to electroneuromyography:

(1) Instrumentation

(2) Pre-examination patient evaluation

(3) Examination procedure and process

(4) Interpretation and recording of examination records and data.

(c) Practical application of electroneuromyography:

(1) Needle examination of muscles

(2) Motor and sensory nerve conduction velocity examinations.

(3) Handling of equipment
(4) Patient preparation and management
(5) Data collection, presentation and summarization.

History:
(1.) New section filed 12-17-80; Register 80, No. 51.
(2.) Amendment filed 8-29-94; Register 94, No. 35.

1399.68. Certification Renewal.
All certificates to perform electromyography shall be renewed concurrently with each holder's physical therapist license.

History:
(1.) Amendment filed 12-17-80; Register 80, No. 51.
(2.) Amendment filed 6-29-83; Register 83, No. 27.
(3.) Change without regulatory effect amending section filed 9-11-97 pursuant to section 100, title 1, California Code of Regulations; Register 97, No. 37. (4.) Amendment filed 3-8-2000, Register 2000, No. 10.

1399.69. Suspension or Revocation of Certificates.
(a) Any certificate to perform electromyography may be suspended or revoked or have probationary conditions imposed thereon by the board as directed by the board after proceedings held in accordance to the Administrative Procedure Act (Section 11500 et seq. of the Government Code) for any violation of this article, the Physical Therapy Regulations or Section 2660 of the code.
(b) It shall constitute unprofessional conduct and a violation of these rules for a physical therapist certified to perform kinesiological electromyography only to perform electroneuromyography without additional authorization obtained from the board, unless such practice is appropriately supervised pursuant to Section 1399.64 in order to meet the experience requirements for examination by the board for such additional authorization.

History:
(1.) Amendment of NOTE filed 4-16-79; Register 79, No. 16.
(2.) Amendment filed 12-17-80; Register 80, No. 51.
(3.) Amendment filed 6-29-83; Register 83, No. 27.
(4.) Change without regulatory effect amending section filed 9-11-97 pursuant to section 100, title 1, California Code of Regulations; Register 97, No. 37.

Thank-you
aaceemg@gmail.com