END-2320: INTERMEDIATE NERVE CONDUCTION STUDIES

Cuyahoga Community College

Viewing: END-2320 : Intermediate Nerve Conduction Studies

Board of Trustees:
January 2023

Academic Term:
Fall 2023

Subject Code
END - Electroneurodiagnostic

Course Number:
2320

Title:
Intermediate Nerve Conduction Studies

Catalog Description:
Advanced discussion of nerve conduction studies and electromyography. Emphasis on less routine nerve conduction studies (NCS), anomalous innervations, equipment, knowledge, placement stimulation sites, sources of error in nerve conduction studies, electronics, pathology, waveforms identification and case presentation.

Credit Hour(s):
3

Lecture Hour(s):
2

Lab Hour(s):
2

Requisites

Prerequisite and Corequisite
END-2300 Nerve Conduction Studies.

Outcomes

Course Outcome(s):
Apply knowledge of peripheral nerve and muscle anatomy and physiology.

Objective(s):
1. Apply knowledge of neuroanatomy with obtained NCS test results.
2. Differentiate nerve and muscle pathology.

Course Outcome(s):
Perform more advanced nerve conduction studies of the upper and lower extremities as well as uncommon NCS procedures.

Objective(s):
1. Modify standard test procedures to include comparison NCS studies.
2. Use diagnosis to determine the need for cranial nerve NCS studies.
3. Analyze routine NCS results to determine need for repetitive nerve stimulation studies.

Course Outcome(s):
Demonstrate competency in trouble shooting common and uncommon technical problems during NCS studies.

Objective(s):

1. Analyze abnormal NCS findings.
2. Distinguish differences between pathological findings and abnormal findings caused by technical problems.

Course Outcome(s):

Apply rules of electrical safety and universal precautions during NCS procedures.

Objective(s):

1. Recognize equipment malfunctions.
2. Practice universal precautions.

Course Outcome(s):

Interpret results of NCS studies.

Objective(s):

1. Report findings of NCS studies.
2. Write accurate technical impression of NCS findings.

Course Outcome(s):

Compare clinical correlations for nerve conduction findings.

Objective(s):

1. Discuss NCS results for specific diagnosis.
2. Defend results of nerve conduction studies.

Methods of Evaluation:

A. Quizzes
B. Lab skills (competency) tests
C. Case study presentations
D. Final exam

Course Content Outline:

a. Electrical safety
    i. Patient grounding
    ii. Equipment ground
b. Instrument setting
    i. Sweep speed
    ii. Sensitivity/gain
    iii. Filter: high/low frequency
    iv. Stimulus duration/intensity
c. Normal/abnormal innervations of peripheral nerves
    i. Upper extremities
    ii. Lower extremities
d. Stimulation points
    i. Upper extremities
    ii. Lower extremities
    iii. Facial/blink studies
e. Recording sights
    i. Upper extremities
    ii. Lower extremities
    iii. Facial/blink studies
f. Orthodromic vs. antidromic stimulation
g. Waveform measurement

i. Latency
ii. Amplitude
iii. Duration
iv. Distances and computation on conduction velocities

h. Pitfalls in nerve conduction studies
i. Temperature effect
ii. Edema
iii. Incorrect stimulation sight
iv. Incorrect recording sight
v. Patient gender
vi. Patient age
vii. Patient height/weight

i. Neurophysiological pathways
i. Motor pathways
ii. Sensory pathways
iii. Reflex pathways

j. Muscle physiology
k. Plexus physiology
i. Brachial plexus
ii. Lumboscaral plexus

l. Universal/standard precautions
m. HIPAA and patient confidentiality
n. OSHA standards

Resources

David Preston and Barbara Shapiro. *Electromyography & Neuromuscular Disorders: Electrophysiological Correlations*. 2nd ed. Butterworth-Heinemann, 2005.

Kimura, Jun. *Electrodiagnosis in Disease of Nerve and Muscle:Priciples and Practice.* 3rd Edition. New York: Oxford University Press, 2001.

Drantz, Veronica, et.al. *Nerve Conduction Studies for the Technologist.* 2nd Edition. Kansas City, MO: American Society of Electroneurodiagnostic Technology, 2003.

Crout, Barbara O. and Charles W. Flicek. *Nerve Conduction Studies From A to Z: A Self-Study Manual for the EDT.* 2nd Edition. Kasas City, MO: American Society of Electroneurodiagnostic Technologists, 2004.

Hammer, Katherine. *Nerve Conducion Studies.* Springfield, Ill: Charles C. Thompson, 1990.

Oh, Shin J. *Clinical Electromyography. Nerve Conduction Studies.* 3rd ed. Lippincott Williams and Wilkins, 2003.

Weiss, Lyn D., M.D., Jay M. Weiss, M.D., and Julie K. Silver, M.D. *Easy EMG: A Guide to Performing Nerve Conduction Studies and Electromyography*. 3rd ed. Elsevier, 2022.

Resources Other

a. Electrodiagnosis in Diseases of Nerve and Muscle: Priciples and Practices, Jun Kimura, 3rd Edition, 2001 Oxford University Press.
b. Nerve Conduction Studies for the Technologist
2nd Ed. American Society of
Electroneurodiagnostic Technologists, Inc, 1999

c. Nerve Conduction Studies A to Z, A self-Study Training Maual for EDT, Barbara O. Crout & Charles W. Flicek, Second Edition, 1997
d. Nerve Conduction Studies, Katherine HammerCharles C. Thomas Publisher, Springfield, Ill, 1990.
e. Essentials of Electromyography, 2010. Gary Kamen and David A. Gabriel
f. Manual of Nerve Conduction Study and Surface Anatomy for Electromyography. Hang J. Lee & Joel A. Delisa, 4th ed. 2004, Lippincott Williams & Wilkins.
g. Peripheral Nerve and Muscle Disease, 2009 Jeffery A. Cohen, Justin Mowchun, Jon Grudem. Oxford University Press.
h. Neuromuscular Disorders. Anthony A. Amato & James A. Russell. 2008. McGraw Hill Companies, Inc.
i. Easy EMG. Lyn Weiss, Julie K. Silver & Jay Weiss. 2004. Elservier Butterworth Heineman.
j. Neuroanatomy for Nerve Conduction Studies, 2010. Kim Butler, Jerry Morris. Kevin Scott & Zach Simmons. American Association of Neuormuscular & Electrodiagnostic Medicine.
k. ASET The Neurodiagnostic Society. 2022. https://www.aset.org/
l. American Clinical Neurophysiology Society. 2022. https://www.acns.org/
m. The Nerve Conduction Association. 2022. https://www.aaet.info/

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