Definition of the Subspecialty of Clinical Neurophysiology

The subspecialty of Clinical Neurophysiology involves the assessment of function of the central and peripheral nervous system for the purpose of diagnosing and treatment of neurologic disorders. The CNP procedures commonly used include EEG, EMG, evoked potentials, polysomnography, epilepsy monitoring, intraoperative monitoring, evaluation of movement disorders, and autonomic nervous system testing. The use of CNP procedures requires an understanding of neurophysiology, clinical neurology, and the findings that can occur in various neurologic disorders.

The following are the recommended CORE curriculum for residents re CNP.

Basic Neurophysiology: Membrane properties of nerve and muscle potentials (resting, action, synaptic, generator), ion channels, synaptic transmission, physiologic basis of EEG, EMG, evoked potentials, sleep mechanisms, autonomic disorders, epilepsy, neuromuscular diseases, and movement disorders

Anatomic Substrates of EEG, EMG, evoked potentials, sleep and autonomic activity

Indications: Know the indications for and the interpretation of the various CNP tests in the context of the clinical problem.

EEG:
1. Recognize normal EEG patterns of infants, children, and adults
2. Recognize abnormal EEG patterns and their clinical significance, including epileptiform patterns, coma patterns, periodic patterns, and the EEG patterns seen with various focal and diffuse neurologic and systemic disorders.
3. Know the EEG criteria for recording in suspected brain death

EMG:
1. Know the normal parameters of nerve conduction studies and needle exam of infants, children, and adults
2. Know the abnormal patterns of nerve conduction studies and needle exam and the clinical correlates with various diseases that affect the neuromuscular and peripheral nervous system

Evoked Potential Studies
1. Know the principles and recording of evoked potential studies, including pattern reversal visual evoked responses, brainstem auditory evoked responses and somatosensory evoked potential studies.
2. Know the generators and names of waveforms and normal values of evoked potential studies.
3. Know the clinical significance of normal and abnormal findings of evoked potential studies.

Sleep recordings: Be familiar with the basic principles of tests, including polysomnography, and multiple sleep latency tests, and evaluation of various sleep disorders.

Autonomic Function Tests: Be familiar with the various tests used to evaluate disorders of the autonomic nervous system, including the quantitative sweat axonal reflex test (QSART), the thermoregulatory sweat test, heart rate, and blood pressure changes.

Special Recordings: Be familiar with the indications for doing prolonged EEG monitoring studies, recording EEG, EMG, evoked potential studies in the ICU, intraoperative intracranial and spinal cord recording, and recording various movement disorders.

Instrumentation: Be familiar with basic electronics, analog/digital recording, electrodes for recording EEG, EMG, and EPs, stimulators and stimulus parameters, amplifiers, and filters.

Principles and Techniques of Recording: Know the techniques for localization, polarity, stimulus parameters, and montages for the various CNP Studies.

Laboratory and Electrical Safety: Know the principles and guidelines for electrical safety of doing recordings in the lab, ICU, and operating room.
**Recommended Educational References and Resources**

**General**


**EEG**


EMG

American Association of Electrodiagnostic Medicine Monographs.


Evoked Potentials


Sleep


Other


Physiology


Anatomy


CNP Articles in the Following Journals

1. Archives of Neurology.
2. Clinical Neurophysiology.
3. Electroencephalography and Clinical Neurophysiology
4. Electromyography and Clinical Neurophysiology
5. Journal of Clinical Neurophysiology
6. Muscle and Nerve

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