

Name of Rotation: Clinical Neurophysiology

Supervisor: Dr. Michael Aminoff, Dr. Jeff Ralph, Dr. Paul Garcia, Dr. Doug Goodin

Rotation Description:

This two month rotation has been designed to allow residents to develop basic competency in both peripheral and central clinical neurophysiology. By participating in teaching sessions and seminars, residents will learn of the underlying principles, technical considerations and clinical utility of clinical neurophysiological studies including EEG, evoked potentials, EMG, and nerve conduction studies. While this rotation cannot make a resident into an electromyography expert, the educational experience should enable the trainee to understand the content of an EMG and EEG report, and the reason different types of studies are performed in selected clinical circumstances.

It is expected that residents will attend one ½ day EMG session per week, didactic EMG lectures, review 5 sets of EMG teaching cases (and be prepared to discuss them), and make use of learning resources that will be discussed in the course of the rotation (e.g.- waveform review analysis). Residents will also attend the twice-weekly teaching seminars held by Dr. Aminoff and the weekly session held by Dr. Goodin, as well as the weekly Pediatric EEG review session.

Core Competencies:

Patient Care-Resident is able to provide compassionate, appropriate and effective patient care for the treatment of health problems and promotion of health. Resident understands how to appropriately prioritize patient problems and develop an appropriate diagnostic plan, prescribes medications appropriately, shows an appropriate balance between attention to the details of patient care and the overall context of treating the patient's illness. Resident obtains consultations appropriately, and is able to perform technical procedures adequately, when appropriate.

Medical Knowledge-Resident demonstrates knowledge of established and evolving biomedical, clinical, epidemiological, and social/behavioral sciences as well as the application of this knowledge to patient care. Resident is able to assess diagnostic information critically and constructively, and recognizes the psychosocial aspects of illness. Resident is able to critically evaluate the medical literature and apply new knowledge to the delivery of safe and effective patient care.

Practice-Based Learning and Improvement- Resident is able to critically evaluate the care of their patients, appraise and assimilate scientific evidence, and continuously improve patient care delivered on the basis of ongoing self-evaluation and learning. The resident uses knowledge to educate patient families, medical students, allied health personnel, peers, and other health professionals as appropriate. Resident is capable of self-identifying strengths, deficiencies, and the limits of their knowledge and expertise. The Resident is receptive to constructive criticism (formative evaluation feedback) regarding the care of patients and physician performance. Resident is able to set learning and improvement goals, and identify and perform activities appropriate to meeting those goals.

Interpersonal and Communication Skills-The Resident demonstrates interpersonal and communication skills that result in effective information exchange and collaboration with patients, families and other health professionals.

These skills include the ability to communicate across a broad range of socio-economic and cultural backgrounds and ability to communicate with physicians, health professionals, and health related agencies effectively. Resident is able to maintain comprehensive, timely and readable medical records. Resident can work effectively as a member or leader of a healthcare team and serve appropriately as a consultant to other physicians and health professionals. Resident is able to clearly lead daily work rounds, when appropriate.

Professionalism- Committed to carrying out professional responsibilities and adhering to ethical principles. Resident demonstrates respect for patient privacy and autonomy and is accountable to patient, society and the medical profession for actions. Resident demonstrates compassion, integrity and respect for others as well as responsiveness to patient needs that supersede self-interest. The Resident demonstrates sensitivity and responsiveness to a broad patient population including diversity in gender, age, culture, race, religion, disability, and sexual orientation. Resident demonstrates the ability to manage personal stress effectively. Answer pages or messages in a timely fashion. Resident understands how to maintain appropriate professional boundaries, and demonstrates integrity, honesty and compassion. Resident completes assigned tasks in a timely fashion.

Systems-Based Practice-Resident understands and is capable to interact effectively with different systems of care. Demonstrates the ability to provide high-quality care in a cost-effective manner. Resident incorporates consideration of cost-awareness and risk-benefit analysis in patient care decisions. Resident advocates for high quality care for all patients.

Rotation Goals: (list 3 – 6 goals)

- 1) Become familiar with the scope and limitations of different investigative techniques used in central clinical neurophysiology, and in particular, with the utility and limitations of EEGs, ambulatory EEGs, and evoked potentials. (Competencies Addressed: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement)
- 2) Understand how these techniques affect clinical management and how they are best used in clinical practice. (Competencies Addressed: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement, Systems-Based Practice)
- 3) Understand the underlying physiological basis of the recorded responses, and the principles of the recording techniques. (Competencies Addressed: Patient Care, Medical Knowledge)
- 4) Develop the knowledge to understand the indications and limitations of EMG and nerve conduction studies. (Competencies Addressed: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement)
- 5) Understand the role of temperature, electrical artifacts, and basic principles of electricity that apply to generating EMG and nerve conduction study results. (Competencies Addressed: Patient Care, Medical Knowledge)

Rotation Objectives: (list 3 – 10 training objectives)

1. Understand how to read an EMG report, including a critique of the conclusions. (Competencies Addressed: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement)

2. Understand the diagnostic circumstances in which an EMG can and cannot help clarify a neurological diagnosis. (Competencies Addressed: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement)
3. Gain hands-on experience doing needle EMG and nerve conduction studies to understand the procedure and clinical reasoning process, and to understand the technical challenges of obtaining reliable data. (Competencies Addressed: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, Systems-Based Practice)
4. Be able to explain what will happen during an EMG study to patients and families-including risks, benefits, limitations, and the meaning of results seen commonly (e.g.-normal, carpal tunnel syndrome, radiculopathy) (Competencies Addressed: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, Systems-Based Practice)
5. Understand how to read an EEG report, including the terminology used to describe common findings. (Competencies Addressed: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement)
6. Know when it is appropriate to order an EEG, and what results are likely to be clinically helpful. Be able to explain the utility of EEG and evoked potentials to patients, families, and referring physicians. (Competencies Addressed: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, Systems-Based Practice)

Bibliography/Study List:

- 1) Aminoff MJ. *Electrodiagnosis in Clinical Neurology*. Churchill Livingstone; 4th edition (April 1999)
- 2) Ebersole JS and Pedley TA. *Current Practice of Clinical Electroencephalography*. Lippincott Williams & Wilkins; 3 edition (January 1, 2003)