

UAMS / CAVHS Adult Neurology EEG / Epilepsy Curriculum Rev. 09/04/2007

Summary Description of Rotation

Electroencephalography has traditionally been an essential component of training in Neurology. The ACGME currently mandates that all neurology residents acquire a core competency in the application of EEG. This is essential in the field of epileptology, although there are many other applications of EEG. Neurology residents are offered an elective rotation for one month during the PGY2-4 years; they may take more than one elective rotation. This rotation complements and expands on the yearly Clinical Neurophysiology EEG lecture series. Supervising UAMS Faculty for the rotation are:

Dr. Naim Haddad: 395-8246 (pager)

Dr. Bashir Shihabuddin: 688-0226 (pager).

In addition, diagnostic EEGs are interpreted at the McClellan VAMC by Dr. W. Steven Metzger: 661-1202 #289 (pager).

Educational Goals Summary

1. The intent of this rotation is to develop competence in utilizing electroencephalography in clinical practice. This involves more than merely reading the studies. It involves having sufficient understanding of the technical issues of recording an EEG that will allow for obtaining and maintaining high quality EEG acquisition after residency training, the interpretation of EEG, and the understanding of its clinical significance in a given clinical situation. Sufficient understanding of the technical issues: of paramount importance since a neurologist running an EEG lab needs to supervise the quality of the studies performed by his technicians.
2. Competency in the interpretation of EEGs & EPs. A resident should also learn how to generate a useful report. Therefore, **all** the studies are to be reviewed & interpreted by the resident. "Volume" is a major key in sharpening the resident's interpretation skills, coupled with his personal reading.
3. Basic understanding of Video EEG monitoring and presurgical evaluation of intractable epilepsy patients. Exposure to inpatient VEEG studies is crucial to achieve this goal.
4. Preliminary exposure to intraoperative corticography and cortical mapping. These are exciting aspects of Clinical Neurophysiology, the resident will better appreciate their indications and usefulness when he directly participates in performing them.

Outpatient EEG and EP studies at UAMS are performed every working day, starting at 8:30 am. The rotating resident is expected to be available to observe or perform the studies with the technicians. He should then review each recording and write a complete report. Later during the day, he will meet with the attending neurophysiologist to review the actual studies and correct the initial interpretation.

He is also expected to be involved in the review and interpretation of inpatient video EEG studies as assigned by the attending physician.

For your first EEG rotation, at UAMS:

In the first week of your rotation, you should observe the EEG techs performing a study from start to finish. You should, with the tech's supervision, then perform studies.

In the first week, you will read EEGs with faculty, but will not be expected to dictate any studies. The resident is to observe the technician perform a few studies in the first week of the rotation. Then, she/he is to perform at least 5 complete studies under the supervision of the techs for each month of EEG rotation.

In the second week, you may begin dictating EEGs. These will be the studies which you have read with faculty, and the dictations will be reviewed with staff for changes, corrections, etc.

In the third and fourth weeks, you will read EEGs on your own, and jot down your observations and impression. These will then be reviewed with the staff, as per above, after which you will dictate them, and review dictations with staff.

If you take additional rotations, your experience will build on this foundation.

EEGs are also performed by the Neurophysiology lab at the VA. The resident is also required to review these studies for at least 2 days each week. These days can be individualized according to his continuity clinic schedule and the attending's reading schedule at the VA. It is the responsibility of the resident to contact Dr. Metzger to arrange a reading schedule.

Due to possible conflict at times between the EEG laboratory responsibilities and the clinic schedule for both the resident and the attending, a detailed schedule for the month is to be finalized few days before the start of the rotation. It is the responsibility of the resident to notify the appropriate attending of his impending rotation. The schedule is to be negotiated between both. It should clarify at least the time periods when the resident has clinic duties and cannot be physically present in the lab, and the approximate timing of the day for the final reading by both. The resident is required to notify the attending and take his permission ahead of time for any potential deviation from the initial schedule.

During the rotation, you should observe at least one surgical monitoring patient undergoing video EEG monitoring. You should observe a Wada (intra-carotid amygdal) test, and observe ablative surgery with pre- and post-resections electrocorticography, if such a case occurs during your rotation. While it is not expected that you will do these studies in your practice, (unless you decide to do a fellowship), it is useful for you to have first hand knowledge of how surgical candidates are selected, evaluated, and treated. Of course, you are always welcome to see more than once case if it is of interest to you.

Similarly, it is recommended that you observe at least some portion of cortical functional mapping, whether in patients who are in preparation for epilepsy surgery, or during neuro-oncological procedures. Some of these mappings are done intra-operatively, and some are done in the EEG monitoring suite, following implantation of subdural electrode grids. The latter are preferable procedures to observe, since there is less pressure on staff to finish expediently (so as to minimize OR time). As such, there is more teaching opportunity in the latter procedures.

You will also participate in the interpretation of any evoked potential studies during the rotation.

Assessment Summary

Resident performance will be assessed in the six core competencies:

1. Patient Care (PC)
2. Medical Knowledge (MK)
3. Interpersonal and Communication Skills (ICS)
4. Practice Based Learning and Improvement (PBLI)
5. Professionalism (P)
6. Systems Based Practice (SBP)

At the end of the rotation, the resident should receive and/or complete the following assessments:

1. Verbal feedback from Attending Physician;
2. Written assessment of performance in the six core competencies;
3. Resident assessment of Attending Physician.

OTHER RESPONSIBILITIES

- Attend all neurology conferences
- Attend your resident continuity clinic

WEEKLY SCHEDULE (UAMS)

Monday:

8:30-11AM, seizure clinic with Dr Shihabuddin.

11-1: Conference.

1-3: individual EEG reading

3-5: EEG reading with attending

Tuesday

8-9: VEEG

9-1: Resident clinic/or EEG reading

1-5: Resident clinic or EEG reading

Wed:

8-9: VEEG if no Q/A meeting

9-12, seizure clinic with Dr Haddad

12-1; Lecture

1-3: individual EEG reading

3-4: EEG reading with attending

Thursday

8-9:VEEG

9-1: Resid clinic or EEG reading

1-5: Resid clinic or EEG reading

Friday

9:30-11: VEEG reading with attending

12-1: clinical neurophysiology conf

1-3: individual EEG reading

3-5: EEG reading with attending

Reading material - See Reading List Distributed Separately.

There are several reasonably good primers on EEG, and they may be adequate for the purpose of introduction.

- 1- Spehlmann's EEG Primer : contains most of the EEG basics that a neurologist needs to know. Fair size, easy to read, good amount of illustrations. Available in the EEG lab.
- 2- Comprehensive Clinical Neurophysiology, Levin & Luders: same as above, plus contains sections on EMG/NCS, EPs, and sleep studies. Good choice if you are looking for a book that covers all aspects of Clinical Neurophysiology.
- 3- Essentials of Clinical Neurophysiology, Misulis: small size, also has sections on all neurophysiological studies, may be good for a starter.
- 4- Current Practice of Clinical EEG, Pedley: For residents with special interest in EEG, can be used as an advanced reference.
- 5- Electroencephalography, Niedermeyer: as # 4, available in the EEG lab.
- 6- Goldensohn's EEG interpretation: A comprehensive atlas, available in the EEG lab.

Dr. Haddad recommends one excellent text on EEG which will serve you well as a reference in your practice, and is just as clear and readable as most of the introductory level books. For that reason, Dr. Haddad highly recommends David Daly and Tim Pedley's book, *Current Practice of Clinical Electroencephalography* (Raven Press). Even if you choose not to buy it, you are still advised to read the following chapters:

Chapter 4	Artifacts
Chapter 5	Physiologic Basis of EEG
Chapter 6	An Orderly Approach to Visual Analysis: Characteristics of Normal EEG of Adults and Children
Chapter 8	Benign EEG Variants, and Patterns of Uncertain Significance
Chapter 10	Epilepsy and Syncope
Chapter 11	Focal Brain Lesions
Chapter 14	Coma, Other States of Altered Responsiveness, and Brain Death

For those with specific interest in Epileptology, Susan Spencer's textbook is superb, and while voluminous, makes an excellent companion to Pedley's, for those who would like to read about the clinical issues so as to correlate them with the EEGs we see together.

Rotation Orientation

The orientation occurs on Day 1 of the rotation by the Attending Physician and the supervising resident on the service. This written handout is provided then.

Supervision

Primary supervision for the rotation will be by the Attending Epileptologists at UAMS, Drs. Haddad and Shuhabadin.

Mix of Diseases

Residents will meet the goals and objectives of the rotation through the study of EEG & epilepsy (primary & secondary), the pathophysiology of seizures, and medical & surgical treatment of epilepsy. In addition, the application and interpretation of EEG in encephalopathy, delirium, dementia, infectious diseases and neoplastic diseases will be addressed.

Conferences:

The neuropathology rotation is associated with numerous clinical conferences directed at patient management the treatment of neurological emergencies, and general didactic reviews. Attendance is required. These conferences include:

1. Basic Neuroscience Conference (Monday 12:00- 1:00 pm- JWS Bldg., 8th floor – Lucy Library)
2. Program Director's Core Competency and Ethics Conference, 1 Monday per month, 11:00 AM - JWS Bldg., 8th floor – Lucy Library)
3. QA (M&M) Conference 1st Wed per month, 7:30 AM - JWS Bldg., 8th floor – Lucy Library)
4. Neuropathology Conference (Wednesdays 4 pm - JWS Bldg., 8th floor – Lucy Library)
5. Neuroradiology Conference (Wednesdays 5 pm - JWS Bldg., 8th floor – Lucy Library)
6. Neurology Grand Rounds (Fridays 8:15-9:30 pm- JWS Bldg., 12th floor)
7. **Clinical Neurophysiology Conference** (EEG & EMG) Fridays @ noon - JWS Bldg., 8th floor – Lucy Library)
8. Movement Disorders Conference, 1 Monday per month as scheduled, 5:00 PM - JWS Bldg., 8th floor – Lucy Library)
9. **Epilepsy Journal Club**, 1 Monday per month as scheduled, 5:00 PM - JWS Bldg., 8th floor – Lucy Library)
10. Stroke Journal Club, 1 Wednesday per month as scheduled, noon - JWS Bldg., 8th floor – Lucy Library)

SPECIALTY: Neurology

ROTATION EXPERIENCE: Adult Neurology EEG/Epilepsy Service

PATIENT CARE

EEG/Epilepsy Rotation (PGY2-4) Patient Care		
Objectives	Teaching Methods	Assessment Strategy
Gather essential and accurate clinical information about patients who undergo EEG or VEEG monitoring.	EMR training Performance feedback Conferences	Faculty rotation rating & evaluation RITE Program Director semi-yearly review
Demonstrate technical skills in the application of EEG electrodes, and the recording of an EEG.	Direct supervision by faculty neurophysiologists & EEG Techs Performance feedback Conferences	Faculty rotation rating & evaluation RITE Program Director semi-yearly review
Demonstrate technical skills appropriate to level of training in the interpretation of EEGs.	Direct supervision by faculty neurophysiologists & EEG Techs Review teaching records Performance feedback Conferences	Faculty rotation rating & evaluation RITE Program Director semi-yearly review
Demonstrate adequate clinical skills in the diagnosis and treatment of seizure types and epilepsy syndromes.	Direct supervision by faculty neurophysiologists & EEG Techs Performance feedback Conferences	Faculty rotation rating & evaluation RITE Program Director semi-yearly review
Become proficient in managing outpatients with epilepsy.	Direct supervision by faculty epileptologists Performance feedback Conferences	Faculty rotation rating & evaluation NEX live patient examinations RITE Program Director semi-yearly review

MEDICAL KNOWLEDGE

EEG/Epilepsy Rotation (PGY 2-4) Medical Knowledge		
Objectives	Teaching Methods	Assessment Strategy
Demonstrate knowledge of the appearance of normal awake and sleep EEG, artifacts, and normal variants. Demonstrate the ability to recognize an abnormal EEG, and characterize the abnormality as generalized or focal, epileptiform or nonepileptiform. Demonstrate the ability to recognize status epilepticus.	Direct supervision by faculty neurophysiologists Review of teaching records Independent study Performance feedback Conferences	Faculty rotation rating & evaluation RITE Program Director semi-yearly review
Demonstrate the ability to recognize an abnormal EEG, and characterize the abnormality as generalized or focal, epileptiform or nonepileptiform.	Direct supervision by faculty neurophysiologists Review of teaching records Independent study Performance feedback Conferences	Faculty rotation rating & evaluation RITE Program Director semi-yearly review
Demonstrate the ability to recognize and treat status epilepticus.	Direct supervision by faculty neurophysiologists Review of teaching records Independent study Performance feedback Conferences	Faculty rotation rating & evaluation RITE Program Director semi-yearly review
Demonstrate knowledge of different seizure types and epilepsy syndromes.	Direct supervision by faculty epileptologists Review of teaching records Independent study Performance feedback Conferences	Faculty rotation rating & evaluation RITE Program Director semi-yearly review
Demonstrate a working knowledge of Antiepileptic Drugs.	Direct supervision by faculty epileptologists Review of teaching records Independent study Performance feedback Conferences	Faculty rotation rating & evaluation RITE Program Director semi-yearly review

INTERPERSONAL AND COMMUNICATION

EEG/Epilepsy Rotation (PGY 2-4) Interpersonal and Communication		
Objectives	Teaching Methods	Assessment Strategy
Develop technical skill in the dictation of EEG reports.	Direct supervision by faculty neuropathologists Review of teaching slides Independent study Performance feedback Conferences	Faculty rotation rating & evaluation Program Director semi-yearly review
Interact in a mature and responsible manner with colleagues, EEG Techs and faculty.	Direct supervision by faculty neuropathologists Performance feedback Conferences	Faculty rotation rating & evaluation Program Director semi-yearly review
Provide patients and their families explanations of neurological disorders and treatment that is geared to their educational level, as well as respecting the patient's cultural, ethnic, religious and economic backgrounds.	Direct supervised patient care Performance feedback	Faculty rotation rating & evaluation NEX live patient examinations Program Director semi-yearly review
Present cases verbally and in writing in a logical and coherent manner.	Direct supervised patient care Performance feedback	Faculty rotation rating & evaluation NEX live patient examinations Program Director semi-yearly review
Demonstrate the ability to obtain, interpret and evaluate consultations from other medical specialties and to develop a diagnostic and management plan, and present this verbally and in writing.	Direct supervised patient care Performance feedback	Faculty rotation rating & evaluation NEX live patient examinations Program Director semi-yearly review

PRACTICE BASED LEARNING AND IMPROVEMENT

EEG/Epilepsy Rotation (PGY2-4) Practice Based Learning and Improvement		
Objectives	Teaching Methods	Assessment Strategy
Critical review and personal record of difficult and interesting cases, and develop a life-long practice of applying knowledge from cases and EEGs encountered.	Direct supervision by faculty neurophysiologists Independent study	Self assessment Faculty rotation rating & evaluation Case log (encouraged) Program Director semi-yearly review
Research clinical and neurophysiological questions regarding patient's neurological problems using information technology to access on-line medical information to support their own education and to improve patient care and education.	Electronic medical record Medline/OVID searches-patient centered Conference presentations	Self assessment Faculty rotation rating & evaluation Program Director semi-yearly review
Evaluate the clinical literature applying knowledge of epidemiology, biostatistics, and research study design.	Direct supervision by faculty neurophysiologists Independent study Medline/OVID searches-patient centered	Self assessment Faculty rotation rating & evaluation Program Director semi-yearly review

PROFESSIONALISM

EEG/Epilepsy Rotation (PGY 2-4) Professionalism		
Objectives	Teaching Methods	Assessment Strategy
Interact responsibly with patients, colleagues, co-workers, and faculty taking into consideration culture and gender issues.	Role Modeling Oral presentations	Self assessment Faculty rotation rating & evaluation
Demonstrate appropriate use of the EMR in regards to patient respect and confidentiality.	EMR training Online HIPAA training	Self assessment Faculty rotation rating & evaluation
Demonstrate responsibility for meeting expectations described in this curriculum.	Direct supervision by faculty Independent study Performance feedback	Faculty rotation rating & evaluation

SYSTEM BASED PRACTICE

EEG/Epilepsy Rotation (PGY2-4) System Based Practice		
Objectives	Teaching Methods	Assessment Strategy
Develop an understanding of the social and legal impact of a diagnosis of epilepsy on a patient.	Direct supervision by faculty Independent study Performance feedback	Self assessment Faculty rotation rating & evaluation
Acquire knowledge of various provider systems and resources for epileptics in our society.	Direct supervision by faculty Independent study Performance feedback	Self assessment Faculty rotation rating & evaluation