

## CLINICAL NEUROSCIENCE CLERKSHIP SYLLABUS 2019-2020

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### Rotation Locations

- 1- University Medical Center (for the inpatient rotation).
  - 2- TTUHSC/Neurology clinic (4801 Alberta Ave, El Paso TX 79905) (for the outpatient period).
  - 3-VA Medical Center with Dr. Miranda (1 student assigned to VA for outpatient rotation period only)
- VA Medical Center address: 5001 N. Piedras St, El Paso TX 79930

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## **Program Description**

The primary purpose of the Clinical Neuroscience Clerkship offered in the MS IV year is to provide the medical student with the ability to perform a neurological interview and examination, interpret signs, consolidate symptoms and signs into syndromes, accurately diagnose neurological diseases, and identify appropriate evidence-based management strategies. The goals and objectives outlined below have been developed internally and are consistent with the neurology core curriculum developed by the Consortium of Neurology Clerkship Directors and the Undergraduate Education Subcommittee of the American Academy of Neurology.

## **Program Goals**

1. Student must master the basic techniques of a neurologic interview and neurological examination.
2. Student must be able to obtain practical information from the interview and neurological examination, and interpret the meaning of every bit of information obtained during the interview and neurological examination.
3. At the end of the rotation, the student must be able to integrate data and formulate appropriate statements regarding topographic localization of lesions within the central and peripheral nervous system.
4. Student will be able to formulate plans for investigation and management.
5. Student must master the knowledge of cardinal manifestation of primary neurologic diseases.
6. Student must know the basic neurologic complications of systemic diseases.
7. Student will be exposed to principles of geriatric neurology.
8. Student will learn utilization of laboratory data to complete a topographic and etiologic diagnosis.
9. Student should be able to define pathophysiologic mechanism of disease processes.
10. Student should be able to assess prognosis of neurological illnesses.
11. Student will identify neurologic emergencies and the need for expert assistance.

During the four-week Neuroscience Clerkship, students are assigned Monday through Friday to 2 weeks of outpatient clinics and 2 weeks inpatient consultative services.

These services will take place in 3 different locations:

- 1- University Medical Center (for the inpatient rotation).
- 2- TTUHSC/Neurology clinic (4801 Alberta Ave, El Paso TX 79905) (for the outpatient period).
- 3-VA Medical Center with Dr. Miranda (1 student assigned to VA for outpatient rotation period only)

VA Medical Center address: 5001 N. Piedras St, El Paso TX 79930.

**Learning Objectives: (All learning objectives are linked to the Education Program Goals and Objectives AY 2019-2020).**

### **PATIENT CARE**

**GOAL: The student will develop recognition and effective integration of factors that contribute to optimal and compassionate care of patients presenting with neurological concerns.**

**OBJECTIVES:** By the end of the clerkship students should be able to:

- Obtain a complete and reliable history (PGO 1.1).
- Conduct a focused and reliable neurological examination.(PGO 1.1)
- Formulate a differential diagnosis based on lesion localization, time course, signs, symptoms, and relevant demographic features (PGO 1.3).
- Interpret electro diagnostic studies (EEGs, EMGs, nerve conduction studies), neuroimaging studies (CT, MRI), and common laboratory test used in the diagnosis of neurological disease (PGO 1.3).
- Formulate a plan for investigation and management of common neurological problems (PGO 1.2, 1.6).
- Discuss neurological manifestations of systemic diseases. (PGO 1.5, 1.3)

### **MEDICAL KNOWLEDGE**

**GOAL: The student will gain and develop an effective understanding of the assessment and management of common clinical conditions in neurology as they are encountered in the inpatient and outpatient settings. The student will master the expertise necessary to perform a complete neurologic examination. The learner will demonstrate the ability to acquire, critically interpret, and apply this knowledge.**

**OBJECTIVES:** The student will recognize the signs, symptoms, and physical findings of neurological problems at the level of an MS IV, including the following:

- Stroke – by the conclusion of this clerkship, the student will be able to:
  - Describe the different subtypes of strokes and their etiologies. (PGO 2.2, 2.3)
  - Match the specific stroke syndromes with the occluded artery. (PGO 2.2, 2.3)
  - List the major risk factors for stroke. (PGO 2.4)
  - Describe treatment of acute stroke and prevention of recurrent stroke. (PGO 2.3, 1.6, 1.9)
- Epilepsy and Seizures – by the conclusion of this clerkship, the student will be able to:
  - Differentiate between seizures, epilepsy, and syncope. (PGO 2.1, 2.2, 2.3)
  - Classify seizure sub-types and describe the clinical features associated with these sub-types. (PGO 2.2, 2.3, 1.3)
  - Identify appropriate treatment options for patients with epilepsy including conventional and new antiepileptic agents. (PGO 2.3, 1.2, 1.6)
  - Recognize common adverse events associated with medications for the management of epileptic disorders. (PGO 2.3, 1.6, 6.3)
- Dementia - by the conclusion of this clerkship, the student will be able to:
  - Define and differentiate between dementia and delirium. (PGO 2.1, 2.2, 2.3, 1.3)

- Recognize clinical features and laboratory findings associated with different types of dementia. (PGO 2.3, 1.3)
  - Generate appropriate differential diagnoses for patients presenting with cognitive problems. (PGO 2.3, 1.3, 1.2)
- Neuromuscular diseases – by the conclusion of this clerkship, the student will be able to:
    - Differentiate between upper motor neuron (UMN) and lower motor neuron (LMN) dysfunction. (PGO 2.2, 2.3)
    - Describe usual clinical features and differential diagnosis of motor neuron disease. (PGO 2.3, 1.3, 1.2)
    - Discuss localization for peripheral sensorimotor disorders (e.g. radicular pain, mononeuropathy, paresthesia, etc.). (PGO 2.2, 2.3)
    - Describe the pathogenesis, usual clinical presentation, workup, and treatment of myasthenia gravis. (PGO 2.2, 2.3, 2.4, 1.3, 1.2, 1.6)
- Headaches - by the conclusion of this clerkship, the student will be able to:
    - Differentiate primary and secondary headaches. (PGO 2.2, 2.3)
    - Discuss the distinctive clinical characteristics and epidemiology of migraine and its variations. (PGO 2.3, 2.4, 1.3)
    - Outline a systematic approach to the management of patients with headache. (PGO 2.3, 1.2, 1.6)
- Infectious Diseases – by the conclusion of this clerkship, the student will be able to:
    - Integrate the information received in previous training about concepts on infectious diseases of the nervous system and their treatment, including viral encephalitis, bacterial meningitis, and fungal meningitis. (PGO 2.2, 2.3, 2.4, 1.2, 1.6, 1.3)
    - Students will review different cerebral spinal fluid changes on different types of infections. (PGO 2.2, 2.3, 1.3)
- Trauma – by the conclusion of this clerkship, the student will be able to:
    - Focus on diagnosis, aggressive screening measures and evidence-based clinical practice guidelines for the care of closed and penetrating Traumatic Brain Injury. (PGO 2.3, 2.4, 1.3, 1.6)
    - Receive information about diagnosis and management of cerebral edema, increased intracranial pressure, and different types of cerebral herniation, brain contusion and traumatic intracranial bleeding (hematomas, subarachnoid hemorrhage). (PGO 2.2, 2.3, 2.4, 1.3, 1.6, 6.3)
- Movement disorders - by the conclusion of this clerkship, the student will be able to:
    - Differentiate between hyperkinetic and hypokinetic movement disorders. (PGO 2.2, 2.3)
    - Describe pathological and neurochemical features of idiopathic Parkinson's disease. (PGO 2.3, 1.3)
    - Describe clinical, pathological, and genetic features of Huntington's disease. (PGO 2.2, 2.3, 2.4, 1.3)

- Discuss pharmacological options available for treatment of essential tremor and Parkinson's disease. (PGO 1.6)
- Discuss pathophysiology of Wilson's disease. (PGO 2.2, 2.3)

## **PROFESSIONALISM**

**GOAL: Students who demonstrate a commitment to carrying out professional responsibilities, adhering to ethical principles, displaying sensitivity to a diverse patient population.**

**OBJECTIVES:** Throughout the clerkship students will demonstrate:

- Respect towards patient, families and co-workers whose lifestyles and values may be different from their own (PGO 5.1).
- Ethical behavior, including patient confidentiality (PGO 5.2, 5.5).
- Cultural sensitivity. (PGO 5.1, 5.4)
- Reliability. Arrive on time and be prepared for all required activities. (PGO 5.3, 5.7)
- Honesty and integrity in patient care (PGO 5.1, 5.6).
- Professional appearance. This means the student wears their white jackets with their name tags clearly visible and in business casual attire. Scrubs are only acceptable when observing procedures. (PGO 5.7)
- Be actively involved. (No Facebook, texting, talking socially with colleagues or cell phone use, during educational activities). (PGO 5.1, 5.3, 5.7)

## **INTERPERSONAL AND COMMUNICATION SKILLS**

**GOAL: The student will develop knowledge of specific techniques and methods that facilitate effective and empathic communication between the learner, faculty, colleagues, staff, and systems.**

**OBJECTIVES:** Throughout the clerkship students will demonstrate the ability to:

- Communicate effectively with families and patients (PGO 4.1).
- Appropriately utilize interpreters if necessary to communicate with patients. (PGO 4.1, 4.3)
- Communicate effectively and respectfully with physicians and other health professionals in order to share knowledge and discuss management of patients (PGO 4.2, 4.3).
- Present clear, concise, and thorough oral and written presentations of patient history and physical examination results. (PGO 4.2, 4.4)
- Maintain professional and appropriate personal interaction with patients. (PGO 4.1, 5.2)

## **PRACTICE-BASED LEARNING AND IMPROVEMENT**

**GOAL: Understand the application of scientific evidence and accept feedback for continuous self-assessment in the improvement of patient care.**

**OBJECTIVES:** Throughout the clerkship students will demonstrate the ability to:

- Apply technology (e.g. PDA, PC, Internet) in the acquisition and evaluation of Evidence-Based Medical information (e-medicine, journals, AAFP, NEJM, etc.). (PGO 3.1, 3.4, 3.5)
- Accept feedback from the faculty and incorporate this into improvement of clinical practice (PGO 3.3).
- Critically assess the quality and utility of medical information based on sources and methodologies (PGO 3.2).

### **SYSTEMS-BASED PRACTICE**

**GOAL: Develop an appreciation of supportive health care resources, and understand their utilization as part of patient advocacy.**

**OBJECTIVES:** Throughout the clerkship students will demonstrate the ability to:

- Wisely utilize resources in patient care (e.g. efficiently use diagnostic and laboratory tests) (PGO 6.3).
- Understand and utilize ancillary health services and specialty consultants properly (PGO 6.2, 6.4).

### **INTERPROFESSIONAL COLLABORATION**

**GOAL: Demonstrate the ability to engage in an interprofessional team in a manner that optimizes safe, effective patient and population-centered care.**

**OBJECTIVES:** Throughout the clerkship, students will be able to:

- Use knowledge of one's own role and the roles of other health care professionals to work together in providing safe and effective care (PGO 7.2).
- Function effectively as a team leader and team member (PGO 7.3).

### **PERSONAL AND PROFESSIONAL DEVELOPMENT:**

**GOAL: Demonstrate the qualities required to sustain lifelong personal and professional growth.**

**OBJECTIVES:** Throughout the clerkship, students will demonstrate the ability to:

- Recognize when to take responsibility and when to seek assistance (PGO 8.1)
- Utilize appropriate resources and coping mechanisms when confronted with uncertainty and ambiguous situations (PGO 8.4).
- Demonstrate the ability to employ self-initiated learning strategies when approaching new challenges, problems, etc (PGO 8.5).

### **Integration Threads**

**An X indicates that this topic is included within the Clerkship:**

<b>X Geriatrics</b>	<b>__ Basic Science</b>	<b>X Ethics</b>
<b>X Professionalism</b>	<b>X EBM</b>	<b>X Chronic Illness Care</b>
<b>__ Patient Safety</b>	<b>--- Pain Management</b>	<b>X Clinical Pathology</b>
<b>__ Palliative Care</b>	<b>__ Quality Improvement</b>	<b>__ Clinical and Translational Research</b>
<b>X Communication Skills</b>	<b>X Diagnostic Imaging</b>	<b>X Interprofessionalism</b>

## **Clinical Conditions**

### **List of clinical conditions students will be expected to see:**

The clinical conditions students will be expected to see and document in the OPLOG patient encounter system are listed above in the section labeled “Medical Knowledge.” Level of involvement for required conditions is **assist or manage**. See Common Clerkship Requirements. These conditions will be encountered in the following settings:

#### **Outpatient** (Clinical Sciences Building-Basement)

- General Neurology Clinic
- Parkinson Clinic (Different types of Parkinson’s Disease, and deep brain stimulation)
- Epilepsy Clinic (Different types of seizure disorders and their treatment including the use of vagus nerve stimulation)
- Electro diagnosis (EMG) (optional)
- Basis of Geriatric Medicine relevant to Neurology (i.e. Dementia, syncope, fall, etc...)
- Headache Clinic

#### **Inpatient** (Team meets at Neurology Offices-AEC 108)

- General Neurology
- Neurological complications of systemic diseases
- Stroke rounds
- Stroke rehabilitation
- Electro diagnosis (EMG, Evoked Potentials)

### **List of procedures students will be expected to observe or to assist in performing:**

1. All students complete at least 20 new patient evaluations.
2. If there is the opportunity, students will be able to perform diagnostic lumbar puncture at the Neurology Clinic under supervision.
3. Students will observe and assist in the performance of nerve conduction studies and electromyography (**only if the student expresses interest in observing this procedure**).

4. Programming of implantable pulse generators for deep brain stimulation and vagus nerve stimulation if requested by the medical student at the beginning of the rotation.
5. Observe and assist in Botox injection for migraine/spasticity post-stroke.

## **Clinical Presentations**

The following clinical presentations (CPs) from year 1-2 will be revisited during this rotation:

- Movement Disorder (Parkinson's Disease, Huntington chorea, Wilson Disease)
- Dementia
- Gait Disorder
- Headaches
- Vertigo
- Epilepsy
- Stroke

## **Schedule of Clinical And Teaching/Learning Sessions**

**The lecture schedule will be given to the students on the orientation day and it will include all the activities for the whole month.**

**All lectures will be available on Canvas for students to review at any time.**

**All lectures (including the simulation lab. sessions) are mandatory.**

**Lecture/Activity Schedule:** (Please refer to Appendix 1 for a typical week calendar, and Appendix 2 for the list of faculty contributing to the lecture series).

1)- The Neurological Physical Exam Lecture will be the first day of the rotation. All other lectures are held on Wednesday/Thursday afternoon.

2)- The following core lectures are scheduled during every rotation:

Dr. Brower

\* Epilepsy

Objective: - To understand the different types of seizure disorders (2.2, 2.3, 2.4)

-To overview the pharmacology of different anti-epileptic drugs. (1.6, 6.3)

Dr. Cruz

\* Neurological Examination

Objective: - To demonstrate the basic and techniques of the neurological examination (1.1)

\* Movement Disorders

Objective: - To explore the different types of Parkinsonism disorders, and the modalities of



Therapies. (2.2, 2.3, 2.4, 1.3, 1.2, 1.6)

Dr. Piriyawat

\* Neuro Imaging

Objective: - To understand the difference between CT scan and MRI (2.2, 2.3)

- To explore the application of each in different clinical scenarios. (1.2, 1.3)

\* Neurologic Emergencies

Objective: - To overview different neurological emergencies encountered in practice through case-based approach. (1.5, 1.3)

Dr. Rodriguez

\* Spinal cord syndromes

Objective: - To overview the different clinical presentations of different spinal cord syndromes through case-based approach. (2.3, 1.3, 1.2)

\* Coma

Objective: - To understand the pathophysiology of coma (2.2, 2.3)

- To overview the neurological examination in a comatose patient. (1.1, 1.3)

- To overview different causes and appropriate management in coma. (2.2, 2.3, 2.4,

1.2, 1.6)

\* Headaches

Objective: - To be able to differentiate between a benign headache and a headache that requires immediate urgent care. (1.5, 1.3)

\* Angiogram

Objective: - To overview the indication of cerebral angiogram, and overview of presentation of commonly encountered diseases. (2.3, 1.2, 1.6, 6.3)

Dr. Kassir

\* Anatomy – An Overview

Objective: - To overview neuroanatomy through clinical cases. (2.1, 2.2, 2.3)

\* Demyelinating Diseases

Objective: - To overview multiple sclerosis and other similar diseases ( diagnosis, management, etc). (2.3, 1.3, 1.2, 1.6)

\* Simulation Center Activity on Wednesdays from 1:00-3:00 pm.

Objective: - To practice lumbar puncture and fundoscopic examination (1.10)

Dr. Maud

\* Stroke

Objective: - To overview different types of stroke, and acute/chronic management. (1.3, 1.2, 1.5, 6.3)

\* Angiogram

Objective: - To overview the indication of cerebral angiogram, and overview of presentation of commonly encountered diseases. (2.3, 1.2, 1.6, 6.3)

Assigned Neurology Resident

\* Dementia

Objective: - To be able to identify the different types of dementia, work up warranted, and available modalities of treatment. (2.3, 1.3, 1.2)

3) - Radiology Case Conferences or Grand Rounds are held every Monday morning from 7:45AM – 8:45AM held in the CSB building, 3<sup>rd</sup> floor, auditorium 3600.

4) - NBME study session (usually the 3<sup>rd</sup> Wednesday of the month, but always the review the calendar provided at the orientation).

## **Description of Clerkship-Specific Assignments**

Weekly didactic lectures/demonstrations will review cardinal manifestations of neurologic diseases and specific neurologic disorders. Special emphasis will be placed on the evaluation of neurologic symptoms, and signs and on neurologic emergencies. Neurodiagnostic examinations such as EEG, evoked potentials, EMG, computerized tomography of head and spine, magnetic resonance imaging of the head and spine will be covered. Students will be assigned topics to cover, (depending on the faculty working with them), given handouts, reprints of articles, etc. Emphasis will be placed on the use of live demonstrations in patients and audiovisual aids such as videos of patients to illustrate neurologic signs (in particular movement disorders, gait disturbances, Horner's syndrome, hemiplegia, asymmetry of reflexes, and abnormal postures).

Every day the students either attend Neurology Clinic or inpatient consultation service, wherever they are assigned (*As mentioned earlier, the student will be given a calendar of the rotation during the orientation. For any questions or concerns about the calendar, the student has to contact the program coordinator*).

1. Student will examine at least 3 patients daily at the clinic under supervision, and student will be able to integrate the clinical information and the physical findings into syndromes and diseases. These clinics include General Neurology and Geriatrics, Parkinson's disease and Geriatrics, Multiple Sclerosis Clinic, Headache Clinic, and Epilepsy Clinic. Every student will be assigned to at least one inpatient consult every day they are assigned to inpatient consults. They will round with the attending daily on their patients and on other students' and residents' patients. They will be required to submit complete workups to the attending. These workups, which will be individually reviewed with the students, will include a detailed history and neurologic examination, topographic and differential diagnosis, and plan for investigation and management.
2. Each student will be tested on the neurologic examination. Students will be members of the consultation team, will follow patients, and will be expected to write progress notes. Students will be graded on clinical performance by the attending.
3. Students assigned to the inpatient team will be asked to participate in rounds 1 day of the weekend. (Mandatory)

## **Methods for Evaluating Clerk Performance**

**See Common Clerkship Policies located on Canvas.**

The clerkship director has ultimate responsibility for ensuring that student knowledge and core clinical skills are assessed in appropriate ways. In this clerkship the following methods are employed:

- \* Direct observation of comprehensive neurological examination: **A faculty will observe the student during an encounter and the faculty will fill out a checklist covering the different aspects of the history, neurological examination, assessment and plan (1 evaluation per 2 weeks. The checklist will be provided to the student at the beginning of the rotation and it is the responsibility of the student to hand the checklist to the faculty who observed the encounter).**

- \* Review of 2 H&P write-ups. These H&P's may reflect the student's ability to conduct a sequenced history and physical examination, and the management plan (The first H and P should be received by the end of the second week, and the second H and P should be received at the end of the rotation).
- \* Each H&P should be attached to a list of orders that a student would like to order for evaluation of the case. (This is an exercise to help the student get used to write orders in the future during residency).
- \* Students will record their encounters on the on-line patient encounter system. At the mid-point of the rotation the clerkship director will review each student's entries to assess whether the educational goals and objectives are being achieved and to assist the student who may not be meeting objectives through schedule adjustments or through alternative methods (e.g. online cases, special readings, simulations, case conferences, etc.)
- \* Performance on end of clerkship written examination (NBME neuroscience exam)
- \* Complete all required Op Log entries. See Common Clerkship Policies. In addition to the Common Clerkship Requirements, 30 entries are required for Honors and 20 entries are required for a Passing grade.
- \* Source of evaluation (for mid and final evaluation) is from: Cumulative faculty inputs and evaluations (2 evaluators/ 2 weeks period). Each week, 1 faculty (resident or nurse practitioner) will be asked to fill out 1 evaluation. At the mid-evaluation (or final evaluation) time, at least 2 evaluations will be available to be reviewed by the clerkship director. The clerkship director will be responsible in providing the final mid-evaluation and the final evaluation and also will be responsible in providing the feedback to the student. (The templates of the mid and final evaluation forms are attached at the end of the syllabus. **Students are not responsible in collecting evaluations from faculty).**

## **Absences**

**See Common Clerkship Policies located on Canvas.**

## **Preparation for Teaching**

Attending faculty and residents will be oriented to the experience by the Neurology Clerkship Director or their designee, and provided copies of the syllabus and forms that they will use to assess student performance.

Residents will be required, as part of their training and orientation, to function as teachers. All residents are required to participate in a “Residents as Teachers” program that is administered by the Office of Graduate Medical Education. In addition, each resident will be provided copies of the Medical Student syllabus with particular emphasis on goals, objectives, and assessment methods and criteria.

## **List of Reading Assignments**

Students are encouraged to consult the following material which is provided:

- 1) - Textbook: Aminof MJ, Greenberg DA, Simon RP: Clinical Neurology 9<sup>th</sup> Ed McGraw Hill
- 2) - Pre-Test Neurology, 9th edition; Principles of Neurology. McGraw Hill; Neurology (Weekly Journal of the American Academy of Neurology)
- 3) - NBME trial test online (It requires to be purchased by the student).
- 4) - [BoardVitals.com](http://BoardVitals.com).

## **Logistical Information**

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