At MSUCOM, we are constantly working to improve our curriculum and to meet new AOA accreditation guidelines. We need to meet the challenges of modern medicine that force us to innovate. While major changes will generally be instituted at the beginning of the school year, most minor changes may be implemented semester to semester.

Please be mindful of the need to read your syllabi before beginning your rotations.
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**Introduction and Overview**

Welcome to Neurology. This syllabus provides an overview of the requirements and expectations of the rotation as well as a guide to help you gain an understanding of the breadth of the field of neurology.

**BACKGROUND:**

Neurological complaints and pathology comprise a substantial share of the patient population treated by primary care physicians. Authors debate the average percentage of a primary care physician outpatient practice that is devoted to neurology, but the range is approximately 10 to 25% depending upon individual practice situations.

Unlike other major organ systems such as heart, kidney, lung, bowel, etc., the nervous system is traditionally not taught in an organized way in the postgraduate education of most primary care physicians. Given the amount of neurology that makes up a typical primary care practice, this is an obvious void nationwide in the curriculum of most primary care physicians. There is a remarkable view of the nervous system as a “black box”. It is easy to recognize when there is something wrong with the nervous system, but regrettably there is little insight by many physicians regarding the localization, nature and severity of the lesion, workup and/or treatment strategies. As such, this neurology rotation with specific goals, objectives and learning material has been created.

**ROTATION FORMAT:**

This rotation is designed to provide you with a basic foundation and ameliorate the complexities of neurology. Furthermore, it is a direct continuation of the material you have already learned in your OST 571 (Neuromusculoskeletal) course taken previously.

Currently, there are numerous base hospitals, each with diverse clinical and teaching opportunities.

In some settings, a student may have the opportunity to rotate on an inpatient service, while others may see patients with neurological conditions in an outpatient clinic or both settings.

Nonetheless, your clinical experience will be supplemented with online didactic material covering the primary areas of neurology and meeting the goals and objectives listed. You will need computer access to utilize *Desire2learn (D2L)* through which the online didactic material has been divided into weekly blocks. Each block will consist of specific topics with goals and objectives along with the appropriate lecture material, recommended book chapter(s), article(s), and/or videos. You are strongly urged to work through these daily. While you are not required to go through the weekly blocks in the order listed in *D2L*, it is recommended that you start with the material located under week 1, which contains information on how to perform the neurological examination. You should focus on the material located under the *REQUIRED* sections within each weekly block. If needed you can also use that under the *Additional Reference Material*, but this is not required.

At the end of the rotation, you will be required to take and pass an online examination through *D2L*. 
**What’s In This Syllabus:** This syllabus is broken down into the following areas:

- **Goals & Objectives**
  A list of learning goals & objectives covering the basics of neurology.

- **References**
  A list of recommended reading references to meet the stated goals and objectives of neurology.

- **Student Responsibilities and Expectations**
  A summary of the clinical and academic student responsibilities and expectations during the rotation.

- **Summary of Clinical Requirements**
  A list of required activities for this month with required submission method and completion dates.

- **Core Competencies and Learning modules**
  A list of core competencies and learning modules addressed during this month.

- **Special Considerations**
  Things to remember while rotating in neurology.

- **Core Neurology Clerkship Exam Information**
  Information regarding the final examination.

- **Rotation Remediation Process**
  An explanation of remediation steps should you not pass the rotation initially.

- **Standard Policies**
  Policies regarding attendance, professionalism, students’ rights and responsibilities, course grades, rotation evaluations, patient logging and exposure incidents protocols.

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**Goals and Objectives**

By the end of the rotation, the student will:

1. Develop the ability to perform a competent neurological examination.
2. Learn to localize neurological lesions based on history and neurological examination.
3. Acquire an understanding of the major neurological disorders.
4. Acquire an understanding of basic laboratory tests necessary to pursue a suspected diagnosis; including, but not limited to, electrophysiology, neuroimaging (CT, MRI, etc.), CSF, hematology and metabolic analysis, history and general physical exam.
5. Develop an understanding of the neuropathology, prognosis and treatment strategies for common neurological conditions.
Neurology Weekly Learning Modules

WEEK 1

TOPICS
- Neurological examination
- Review of neuroanatomy
- Neuroimaging basics
- General concepts in lesion localization and formulation of common differential diagnoses

SPECIFIC LEARNING OBJECTIVES
- Learn how to properly perform the neurological examination in the awake and cooperative patient
- Learn how to properly perform the neurological examination in the uncooperative or comatose patient
- Review the basic structures and common pathways in neuroanatomy
- Describe the common modalities used in neuroimaging
- Learn to recognize normal anatomic structures on neuroimaging
- Learn to recognize common abnormal findings on neuroimaging

WEEK 2

TOPICS
- Stroke/TIA
- CNS hematomas and hemorrhages
- Seizures/Epilepsy
- Neurological infections
- CNS malignancies

SPECIFIC LEARNING OBJECTIVES
- Classify the 2 major stroke subtypes
- Describe the common causes of ischemic strokes
- Learn to recognize the signs and symptoms of an acute ischemic stroke
- Discern TIA from stroke
- Appropriate management/treatment of acute vs chronic strokes
- Understand the contraindications in treating acute strokes with tPA.
- Understand the etiologies of the various cerebral hematoma types and hemorrhage
- Define the different types of seizures
- Learn to correctly recognize and treat seizures/epilepsy
- Be able to correctly diagnose and treat status epilepticus and non-convulsive status epilepticus.
- Understand the appropriate evaluation and treatment of CNS infections—meningitis
- Learn the characteristics of common malignant (GBM), metastasis and non-malignant (meningioma) CNS tumors
WEEK 3

TOPICS
- Neuromuscular disorders
- Encephalopathy
- Coma
- Headaches
- Vertigo

SPECIFIC LEARNING OBJECTIVES
- Understand the causes and treatment of common neuromuscular conditions—Myasthenia gravis, ALS, peripheral neuropathy, radiculopathy, inflammatory myopathies
- Be able to recognize and treat emergent neuromuscular conditions--AIDP.
- Understand common causes of encephalopathy
- Learn to differentiate emergent versus non-emergent causes of encephalopathy
- Understand the common causes of coma
- Learn to differentiate emergent from non-emergent causes of headaches
- Understand common headache types and treatments—migraines, tension headaches, rebound headaches, cluster headaches
- Be able to correctly obtain the appropriate workup and treatment of emergent causes of headaches
- Be able to discern the common causes of vertigo (BPPV) and the appropriate treatment
- Be able to discern emergent from non-emergent causes of vertigo

WEEK 4

TOPICS
- Neuro-Ophthalmology
- Multiple sclerosis
- Movement disorders
- Dementia

SPECIFIC LEARNING OBJECTIVES
- Differentiate mono-ocular from binocular diplopia
- Understand common causes of diplopia
- Learn about common neurological causes of acute and sub-acute vision loss
- Understand the criteria required to diagnose Multiple sclerosis
- Understand the various treatment modalities used in in Multiple sclerosis
- Learn the symptoms and signs in common movement disorders (Parkinson’s disease, essential tremor, cervical dystonia, chorea)
- Understand the treatments used in common movement disorders
- Understand the common types and treatments of dementia
References

SUGGESTED TEXTBOOKS:
The following is a list of recommended textbooks that can be used to supplement both the online educational material located through D2L and the clinical experience. However, listed on the D2L site are specific recommended textbook chapters (or pages) corresponding to the weekly objectives and goals; these may be different than those references listed below.

The first book listed (Neuroanatomy through Clinical Cases) is the required text for the OST 571 course taught at MSU. All the other listed texts are available through the MSU library website (www.lib.msu.edu) in electronic format and therefore, are free.

The MSU library has numerous other electronic and standard Neurology textbooks that can be used as well. The choice of additional material is at the discretion of the individual student. However, it is recommended that one or more of these materials are utilized in order to enhance the educational experience and prepare for the end of the rotation written examination.

1. Neuroanatomy Through Clinical Cases, Blumenfeld: This reviews the basics of neuroanatomy through clinical cases and localization. Required text in the OST 571 course.
5. Neurology [electronic resource]: PreTest self-assessment and review: McGraw Hill Medical Pub., c2001. This is a good study guide to help with the final written examination that will be delivered at the end of the rotation.

PEDIATRIC NEUROLOGY:

NEURORADIOLOGY:
Student Responsibilities

During the course of this month, the student is expected to take a proactive approach to learning about the discipline of neurology. Students should make every effort to have an initial orientation session with their attending physician in an effort to review goals, objectives and expectations on both the part of the preceptor and student. During this initial orientation meeting, students should present the preceptor with both a copy of their evaluation form as well as review this syllabus with him or her. Doing so will improve the overall rotational experience in terms of training and evaluation. Students should also suggest to have a mid-month evaluation during the rotation to gain formative feedback and make adjustments as needed based on commentary from the preceptor. Doing so will encourage active participation and improve summative evaluations that occur at the end of the rotation.

It is expected that the student will meet the following clinical responsibilities during this rotation:

- Report to their rotation in a timely fashion and dressed appropriately for each day of work. Be cognizant of any scheduling changes that occur and provide timely communication to the preceptor about excused or unexpected absences.
- Demonstrate an enthusiastic and proactive attitude towards the learning process.
- Treat all staff members, other rotators and patients with respect and demonstrate professional behavior in all interactions.
- Not engage in behaviors that are either: unprofessional/unethical, illegal or pose a risk to the patient or practice. If there is a question about something you are asked to do, speak with your precepting physician or (if the person you have concern about is the precepting physician) your Student Coordinator and/or Director of Medical Education for your base hospital.
- Complete any and all requested responsibilities in a timely fashion and as directed by your precepting physician excepting behaviors mentioned previously.
- Represent yourself, fellow students and the College in a positive and professional manner.

It is expected that the student will meet the following academic responsibilities during this rotation:

- Complete all College’s curricular elements of the rotation as specified in this syllabus in a timely fashion.
- Regularly access and review content provided within Desire2Learn (D2L) during the rotation to support and supplement your active learning process.
- Attend the C3 didactic sessions provided during this month as indicated in the C3 (OST 603) syllabus. No exception for this attendance is allowed except as approved by the C3 Director of your base hospital, the Instructor of Record for OST 603 and/or the Director of Medical Education of your base hospital.

Failure to meet the clinical and/or academic responsibilities (as determined by your preceptor, Director of Medical Education of your base hospital and Instructor of Record for NOP 656) may result in a failing grade for this course and require a corrective action plan and/or remediation as outlined below.
Core Neurology Clerkship Rotation Academic Requirements

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Submission Method</th>
<th>Due Date</th>
<th>Passing Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurology Final Examination</td>
<td>Desire2Learn</td>
<td>4:00pm the Friday following the end of the rotation</td>
<td>Minimum of 60%</td>
</tr>
</tbody>
</table>

Core Neurology Clerkship Exam Information

The final examination for the neurology rotation will consist of multiple choice case and non-case based style questions. Passing the examination is a requirement for the rotation.

EXAM PREPARATION
All of the questions will be based on the defined weekly topic objectives listed in the syllabus and D2L website. It is recommended that you study the appropriate content as defined and provided on D2L. You are STRONGLY encouraged to take the practice examination located under the Practice Examination section prior to taking the final examination!

EXAM ADMINISTRATION
To take this exam, you must log onto the D2L website for this course and complete the online exam, which is based on the preparatory material mentioned above. The test will be available during week 4 of your rotation to one week afterwards. Students would be wise to use the preparatory material to study before taking the online exam.

If you are experiencing technological issues taking the exam, please contact the HELP DESK 517.355.2345. For all other issues, contact Katie Cantin: Katie.Cantin@hc.msu.edu.

EXAM SCORING
In order to pass the examination, a minimum 60% is required.

Core Neurology Clerkship Corrective Action Process for Deficient Academic Requirements

If a student does not successfully complete the academic requirements of the course, the student will be permitted to go through a “Corrective Action” process.

For students who do not meet the minimum passing score requirement, one make-up/repeat examination can be taken within one week after a failed first attempt.

If a student completes the corrective action successfully, as determined by the Instructor of Record, the student will receive credit for the deficient academic grading requirement(s).

If a student does not complete the corrective action successfully, as determined by the Instructor of Record, the student will receive an “N” grade for the course.
## Core Neurology Clerkship Rotation Clinical Requirements

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Submission Method</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attending Evaluation of Student</td>
<td>Submit completed evaluation to your base hospital’s Medical Education office.</td>
<td>4th Friday of the rotation</td>
</tr>
<tr>
<td>Student Evaluation of Rotation</td>
<td>“Evaluate” Link in Kobiljak Schedule</td>
<td>End of Rotation</td>
</tr>
</tbody>
</table>

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### Unsatisfactory Clinical Performance

A student’s clinical performance will be assessed through the Attending Evaluation. A satisfactory Attending Evaluation is required for completion of the clinical requirements for the course.

Unsatisfactory Attending Evaluations are governed by the Policy for Retention, Promotion and Graduation. Evaluations with below average scores in two or more categories defined as rankings of Needs Improvement/Unsatisfactory (on a scale of Needs Improvement/Unsatisfactory-Exceptional) or 3 and below (on a numerical scale of 1-7) will be referred to the Department Chairperson/Instructor of Record for review and grade determination.

Any student with marginal evaluations in two or more rotations will be referred to the COSE Clerkship Performance Subcommittee for review.

**IMPORTANT NOTE:** The student will maintain an “Extended” (ET) grade until they have successfully completed all academic and clinical requirements for the course.

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### “N” Grade and Remediation

[http://com.msu.edu/Students/Policies_and_Programs/Remediation_Policy.htm](http://com.msu.edu/Students/Policies_and_Programs/Remediation_Policy.htm)

A student who receives an “N” grade will be required to appear before the Committee on Student Evaluation (COSE) Clerkship Performance Subcommittee for review of the student's overall performance. The Subcommittee may recommend that the student who has received an "N" grade be permitted to remediate the “N” grade (see below) or academically dismissed. If a student is recommended for dismissal, the student will appear before COSE to have their status in MSUCOM determined. COSE will review the student’s academic/clinical performance; determine whether dismissal is appropriate or if the
student’s circumstances warrant an opportunity for continuation in the curriculum. The student’s eligibility to remediate will be determined following this COSE decision. Remediation is the method by which course objectives will be met after receiving an "N" grade. Remediation will be offered only after the student’s eligibility for remediation has been determined.

To successfully remediate an “N” grade, a student must demonstrate mastery of the course objectives. To do this the student may be required to retake the course or enroll and participate in a College directed study course demonstrating successful mastery of the course objectives.

Upon remediation of the “N” grade, the original “N” grade remains on the permanent transcript along with the grade, “P” or “N,” for the remediation experience.

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**Base Hospital Requirements**

*(To be defined and evaluated by individual hospitals)*

*Students are responsible for completing any and all additional requirements set by the hospital/clinical site in which the student is completing the rotation.* However, students are not responsible for reporting results of requirements outside the ones listed above to the department/college.
Special Considerations

In the field of neurology, the examination is vital. Most neurologists take significant pride in their neurological examination skills and utilize their findings in conjunction with the patient’s history to localize and determine the nature of the patient’s deficits. Along these lines, you are strongly encouraged throughout your rotation to continually hone your neurological examination abilities. Attempt to work on lesion localization(s) based on history and your examination findings. Discuss these with your preceptor and address any difficulties you may be experiencing. During the rotation you should always carry a reflex hammer, ophthalmoscope, visual acuity card, 128 Hz tuning fork, safety pin and stethoscope.

Core Neurology Clerkship Competencies

The Core Competencies were developed by the AOA to represent seven defined areas. In 2007, the American Association of Colleges of Osteopathic Medicine developed a document to assist colleges in integrating these same core competencies into medical education at the medical student level. The following core competencies are addressed during the month of Neurology:

1) Osteopathic Principles and Practice
   a. Approach the patient with recognition of the entire clinical context, including mind-body and psychosocial interrelationships
   b. Diagnose clinical conditions and plan patient care
   c. Perform or recommend OMT as part of a treatment plan
   d. Communicate and document treatment details

2) Medical Knowledge
   a. Articulate basic biomedical science and epidemiological and clinical science principles related to patient presentation

3) Patient Care
   a. Gather accurate data related to the patient encounter
   b. Develop a differential diagnosis appropriate to the context of the patient setting and findings
   c. Form a patient-centered, inter-professional, evidence-based management plan
   d. Health promotion and disease prevention (HPDP)
   e. Documentation, case presentation, and team communication

4) Interpersonal and Communication Skills
   a. Establish and maintain the physician-patient relationship
   b. Demonstrate effective written and electronic communication in dealing with patients and other health care professionals
   c. Work effectively with other health professionals as a member or leader of a health care team
5) Professionalism
   a. Demonstrate humanistic behavior, including respect, compassion, probity, honesty, and trustworthiness
   b. Demonstrate accountability to patients, society, and the profession, including the duty to act in response to the knowledge of professional behavior of others
   c. Attain milestones that indicate a commitment to excellence, as, for example, through ongoing professional development as evidence of a commitment to continuous learning

6) Practice-Based Learning and Improvement
   a. Describe the clinical significance of and apply strategies for integrating research evidence into clinical practice
   b. Critically evaluate medical information and its sources, and apply such information appropriately to decisions relating to patient care

7) Systems-Based Practice
   a. Demonstrate understanding of how patient care and professional practices affect other health care professionals, health care organizations, and society
   b. Identify and utilize effective strategies for assessing patients
MSU College of Osteopathic Medicine Standard Policies

The following are the standard MSUCOM policies students must adhere to across rotations.

ATTENDANCE POLICY

Attendance at all scheduled Clerkship activities is mandatory.

If a student is unable to be present for a scheduled clerkship activity because of extenuating circumstances, the student is required to complete a Clerkship Excused Absence Request form. In all cases except for emergencies or sudden illness, requests for scheduled absences are to be submitted at least 30 days prior to the date(s) of absence. Absences are not approved until the form is completed with all required signatures. Once approved, the student is required to notify their preceptor of their absence within 24 hours. Failure to complete this form or obtain required signatures will result in an unexcused absence from the rotation. Unexcused absences are considered unprofessional behavior and could be noted as a mark of unprofessionalism on the student’s performance evaluation, and may lead to failure of the rotation.

An absence request for the first or last day of the rotation will be denied. All absences (excused or unexcused) must be made up as specified on the Excused Absence Form as outlined under the conditions of approval. Makeup experience will be determined by the Director of Medical Education and may include additional clinical day(s) or written assignment(s).

If a student has an emergency or sudden illness they should immediately notify the Director of Medical Education and rotation preceptor. The excused absence request form must be submitted to the Medical Education Office within 24 hours of the original emergency or sudden illness notification.

**IMPORTANT NOTE:** The only exception to this attendance policy is Emergency Medicine, where attendance is based on a shift schedule assigned by the hospital. Please refer to the Emergency Medicine “Introduction and Overview” for more information.

STATEMENT OF PROFESSIONALISM

Principles of professionalism are not rules that specify behaviors, but guidelines that provide direction in identifying appropriate conduct. These principles include the safety and welfare of patients, competence in knowledge and skills, responsibility for consequences of actions, professional communication, confidentiality, and lifelong learning for maintenance of professional skills and judgments. Professionalism and professional ethics are terms that signify certain scholastic, interpersonal and behavioral expectations. Among the characteristics included in this context are the knowledge, competence, demeanor, attitude, appearance, mannerisms, integrity and morals displayed by the student to faculty, peers, patients and colleagues in other health care professions. Students are expected to conduct themselves at all times in a professional manner and to exhibit characteristics of a professional student.

STUDENTS’ RIGHTS AND RESPONSIBILITIES

Each individual student is responsible for their behavior and is expected to maintain standards of academic honesty. Students share the responsibility for creating an environment that supports academic honesty and principles of professionalism. Proper relationship between faculty and student are fundamental to the college's function and this should be built on mutual respect and understanding together with shared dedication to the education process. It is a fundamental belief that each student is worthy of trust and that each student has the right to live in an academic environment that is free of injustice caused by dishonesty. While students have an obligation to assist their fellow students in meeting the common goals of their education, students have an equal obligation to maintain the highest standards of personal integrity.
FACULTY RESPONSIBILITIES

It is the responsibility of the college faculty to specify the limits of authorized aid (including but not limited to exams, study aids, internet resources and materials from senior students) in their syllabi, and it is the responsibility of students to honor and adhere to those limits. Course instructors shall inform students at the beginning of the semester of any special criteria of academic honesty pertinent to the class or course.

It is the responsibility of the clinical faculty to provide students with ongoing feedback during rotation upon request. Clinical faculty are generally recommended (though not required) to limit student assigned duty hours from 40 to 60 hours weekly (and not exceeding 60 hours). Both faculty and students are to be treated fairly and professionally in order to maintain a proper working relationship between trainer and trainee.

COURSE GRADES

- **P-Pass** – means that credit is granted and that the student achieved a level of performance judged to be satisfactory according to didactic and clinical performance by the department.
- **N-No Grade** – means that no credit is granted and that the student did not achieve a level of performance judged to be satisfactory according to didactic and clinical performance by the department.
- **ET-Extended Grade** – means that a final grade ("Pass" or "No Grade") cannot be determined due to one or more missing course requirements. In Years 3 and 4, the ET grade is used instead of an “Incomplete (I)” grade. Once all course requirements have been completed, received, and processed, the ET grade will be changed to a final grade. An “ET” will NOT remain on a student’s transcript.

ROTATION EVALUATIONS

**Attending/Faculty/Resident Evaluation of Student**

Students are responsible for assuring that his/her clinical supervisor receives the appropriate evaluation form. Forms can be accessed via the “Attending Evaluation” link in the student’s Kobiljak online Clerkship schedule.

Students should assertively seek feedback on his/her performance throughout the course of the clinical rotation. Students should also sit down and discuss the formal evaluation with the clinical supervisor. Note that the clinical supervisor and the DME from the rotation hospital are required to sign the form.

Students should keep a copy of the evaluation and leave the original with the Medical Education Office at the clinical training site where that office will review, sign, and forward the completed form to the COM Office of the Registrar. It is important to know that evaluations will not be accepted by the COM Office of the Registrar if submitted by the student. Any evidence of tampering or modification while in the possession of the student will be considered “unprofessional behavior” resulting in an “N” grade and review by the Committee on Student Evaluation (COSE) and/or the College Hearing Committee.

Grades are held until all rotation requirements, including evaluation forms, are received. Be sure you are using the correct form.

**Student Evaluation of Rotation**

Students will submit their rotation evaluations electronically at the conclusion of every rotation by accessing their online schedule through Kobiljak.
EXPOSURE INCIDENTS PROTOCOL
A form has been developed by the University to report exposure incidents. These forms will be on file in your DME's office. You can also access the form at www.com.msu.edu/AP/clerkship_program/clerkship_documents/exposure.pdf. Please make yourself familiar with the procedure and the form.