Oregon Health & Science University
School of Medicine

NEUROLOGY
CLERKSHP
OBJECTIVES
NEUROLOGY COURSE, 721

Welcome to the Senior Clerkship in Neurology. This course in clinical neurology satisfies the requirements for graduation of the Oregon Health & Science University School of Medicine. This course is a fourth year course, but may also be taken under special conditions by third year students. This course must be completed prior to enrolling in advanced electives in clinical neurology.

COURSE GOALS:

1) To familiarize the student with the clinical presentation of common neurological disorders. History taking skills to elicit precise symptoms and to distinguish clinical syndromes will be emphasized.

2) To develop in the student a facility with the neurologic exam. Both the detailed neurological examination and features of the neurological examination for practical application in general medical practice and allied neurological specialties such as orthopedics, and physical medicine will be taught.

3) To have the student acquire a sound knowledge of the differential diagnosis of common neurologic disorders, the laboratory evaluation and clinical management of these diseases. Categorically included are: stroke, seizure disorders, headache, movement disorders, multiple sclerosis, stupor and coma, diseases of muscle and nerve, dizziness, and dementia.

4) To introduce the student to the diagnostic evaluation and management of urgent neurological or neurosurgical illness.

5) To convey the indications for and to acquire skills in performing lumbar puncture and to appreciate both the clinical value and the limitations of technologies such as: electroencephalography, evoked potentials, computerized axial tomography (CT), magnetic resonance imaging (MRI), arteriography, myelography, and radionucleide imaging.

6) To acquaint the student with the new frontiers in neurology and many of the cutting-edge issues in neuroscience.

7) To introduce the concepts of neurologic consultation and an understanding of the role of the consultant in clinical problem solving.
RESOURCES:

Required reading:
- OHSU Neurology 721 syllabus

Recommended reading (provided while on rotation):

Recommended references for your library:
- Rowland. Merritt's Neurology. 2005

Electronic resources:
- www.medlink.com – UpToDate specific to neurology
- www.aan.com – American Academy of Neurology website
  - Education site has practice parameters

COURSE DESCRIPTION:

The course is divided into 3 principal components: Inpatient Service, Outpatient Clinics and Teaching Sessions. It is designed to give the student a broad overview of clinical neurology. Students assigned to Bend or Eugene away rotations will have a mix of inpatient and outpatient activities to which you will be oriented when you arrive at those sites.

1) **Inpatient Service (3 weeks):** Each student is assigned to an inpatient ward experience either on the general neurology VA or OHSU service, the NSICU service, the OHSU stroke service, or the pediatric neurology service. Of note, the pediatric neurology service consists of both inpatient and outpatient responsibilities. The location of your assignment may be found in the beginning of the assignment. The student will evaluate patients admitted to the ward or seen on the consultation service, and will present the case to the attending physician during rounds. The student will be expected to write an admitting history and physical examination along with case analysis for each patient they are assigned. The student will make rounds with the house staff and actively participate in the care of patients he or she is assigned. Students are required to write daily notes on their patients either in EPIC or CPRS. An awareness of the status of their patients during hospitalization as well as pertinent results of laboratory and radiological testing is expected from the student. Students are especially encouraged to undertake independent in-depth reading and literature search on neurologic disorders that pertain to their patients. Participation may also include performance of simple diagnostic tests such as lumbar puncture.

During the weeks a student clerk is assigned to the inpatient service, each student is expected to be present for daily rounds Monday through Friday. Students not “on call” will be expected to be available to accept a new patient until 5 pm. Students will be "on call" until 10:00 pm three nights during their rotation. Students assigned to the NSICU may take their call with the NSICU team. Students will be asked to be present one weekend during the rotation. In order to allow greater continuity in patient care it is generally expected that you will perform your weekend call time while you are assigned to the inpatient wards. Students
should read extensively and be familiar with the disease processes, complications, and potential therapies of the patients they have seen.

2) **Outpatient Clinics (1 week):** Each student will be assigned to General and Subspeciality Neurology Clinics for one week. During this assigned week, students are required to attend clinics according to the accompanying schedule. The level of involvement of the student will vary from clinic to clinic. Ideally the student will be allowed to see patients individually and discuss the case with a staff. Unfortunately due to busy clinic schedules, this level of involvement in the patient care is not always available.

3) **Teaching Sessions:** In the course of his/her ward assignment; it is unlikely that each student will be exposed to all the important aspects of neurological diseases. A Medical Student Attending will conduct one-hour teaching sessions at least 3 times per week. These are intended to introduce students to the approach of common neurological problems, through didactic sessions, case vignettes and student presentations. The students will also learn the fundamentals of the neurological examination. This is an important portion of the clerkship, and all students are expected to attend. These teaching sessions take priority in case of scheduling conflicts.

Students will also be assigned to participate in a learning experience at a long term Alzheimer’s care unit. This is a required trip, and if the student is unable to attend on the day they are assigned, they must make arrangements to reschedule or make up the experience with the course director.

5) **Clinical Conferences:** Each student is encouraged to attend as many of the regularly scheduled neurological conferences as possible. Attendance by all students is expected at the Neurology Grand Rounds, Neuroradiology Conferences, the Thursday Noon Conference and the Neuroscience Conferences.

**REQUIRED ASSIGNMENTS:**

1) **Patient write-up:** Each student will turn in a formal write up of a patient they have encountered during the course of the clerkship due on the third Friday of the clerkship. Papers should be submitted by email directly to the clerkship director (kraakevi@ohsu.edu).

The write up should include a complete history (CC, HPI, ROS, PMHx/PSHx, MEDS, FHx, SHx), and physical examination (with complete neurological examination). If applicable the discussion should include an explanation of neurological localization which justification for the localization based on clinical presentation. Based on localization, a prioritized differential diagnosis should be discussed briefly. The discussion will then include a basic science principle learned in neuroscience course that applies to this person’s likely disease state, diagnostic testing, or treatment. This basic science principle can include (but is not limited to) discussion of neuropathology, neurophysiology, neurochemistry, epidemiology, or in-depth discussion of neuro-anatomy. Each write-up will have at a minimum 3 references (from neurological textbooks/web resources). An honors level paper will have references from the primary literature from neurology journals (ie Neurology, Annals of Neurology, Lancet Neurology, various subspecialty journals, etc.).
2) **Neurological examination passport:** Each student will have the entire neurological examination observed by a faculty member. As we realize that faculty members do not always have the time to watch a complete physical examination, we have established a passport system. With this system, the student has the opportunity to have a faculty member observe a single component of the examination. If the student is felt to have competently demonstrated that portion of the examination, the faculty member will sign off on the passport form. Later a student may then have another faculty member observe a different portion of the examination. **Through the course of the clerkship, the student is responsible for having all of the portions of the neurological examination observed and signed off.** For example, student Luke has attending Dr. Vader observe the cranial nerve examination. Luke then asks Dr. Vader to sign the cranial nerve part of the passport. Luke the next day has Dr. Yoda observe him doing the strength testing, and Dr. Yoda signs on the strength testing line. By the end of the rotation, Luke has a signatures on each part of the neurological examination, and he feels super to have mastered this part of his training. (Then Luke finds out Dr. Vader is his father, and throws himself into a wind tunnel, and he then drops out of medical school and goes to some naturopathic school.).

3) **Alzheimer’s Disease day center visit:** Attendance to your assigned visit to an Alzheimer’s disease center is required to pass this course.

**ATTENDANCE POLICY:**

If you are unable to be on your ward service or attend your clinic rotation, please let Lisa Bui know by email, buili@ohsu.edu, prior to being absent. An alternative clinic will be arranged or additional call may be scheduled for making up the time. Medical students are allotted 2 excused days from the rotation with time absent made up. If you plan on being away for more than 2 days from your rotation, please discuss with Dr. Kraakevik for approval and arrangements.

**STUDENT EVALUATION:**

Total grade will be determined based on these three activities with majority of grade (approximately 75%) based on clinical evaluations along with examination score (approximately 15%), and patient write-up (approximately 10%). Although not formally graded, participation in didactic sessions may influence grades which are felt to be borderline.

1) **Ward/Clinic evaluations:** Evaluation of the student clerk's performance, knowledge base and clinical skills will be provided by the residents and attending staff on each service. The Medical Student Attending will be responsible to gather together these evaluations and provide feedback to each student. Although there are individual differences in emphasis, most attending and resident staff looks for motivation, competence and responsibility in a student. The student will have ample opportunity to demonstrate mastery of the history and neurological examination skills with a Neurology staff. The neurological examination passport must be completed for a student to pass this course.

3) **Patient write-up:** Students are expected to complete a patient write-up by the end of the third week. Description is found above.
4) **Final examination**: Students are expected to take an exam on the final day of the clerkship. The score from the exam will be incorporated into the students’ final grade. The examination consists of 25 questions – roughly half in short answer format and half in multiple choice format. Students will have 1 hour to complete the examination. The examination will be graded as follows: 95-100%: Honors, 85-94% Near Honors, 75-84% Satisfactory, 70-74% Marginal, <69% Fail. Marginal or failing grades will need to be discussed with the clerkship director and at the clerkship director’s discretion, the examination may be re-administered.

**WEEKLY SCHEDULE:**

**Inpatient Service**: Work rounds and attending rounds - exact time varies.

**Clinics**: Most clinics start at 8:30AM and 1:00PM. Check your clinic assignments during the assigned week. We are often not informed of last minute changes in the clinic schedule. Don’t be shy about joining other ongoing clinical activities if you have an unexpected lull in your schedule. Also bring along a book or be prepared to use the library just in case.

**Teaching Sessions**: You will meet with your teaching attending at least 3 times per week. Each session is about an hour long. These generally occur on Mondays, Wednesdays, and Thursdays from 4 to 5 pm, but the time is subject to change based on availability of the teaching physician. Attendance at the teaching sessions is required. Students on the Bend and Eugene rotations will be required to log into the Monday and Thursday didactic sessions from 4-5 PM. The Wednesday lecture topics should be discussed with your on-site preceptors.

**Conferences**: Conferences of relevance are listed below.

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>Monday</td>
<td>8:30 AM</td>
<td>Morning Report, Hatfield Building, 12D03</td>
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<tr>
<td></td>
<td>12:00 PM</td>
<td>◈ Neuroradiology / Neuro-oncology Conference, Hatfield Building, 14D03</td>
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<td></td>
<td>4:00 PM</td>
<td>◈ Medical student teaching session</td>
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<tr>
<td>Tuesday</td>
<td>7:00 AM</td>
<td>Neuropathology Conference, Hatfield Building, 12D03</td>
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<tr>
<td></td>
<td>4:00 PM</td>
<td>◈ Medical student teaching session</td>
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<tr>
<td>Wednesday</td>
<td>8:00 AM</td>
<td>◈ *Neurology/Neurosurgery Grand Round, UHS 8B-60</td>
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<td></td>
<td>11:00 AM</td>
<td>Epilepsy Conference, VAMC 5th Floor Conference Room</td>
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<tr>
<td>Thursday</td>
<td>11:00 AM</td>
<td>◈ Brain Cutting, Basic Science Building, Morgue</td>
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<td></td>
<td>Noon</td>
<td>◈ Clinical Conference/M&amp;M Conference, MacHall, 3198</td>
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<tr>
<td></td>
<td>4:00 PM</td>
<td>◈ Medical student teaching session</td>
</tr>
<tr>
<td>Friday</td>
<td>8:30 AM</td>
<td>Morning Report, Hatfield Building, 12D03</td>
</tr>
<tr>
<td></td>
<td>12:30 PM</td>
<td>◈ Neuroscience Conference, Hatfield Building, 12D03</td>
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◈=You really should go to these conferences.

*= Neurology Grand Rounds are canceled during the summer.
# NEUROLOGY CLERKSHIP OBJECTIVES

<table>
<thead>
<tr>
<th>General Objectives</th>
<th>Knowledge and Skills Objective</th>
<th>Instructional Strategies</th>
<th>Evaluation Methods</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1K, 2K, 8K, 10K, 14K, 1S, 2S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 1P, 2P, 3P, 4P, 5P, 6P, 7P, 8P</td>
<td>Acquire knowledge of the differential diagnosis of neurologic disorders, the laboratory evaluation and management of these disorders</td>
<td>Students are to work at least 4 patients during their 4 week rotation.</td>
<td>Observation by residents and attendings and turn in complete write-up to teaching attending</td>
<td>Students keep a log of patients worked up and present and turn in at end of clerkship.</td>
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<tr>
<td>1K, 2K, 8K, 10K, 14K, 1S, 2S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 1P, 2P, 3P, 4P, 5P, 6P, 7P, 8P</td>
<td>Demonstrate knowledge of work up of a patient with mental status changes</td>
<td>Evaluate a patient with mental status changes</td>
<td>Presentation to attending and or residents</td>
<td>Enter into log</td>
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<tr>
<td>1K, 2K, 8K, 10K, 14K, 1S, 2S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 1P, 2P, 3P, 4P, 5P, 6P, 7P, 8P</td>
<td>Demonstrate knowledge of evaluation of a patient with a stroke</td>
<td>Work up one patient with an acute stroke or TIA</td>
<td>Observation by attending and residents</td>
<td>Enter into log</td>
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<td>1K, 2K, 8K, 10K, 14K, 1S, 2S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 1P, 2P, 3P, 4P, 5P, 6P, 7P, 8P</td>
<td>Familiarize the student with clinical presentation and treatment of common neurological disorders</td>
<td>Students are to attend all conferences that are specific for students. Lectures and attendance in specialty clinics.</td>
<td>Participation and attendance at lectures and end of rotation examination.</td>
<td>End of rotation examination</td>
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<td>1K, 2K, 8K, 10K, 14K, 1S, 2S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 1P, 2P, 3P, 4P, 5P, 6P, 7P, 8P</td>
<td>Appreciate the clinical value and limitations of technologies such as: EEG, EMG/NCV, CT scan and MRI/MRA.</td>
<td>Ordering appropriate ancillary test. Attend epilepsy and neuroradiology conferences</td>
<td>Faculty will access knowledge during rounds.</td>
<td>Students will log into the computer system.</td>
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<td>1K, 2K, 8K, 10K, 14K, 1S, 2S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 1P, 2P, 3P, 4P, 5P, 6P, 7P, 8P</td>
<td>Demonstrate ability to follow patients in an inpatient setting and plan appropriate discharge</td>
<td>Students are to write progress notes on their patients daily.</td>
<td>Residents and attendings will review the daily notes</td>
<td>Student evaluations will reflect their participation and abilities; Add to their log</td>
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<td>Learn about community resources for patients and families of patients with dementia</td>
<td>Visit a community respite care center</td>
<td>Feedback from the nurses that set up the field trip</td>
<td>Enter into log</td>
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</table>