
Welcome to the Neurology Clerkship!

The purpose of this clerkship is to give you a firm grounding in *fundamental neurologic concepts*, and in the recognition and initial management of *emergent and common neurological problems*. The clerkship relies on the idea that you will carry out self-directed learning that builds from the experiences that we provide.

This syllabus establishes the rules and responsibilities of both the student and the clerkship, and functions as the *de facto* contract between us.

CLERKSHIP GOALS

Learning Objectives

By the time you are finished with the rotation, you should be able to:

1. Obtain an adequately detailed history from a patient with neurologic (or potentially neurologic) complaints, performing at the level appropriate for a practicing physician (non-neurologist);
2. Perform a "screening" neurologic examination (as defined by the American Academy of Neurology Core Clerkship Curriculum recommendations) on every patient
3. Conduct a more detailed neurologic examination of systems associated with patient complaints or abnormalities found on screening exam
4. Demonstrate the skills of clinical localization of lesions within the nervous system on the basis of history and physical findings;
5. Recognize, appropriately respond to, and initiate management of these common neurologic complaints and syndromes
 - Focal weakness
 - Somatosensory deficits (e.g. Numbness, tingling)
 - Gait and movement disorders
 - Dizziness (e.g. Vertigo, light-headed)
 - Specific cognitive loss (e.g. Aphasia, amnesic disorder)
 - Altered level of consciousness (e.g. Delirium, coma)
 - Headache
 - Back and neck pain
 - Acute ischemic stroke/intracranial hemorrhage
 - Seizures/epilepsy
6. Recognize the key features and initiate management of these neurologic emergencies:
 - Coma
 - Status epilepticus
 - Acute spinal cord dysfunction.

OVERALL APPROACH

The core philosophy of this clerkship is that people learn best when they actively participate in their own learning, not when things are spoon-fed to them. As an adult learner, we consider it your job to learn while you are with us, and take a responsible and professional approach to the experience.

We will teach you, spend time with you, encourage you, give you resources and experiences, and frame a structure and context within which your learning can grow. Ultimately, though, you are the single most important engine driving the type and amount of learning you get from this clerkship. We expect you to take that responsibility seriously and “go after” learning experiences.

We try to balance patient care assignments. Since we must use multiple services, and the patient mix within a service can change unpredictably, clinical experiences may vary. Our expectation is that you will use whatever clinical experiences you happen to have as a *starting point* for learning. We supplement clinical experiences with conferences, exercises, and other activities that are relatively standardized across all students throughout the year. In this way, we help each of you build the same explicit “skeleton” of core knowledge and skills in neurology. Beyond these issues, the purpose of your clinical activity is to put those tools into action, and in an individualized way put “meat” on that skeleton.

ACTIVITIES AND SCHEDULES

Planned Activities

- The four weeks are divided into two, 2-week blocks. The first block begins on Monday of week #1 and ends on Friday of week #2. The second block begins Monday of week #3, and ends with the shelf exam in week #4. You are off on Saturday and Sunday between weeks #2/3.
- On the first day you have a morning orientation session, and an afternoon workshop.
- Each week you have didactic teaching conferences Tuesday mornings (8am) and afternoons (3pm) and Thursday mornings (8am).
- You have a teaching conference on the first three Friday afternoons.
- You have a clinical skills small group session one Monday afternoon.
- You will have a bioethics session on a Wednesday afternoon.
- You are released from clinical service after fulfilling your patient care responsibilities the day before the shelf exam.
- On the last day you will take a closed book NBME Neurology Subject Shelf Exam.
- You are expected to round with your assigned services each day that the service rounds, including weekends, and participate in all activities below. Students can expect one day off per week, and one full weekend off in each 4 week block (unless making up other absences).
- Attendance at all teaching activities is mandatory; and will be considered in the class participation portion of your grade.

Absences and Remediation

- E-mail is the required method of communication for all clerkship related issues, including requested absences
- **All absences must be approved by the Neurology Clerkship Director in advance** (except for family/personal emergencies).
- **Requests for expected absences must be received no later than the first day of the clerkship. The Director reserves the right to refuse late requests.**
- As soon as you know that you may need to be absent, it is your responsibility to contact, immediately, the Neurology Clerkship Director and Coordinator by e-mail. **It is inappropriate and unprofessional to commit to an event or make travel commitments before receiving permission for that time off.**
- ACLS training, Admissions Committee Meetings, Applicant Interviews and Tours, and Alumni Association functions are **not** excused reasons for absence from clerkship activities.
- If you have an unexpected illness or family/personal emergency, you must inform the Neurology Clerkship Director and the Coordinator, as well as the resident or attending on your assigned clinical team, as soon as possible.

Any absence will need to be made up on an equal time (day for day) basis. **All requests for absences should include a plan for making up the missed time.** Excessive absences may result in a grade of incomplete or repeating the entire clerkship.

First day of the Clerkship

On Monday of week #1, please meet at 8:00 am in the 4th Floor Camp Heart Auditorium Conference Room. After a brief orientation, you will join your assigned clinical service at 8:30 am (see below). In the afternoon, starting at 3:00 pm, we will reconvene in Ohrstrom Library, 2nd floor, McKim Hall for a conference for all students based on a pretest and review.

ASSIGNMENT	TO MEET UP WITH TEAM FOR THE FIRST TIME
General (inpatient)	Meet up with team in NNICU (Page 1682 if team is not there)
Stroke (inpatient)	Meet up with team in NNICU (Page 1682 if team is not there)
Nerancy Neurological ICU (NNICU)	Meet up with team in NNICU.
Adult Consults	Page adult consult neurology resident (pic # 1317)
Pediatric Neurology	Page pediatric neurology resident (pic # 1555)
UVA Outpatient Neurology (NOPU)	Go to the Neurology Clinic, basement of Primary Care. The nursing staff and residents will orient you, coordinate activities, and identify people for you to work with.

Clinical Activity

- You are expected to round with your assigned services each day that the service rounds, *including the weekends*. If your team rounds on both weekend days, you may “split” a weekend, such that you come on either Saturday or on Sunday.
- On all services, you are expected to behave as a responsible, professional team member.

- As each service dictates, we want you to ask questions, participate in discussions, write chart notes, and assist in patient evaluation and care.
- When assigned patients to follow, you are expected to be knowledgeable about your patients, the progress of their care, and literature/general reading in relevant areas. You are expected to write appropriate daily notes on the patients you follow in the inpatient setting. Please advise your resident that you’ve placed notes for review and countersigning in chart.
- You will be asked to submit the name of attendings and residents to evaluate you. At least one attending (or post-doctoral fellow) is required for each service assignment. These evaluations are the *sole* documentation of your attendance and performance on the clinical services.
- On inpatient UVA services, you should be available on grounds (i.e., in the hospital, library, student lounge, etc.) until 5:00 pm. Students not on call should still try to pick up at least one new patient each day, either by working up an “early” admission or by picking up a patient after morning rounds.

List of Required Patient Complaints and Problems

- A nation-wide accreditation rule known as ED-2 requires all clerkships in all U.S. medical schools to specify—ahead of time—a minimal list of the exact types and numbers of patients that every student must see to pass the clerkship, and must document and oversee that all students comply with this. For the Neurology clerkship, the list of conditions is as follows:

Mandatory Case Exposures

- Limb weakness
- Somatosensory deficit (e.g. Numbness, tingling)
- Gait and/or movement disorder
- Dizziness (e.g. Vertigo, light-headed)
- Specific cognitive loss (e.g. Aphasia, amnesic disorder)
- Altered level of consciousness (e.g. Delirium, coma)
- Headache
- Back and/or neck pain
- Acute stroke and/or intracranial hemorrhage
- Seizures/epilepsy
- **It is your responsibility to seek out and document exposure to all 10 of these problems. You will do that in two ways.**
 - ***FIRST***, when you see a patient that meets any of these 10 items, record the level of exposure and date in your “Passport” (see below). Record the same information online that same day.
 - A single patient may satisfy more than one item (e.g. a stroke patient may have right sided weakness and a walking problem, so you can satisfy two items).

- You must have *at least 5 patient complaints or problems* addressed from seeing live (not simulated) patients during the clerkship.
- **SECOND**, our prepared didactic activities—*problem sets* (see below)—have each been designed to satisfy all 10 items each.
 - The 9 clinical problems cover all 10 items.
 - For each problem set that you complete, record the date in your Passport on the relevant line indicating the item that was addressed.
 - Note that a given problem may satisfy more than one of the 10 items.
- By the end of the clerkship, you must address all 10 patient complaints or problems in these ways. That is, for each patient complaint or problem, you must have addressed it with a problem set and/or a live patient.
- You must document all of the above in your Passport, and you must submit that Passport at the end of the clerkship in order to be eligible for a grade for the clerkship.
- In addition, the School of Medicine requires that you keep track of the same information on-line in a timely manner. The case logging system is accessible through <http://www.med-ed.virginia.edu/patientlogs/login.cfm>. ***Please note that this web-based log is separate from the Passport requirement; completing one form of documentation does not meet the requirements of the other form.***

On-Call

- All neurology clerkship students have one mandatory assigned on-call session.
- The on-call experience is a time for one-on-one interaction with a neurology resident. This can be one of the best learning experiences of the clerkship. Call is intended to be a time to evaluate patients presenting with still undiagnosed neurological problems, and to review and participate in the evaluation and management of neurological emergencies.
- Students on other UVA services will take call with either a General or Stroke service neurology resident.
- On weeknights you should page the junior neurology resident on-call (pic # 1354) by 4:00 pm of your on-call session. From then on you should accompany the on-call junior neurology resident on consults, calls to the emergency department and intensive care units, and assist with emergencies involving neurology patients. To get the most out of the one night on-call, you should be ***with*** the resident and/or intern at all times they are involved in patient care and ***not just available by pager***.
- If the service is quiet, the on-call session may be a good time to have the on-call junior or senior neurology resident discuss the three neurological emergencies on the Passport (see below).
- You are required to stay in the hospital at least until 11:00 pm weekdays and 6 hours after rounds are completed on weekends or until 5 pm, whichever comes first. If the neurology resident does not need your continued help with patient care issues, you may leave at that point.
- Students on the outpatient service (NOPU) will typically be assigned a weekend call date in order to balance learning days across all students. They should round with the consult service (page 1317 to establish meeting time and place). After rounds, contact the resident on call and work with them for the remainder of the day.

The “Passport”

- All students receive a “Neurology Clerkship Passport.” This is a critical document that must be turned in at the end of the clerkship (i.e. no grade without it!)
- The Passport components are valuable feedback and teaching components of the clerkship. The purpose of this format is to give you autonomy in getting feedback and teaching. **It is your responsibility to seek out feedback.** Each required component should be initialed by your residents and/or attendings before turning in the completed Passport. For each two week block an attending should conduct and sign off on the feedback evaluation. (In NOPU, the NOPU resident may sign)
- There may be less time pressure in inpatient rather than outpatient settings for an attending to watch the student perform patient examinations. So, you should approach your inpatient attending or senior resident to coordinate time(s) to do this. It may be easier to do the exam in stages, doing one or a few components at a time. **Avoid waiting until the last two days to complete.**
- Midpoint during each 2-week block is a good point to request feedback from a required attending. By this time, everyone will know one another and attendings will have an idea of your areas of strength as well as areas needing improvement. Please seek out this feedback.
- The on-call experience is a good time to ask the on-call junior or senior neurology resident to go over and sign-off on the neurological emergencies (status epilepticus, coma, acute stroke). If it is a busy day, it may not be possible to review all three, so you may want to do this with a neurology resident on your service.
- The minimal list of patient complaints/problems must be appropriately completed and documented on the passport (see above).
- Observing or attempting a lumbar puncture is optional, but a good idea if you get the chance.

Teaching Sessions

Student Conferences

- Tuesdays and Thursdays, 8:00 - 8:30 am, 4th Floor Camp Heart Auditorium Conference Room.
 - Neurology faculty will present clinically-relevant topics in Neurology.
- Tuesdays, 3:00 – 4:00 pm, Rm. 6410 (6th floor University Hospital).
 - Senior neurology residents review films, neuroanatomy, and clinical correlations.
- Attendance is mandatory for all students. If you are on an inpatient service you will need to see your patients before the 8:00 am conference.
 - Please arrive promptly. Attendance will be recorded at start of each session.

Neurology Grand Rounds

- Fridays at 12:05 - 1:00 pm, Camp Heart Auditorium
- 1st, 2nd, and 3rd weeks. Attendance recommended, not required.

Problem Set Review Sessions

- Fridays at 2:30 - 4:00pm, 1st, 2nd and 3rd weeks, Ohrstrom Library in McKim Hall.
- Enclosed in the Neurology Clerkship Packet is a book with 9 clinical problem sets.
- Each problem has a series of questions. You are expected prepare for these sessions by reading the cases and whatever resources are required to answer these questions, *in advance*. You may use any resources you like (e.g. books, journals, residents, attendings, fellow students).
- Reviewing these problems, reading and thinking about them, and writing responses to the questions are key learning activities in this clerkship. ***Knowing answers to the questions is less important than knowing why they are the answers.***
- Each Friday afternoon, you will meet with a neurology attending to discuss three problem set cases. On week #1, problem sets #1, #2, and #3 will be reviewed. On week #2, problems sets #4, #5, and #6 will be reviewed. On week #3, problem sets #7, #8, and #9 will be reviewed. The problem sets end up addressing all 10 items of the clerkship's minimal list of patient complaints and problems, and if you miss a session for an excused absence you remain responsible for that content.

Clinical Skills Sessions

- Students will be assigned to one of three small groups.
- Each group will meet with Dr. Ivan Login (the associate clerkship director) or his designee for one 2 hour session.
- Students in the group should each choose an adult patient with signs on neuro exam signs that would be valuable and informative to explore in detail. We will not work with pediatric patients.
- ***It is the student's responsibility to obtain - BEFORE THE MEETING - verbal approval from the patient or family to have a small group examine them as a teaching exercise.*** If there are insufficient patients on your service, coordinate access to other potential cases with the senior resident on the inpatient or adult consultation services. **Failure to obtain permission in advance may be construed as unprofessional behavior.**
- At the meeting, 2-4 patients will be selected to examine, depending on complexity.
- Attendance is mandatory at your assigned session and contributes to the class participation element at the grading algorithm.
- Meetings will occur on the second, third and fourth Monday of each rotation at 2:30 pm at the resident lounge facing the elevators between 6C and 6E.

Ethical, Legal, and Social Matters Affecting the Clinical Practice of Neurology Seminar

- 2nd or 3rd Wednesday, 3:30-5:00 (as per your clerkship schedule)
- Center for Biomedical Ethics and Humanities Conference Room, Barringer 5382
- Faculty: Donna Chen MD MPH and Lois Shepherd JD
- Members of the Biomedical Ethics faculty will explore ethical, legal and social matters related to the clinical practice of neurology, and indeed, all of medicine, through a facilitated discussion of prepared clinical case presentations as well as a general discussion of student experiences.

- Case presentations will include aspects of brain death and disorders of consciousness in adults. While working through the presented cases, we will incorporate discussion of students' experiences. Please spend some time thinking about your experiences to date and bring questions, comments, concerns about related clinical situations, interactions with patients and their families, professional roles and responsibilities as medical students, etc.
- To prepare, students should have read the articles listed below.
 - Fins JJ. Rethinking disorders of consciousness: New research and its implications. *Hastings Center Report* 2005;35:22-24.
 - Laureys S. Science and society: death, unconsciousness and the brain. *Nat Rev Neurosci.* 2005 Nov;6(11):899-909.
 - Wijdicks EFM. Determining brain death in adults. *Neurology* 1995;45:1003-1011. (will also be useful for problem sets)
 - Wijdicks EFM et al. Practice parameters: Prediction of outcome in comatose survivors after cardiopulmonary resuscitation (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology* 2006;67:203-210. (will also be useful for problem sets)

Homework

- Homework activities may be assigned by the clerkship director for either regular credit or extra credit. This is in addition to other take-home responsibilities assigned by attendings and residents.
- Homework topics may include case discussions, imaging review, Neurology in the Humanities submissions, etc.

Last Week of the Clerkship

- All students take the required NBME exam. There will be no excused absences from the final day of the clerkship.
- All students are excused from all clinical activities on the last day of the clerkship. Thus, you finish your clinical activities after the last Thursday of the clerkship. (Wednesday, when the shelf exam is on a Thursday)
- Medical School policy requires that all clinical responsibilities be accomplished prior to sitting for the shelf exam. Exceptions may only be granted by Dr. Pearson in Student Affairs.

EVALUATION & GRADES

To obtain a passing grade, all of the following requirements must be met

- 1. Adhere to all applicable University of Virginia and School of Medicine codes of student conduct.**
 - You are on your honor to comply with all clerkship requirements as detailed herein.
- 2. Submit a properly completed Neurology Passport.**
 - see "Activities & Schedules".

3. **Receive a passing score on your OASIS Clerkship Student Evaluation.**
 - These are completed by your service attendings and residents.
 - Any student who receives an overall grade of “marginal” or “unsatisfactory” from any evaluator will be asked to meet with the Clerkship Director to discuss and develop a remediation plan.
4. **You must submit a completed “Student Evaluation of the Neurology Clerkship” form in OASIS.**
5. **You must complete the Clerkship/Faculty Evaluation in OASIS**
 - These are our primary quality control measures; they ensure we are meeting your learning needs and teaching appropriately.
6. **You must pass the local take-home Knowledge/Application exam in Neurology with a score $\geq 70\%$**
7. **You must pass the NBME “shelf examination” in Neurology**
 - A passing score is at or above the national 5th percentile (as defined by NBME for the time period from which the most recently available NBME percentiles were calculated.).
 - For more information on the neurology subject examination from the National Board of Medical Examiners see <http://www.nbme.org/programs-services/medical-schools/subject-examinations/clinical-science-disciplines.html>
 - It is a closed-book, tightly proctored test.
 - The test is on the morning of the last day of the clerkship.
 - *Do not bring backpacks, pagers, cell phones etc. to the exam room.*
 - *Use the bathroom before you enter the exam room.*

Grades

The Clerkship Director will submit, via the OASIS system, a report to the Dean’s office including written description of the student’s clerkship performance. This may comment on professionalism, attendance, and compliance with clerkship’s requirements as appropriate. It may include direct quotations from individual evaluators, summative assessments, qualitative statements, and formative feedback. Both strong points and weak points in performance may be included in the narrative. Except under extenuating circumstances this will be delivered approximately 5-6 weeks after the conclusion of the clerkship.

Clerkship grades will be calculated as follows:

1. Clinical evaluations

- a. Account for 65% of overall grade
- b. Weighted by exposure and evaluator type
 - i. Attendings weight higher than residents
 - ii. PGY-1 evaluations are not included in this weighted calculation, but will be used to support the narrative summary comments
 - iii. OASIS exposure descriptions by time
 1. Extensive (x7)
 2. Moderate (x3)
 3. Minimal (x1)

- c. *Since OASIS defines Superior and Honors levels as representing the top 20% of the class and uses UVa students as the benchmark, most students should expect to obtain a B (typical performance). Only weighted scores of Superior or Honors will qualify to receive an A*
- d. OASIS reports an unweighted arithmetic average of all evaluators, it may therefore vary from the final clerkship evaluation of clinical performance, which is weighted (see above).
- e. The Clerkship Director will not override any individual evaluator's determination of a student's performance for the purpose of grade adjustments.

2. Knowledge/Application exam

- a. 25% contribution to overall grade
- b. Open-book multiple choice exam, subject to Honor Code standards
- c. Usually about 50 case-based questions focus on course objectives
- d. Minimum passing score is 70%
- e. Among passing scores, actual percent correct rather than letter grade equivalent will be used in the final grade calculation. However, a rough approximation of letter grade equivalents on the test is as follows:
 - i. 94-100 = A
 - ii. 90-93 = A-
 - iii. 87-89 = B+
 - iv. 84-86 = B
 - v. 80-83 = B-
 - vi. 77-79 = C+
 - vii. 74-76 = C
 - viii. 70-73 = C-
 - ix. Scores lower than 70 receive no credit and require remediation.
 - x. Adjustments (curve) will be applied if mean <81
 - xi. Item validity and discrimination analyses are performed on all questions on all exam administrations.
 - *Individual students' test scores will not be adjusted on questions answered correctly by $\geq 50\%$ of students on the test administration in question.*
 - Items answered correctly by <50% of students on a test administration are NOT automatically considered invalid

3. NBME Shelf exam

- a. 10% contribution to overall grade
- b. Percentile based on national quarterly adjusted norms from prior academic year
 - i. >80%ile = A
 - ii. 20-79%ile = B
 - iii. 5-19%ile = C
 - iv. Scores <5%ile receive no credit and require remediation

4. Overall Grade:

- a.. To receive a passing grade in neurology, the student
 - i. Must pass NBME ($\geq 5^{\text{th}}$ percentile)
 - ii.. Must pass Neurology Knowledge/Application exam ($\geq 70\%$)

- iii.. Must pass clinical evaluations with weighted performance above “marginal”
- iv... Must complete all other clerkship requirements as noted in the syllabus
- b. If i.-iv. are met, then letter grade is calculated as follows:
 - i. Clinical grade weighted at 65%
 - ii. Knowledge Exam = 25%
 - iii. Shelf exam = 10%
 - iv. Extra credit, if assigned
- c. Final letter grade will be determined solely by these criteria
- d. Requests for grade adjustment after submission to the Dean’s Office can only be considered when there is evidence that erroneous or incorrect data was used in calculation of the final grade.

If any of these requirements for a passing grade are not met, you must see the Neurology Clerkship Director immediately to discuss remediating the clerkship, in part or in total. The final remediation decisions are made by the Medical School’s Student Academic Standards & Achievement Committee, acting on the Clerkship Director’s recommendation.

READINGS

Text for problems sets, online cases, question set, exam preparation, and general study.

- We recommend ***Clinical Neurology, 6th edition*** by Michael J. Aminoff, David A. Greenberg, & Roger P. Simon (2005, McGraw-Hill). Lange series, Available through AccessMedicine on the UVa Library’s site.
- Rich narrative descriptions of neurological phenomena characterize ***Adams and Victor’s Principles of Neurology, 8th Edition*** by Allan H. Ropper, Robert H. Brown (2005.) Available through AccessMedicine on the UVa Library’s site

Neurological Examination

- A particularly excellent, brief, and readable book is ***Neurological Examination Made Easy***, by Geraint Fuller (2004, Elsevier; ISBN 0443074208).

Neuroanatomy

- A nice overview emphasizing the “forest” with mnemonics and clinical focus, is ***Clinical Neuroanatomy Made Ridiculously Simple***, by Stephen Goldberg (2003, Medmaster; ISBN 0940780577)

Neurologic differential diagnosis and localization (Library resources)

- ***Neurological Differential Diagnosis, 2nd Edition***, by John Patton (1996, Springer-Verlag, New York; ISBN: 3540199373).
- ***Localization in Clinical Neurology, 5th edition***, by Paul Brazis, Joseph Masdeu, and Jose Biller (2006, Lippincott Williams, & Wilkins, ISBN 0-7817-9952-X)

More detailed reading about your patients’ conditions

- ***Merritt’s Neurology, 11th edition*** (2005) full text available through UVA Library (R2 Library)

We look forward to working with you over the next month.

David Geldmacher, M.D.
Neurology Clerkship Director
dsg8n@virginia.edu

KarenMarie Vale
Neurology Clerkship Coordinator
kc8d@virginia.edu
ph. 924-5548
2001 McKim Hall