Level: 4th year medical student
Medical Student Coordinator: Jeffrey Reed (412-359-6671, jeff.reed@ahn.org)
Neurosurgical Faculty Coordinator: Dr. Jody Leonardo (412-228-9618, jody.leonardo@ahn.org)
Supporting Faculty: Neurosurgical Attending Staff, Neurosurgical Resident Staff

Course Description: This elective may be taken to either gain exposure to all aspects of neurosurgery functioning as a sub-intern with direct responsibility for patient management and care. The emphasis will be on understanding the nature and consequences of neurological disease and trauma requiring neurosurgical treatment. Participation in the operating room is encouraged and students are expected to observe a variety of intracranial and spinal procedures. A skull base/neuroanatomy laboratory is available for hands on experience.

Goals
- Provide medical students interested in the field of neurosurgery full exposure to all aspects of neurosurgery and/or the opportunity to become a part of the neurosurgical team, functioning as a "sub-intern" under the direct supervision of the attending and neurosurgical residents.

Responsibilities
- The students will actively follow and manage Neurosurgical Intensive Care Unit (NICU) and floor neurosurgical patients under direct supervision of faculty and residents.
- The students will be expected to present thorough patient histories, perform physical examinations focusing on the neurological examination, interpret radiographic images, and put together basic management plans for patients seen in clinic as well as in consultation on the Neurosurgical Service.
- The students will actively participate in surgeries in the operating room and in procedures at the bedside.
- The students will round and write daily progress notes on the patients they operate on/or are assigned to in addition to post-operative notes on operative patients as assigned by the chief residents and/or attending neurosurgeons.
- The students will be expected to attend all clinical conferences, journal clubs, and seminars as indicated on the Department of Neurosurgery Schedule of Events including the Medical Student Lecture Series.
- The student will be expected to attend the Attending Clinics as scheduled.
- The student is encouraged to take call as recommended.

Objectives
- To understand the diagnosis, evaluation, and medical and surgical treatment of neurosurgical diseases and conditions involving the central and peripheral nervous system.
- To perform thorough neurological histories and physical examinations including a focused neurological examination on awake and comatose patients.

- To appreciate the appearance of normal anatomy on imaging modalities and to interpret and understand the appearance of neurosurgical pathology on neurodiagnostic imaging including CT scans, MR imaging, and angiograms.
- To participate and assist in basic neurosurgical bedside procedures and operative interventions.
- To differentiate between diseases of the nervous system that should be treated surgically and those that should be treated by conservative measures or be further evaluated by neurology.
- To understand the neurosurgical interventions available in neuroendovascular patients and become familiar with the different types of interventions.
- To recognize signs of increased intracranial pressure, seizures, post-operative hemorrhages, and sodium disturbances on the floor and NICU patients and to understand management as well as surgical treatments if applicable.
- To become familiar with the basic set-up of a neurosurgical operating room and the roles of the operative staff.
- To understand the basic surgical approaches to the cranium and spine including indications, peri-operative, and post-operative care.

Rotation Resources
- AHN Neurosurgical Resident Handbook (Contains updated Phone List of Faculty, PA, resident cell phones/pagers)
- Department of Neurosurgery Conference Schedule (Required activities will be highlighted)
- Department of Neurosurgery Call Schedule
- Attending Clinic Neurosurgical Medical Student Monthly Schedule

Learning Resources
- Handbook of Neurosurgery, Mark S. Greenberg, Thieme (Recommended)
- Outside reading throughout the sub-internship is required as directed

Additional Resources
- Additional Surgical Texts and Resources available in AGH Library (First Floor)
- AHN Neurosurgical Interest Group

Additional Requirements
- **Presentation:** Sub-interns are required to prepare a 15 to 20 minute presentation and present it to the residents and faculty during an assigned time near the end of your rotation.
- **Call Requirements:** Every 4 to 6 days (recommended); medical students must abide by Neurosurgical Resident Work Hour Limitations.

Evaluations
- **Skills Assessed:** Neuroscience knowledge base, technical abilities in basic neurosurgical interventions, ability to complete objectives efficiently in a professional and collegial

manner pertaining to interactions with peers, attending physicians, residents, and all other staff.

- ○ **Process:** Fulfillment of the goals and objectives described.

- ○ **Evaluator:** Course director with direct input from Neurosurgical attending physicians and residents.

- ○ **Method of Grading:** Standard Evaluation Form as provided by Medical School.

- ○ **Feedback to Students:** Formative feedback provided verbally mid-rotation and upon completion of course.

- ○ **Feedback from Students:** Formative feedback provided via means of written evaluation of course distributed by Course Director.

Research in neurosurgery
4th year medical student
Students may work with a faculty member on a research project that is either clinical or laboratory based. This elective must be set up in advance so that the student can be paired with an appropriate faculty mentor to facilitate their project.

3rd Year Surgical Rotation (Neurosurgical Elective)
- *Available to Drexel University College of Medicine and Temple University Lewis Katz School of Medicine students only. Please see your Surgical Rotation course descriptions for additional information.*