Medical College of Wisconsin

Department of Neurosurgery

Resident Handbook
(updated 6/2019)
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Resident Handbook

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Introduction

The Department of Neurosurgery at the Medical College of Wisconsin provides a broad-based subspecialty, hands-on training program. Residents are exposed to a large volume of clinical cases, covering the full depth and breadth of neurosurgical practice. Operative experience begins early in training. This is supplemented by exposure to and involvement with internationally renowned neurosurgical researchers, utilizing our extensive departmental research resources. This training takes place in a supportive, collegial atmosphere in a major Midwestern city. Our facilities include a nationally recognized children’s hospital, a large tertiary care center with an active trauma center, a Veterans’ Affairs Administration hospital that is a regional referral center, and exceptional departmental research facilities.

The Neurosurgical Residency Program at the Medical College of Wisconsin is a seven-year program under the direction of the Department of Neurosurgery, the Medical College of Wisconsin, and the Office of Graduate Medical Education. Graduates of this residency program have gone on to become leading clinicians and researchers in the profession.

Educational Goals of the Program

The primary goals of the Medical College of Wisconsin Neurosurgery Residency Program are to produce knowledgeable, skilled, safe, humanitarian, and collegial neurosurgeons that can contribute to their community and to their profession. These men and women are bright, dedicated, and enthusiastic. Providing them with the knowledge and experience necessary to achieve board certification and the education and training to master the six core competencies set by the ACGME, (Medical Knowledge, Patient Care, Practice-based Learning and Improvement, Systems-based Practice, Professionalism, and Interpersonal & Communication Skills), will allow the graduating resident his or her choice of career pathway, including academic practice, private practice, or additional sub-specialty fellowship training.

Application to the Program and Selection of Residents

Our program only accepts applications through the Electronic Residency Application Service (ERAS) and the match is done through the National Residency Match program (NRMP). Details for each process are at their websites, https://students-residents.aamc.org/ and http://www.nrmp.org/. We accept applications from mid-September through October. The Department reviews applications and offers invitations to interview to selected applicants. There are four, one-day interview dates from which to choose. Candidates have the opportunity to have dinner with current residents the evening before their selected interview date. Interviews are usually in November and December each year.

Candidates meet a number of faculty members on the day of the interview. They will also have a guided tour of the hospitals and research facilities. At the conclusion of candidate interviews, the faculty and residents discuss all candidates based upon personal interviews and information provided in their application. The final rank list is submitted to the NRMP for processing to match one or two positions per year. On Match Day, the Program Director contacts the matched candidate(s).
### Block Schedule

#### Model Rotation Block

<table>
<thead>
<tr>
<th>PGY</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
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<td>VA Chief</td>
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<td>FMLH Chief</td>
<td>FMLH Chief</td>
</tr>
<tr>
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<td>Research</td>
</tr>
<tr>
<td>4</td>
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<td>FMLH Sr</td>
<td>Elective</td>
<td>Elective</td>
</tr>
<tr>
<td>3</td>
<td>FMLH Jr</td>
<td>FMLH Jr</td>
<td>Interventional/GK</td>
<td>FMLH Jr</td>
</tr>
<tr>
<td>2</td>
<td>NCC</td>
<td>CHW</td>
<td>FMLH Jr</td>
<td>FMLH Jr</td>
</tr>
<tr>
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<td>FMLH NS Intern</td>
<td>Neuroscience</td>
<td>CHW</td>
<td>Trauma/Peds</td>
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</tbody>
</table>

FMLH=Froedtert Memorial Lutheran Hospital, VA=Veterans Administration Medical Center, GK=GammaKnife, NCC=Neurocritical Care, NS=Neurosurgery, CHW=Children’s Hospital of Wisconsin

This Model Rotation Block is used as a guide for a resident’s training program. Rotations are adjusted based on changes in Training Requirements, individual resident interests, and resident numbers. Below are 2 rotation blocks of recent graduates that illustrate this flexibility.

#### Actual Rotation Block A

<table>
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<tr>
<th>PGY</th>
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<td>VA Chief</td>
</tr>
<tr>
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<td>FMLH Sr</td>
<td>FMLH Sr</td>
<td>Interventional/GK</td>
<td>NCC</td>
</tr>
<tr>
<td>4</td>
<td>Research</td>
<td>Research</td>
<td>Research</td>
<td>Research</td>
</tr>
<tr>
<td>3</td>
<td>FMLH Jr</td>
<td>Neuropath/radiology</td>
<td>CHW</td>
<td>CHW</td>
</tr>
<tr>
<td>2</td>
<td>CHW</td>
<td>FMLH Jr</td>
<td>FMLH Jr</td>
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<tr>
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<td>NCC/neurovascular</td>
<td>Gen surg/ENT/trauma</td>
<td>Anesthesia/vascular/peds</td>
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#### Actual Rotation Block B

<table>
<thead>
<tr>
<th>PGY</th>
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<th>Q4</th>
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<td>Elective</td>
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<td>NCC</td>
<td>Interventional/GK</td>
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<td>4</td>
<td>Research</td>
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<tr>
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<td>GK</td>
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<td>FMLH Jr</td>
<td>CHW</td>
<td>Neuroradiology</td>
</tr>
<tr>
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<td>FMLH NS Intern</td>
<td>NCC</td>
<td>ENT/trauma/peds</td>
<td>Anesthesia/vascular/gen surg</td>
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</table>
Resident Supervision

The Neurosurgery Residency Program follows MCWAH’s Institutional Policy, Supervision of Housestaff, which is on the MCWAH InfoScope site.

Additional program-specific guidelines are as follows:

- Residents may perform inpatient or outpatient consultations on a routine or emergency basis. The resident will communicate with the chief resident (if applicable) and supervising faculty regarding the patient's condition and diagnostic studies to formulate treatment plans. The faculty will directly confirm the examination and interpretation of imaging studies as needed. Communication with faculty should occur at the time of initial consultation for critically ill or unstable patients, patients with unexpected deterioration, patients with need for ICU care, and patients under consideration of surgery, or when requested by patient or family members.
- Residents may perform daily assessment of hospitalized patients. Communication with faculty should occur for critically ill or unstable patients, patients with unexpected deterioration of condition, patients with need for ICU care, and patients under consideration of surgery, deaths, or when requested by patient or family members. Faculty will evaluate patients daily or more frequently as needed to confirm resident assessments and collaboratively establish treatment plans with the residents.
- No major or minor procedures are performed without discussion and approval of the attending physician. Residents may perform procedures when their skill level has been determined to be "independent" for the procedure. Otherwise, the procedure must be directly supervised by the faculty, or by another resident with skill at the "instructor" level for that procedure.
- Patients requiring admission to the hospital must be discussed with the attending faculty as outlined above or with the chief resident when above conditions do not apply.
- The resident will provide documentation of faculty participation in patient care in the medical record. Faculty will provide documentation of their participation in patient care in the medical record.
- All residents will comply with hospital policies and procedures as they pertain to patient care and documentation.
- In the Department of Neurosurgery, the default level of supervision is Direct, unless the patient’s attending neurosurgeon has previously designated otherwise.
Transitions of Care

The Neurosurgery Residency Program follows MCWAH’s Institutional Policy, Transitions of Care found on the MCWAH InfoScope site.

Additional program-specific guidelines are as follows:

- Froedtert Memorial Lutheran Hospital:
  - Morning rounds - All in attendance will have an updated patient list printed daily each morning prior to beginning AM rounds. Overnight events/consults/operations/new patients and pertinent lab/radiology findings are discussed with FMLH chief, residents, rotating interns, medical students, etc. This is followed by rounds to see patients, discuss plans for the day, and integrate care with the mid-level provider team. The chief and senior residents will communicate with the attending neurosurgeons regarding their patients during this time and update the plans for each patient. Similar sessions of updating the patient list occur throughout the day between the residents and the mid-level providers.
  - Evening sign-out - This will occur when the resident covering the night is available to meet with the FMLH resident holding the ‘hot’ pager. The chief resident will be present unless otherwise unavailable. Each patient will be discussed in detail including events of the day, pertinent lab and radiology findings, and plans for the following day/future. The chief resident will contact the resident holding the pager for any updates if unable to attend the evening sign-out.

- Children’s Hospital of Wisconsin/Clement J Zablocki VA Medical Center:
  - Weekdays - Designated CHW junior resident coverage from 5:30 AM to 5:30 PM unless CHW resident is post-call. Then this responsibility is assumed by the CHW PA staff during that day. VA coverage: Monday through Friday during the day will be handled by the designated VA resident.
  - Weeknights - CHW resident/PA will sign out to on call resident at approximately 5:30 PM. A written handoff tool is maintained within the electronic medical record. The handoff will include both verbal and written transmission of information. Similar discussion will take place between the VA resident and the overnight on call resident. Overnight events/consults/new admits/surgeries are then discussed in similar fashion the following morning between the overnight resident and the designated CHW/VA resident or CHW PA.
  - Weekends - On call resident is pager call for CHW and VA from Friday 6PM until Monday 6AM. Sign-out occurs as described above on Friday evening and again on Monday morning. During weekends, the same resident will cover the VA as well. Sign out from the VA resident will occur on Friday evening, usually via phone. Patient information including diagnosis, exam, pertinent lab and radiology findings, plan, and attending physician is shared for each patient. Similar sign-out will occur between the weekend resident and the VA resident on Monday AM. Please see Addendum E.

The Neurosurgery Residency Program will assess residents on their utilization of the standardized transitions of care process and their communication skills using regularly administered departmental evaluations.
Program Evaluation Committee (PEC)

The Neurosurgery Residency Program follows MCWAH’s Institutional Policy, Program Evaluation Committee on the MCWAH InfoScope site.

Additional program-specific guidelines are as follows:

- Membership shall include the department chair, residency program director, associate program director, and a senior resident (who will serve a term of 1 year) and a mid-level resident.
- The PEC will meet at quarterly each year. Minutes of each meeting will be taken by the program coordinator and distributed to all members.
- The PEC will:
  - plan, develop, implement, and evaluate the educational activities of the Neurosurgery Residency program;
  - review and make recommendations for revision of curriculum goals and objectives;
  - address areas of non-compliance with the requirements of the Accreditation Council for Graduate Medical Education (ACGME);
  - conduct an annual program evaluation (APE) and monitor program progress in addressing areas in need of improvement identified during the APE.

Clinical Competency Committee (CCC)

Programs must comply with the MCWAH policy, Clinical Competency Committee. Should there be a conflict between the MCWAH policy and the program information outlined below, MCWAH’s policy takes precedence.

- The program director appoints the Clinical Competency Committee.
- At a minimum, the Clinical Competency Committee is composed of three members of the program faculty, including the department chair and residency program director.
  - Others eligible for appointment to the committee include faculty from other programs and non-physician members of the health care team.
- The responsibilities of the Clinical Competency Committee include:
  - review of all resident evaluations semi-annually;
  - preparation and reporting of Milestones evaluations of each resident semi-annually to ACGME;
  - advising of the program director regarding resident progress, including promotion, remediation, and dismissal.
Evaluation Process

The Neurosurgery Residency Program follows MCWAH’s Institutional Policy, Evaluation of Housetaff on the MCWAH InfoScope site.

Additional program-specific guidelines are as follows:

1. **Evaluation of Residents**

   **Evaluation of Residents by Neurosurgery Faculty (every six months)**

   Every six months a resident evaluation form is sent to the Neurosurgery clinical faculty via the Society of Neurosurgery Portal. A milestone evaluation of all core competencies (patient care, medical knowledge, systems-based practice, practice-based learning and improvement, professionalism, and interprofessional and communication skills) is completed for each resident based on their rotation-specific discipline over the past six months. Free text for refinement and elaboration is also collected. The numerical ratings are collated and trended. The Clinical Competency Committee (CCC) then meets to review the evaluations. Other elements of the resident performance are reviewed including primary written board examination, conference attendance, research progress, teaching and administrative responsibilities. The resident operative logs for the time-period are also reviewed. Based on all the information, milestone levels are set for each resident and submitted to the ACGME. The evaluations are reviewed with each resident individually by the program director and documented in a written report.

   **Evaluations of Residents by Non-Neurosurgery Clinical Faculty (at the completion of non-neurosurgery clinical rotations)**

   One week before a resident completes a non-neurosurgery clinical rotation, the non-neurosurgery clinical faculty responsible for the rotation receives an evaluation form via New Innovations software. A 10-point rating system for core categories and free text for refinements and elaborations is used. The numerical ratings are collated and trended. The evaluations are discussed with the residents during the individual evaluation meetings with the program director.

   **360 evaluation of the residents by self, peers, mid-levels and other staff.**

   Every six months resident peers, mid-levels and other staff are invited to evaluate each resident using a 360-evaluation form in New Innovations. Residents evaluate themselves using this form as well. Free text for refinement and elaboration is also collected on this form. This information is collected and reviewed by the CCC at their biannual meetings.

   **ABNS Written Board Examination**

   Residents will sit for the examination for self-assessment during the PGY-2 year. They will continue to take the examination yearly for self-assessment until a passing score is attained. The following year they will take it for credit. The exam scores are reviewed by the CCC at their biannual meetings.

2. **Evaluation of Faculty**

   Annually, residents perform anonymous evaluations of each of the faculty members via New Innovations software. The program director cannot determine which resident made any comments about a faculty. The tool includes numerical ratings of core categories and free text for elaboration. The department chair and program director review the results.

3. **Loop Closure**
Bimonthly meetings are held with all the residents (in a group) with the program director, associate program
director, and program coordinator. Discussions regard anything related to the residency program, including, but not
limited to: rotations, policies, duty hours, on-call schemes, and conferences. In addition, the program director and
associate program director are respectively readily available throughout the year to address questions or concerns
regarding program activities or personal issues.

Work Hours (Duty Hours)

The Neurosurgery Residency Program follows MCWAH’s Institutional Policy, Work Hours on the MCWAH
InfoScope site.

Additional program-specific guidelines are as follows:

Residents are expected to log their hours in New Innovations within two days of working.

Maximum Hours of Clinical and Educational Work per Week

- Work hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-
  house clinical and educational activities, clinical work done from home and all moonlighting.

Mandatory Time Free of Clinical Work and Education

- Residents should have eight hours off between scheduled clinical work and education periods.
- Residents must have at least 14 hours free of clinical work and education after 24 hours of in-house call.
- Residents must be scheduled for a minimum of one day in seven free of clinical work and required
  education (when averaged over four weeks or month in a month-long rotation). At-home call cannot be
  assigned on these free days.

Maximum Clinical Work and Education Period Length

- Clinical and educational work periods for residents must not exceed 24 hours of continuous scheduled
  clinical assignments.
  - Up to four hours of additional time may be used for activities related to patient safety, such as
    providing effective transitions of care, and/or resident education.
    - Additional patient care responsibilities must not be assigned to a resident during this
      time.
- Exceptions: In rare circumstances, after handing off all other responsibilities, a resident, on their own
  initiative, may elect to remain or return to the clinical site in the following circumstances:
  - To continue to provide care to a single severely ill or unstable patient;
  - Humanistic attention to the needs of a patient or family; or,
  - To attend unique educational events.
  These additional hours of care or education will be counted toward the 80-hour weekly limit
  - document the reasons for remaining to care for the patient in question and submit that
    documentation in every circumstance to the program director. This should be documented in New
    Innovations and the Program Director will review and if the violation is justified, it will be
    removed from the duty hour log.
  - The program director will review each submission of additional service, and track both individual
    resident and program-wide episodes of additional duty.

Maximum Frequency of In-House Night Float

- The Program does not currently use a night float system. However, should one be implemented:
  - Night float must occur within the context of the 80-hour and one day of in seven requirements.
Maximum In-House On-Call Frequency

- Residents must be scheduled for in-house call no more frequently than every third night when averaged over a four-week period.
At-Home Call

- The frequency of at-home call is not subjected to the every third night limitation, but must satisfy the requirement for one day in seven free of clinical work and education when averaged over four weeks.
- Time spent on patient care activities by residents on at-home call must count toward the 80-hour maximum weekly limit.
- At home call must not be so frequent or taxing as to preclude rest or reasonable personal time for each resident.
- Residents are permitted to return to the hospital while on at-home call to provide direct care for new or established patients. These hours of inpatient care must be included in the 80 hours maximum weekly limit.

Residents are expected to notify the chief resident, attending or program director if they are concerned they may soon violate a duty hour rule.
1. The clinical rotation schedule will be made by the Program Director (PD). All requests regarding elective rotations should be submitted in writing to the PD. All adjustments to the clinical rotation schedule will be at the discretion of the PD with input from the Clinical Competency Committee.

2. The monthly call schedule will be created by the Chief Resident (CR) with the approval of PD. The monthly call schedule will be disseminated no later than 2 weeks prior to the first day of the relevant month. Any requests for alterations in the schedule should be made in writing to the CR and made transparent to everyone. Except for the Chief Resident, all residents are expected to be on call and have generally equivalent call schedules each month. (When the compliment of housestaff permits, the call burden of the resident on the research year will decrease or be eliminated.)

3. Programs must comply with the MCWAH leave policies outlined in the MCWAH Housestaff Handbook. Should there be a conflict between a MCWAH policy and the program information outlined below, MCWAH’s policy takes precedence.

4. Points of emphasis from the MCWAH Housestaff Handbook (2015-2016) include:
   a. Housestaff are considered to be available to be scheduled 365 days a year including all religious and secular holidays. Due to variations among programs’ training and clinical requirements, requests for time off will be granted based on specific policies of each program regarding scheduling, requesting time off and vacation.
   b. Housestaff are allowed annual paid vacation of three weeks. Vacation time is not cumulative from year to year.
   c. Housestaff (PGY-2 and above) are allowed up to one week of educational leave, without interruption of pay or benefits, contingent upon the approval of the PD. Educational leave time is not cumulative from year to year. [We refer to these as “academic days”].

5. There will be a semi-annual meeting (Spring and Fall) between the PD/PC and the housestaff for scheduling vacation time. In Spring (April/May), the meeting will allocate vacations for the following July-December. In the Fall (October/November), the meeting will allocate for the following January-June. Incoming residents will submit their requests shortly after arrival for the July-December block.

6. Vacation requests will be for a contiguous 7-day block, Monday through Sunday. The ability to break up a week may be done for one of the three weeks for a valid reason (e.g. job interviews) at the discretion of the PD. The resident will not be post-call on the first day of vacation but is likely to be on duty the Saturday prior to vacation.

7. Time away for job interviews may require the use of vacation time or monthly off-days.

8. Resident vacations generally cannot overlap, however exceptions can be made at the discretion of the PD. If there are conflicting contemporaneously requested vacation requests, they will be awarded based on seniority.

9. Vacations are limited to no more than one 7-day block during a clinical rotation unless that rotation exceeds 3 months, in which case the vacation weeks should not be within the same 3-month period. Exceptions can be made at the discretion of the PD. Not all 3 weeks of vacation can be taken within the same 6 months (maximum of 2 weeks’ vacation in one 6-month period.

10. Vacations can be taken during any neurosurgical rotation. If vacation time is desired while on a rotation within another department, written permission must be obtained from that department and provided to the PD/PC.

11. Vacations will not be permitted during the 1st two weeks of July, the last 2 weeks of June, the weeks of the main AANS and CNS meetings, the week of the board exam, the weeks of Thanksgiving and Christmas, and the week of the Chicago Review Course in Neurosurgery. Exceptions can be made at the discretion of the PD.

12. Holiday call days will be tracked by the PD/PC. These will include July 4, Labor Day, Thanksgiving, Christmas Eve, Christmas Day, New Year’s Eve, New Year’s Day, and Memorial Day. These counts will be provided to all the residents on a regular basis and used by the PD/PC to encourage a relatively even distribution of holiday call.

13. If a resident would prefer to observe other holidays (e.g. Yom Kippur, Eid al-Fitr), the program will try to accommodate the request with the expectation that said resident would be more likely to cover other holidays to compensate his/her peers. These alternate holidays would also be monitored by the PD.
14. Efforts will be put forth to have the holiday/religious observation day(s) schedule set for the AY by July 1st of each year.
15. Sick days will be tracked by the PD/PC. Residents should notify the PD, CR and PC when a sick day is being taken. Residents must adhere to the Neurosurgery Residency Sick Leave Policy. See Addendum A.
16. Academic Days, as noted on 4c above, may be used for courses, non-working conference attendance, as well as interviews days. Seven academic days are available each year for PGY 2 residents and above. Unused time does not rollover.
17. Residents who have passed their boards are expected to cover call the day before and the day of the board exam. If there are not enough passed residents to cover the two days of call for all the services, residents who are not taking the exam for credit may be required to take call as well.
18. Certain courses will be provided throughout the residency. These currently include but are subject to change based on evolving curriculums: SNS Boot Camp (2 days, PGY-1), AANS Junior Residents Course (3 days, PGY-1), SNS RUNN Course (7 days, PGY-3, 4 or 5), ABNS Board Review Course (10 days, variable PGY, same year as taking primary exam for credit). See Addendum B for information on how to request to attend a course.
19. Residents are encouraged to submit research to the major neurosurgical meetings (AANS, CNS, Joint Section Meetings). Exceptions can be made by the PD for major non-AANS/CNS affiliated meetings. The goal is for each resident to submit to at least one conference each academic year.
20. If a presentation is accepted, the resident may attend the meeting. If the resident is already exceeding the allotted one week of academic leave for the year (this includes the provided courses in #16), he/she may stay for only one night either before or after the presentation to minimize time away.
21. Any additional time away for meetings beyond the 7-day limit will require use of vacation time or off-days within a given month.
22. Reimbursement for expenses from meetings (excluding provided courses above in #16) will be limited to $3000/meeting, and $4500/resident/year.
23. No more than 2 residents can attend the same meeting. All meeting submissions must be sent first to the PD/PC to prevent conflicts at least one month prior to the abstract deadline; these requests if approved should then immediately go to the CR. Conflicts will be prioritized by seniority if more than 2 abstracts are submitted by this deadline. Within a month of the abstract deadline, submissions will be prioritized by timeliness of submission. Exceptions can be made at the discretion of PD.
24. During the PGY-7 year, the CR(s) may attend a major meeting without the requirement of a presentation, with the same restriction of no more than 7 days total academic leave. If there are two CRs, they cannot attend the same full-length meeting.
25. Regional cadaver labs/workshops participation will also be tracked by the PD/PC. These courses are encouraged for all residents. Once residents have attended a course it will be expected they cover call during subsequent courses as needed to allow other residents to attend the same in following years.
26. Please note for all courses/conferences – Courses requiring more than a nominal registration fee will not be approved. Residents will be allowed to attend 1 traveling course per calendar year unless approved otherwise. See Addendum B for information on how to request to attend a course.

Publishing Support

1. Publishing fees less than or equal to $200 will be reimbursed without requiring approval.
2. Fees greater than $200 will require endorsement by a faculty member and review by the PD.
   a. Article processing charges >$200 will not be reimbursed for journals with impact factors <1.0.
   b. Extra fees for supplementary material (e.g. video), color photographs, etc. to journals with measurable impact factors (>0.3) will be reimbursed.
   c. Extra fees to make an article open access, will not be approved.
Moonlighting

The Neurosurgery Residency Program follows MCWAH’s Institutional Policy “Moonlighting” which can be found on the MCWAH InfoScope site.

Additional program-specific guidelines are as follows:

The MCWAH Moonlighting Policy gives the program director the discretion to prohibit moonlighting for all housestaff in his/her program. The program director has determined that moonlighting by Neurosurgery Residents is not permitted.

Other MCWAH Institutional Policies

Other MCWAH Institutional Policies are at https://infoscope.mcw.edu/GME-Intranet/MCWAH-Institutional-Policies.htm, including the following policies.

- Accommodation for Disabilities (PDF)
- Alcohol and Controlled Substance Abuse (PDF)
- Annual Institutional Review (AIR)
- Appeal of Adverse Academic Decisions (PDF)
- Combined Programs with Components Individually Accredited (PDF)
- Complaints and Grievances by Housestaff Regarding the Educational and Professional Environment (PDF)
- Designated Institutional Official (DIO) (PDF)
- Educational Resources Committed to a Program
- Eligibility and Selection of Residents and Fellows
- Eligibility Exception Committee
- Encryption for Electronic Protected Information- Mobile Devices
- Evaluation of Faculty
- Fitness for Duty Evaluations (PDF)
- Graduate Medical Education Committee (GMEC)
- Harassment or Discrimination
- Health Care Industry Product Interactions
- Housestaff Fatigue
- Housestaff Health and Welfare Committee (HHWC) (PDF)
- Housestaff Substandard Performance (PDF)
- Immunization and TB Testing
- Intellectual Property
- Licensure Requirements for OMS
- Licensure, Resident Educational License and DEA Number Requirements
- Management of Substandard Housestaff Performance (PDF)
- Non-Competition Guarantee
- Offsite Elective Rotation
- Part-Time Housestaff Training
- Professional Behavior
- Professional Personal Appearance
- Program Administration
- Program Director Qualifications and Responsibilities (PDF)
- Program or Sponsoring Institution Reduction/Closure
- Records and Record Retention
- Scholarly Activity
- Social Media Policy
- Support For GME Programs During Disasters
- Teaching of Medical Students by Housestaff
- Transfers to and from Graduate Medical Education Programs
- Vacation and Leave of Absence
- Visiting Housestaff Rotations
ACGME Case Logs

Each resident must record, in the ACGME Case Log System, the number and type of each procedure he or she performs as either assistant resident surgeon, senior resident surgeon, or lead resident surgeon. Resident cases must be entered into the ACGME Case Log System. Residents must indicate their major role in each case: assistant resident surgeon, senior resident surgeon, or lead resident surgeon. The definitions for these roles are:

- **Assistant resident surgeon**: includes positioning, sterile preparation, monitoring devices, microscope preparation, participation in the initial (opening) or final (closing) portions of the case, and/or assisting the resident or staff surgeon(s). **This category does not accrue case numbers for residents.**
- **Senior resident surgeon**: may include aspects of all of the above and must include participation in the surgical procedure between opening and closing.
- **Lead resident surgeon**: may include aspects of all of the above and must include participation in the critical portion of the case.

To claim a case, a resident must ‘scrub in’ (i.e., scrub hands, use sterile gloves, with or without gown). There can be several residents per case but each resident may claim only one role per case (assistant, senior, or lead). There can be only one lead resident surgeon per case, but the assistant and senior resident roles are not limited in number per case. Each resident may enter one or more CPT codes per case but may claim credit for only one CPT code per case. If two residents participated in the same case, each resident may claim the same CPT code for credit for that case as appropriate and as long as the claimed roles are not the same.

**Only those cases completed in the role of senior resident surgeon or lead resident surgeon will count towards the required minimum Case Log numbers.** However, the Review Committee expects that the Case Log data will demonstrate increasing participation and progressive responsibility. Programs must monitor the accurate and timely entry of cases into the system. As part of monitoring resident progress towards developing competence in surgical skills, cumulative operative experience reports should be generated from the Case Log System and reviewed with each resident as part of his or her semiannual review.

The Review Committee defines a pediatric patient as one who is less than 18 years old at the time of the procedure. An adult patient is defined as one who is 18 years or older at the time of the procedure. A pediatric patient who is 18 years or older at the time of a follow-up procedure must be logged as an adult patient.

**Defined Case Categories and Minimum Numbers**

<table>
<thead>
<tr>
<th>Senior+Lead Cases</th>
<th>Lead Cases</th>
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</thead>
<tbody>
<tr>
<td>Adult Cranial</td>
<td>300</td>
</tr>
<tr>
<td>Adult and Pediatric Epilepsy</td>
<td>10</td>
</tr>
<tr>
<td>Adult Spinal</td>
<td>300</td>
</tr>
<tr>
<td>Pediatric</td>
<td>40</td>
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<tr>
<td>Critical Care</td>
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</tr>
<tr>
<td>Total All Defined Case Categories =</td>
<td>800</td>
</tr>
<tr>
<td>o Intradural Microdissection</td>
<td>--</td>
</tr>
</tbody>
</table>

14
ACGME Neurological Surgery Milestones

**Patient Care 1: Brain Tumor**

**Level 1**
- Performs a history and physical examination in patients with a brain tumor
- Places an external ventricular drain; assists with set-up, opening, and closing for brain tumor craniotomies
- Provides routine peri-operative care for brain tumor patients

**Level 2**
- Explains the risks and benefits of craniotomy for brain tumor
- Assists with routine craniotomy for brain tumor
- Recognizes and initiates work-up of routine complications (e.g., air embolism, CSF fistula, hematoma)

**Level 3**
- Formulates a diagnostic and treatment plan for a patient with a brain or spinal cord tumor
- Performs routine craniotomy for brain tumor; assists with complex craniotomy for brain tumor
- Manages routine complications and recognizes complex complications (e.g., refractory cerebral edema, major vascular injury)

**Level 4**
- Adapts standard treatment plans and techniques to special circumstances (e.g., recurrence, bone marrow suppression)
- Performs complex craniotomy for brain tumor; assists with advanced craniotomy for brain tumor
- Manages complex complications

**Level 5**
- Leads discussion at an interdisciplinary tumor board
- Performs advanced craniotomy for brain tumor
- Utilizes patient outcome data for quality improvement or the development of adjunctive therapy protocols

**Patient Care 2: Surgical Treatment of Epilepsy and Movement Disorders**

**Level 1**
- Performs a history and physical examination in patients with epilepsy or movement disorders
- Performs stereotactic frame placement or frameless navigation registration; assists with set-up, opening, and closing for functional neurosurgical procedures
- Provides routine peri-operative care for movement disorder and epilepsy patients

**Level 2**
- Explains the risks and benefits of functional neurosurgical procedures
- Assists with routine functional neurosurgical procedures
- Recognizes and initiates work-up of routine complications (e.g., seizures, device infection)

**Level 3**
- Formulates a diagnostic and treatment plan for a patient with epilepsy or a movement disorder
- Performs routine functional neurosurgical procedures; assists with complex functional neurosurgical procedures
- Manages routine complications and recognizes complex complications (e.g., status epilepticus, dystonia)

**Level 4**
- Adapts standard treatment plans and techniques to special circumstances (e.g., Parkinson’s plus, multifocal epilepsy)
- Performs complex functional neurosurgical procedures; assists with advanced functional neurosurgical procedures
- Manages complex complications

**Level 5**
- Leads discussion at an interdisciplinary epilepsy center patient management conference
- Performs advanced functional neurosurgical procedures, including interpretation of electrophysiological data
• Utilizes patient outcome data for quality improvement; designs care pathways for epilepsy or movement disorder patients

**Patient Care 3: Pain and Peripheral Nerve Disorders**

**Level 1**
- Performs a history and physical examination in patients with chronic pain or a peripheral nerve disorder
- Interrogates and programs implanted devices; assists with set-up, opening, and closing for chronic pain and peripheral nerve procedures
- Provides routine peri-operative care for chronic pain or peripheral nerve disorder patients

**Level 2**
- Explains the risks and benefits of chronic pain and peripheral nerve procedures
- Assists with routine chronic pain and peripheral nerve procedures
- Recognizes and initiates work-up of routine complications (e.g., implanted device failure or infection)

**Level 3**
- Formulates a diagnostic and treatment plan for patients with chronic pain or peripheral nerve disorders
- Performs routine chronic pain and peripheral nerve procedures; assists with complex chronic pain and peripheral nerve procedures
- Manages routine complications and recognizes complex complications (e.g., intrathecal drug overdose or withdrawal)

**Level 4**
- Adapts standard treatment plans and techniques to special circumstances (e.g., cancer pain, deafferentation pain)
- Performs complex chronic pain and peripheral nerve procedures; assists with advanced chronic pain and peripheral nerve procedures
- Manages complex complications

**Level 5**
- Leads discussion at an interdisciplinary case conference or specialty clinic for chronic pain or peripheral nerve disorder patients
- Performs advanced chronic pain and peripheral nerve procedures
- Utilizes patient outcome data for quality improvement; designs care pathways for chronic pain or peripheral nerve disorder patients

**Patient Care 4: Spinal Neurological Surgery**

**Level 1**
- Performs a history and physical examination in patients with degenerative, traumatic, or neoplastic spinal disorders
- Implements spinal bracing or traction; assists with set-up, opening, and closing for spinal surgery procedures
- Provides routine peri-operative care for spinal surgery patients

**Level 2**
- Explains the risks and benefits of spinal surgery
- Assists with routine spinal surgery procedures
- Recognizes and initiates work-up of routine complications (e.g., pain, surgical site infection)

**Level 3**
- Formulates a diagnostic and treatment plan for a patient with degenerative, traumatic, or neoplastic spinal disorders
- Performs routine spinal surgery procedures; assists with complex spinal surgery procedures
- Manages routine complications and recognizes complex complications (e.g., myelopathy, cerebrospinal fluid (CSF) leak, instrument failure/malposition)

**Level 4**
- Adapts standard treatment plans and techniques to special circumstances (e.g., spinal deformity, post-irradiated spine, or infection)
- Performs complex spinal surgery procedures; assists with advanced spinal surgery and reconstructive procedures
• Manages complex complications

**Level 5**
• Leads discussion at an interdisciplinary spine case conference or specialty clinic
• Performs advanced spinal surgery and reconstructive procedures
• Utilizes patient outcome and registry data for quality improvement and treatment selection

**Patient Care 5: Vascular Neurological Surgery**

**Level 1**
• Performs a history and physical examination in patients with ischemic or hemorrhagic stroke or vascular neurosurgical disorders
• Manages and obtains CSF samples from external ventricular drains; assists with set-up, opening, and closing for vascular neurosurgical and endovascular procedures
• Provides routine peri-operative care for vascular neurosurgical and endovascular patients

**Level 2**
• Explains the risks and benefits of vascular neurosurgical and endovascular procedures
• Assists with routine vascular neurosurgical and endovascular procedures
• Recognizes and initiates work-up of routine complications (e.g., seizure, hydrocephalus)

**Level 3**
• Formulates a diagnostic and treatment plan for a patient with ischemic or hemorrhagic stroke or vascular neurosurgical disorders
• Performs routine vascular neurosurgical and endovascular procedures; assists with complex vascular neurosurgical and endovascular procedures
• Manages routine complications and recognizes complex complications (e.g., cerebral vasospasm, herniation syndrome, intra-operative aneurysm rupture)

**Level 4**
• Adapts standard treatment plans and techniques to special circumstances (e.g., vasculitis, ischemic heart disease)
• Performs complex vascular neurosurgical and endovascular procedures; assists with advanced vascular neurosurgical and endovascular procedures
• Manages complex complications

**Level 5**
• Leads discussion at an interdisciplinary vascular neurosurgical and endovascular surgery case conference or specialty clinic
• Performs advanced vascular neurosurgical and endovascular procedures
• Utilizes patient outcome data for quality improvement; designs care pathways for vascular neurosurgical and endovascular patients

**Patient Care 6: Pediatric Neurological Surgery**

**Level 1**
• Performs an age-appropriate history and physical examination with developmental assessment, including for non-accidental trauma
• Performs CSF shunt tap and valve programming; assists with set-up, opening, and closing for pediatric neurosurgical procedures
• Provides routine peri-operative care for pediatric neurosurgical patients

**Level 2**
• Explains the risks and benefits of pediatric neurosurgical procedures; adapts diagnoses to age-related variations
• Assists with routine pediatric neurosurgical procedures
• Recognizes and initiates work-up of routine complications, including in pre-verbal children (e.g., CSF shunt failure, seizure)

**Level 3**
• Formulates a diagnostic and treatment plan for a pediatric patient; determines prognosis in severe brain injury and/or diagnoses brain death in infants and children
• Performs routine pediatric neurosurgical procedures; assists with complex pediatric neurosurgical procedures
• Manages routine complications and recognizes complex complications (e.g., hematoma, CSF leak)

Level 4
• Adapts standard treatment plans and techniques to special circumstances (e.g., very young children and infants)
• Performs complex pediatric neurosurgical procedures; assists with advanced pediatric neurosurgical procedures
• Manages complex complications

Level 5
• Leads discussion at an interdisciplinary pediatric case conference or specialty clinic; counsels expectant parents regarding fetal anomalies
• Performs advanced pediatric neurosurgical procedures
• Utilizes patient outcome data for quality improvement; designs care pathways for pediatric neurosurgical patients

Patient Care 7: Traumatic Brain Injury (TBI)

Level 1
• Performs a history and physical examination in patients with severe TBI and assigns a Glasgow Coma Scale score
• Places an intracranial pressure (ICP) monitor; assists with set-up, opening, and closing for neurotrauma procedures
• Provides routine peri-operative care for patients with TBI

Level 2
• Explains risks and benefits of trauma neurosurgical procedures; evaluates patients with multiple trauma
• Assists with routine procedures for patients with TBI
• Recognizes and initiates work-up of routine complications (e.g., sinus injury, air embolus)

Level 3
• Selects patients for operative intervention; prioritizes the management of injuries in patients with multiple trauma
• Performs routine procedures for patients with TBI; assists with complex procedures for patients with TBI
• Manages routine complications and recognizes complex complications (e.g., cerebral herniation syndrome, persistent CSF fistula)

Level 4
• Adapts standard treatment plans to special circumstances (e.g., medical co-morbidity, coagulopathy)
• Performs complex procedures for patients with TBI; assists with advanced procedures for patients with TBI
• Manages complex complications

Level 5
• Leads discussion at interdisciplinary trauma unit rounds and/or conference
• Performs advanced procedures for patients with TBI
• Utilizes patient outcome data for quality improvement; designs care pathways for neurotrauma patients

Patient Care 8: Critical Care

Level 1
• Performs a history and physical examination in critically-ill patients
• Inserts arterial and central venous catheters
• Manages neurocritical care unit admissions and discharges

Level 2
• Manages transient intracranial hypertension (e.g., hyperosmolar agents, CSF drainage)
• Assists with routine neurocritical care unit procedures; manages airway and performs endotracheal intubation
• Recognizes and initiates work-up of routine systemic complications (e.g., pneumonia, infection, pulmonary embolus, cardiac dysrhythmia, myocardial infarction)

Level 3
• Manages refractory intracranial hypertension (e.g., cerebral perfusion pressure directed therapy, advanced monitoring, decompressive craniectomy)
• Performs routine and assists with complex neurocritical care unit procedures; manages difficult and emergency airways
• Manages routine systemic complications and prioritizes simultaneous critical clinical events

Level 4
• Diagnoses and initiates management of acute respiratory distress syndrome
• Performs complex and assists with advanced neurocritical care unit procedures; manages or initiates management of surgical airways
• Manages metabolic and nutritional support for critically-ill patients

Level 5
• Leads a multidisciplinary neurocritical care team
• Performs advanced neurocritical care unit procedures; performs bronchoscopy
• Manages complex critically-ill patients (e.g., septic shock, organ failure); designs care pathways for critically-ill patients

Medical Knowledge 1: Information Gathering and Interpretation

Level 1
• Correlates normal neuroanatomy and physiology with function
• Gathers, interprets, and reports basic diagnostic test results (e.g., serology, chest radiograph, brain and spine CT)

Level 2
• Correlates pathological neuroanatomy and physiology with function
• Describes indications for standard diagnostic testing

Level 3
• Identifies anatomical and temporal patterns of disease occurrence
• Prioritizes, orders, and interprets diagnostic tests appropriate to clinical urgency and complexity

Level 4
• Interprets unusual variations in patterns of disease occurrence
• Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography)

Level 5
• Effectively teaches anatomic-pathological correlation
• Utilizes complex diagnostic approaches in novel situations

Medical Knowledge 2: Critical Thinking for Diagnosis and Therapy

Level 1
• Lists a differential diagnosis for common clinical presentations
• Lists therapeutic options for common clinical presentations

Level 2
• Provides a comprehensive differential diagnosis for a wide range of clinical presentations
• Explains advantages and drawbacks of standard therapeutic options

Level 3
• Provides a focused differential diagnosis based on individual patient presentation
• Justifies optimal therapeutic option based on individual patient presentation

Level 4
• Interprets anomalous presentations and rare disorders
• Adapts therapeutic choice to anomalous or rare patient presentations

Level 5
• Studies and reports challenging diagnostic presentations
• Creates new or modifies existing therapeutic options
Systems-Based Practice 1: Patient Safety
Level 1
• Describes principles of patient safety; performs safe and effective hand-offs and transitions of care in routine clinical situations
Level 2
• Recognizes and reports patient safety events; performs safe and effective hand-offs and transitions of care in complex clinical situations
Level 3
• Discloses patient safety events; supervises hand-offs and transitions of care
Level 4
• Analyzes patient safety events and offers error prevention strategies; advocates for safe and effective transitions of care within and across health care systems
Level 5
• Actively engages teams in process and system modification to prevent patient safety events; improves care transition practices within and across health care systems

Systems-Based Practice 2: Quality Improvement
Level 1
• Describes basic quality improvement methods and metrics
Level 2
• Participates in local quality improvement initiatives (e.g., surgical site infection (SSI) reduction, care pathway implementation)
Level 3
• Identifies quality improvement opportunities and assists in the development, implementation, and analysis of a quality improvement project
Level 4
• Advances multiple quality improvement initiatives through participation in a quality improvement working group or committee
Level 5
• Creates, implements, and assesses quality improvement initiatives

Systems-Based Practice 3: Health Care Systems Awareness
Level 1
• Describes principles of US health payment systems
Level 2
• Analyzes how personal practice affects the health care system (e.g., test ordering, length of stay, readmissions)
Level 3
• Seeks information about neurosurgical career options and identifies professional mentor(s)
Level 4
• Prepares for transition to practice (e.g., information technology, risk management, billing and coding, financial, personnel)
Level 5
• Collaborates with nursing and administrative teams to promote high value, quality care within a health care system

Practice-Based Learning and Improvement 1: Evidence-Based Practice
Level 1
• Applies institutional treatment guidelines in basic patient care; identifies and reports complications
Level 2
• Applies published treatment guidelines in standard patient care; tracks personal clinical care outcomes
Level 3
• Critically adapts guideline recommendations to individual patient specifics and preferences; evaluates and applies available outcomes data to improve patient care
Level 4
- Participates in the creation and implementation of institutional guidelines or evidence-based practice protocols; analyzes and reports outcomes data

Level 5
- Promotes evidence-based practice by publishing clinical guidelines and teaching at local or national conferences; participates in clinical outcomes registry design or administration

**Practice-Based Learning and Improvement 2: Research**

Level 1
- Formulates hypotheses and investigative approaches to clinical or basic scientific problems

Level 2
- Participates effectively in clinical or basic scientific research

Level 3
- Contributes to peer-reviewed clinical or basic scientific literature

Level 4
- Leads a clinical or basic scientific research effort, including application for funding

Level 5
- Receives grant funding for clinical or basic scientific work and makes novel scientific contribution(s)

**Practice-Based Learning and Improvement 3: Mentorship and Teaching**

Level 1
- Demonstrates self-awareness and identifies gaps in knowledge, skills, and experience; incorporates feedback

Level 2
- Teaches medical students, other residents, and patients in informal settings; develops faculty mentorship of self

Level 3
- Teaches health professionals in formal settings (e.g., nursing in-service training, residency teaching conference); mentors medical students

Level 4
- Organizes educational activities at the program level; mentors residents and other health care professionals

Level 5
- Designs and implements clinical rotations, curricula, or learning and assessment tools; models and teaches mentoring to others

**Professionalism 1: Ethical Behavior**

Level 1
- Behaves ethically and professionally and takes responsibility for personal conduct

Level 2
- Employs ethical and legal principles (e.g., informed consent, advance directives, confidentiality, error disclosure, resource stewardship) and appropriately seeks advice

Level 3
- Performs tasks in a thorough, timely, and respectful manner in complex or stressful situations and takes ownership of team outcomes

Level 4
- Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others

Level 5
- Promotes ethical and professional behavior by creating a teaching resource, addressing system-level problems, or serving on an ethics panel or Institutional Review Board

**Professionalism 2: Well-Being**

Level 1
- Describes the importance of personal and professional well-being; manages sleep deprivation and fatigue

Level 2
• Evaluates personal and professional well-being; seeks appropriate personal help and fatigue mitigation when needed

Level 3
• Monitors and attempts to optimize professional well-being of the team; adjusts team assignments to mitigate fatigue and promote wellness

Level 4
• Coaches and assists others in meeting professional expectations; recognizes and responds to physical impairment in self and others

Level 5
• Develops a structured plan or team activity to optimize personal and professional well-being, resilience, and success; participates in a peer support program

**Interpersonal and Communication Skills 1: Patient and Family Communication**

Level 1
• Uses language and non-verbal behavior to exhibit respect, establish rapport, and demonstrate cultural competency

Level 2
• Establishes therapeutic relationships in straightforward encounters using active listening and clear language

Level 3
• Establishes therapeutic relationships, thoughtfully delivers information, and strives for consensus in challenging patient encounters

Level 4
• Consistently models and mentors others in optimal patient and family communications

Level 5
• Formally teaches communication skills to health care professionals

**Interpersonal and Communication Skills 2: Communication in Coordination of Care**

Level 1
• Accurately records information in the patient record and safeguards protected health information; coordinates care within the neurosurgical service

Level 2
• Communicates orally and in writing in a respectful, organized, clear, concise and timely manner with all members of the interprofessional health care team; coordinates care with consulting services

Level 3
• Effectively manages complex, team-based clinical care; coordinates care within a hospital system

Level 4
• Models and mentors others in effective communication, including bidirectional feedback and conflict resolution; coordinates long-term care, including rehabilitation

Level 5
• Develops or implements strategies for improving communication and teamwork within a health care system; creates care pathways at the health care system level
## Neurosurgery Conference Schedule

<table>
<thead>
<tr>
<th>Conference</th>
<th>Day/Frequency</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Rounds</td>
<td>Fridays/Weekly</td>
<td>7-8am</td>
<td>HUB-A4001</td>
</tr>
<tr>
<td>Neurosurgery Case Conference</td>
<td>1st Tuesdays/Monthly</td>
<td>5-6pm</td>
<td>HUB-A4001</td>
</tr>
<tr>
<td>Journal Club</td>
<td>2nd Tuesdays/Monthly</td>
<td>5-6pm</td>
<td>HUB-A4001</td>
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<tr>
<td>Adult M&amp;M/QI</td>
<td>3rd Tuesdays Monthly</td>
<td>5-6pm</td>
<td>HUB-A4001</td>
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<tr>
<td>Peds M&amp;M/QI</td>
<td>4th Tuesdays/Monthly</td>
<td>5-6pm</td>
<td>CCC 310 Conf. Rm.</td>
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<tr>
<td>Resident Meeting</td>
<td>Every 2nd and 4th Wednesday</td>
<td>7-8am</td>
<td>FMLH Neuroscience Clinic 2654 B</td>
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<tr>
<td>Neuroscience Board Prep Lectures</td>
<td>Wednesday/Weekly, Sept-March</td>
<td>7-8:30am</td>
<td>FMLH Neuroscience Clinic 2654 B</td>
</tr>
<tr>
<td>Neuro-Oncology Tumor Board</td>
<td>Wednesdays/Weekly</td>
<td>7-8:30am</td>
<td>FMLH A5520/A5628</td>
</tr>
<tr>
<td>NICU Conference</td>
<td>Wednesdays/Weekly</td>
<td>1-2pm</td>
<td>NICU Physician Rm</td>
</tr>
<tr>
<td>Stroke</td>
<td>Thursdays/Weekly</td>
<td>5-6pm</td>
<td>Neurology Conf. Rm</td>
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</table>

## Mandatory/Protected Time

<table>
<thead>
<tr>
<th>Conference</th>
<th>Day/Frequency</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Epilepsy</td>
<td>Tuesdays/Weekly</td>
<td>8-9:30am</td>
<td>HUB-A350</td>
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<tr>
<td>Neuro-interventional</td>
<td>Tuesdays/Weekly</td>
<td>7-8am</td>
<td>CFAC BLDG 4401</td>
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<tr>
<td>Neuro-interventional &amp; NICU M&amp;M</td>
<td>Thursdays/Weekly</td>
<td>7-8am</td>
<td>FMLH Neuroscience Clinic 2654 B</td>
</tr>
<tr>
<td>Neuro-Oncology Tumor Board</td>
<td>Wednesdays/Weekly</td>
<td>7-8:30am</td>
<td>FMLH A5520/A5628</td>
</tr>
<tr>
<td>NICU Conference</td>
<td>Wednesdays/Weekly</td>
<td>1-2pm</td>
<td>NICU Physician Rm</td>
</tr>
<tr>
<td>Stroke</td>
<td>Thursdays/Weekly</td>
<td>5-6pm</td>
<td>Neurology Conf. Rm</td>
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Spine Surgery Fellowship

The Spine Surgery Fellowship Program in the Department of Neurosurgery at Froedtert & The Medical College is a one-year integrated clinical and research program for individuals who have completed residency and are contemplating careers in academic medicine. A second year emphasizing research is available.

Clinical Opportunities
A large and varied surgical experience includes spine trauma, tumors, and degenerative diseases, including all types of surgical fixation. The Neurosurgery Department is staffed by one of the most experienced surgical teams in the Midwest, offering surgical specialization in spine surgery. During the program, fellows assume increasing responsibility for operative performance, including teaching of residents in neurological surgery. In 2003, the Department of Neurosurgery fellows assisted in over 434 spine surgery cases.

Research Opportunities
Fellows participate in both basic and clinical research and have the opportunity to design limited studies or participate in ongoing efforts. The latter currently include investigation regarding the effects of spinal fixation, models of spondylolisthesis, spine material properties, finite element analysis of the spine, pathophysiology of spinal and spinal cord injury and its modification.
Our facility includes one of the largest crash test facilities in the world. Retrospective clinical reviews of various problems can be performed, as well as limited prospective studies. Presenting research at a national forum as well as producing at least two articles for publication are necessary to enhance this educational opportunity. Salary and benefits are competitive.

Outpatient Clinic
The out-patient clinic is a vital part of resident education. Each resident is expected to participate in the out-patient clinics of whichever service to which they are assigned and to work closely with the attending in the evaluation, work-up, and follow-up of patients in the clinic. It is recognized that this out-patient experience will vary by service, and the resident is expected to work out an arrangement with the faculty on his/her service in this regard. A varied experience with all faculty members is encouraged. Although the resident’s highest priority should be the operating room whenever possible, the out-patient clinic is the next highest priority. Residents’ who are unassigned to a procedure should attend clinic. At no times should residents be unaccounted for by either clinic or a procedure during work hours.
Facilities

**Froedtert Hospital** is a 604-bed medical center and is the region’s only adult Level 1 Trauma Center. The fifth floor of the Froedtert Memorial Lutheran Hospital is assigned in part to neurosurgery critical care, acute neurosurgery, neurosurgery-neurology, and spinal cord injury rehabilitation. There are 20 Neurosurgical Intensive Care Unit beds, eighteen acute spinal cord injury beds and twenty-eight general neurosurgical beds. Overflow patient beds are available. Froedtert outpatient facilities are located in the clinic building adjacent to the hospital. There are thirteen examination rooms and a workroom in the Neurosurgery Clinic.

**Children’s Hospital of Wisconsin** is a 298-bed tertiary care facility serving as the largest children’s hospital in the state. Children’s Hospital of Wisconsin is a Level 1 Children’s Surgery Center, a Level 1 Trauma Center, with a Level IV neonatal intensive care unit, and a Level 4 epilepsy center (all representing the highest level of care accreditation) along with a 72-bed pediatric intensive care unit.

**The Zablocki Veterans Administration Medical Center** provides primary, secondary and tertiary medical care in 196 hospital beds. It is conveniently located approximately five miles from Froedtert Memorial Lutheran Hospital. Neurosurgical patients share a surgical intensive care unit and accommodations on the general surgical floor. Outpatient clinic facilities are in the main hospital building.

Resources and Support

The institution assures that appropriate support services, personnel, and facilities are available for its trainees. Call rooms are available for residents who are on overnight call or who are too fatigued to drive home. The residents also have a private workroom, which is located near the NICU that has computers, a printer, and several textbooks for their use. There are eight dining areas on the medical complex. Residents are provided with meal cards that can be used at the dining areas in the corresponding hospitals. Residents are also provided with a set of surgical loupes and a tablet computer in their first year. In addition, the program covers the cost of the residents’ cell phone bills. A $1500/year stipend for academic expenses is also available each year for books and to offset the cost of exams and licensing fees.

The Neurosurgery Department also employs Physicians Assistants, Nurse Practitioners, a Patient Liaison Nurse for patient education and telephone triage activities, a Nurse Specialist for Gamma Knife patients, Clinical Research Coordinators, Medical Assistants, a Residency Program Coordinator and Administrative Support Staff. The Residency Program Coordinator is available to assist residents with program related activities.
Sick Leave

Sick leave accrues to housestaff at the rate of two weeks per year to a maximum of four weeks from previous academic years. Unused sick leave is not paid upon separation of employment or the end of Trainee’s term or Agreement.

When ill, a housestaff will use their previously accrued days first, utilize the two weeks from the current academic year next, and then may borrow two weeks from the next academic year providing their training program extends throughout another academic year. Housestaff requiring more paid leave than this may utilize vacation leave.

When ill/sick, the resident must notify the Program Director, Chief Resident and Program Coordinator immediately or as soon as practical, via pager and emails. A resident on an out of department rotation (e.g. Anesthesiology) will also need to notify the faculty they are assigned to in that specific department. Failure to notify the appropriate personnel will negate your sick leave, requiring you to take the time from your vacation leave.

Sick leave documentation of more than three days must be accompanied by appropriate health care provider documentation of resident’s condition. If a resident is found to take unusually higher number of sick days compared to other residents, upon PD’s discretion, the resident may need to provide appropriate health care provider documentation of resident’s condition for each occurrence.

Sick days need to be appropriately entered in the New-Innovations duty hours logs by the resident.

https://infoscope.mcw.edu/FileLibrary/Groups/InfoScopeGraduateMedicalEducation/MCWAHHB18-19_final.pdf

Last update 8/6/2019
Course Attendance Process

1. Submit an email of request to Program Director, Chief Resident and Program Coordinator to include the dates, place, registration fee (other fees if applicable), name of course and name of the sponsor of the course. Include a link to, or screen shot of, the course flyer.

2. Program Director will consider the course details and costs and confer with the Chief Resident about the resident schedule for the days of the conference.
   a. The following is the consideration priority for attending courses:
      Vacations→ Religious Days of Observance→ Meetings with Presentation→ Courses

3. If approved, complete the travel request form sent via from the program coordinator and return to the program coordinator for tracking.

4. Refer to Addendum C regarding the travel expense guidelines.
TRAVEL GUIDELINES/PURCHASING INFO

Travel – see travel guidelines form.

Mobile phone service – send your paid mobile phone service bill to Chris Sumter-Etzel once a month for reimbursement. We will not pay for services over 60-days. MCW does not pay for mobile phones just mobile service.

Lab coats – contact Jan Schiebenes. 3 new lab coats per year

Meal Cards – contact Jan Schiebenes.

Pagers – contact Jan

Books, loupes and Surface Pro/iPad – contact Laura Walker for approval.

Request Time Off – send form to Laura and Chief Resident for approval.

Reimbursements – Send to Chris Sumter-Etzel and cc Katie Krahn. Reimbursements go through MCWAH. It takes 1 to 2 pay periods to reach your direct deposit account. MCWAH adds it to your pay check.

TRAVEL GUIDELINES

POST APPROVAL/PRIOR TO EVENT

☐ REGISTRATION: Complete registration form and send with approval form to Chris Sumter-Etzel. Chris will submit registration form to purchase to be paid. Please save the returned PO number for competing the travel reimbursement from upon your return.

☐ TRAVEL:

1. Airfare: Make travel arrangements either on your own or through Richard at Magic Carpet Travel, 414-769-4800.
   - If you arrange/pay on your own – you can be reimbursed after travel. Save itineraries and proof of payment.
   - If you arrange through Magic Carpet Travel, fees will be paid by PO.

2. Auto: Submit map of route. You will be reimbursed per mile after your return.

☐ LODGING:

Option 1: Reserve/pay on your own and submit for reimbursement upon return. Please get an itemized receipt upon checkout.

Option 2: Make arrangements on your own 30 to 60 days in advance and ask if the hotel will take a check for payment. If so, let Chris Sumter-Etzel know and a check will be sent via UPS. You will still be responsible for incidental charges.

☐ MEALS: Meals are reimbursed per-diem based on the location. Keep track of the number of breakfasts, lunches, and dinners you purchase. Receipts not required.

LIST OF DOCUMENTS NEEDED FOR TRAVEL REIMBURSEMENT

☐ Conference flyer that includes dates and place (submitted with approval request)

☐ TRANSPORATION

a. FLIGHT - Flight itinerary with payment information
   i. If itinerary does not show payment info, submit itinerary as well as CC receipt (or other proof of payment)

b. RAIL – Itinerary with payment information

c. AUTO – Map demonstrating the miles from start to destination

d. CAR RENTAL (must be preapproved) – Paid receipt and justification

e. BUS TRAVEL – Itinerary with payment information
☐ LODGING
  a. Itemized hotel receipt with proof of payment
     a. Extra hotel charges, such as dinner/drinks will not be reimbursed, Wifi charges, will likely be reimbursed if needed for work

☐ MEALS (reimbursed per diem)
  a. # of breakfasts ______
  b. # of lunches ________
  c. # of dinners ________

☐ OTHER EXPENSES
  a. Registration fees – Proof of payment (if not already paid by Dept)
  b. Taxi – amount paid $________
  c. Parking – Paid Receipt
  d. Tolls – amount paid $________
  e. Other – Name of expense and amount $________ If over $25, a receipt must be submitted
     i. Example: Inflight WIFI charges, checked bag fee
DRESS CODE

General Dress Code
1. scrubs OR business casual (no jeans for residents)
2. white coat OR department jacket
3. ID badge
-applies to all clinical care settings outside of OR, including in house call or if coming in to hospital during home call, except for clinic and Grand Rounds, which are outlined below
-does not apply if in hospital for non-clinical purposes (ie, research, etc.)

Clinic
1. scrubs OR business casual
2. white coat
3. ID badge

Grand Rounds
If attending Grand Rounds:
1. scrubs OR business casual (no jeans)
2. white coat OR department jacket
3. ID badge

If presenting at Grand Rounds:
1. scrubs with white coat
OR
2. professional attire with or without white coat
CHW Resident – APP Handoff Guidelines

- Handoff process can begin after 5p on M, W-F and should be complete by 6p (APPs can be off-site and pager off)
- Written handoff tool in Epic updated to speed process. OK to do abbreviated verbal handoff with written tool and ability to call later for clarification.
- CHW Chief utilized PRN M-Th if too much clinical demand at time of handoff. Can also utilize on-call CHW faculty.
- It is OK to take over new pages and call APP later for clarification/details when there is more time.
- When resident is taking handoff from both FMLH and CHW, get CHW handoff first since it is reliably shorter
- APP and resident work together to triage work in the 5p-6p range (this is where the good faith and common sense come into play). This includes communication about when pager responses are turned over.
- It is OK for an APP to start a consult to be finished by resident. This is preferable to a patient waiting longer in ED because the APP doesn’t want to start a consult that will keep them at work late and preferable to an APP staying late because of starting such a consult that a resident won’t finish. Again, good faith.
- On Tuesdays, 1st priority after 5-6p conference should be to get sign-out from APP who has been covering.
- Handoff following morning ~6:45a, use written handoff tool as needed to speed up process
Guidelines for Pulling Residents Off-Service

Prioritizing OR coverage for non-FMLH resident help:

- If there is an insufficient # of FMLH residents available to provide OR coverage at FMLH, additional case coverage may be necessary.
- Coverage is to be arranged by the chief resident using the following order of priorities.
  - Spine fellow if available
  - Is it a minor case that the faculty is willing to do alone or with a PA.tech? Then do so.
  - VA resident if no conflicting cases/clinic
  - Research resident if no conflicting experiment/meetings, etc
  - Resident on electives (prioritize resident with least concurrent clinical responsibilities)

- The program coordinator is to be notified by email of all instances of residents being pulled onto the FMLH service
- An individual resident should be pulled no more than 1x/week without extenuating circumstances that should be made clear to all parties
- Matching the complexity of the case with the level of resident can be factored into the decision-making
- This is not a strict algorithm; the judgement of the chief resident will be required
- If a resident feels that their non-FMLH rotation is being adversely affected by being pulled onto the FMLH service, they are encouraged to notify the PD or associate PD so the situation can be assessed and rectified
ADDNEDUM G

NEUROSURGERY ROTATIONS - GOALS AND OBJECTIVES

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Forthcoming G&O: Pediatric Ortho Rotation, Trauma Rotation, Hand Surgery (elective) Rotation
Department of Neurosurgery
Neurosurgery Fundamentals PGY1 Rotation

Description of Rotation
This is an introduction for the intern to the neurosurgery service with most of the time spent in the Neuroscience Intensive Care Unit (NICU) and with the inpatient surgical team for fundamental neurosurgical and critical care skills.

Resident Responsibilities:
1. Perform an initial assessment on new and follow-up patients
2. Obtain and organize daily laboratory, imaging, and other diagnostic results
3. Obtain and organize vital signs, physical examination findings, and other monitoring results and reports
4. Present 24 hours events, data, examination and plan to multidisciplinary team
5. Write daily patient note in collaboration with attending physician
6. Follow up and facilitate daily studies
7. Communicate daily or as appropriate with family members and other physician consultants
8. Perform critical care procedures under supervision of attending physician, senior resident, or fellow
9. Sign out patients for overnight coverage.

Patient Care
Goals and Objectives:
- Perform a competent and comprehensive neurological evaluation including relevant history and detailed neurological examination.
- Adapt the evaluation to pertinent positives and negatives related to traumatic brain injury, spinal injury, and ischemic and hemorrhagic stroke.
- Perform comprehensive systemic assessment in relation to these same clinical entities. Recognize the need for diagnostic studies and their prioritization in relation to common presentations of trauma, hemorrhagic and ischemic stroke.
- Recognize the need for laboratory studies related to multi-system homeostasis and other clinical assessment of these entities.
- Recognize the common expected clinical course of patients with traumatic brain injury, spinal injury, ischemic and hemorrhagic stroke.
- Recognize phases of illness with common systemic and neurologic complications (including periods of vulnerability to respiratory, hemodynamic, cardiac and other common complications).
- Recognize specifically the clinical course of anticipated edema following traumatic brain injury, spinal injury and stroke, and its general principles of management.
- Recognize specifically the time course and management principles of vasospasm following subarachnoid hemorrhage.
- Perform a specific, rapid assessment of patients during neurologic emergencies, and the priorities of airway, hemodynamic, and neurologic resuscitation.
- Recognize the indications and timing of operative intervention for traumatic brain injury, spinal injury, and hemorrhagic and ischemic stroke. Initiate appropriate pre-operative testing for emergency surgical intervention.
- Interpret pre-operative diagnostic studies and relation to common emergent and elective surgical interventions for trauma and stroke.
- Understand and apply assessment and intervention paradigms for abnormal respiratory function, cardiac and hemodynamic function, and elevated intracranial pressure.
- Understand and apply protocols for barbiturate induced coma, including timing of intervention and management of therapy and its common complications.
- Perform placement of arterial catheters, central venous catheters, pulmonary artery catheters, and burr hole/twist–drill ventricular catheter placement, including indications, landmarks, performance of the procedure and post-procedure verification of placement accuracy and application of the devices to the patient care plan.
- Begin developing basic operative technical and intraoperative decision making skills.
**Medical Knowledge**

**Goals and Objectives:**

- Recognize the principles, indications, and interpretation of normal and common pathologic findings on x-rays of the cervical, thoracic and lumbar spine, skull and chest. Recognize adequate and inadequate x-ray studies and common pathologic abnormalities on these respective x-rays, in association with trauma, stroke, and common complications in the intensive care unit.
- Understand the fundamentals of computerized tomographic imaging and magnetic resonance imaging (CT and MRI), normal findings, general localization of pathology in relation to neuro-anatomic structures and vascular structures, and the appearance of pathologic findings in association with trauma and stroke.
- Recognize the indications for non-invasive vascular imaging with ultrasound, MRA, and CT contrast studies, the emergency use of these modalities and their common interpretation, and limitations of non-invasive vascular imaging. Interpret carotid ultrasound and transcranial doppler diagnostic findings in the setting of trauma, stroke, and clinical vasospasm.
- Understand the indications for catheter angiography, its general principles (including anatomic vascular access) and the broad interpretation of angiographic findings in ischemic and hemorrhagic cerebrovascular disease.
- Correlate the location of focal cranial and spinal pathology to the region of the neuraxis, and ability to localize this region using anatomic landmarks, x-ray, and stereotactic guidance.
- Perform routine lumbar puncture and tapping of reservoirs and shunts.

**Practice-Based Learning and Improvement**

**Goals and Objectives:**

Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.

Residents are expected to develop skills and habits to be able to meet the following goals:

- identify strengths, deficiencies, and limits in one’s knowledge and expertise;
- set learning and improvement goals;
- identify and perform appropriate learning activities;
- systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;
- incorporate formative evaluation feedback into daily practice;
- locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems;
- use information technology to optimize learning; and, participate in the education of patients, families, students, residents and other health professionals.
- apply knowledge of study design and statistical methods to critically appraise the medical literature;
- Facilitate the learning of students and other health care professionals
- Resident participation in undergraduate medical education is desirable.

**Systems Based Practice**

**Goals and Objectives:**

Residents must demonstrate an awareness of and responsiveness to the larger context and system of healthcare, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Residents are expected to:

- work effectively in various health care delivery settings and systems relevant to their clinical specialty;
- coordinate patient care within the health care system relevant to their clinical specialty;
- incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;
- advocate for quality patient care and optimal patient care systems;
- work in inter-professional teams to enhance patient safety and improve patient care quality;
- participate in identifying system errors and implementing potential systems solutions.
• understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal neurosurgical care;
• understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;
• practice cost-effective health care and resource allocation that does not compromise quality of care;
• advocate, coordinate, and facilitate patient care;
• understand principles of and advance practices for patient safety at the institutional and individual level.

**Professionalism**

**Goals and Objectives:**
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.
Residents are expected to demonstrate:
• compassion, integrity, and respect for others;
• responsiveness to patient needs that supersedes self-interest;
• respect for patient privacy and autonomy;
• accountability to patients, society and the profession;
• sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.
• treat patients/family/staff/ paraprofessional personnel with respect;
• demonstrate sensitivity to patient’s pain, emotional state, and gender/ethnicity issues;
• discuss death honestly, sensitively, patiently, and compassionately;
• exemplify integrity;
• accept responsibility/accountability;
• demonstrate reliability;
• maintain calm, even temperament;
• exhibit self-awareness and knowledge of limits;
• respond to the comments of other team members, patients, families, and peers openly and responsibly.

**Interpersonal and Communication Skills**

**Goals and Objectives**
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.
Residents are expected to:
• communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
• communicate effectively with physicians, other health professionals, and health related agencies;
• work effectively as a member or leader of a health care team or other professional group;
• act in a consultative role to other physicians and health professionals;
• maintain comprehensive, timely, and legible medical records.
• develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
• develop effective written communication skills;
• involve patients in medical decisions; and,
• strengthen listening and non-verbal communication skills.
Department of Neurosurgery
Neurosurgery PGY2 Rotation

Description of Rotation
This year is marked by a more significant role in patient management and operative responsibilities, while building on PGY 1 fundamentals.

Resident Responsibilities:
- Become proficient in the comprehensive neurosurgical history and physical examination.
- Interpret diagnostic imaging studies and be able to communicate results to patients, residents, and faculty.
- Perform initial stabilization and management of critically ill ICU and emergency room patients.
- Develop basic decision-making skills for managing non-operative and operative consults.
- Develop communication skills with neurosurgical staff and other services in order to deliver appropriate patient care.

Patient Care

Goals and Objectives:
- Develop effective communication skills with patients and their families as well as develop ability to communicate plans to patients.
- Interpret diagnostic imaging studies.
- Perform initial stabilization and management of patients.
- Respond in timely fashion to patient needs.
- Further develop basic operative technical and intraoperative decision making skills.

Medical Knowledge

Goals and Objectives:
- Participate in daily teaching by senior residents during work rounds (case directed learning).
- Read standard neurosurgery texts and landmark articles.
- Present at required teaching conferences and incorporate current literature reviews.
- Sit for the neurosurgery board examination each year.

Practice-Based Learning and Improvement

Goals and Objectives:
- Expected to attend all didactic sessions.
- Track procedures, operations, and outcomes in a centralized database.
- Conduct frequent interactive presentations (informal and formal) before the faculty and senior residents.
- Conference presentations designed to increase a resident's depth of knowledge in critical topics will be regularly assigned.

Systems Based Practice

Goals and Objectives:
Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.
Residents are expected to develop skills and habits to be able to meet the following goals:
- Interpret diagnostic imaging studies.
- Perform initial stabilization and management of critically ill ICU and emergency room patients.
- Basic skills for all bedside procedures.

Professionalism

Goals and Objectives:
Residents must demonstrate an awareness of and responsiveness to the larger context and system of healthcare, as well as the ability to call effectively on other resources in the system to provide optimal health care.
Residents are expected to:

• Develop relationship with other services
• Develop insight on when to contact chief residents and/or attendings regarding larger patient issues that require complex health care resources

**Interpersonal and Communication Skills**

**Goals and Objectives:**

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Residents are expected to:

• Develop communication skills to effectively obtain as well as effectively deliver information to midlevels, attendings, and other services
• Develop insight on when to seek help and/or provide information to chief residents and/or attendings regarding important time-sensitive patient information
• Become comfortable in providing diagnosis and treatment plans to patients and their families
• Develop comfort in goals of care discussion, specifically leading the discussion for critically ill patients
**Department of Neurosurgery**  
**Midlevel Neurosurgery Rotation**

### Description of Rotation
The resident participates in daily rounds and physical examination of floor patients on the service and is responsible for rounding on the ICU patients with the chief resident. After rounding, the resident will go to assigned cases for the day. If the resident is not in the OR, they are responsible for helping with non-operative care. Residents are expected to take an increasingly active role in interpreting complex patient presentations, and planning for their care, as well as executing established plans independently.

**Resident Responsibilities:**
- Daily rounds with the chief resident on ICU patients
- Assist in non-operative patient care
- Daily OR cases

### Patient Care

**Goals and Objectives:**
- Becoming proficient in the comprehensive neurosurgical history and physical examination.
- Interpreting diagnostic imaging studies with neuroradiology fellows and attendings.
- Performing initial stabilization and management of critically ill ICU and emergency room patients.
- Developing operative technical and intraoperative decision-making skills.
- Performing daily rounds and sequentially follow patient progression from admission through treatment until hospital discharge
- Developing outpatient clinic and decision-making skills.

### Medical Knowledge

**Goals and Objectives:**
- Becoming proficient in the comprehensive neurosurgical history and physical examination.
- Interpreting diagnostic imaging studies with neuroradiology fellows and attendings.
- Performing initial stabilization and management of critically ill ICU and emergency room patients.
- Understand basic cranial approaches in the OR including positioning, opening and closing cases.
- Understand common post-operative complications and management
- Understanding when to inform the chief resident and attending on changes in their patients
- Understand basic spinal operations including positioning, drill work and closure
- Understand the pathophysiology of most neurosurgical diseases

### Practice-Based Learning and Improvement

**Goals and Objectives:**
Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.

Residents are expected to develop skills and habits to be able to meet the following goals:
- Identify strengths, deficiencies, and limits in one’s knowledge and expertise;
- Set learning and improvement goals;
- Identify and perform appropriate learning activities;
- Systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;
- Incorporate formative evaluation feedback into daily practice;
- Locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems;
- Use information technology to optimize learning;
- Participate in the education of patients, families, students, residents and other health professionals.
- Apply knowledge of study design and statistical methods to critically appraise the medical literature;
Facilitate the learning of students and other health care professionals
Resident participation in undergraduate medical education is desirable.

### Systems Based Practice

**Goals and Objectives:**
Residents must demonstrate an awareness of and responsiveness to the larger context and system of healthcare, as well as the ability to call effectively on other resources in the system to provide optimal health care.
Residents are expected to:
- Work effectively in various health care delivery settings and systems relevant to their clinical specialty;
- Coordinate patient care within the health care system relevant to their clinical specialty;
- Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;
- Advocate for quality patient care and optimal patient care systems;
- Work in inter-professional teams to enhance patient safety and improve patient care quality;
- Participate in identifying system errors and implementing potential systems solutions;
- Understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal neurosurgical care;
- Understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;
- Practice cost-effective health care and resource allocation that does not compromise quality of care;
- Advocate, coordinate, and facilitate patient care;
- Understand principles of and advance practices for patient safety at the institutional and individual level.

### Professionalism

**Goals and Objectives:**
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.
Residents are expected to demonstrate:
- Compassion, integrity, and respect for others;
- Responsiveness to patient needs that supersedes self-interest;
- Respect for patient privacy and autonomy;
- Accountability to patients, society and the profession;
- Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation;
- Treat patients/family/staff/ paraprofessional personnel with respect;
- Demonstrate sensitivity to patient’s pain, emotional state, and gender/ethnicity issues;
- Discuss death honestly, sensitively, patiently, and compassionately;
- Exemplify integrity;
- Accept responsibility/accountability;
- Demonstrate reliability;
- Maintain calm, even temperament;
- Exhibit self-awareness and knowledge of limits;
- Respond to the comments of other team members, patients, families, and peers openly and responsibly.

### Interpersonal and Communication Skills

**Goals and Objectives:**
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.
Residents are expected to:
• Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
• Communicate effectively with physicians, other health professionals, and health related agencies;
• Work effectively as a member or leader of a health care team or other professional group;
• Act in a consultative role to other physicians and health professionals;
• Maintain comprehensive, timely, and legible medical records.
• Develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
• Develop effective written communication skills;
• Involve patients in medical decisions; and,
• Strengthen listening and non-verbal communication skills.
Department of Neurosurgery
VA Neurosurgery Rotation

Description of Rotation
The VA rotation is an integral part of training for Neurosurgery Residents. Residents rotate at the VA during PGY-6. At this time, the resident has already had ample experience in the management of inpatient floor, inpatient ICU patients, and in seeing ED and inpatient consults under the supervision of both the chief resident and attending neurosurgeon. During the VA rotation, residents are further transitioned towards independence in that they work more directly with the neurosurgery attending and are expected to demonstrate more independence in patient care in and out of the operating room. Additionally, there is a more substantive outpatient clinical experience during this rotation than in prior rotations.

Resident Responsibilities:
The VA resident has the primary responsibility for VA inpatients, consults, the ED, OR, and clinics. These responsibilities include direct patient care, documentation, and helping to coordinate the VA cross-coverage by other residents. The resident is responsible for self-directed learning during this rotation about the common pathology and treatment of VA patients including chronic degenerative spine conditions and peripheral nerve compression.

Patient Care
Goals and Objectives:
The VA rotation has a slower pace than other rotations, hence this presents an opportunity to hone patient care skills, allowing longer, more substantive interactions with VA patients. Additionally, the resident rotating at the VA is able to provide more continuity of care than when on other rotations. The resident that sees the patient preoperatively in clinic is often the same resident who performs the operation and sees the patient in clinic for post-operative follow-up. This imbues a better sense of patient “ownership” and allows the resident a unique opportunity to work on patient communication and expectation throughout the process.

Medical Knowledge
Goals and Objectives:
- The patient population at the VA has a different, but important cross section of medical pathology than seen during other rotations. Chronic degenerative spine and peripheral neuropathies are more prevalent in this population.
- The resident is expected to supplement clinical experience with focused reading about these conditions and both operative and non-operative management of these diseases.
- The resident is expected to apply this knowledge both in clinic and in the operating room.
- In the clinic the resident is expected to learn proper physical exam and diagnostic evaluation of these conditions. The resident is expected to learn and become independent in preoperative patient evaluation and preparation.
- The resident is expected to learn and become independent in setting up the operating theater and proper patient positioning.
- The resident is expected to learn and become more independent over time with regards to the performance of operative intervention.

Practice-Based Learning and Improvement
Goals and Objectives:
The VA rotation involves a high level of continuity of care, the resident who evaluates the patient preoperatively in clinic is often the same resident who performs the procedure and sees the patient post-operatively in clinic. This provides increased opportunity to see first-hand the effects of patient care, and to obtain feed-back from patients regarding their operative experience. Additionally, the VA resident works more directly with the neurosurgical attending than during prior rotation and is expected to seek direct performance feedback at routine intervals during the rotation in order to improve patient care.
### Systems Based Practice

**Goals and Objectives:**
- During the VA rotation, the resident has increased experience along the entire continuum of patient care.
- The resident is expected to manage all aspects of patient care. This includes working closely with program coordinators to schedule clinic visits, arrange for preoperative workups, schedule operative procedures including assessment and facilitation of necessary operative resources such as intraoperative tools (fluoroscopy, hardware vendors, neuro-navigation, operative table selection, etc.), appropriate level of care required post-operation (i.e. ICU vs step-down vs floor).
- The resident is expected to take into account the level of urgency for different patients and to allocate available resources appropriately (i.e. booking more urgent cases first).

### Professionalism

**Goals and Objectives:**
- The VA resident is often the primary point of contact for direct patient care in the clinic and in the hospital and is responsible for coordinating overall patient care.
- The VA resident is expected to act professionally, showing caring and compassion during all patient encounters.
- The resident interacts with a number of other patient care professionals including nursing staff, other support staff, and vendors; the resident is expected to act professionally and ethically during these interactions.
- The VA resident is expected to demonstrate professional responsibility for the operation of the service. This rotation provides the resident with increased opportunity to refine these skills.

### Interpersonal and Communication Skills

**Goals and Objectives**
- The VA resident interacts with patients and other health care professionals throughout the rotation.
- The resident responsibilities include: communication with patients and families before and after an operative intervention which includes conveying the pathology and explanations of treatment options, consequences, and complications in a manner in which they are able to fully understand; communication with other health professionals including support staff (i.e. with nursing to ensure the patients are obtaining proper care), other MDs during consultations and cross-disciplinary care, and the neurosurgery attending to keep them adequately apprised of each patient’s status and plan of care.
Department of Neurosurgery
Neurosurgery PGY7 Rotation

Description of Rotation
These individuals are the formal Chief Residents of the service. These residents also act as administrative chief with
educational responsibilities. The rotation exposes residents to the management and operative skills necessary to evaluate and care for oncological patients, patients with movement disorders, trigeminal neuralgia, spasticity, epilepsy, adult spine surgery, and neurovascular disease.

Patient Care
Goals and Objectives:
Residents must be able to provide patient care that is compassionate, appropriate and effective for the treatment of health problems and the promotion of health. Residents must:

- Gather essential information in a timely manner
- Generate a differential diagnosis and understand the management of associated oncological conditions including hydrocephalus, radiation necrosis and seizures.
- Appropriately evaluate and manage pre- and post-operative patients including management in the critical care setting
- Describe the important clinical signs and symptoms for patients that require emergency intervention for a brain tumor.
- Understand the signs and symptoms of meningeal carcinomatosis.
- Understand the variations in patient positioning for brain tumor surgery. 
- Perform neurosurgical operative procedures including: brain biopsies, placement of lumbar drains and intracranial pressure monitors, gamma knife radiosurgery for metastatic brain tumors, laser thermocoagulation of lesions, craniotomies for supra- and infratentorial lesions, craniotomies with language and/or motor mapping, endonasal endoscopic and microscopic removal of pituitary lesions.
- Gather a comprehensive history and physical in patients with motor disorders and be able to differentiate between Parkinson’s disease, essential tremor and dystonia
- Perform an adequate background and risk assessment in patients with epilepsy
- Perform an appropriate examination of a patient with facial pain and be able to differentiate between trigeminal neuralgia and other causes of pain.
- Identify spasticity and differentiate from hemiparesis or plegia.
- Identify seizures in the critical care patient and develop a management paradigm
- Perform neurosurgical operative procedures including: microvascular decompression, stereotactic radiation for trigeminal neuralgia, deep brain stimulation in STN and/or GPi, medial temporal lobectomy with complete hippocampectomy, functional cortical resections and topectomies, placement of depth and subdural electrodes for intracranial seizure monitoring, initial placement and replacement of baclofen pumps, placement of batteries for vagal nerve and deep brain stimulation.
- Understand the detailed anatomy of the extra-cranial and intra-cranial vertebral, carotid and spinal circulation including arterial branches, the venous system, and their nomenclature. Learn to recognize these structures on angiographic films. Learn to correlate the location of the vasculature with the respective neural compartments and supplied territory as visualized on imaging studies (CT and MRI)
- Understand the concepts of cerebral blood flow, ischemic thresholds, intracranial pressure, cerebral perfusion pressure, and the impact of intracranial mass lesions.
- Recognize common mechanisms of brain ischemia and their clinical manifestations and correlates on diagnostic imaging.
- Recognize common mechanisms of intracranial hemorrhage, their etiologies, and their clinical manifestations and correlates on diagnostic imaging.
- Understand the general epidemiologic principles of traumatic brain injury, spinal cord injury, and stroke.
- Perform neurosurgical operative procedures including: aneurysm management, vascular malformations, and cerebral revascularization.
Medical Knowledge

Goals and Objectives:

- Residents must demonstrate knowledge of established and evolving biomedical advances in the field of neurooncology.
- Understand the epidemiology, natural history, common locations and incidence of primary brain tumors including hereditary syndromes.
- Understand the basics of tumor biology including proliferation, invasiveness and vascularization.
- Describe the important MRI and CT findings for the differential diagnosis of primary brain tumors.
- Understand the principle histological findings that characterize different gliomas and the criteria for astrocytoma grading.
- List the common metastatic tumors that are found in the CNS according to their frequency.
- Describe the more common locations and characteristics of meningiomas.
- Understand the orientation of cranial nerves entering the cavernous sinus, internal auditory canal and jugular fossa.
- Describe the origin of craniopharyngiomas and Rathke’s cleft cyst.
- Understand the clinical presentations for pituitary tumors including hormonally active and inactive lesions.
- Describe the appropriate use of medications for brain tumor surgery including steroids, mannitol, antibiotics and hormone replacement.
- Demonstrate the external landmarks used for intracranial surgery including the pterion, asterion, and inion and how to localize the superior sagittal sinus, transverse sinus and sigmoid sinus.
- Understand the non-operative management of Parkinson’s disease, essential tremor and epilepsy.
- Understand the steps needed for the presurgical evaluation of epilepsy patients.
- Be able to describe the different modalities for the treatment of trigeminal neuralgia including stereotactic radiation, rhizotomy and microvascular decompression.
- Identify and differentiate simple and partial complex seizures.
- Understand the effect of seizures in the critical care patient.
- Identify and manage side effects of antiepileptic medications.
- Be cognizant of the emerging role of stimulation on epilepsy patients.
- Understand the non-operative management of spasticity.
- Understand pathophysiologic mechanisms associated with the spectrum of traumatic brain injury, spinal injury, and stroke.
- Recognize the broad spectrum of lesions responsible for subarachnoid hemorrhage, intracranial hemorrhage, and ischemic stroke.
- Understand the major principles of fluid, electrolytes, respiratory, coagulation, cardiac, and nutritional physiology and pathophysiology in relation to the neurologically injured patient, the stroke patient, and the post-operative patient.
- Describe the radiologic anatomy of the extracranial and intracranial vessels, including the carotid and vertebral arterial circulations; to understand and describe common and uncommon vascular variants.
- Understand and describe the major cerebral venous system structures.
- Understand and describe the arterial supply and venous drainage of the spinal cord and adjacent vertebrae.
- Correlate the angiographic anatomy on CTA, MRA, and digital subtraction angiography and to understand the advantages, disadvantages and limitations of imaging methods and imaging strategies for various disease processes.
- Understand and recognize the signs and symptoms of disorders amenable to diagnosis and treatment by endovascular surgical neuroradiology techniques.
- Understand the clinical indications, risks, contraindications and limitations of endovascular surgical/ neurointerventional procedures.
- To become familiar with the use of needles, catheters, guidewires, and endovascular devices and materials for endovascular procedures, both diagnostic and therapeutic.
- To understand basic radiologic science related to image production, including radiation physics and radiation protection (safety).
• To understand the clinical pharmacologic aspects of radiographic contrast materials, including toxicity and the management aspects of contrast allergy and renal toxicity prophylaxis and treatment.
• To understand the use and administration of analgesics, antibiotics, anticoagulation, anticoagulants, and anesthetic agents commonly utilized in endovascular surgical neuroradiology procedures.
• To understand clinical aspects of patient assessment, treatment planning, and management specific to endovascular neurosurgical treatments including the use of invasive monitoring and neurointensive care management, and the special considerations related to the use of anti-platelet agents, heparin, rTPA, and other thrombolytic agents.
• To understand the choices of embolic materials and devices for the endovascular treatment of disorders of the head, neck and spine, including indications, limitations, risks, benefits and complication avoidance.
• Upon completion of the rotation all residents will be able to demonstrate an appropriate medical knowledge base of spine anatomy and physiology, histology, biomechanics, and pathophysiology.
• Residents will demonstrate a working knowledge of the natural history of degenerative, osteoporotic, infectious, and deformity type spinal disorders.
• Residents will be able to appropriately perform routine diagnostic work up for common spinal disorders (e.g. X-ray, MRI, CT scan, EMG)
• Residents will have a comprehensive understanding of non-operative spine care: physical therapy, back school/education, therapeutic injections, medications, activity alterations, exercise and non-standardized treatment alternatives.
• Understand complications associated with caring for the spine surgery patient.
• As their knowledge and experience grows, residents perform increasingly more complex aspects of spinal surgery, including lumbar discectomy, lumbar pedicle screw insertion, anterior cervical discectomy, fusion, and the treatment of Degenerative Disc Disease, Deformity/Scoliosis, and Infection. Further skill progression includes revision spine surgery, anterior and posterior spine surgery, minimally invasive techniques and more complex revision and oncologic surgery.

Practice- Based Learning and Improvement
Goals and Objectives:
Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.
Residents are expected to develop skills and habits to be able to meet the following goals:
• Identify strengths, deficiencies and limits in one’s knowledge and expertise
• Set learning and improvement goals
• Identify and perform appropriate learning activities including but not limited to grand rounds, journal club and seminars
• Locate evidence and apply to patient’s health problems
• Use information technology to optimize learning
• Participate in the education of patients, families, residents and other health professionals.

Systems Based Practice
Goals and Objectives:
Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.
Residents are expected to:
• Work effectively in various healthcare delivery systems
• Coordinate patient care within the health care system relevant to their specialty
• Consider cost and risk-benefit analysis in patient care, particularly during end-of life decisions in oncological care
• Advocate for quality patient care and optimal patient care systems
• Work in inter-professional teams to enhance patient safety and quality of care
• Participate in identifying system errors and implementing potential systems solutions
• Participate in residency improvement forums at both the department and institutional level
Professionalism  
**Goals and Objectives:**
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.
Residents are expected to demonstrate:
- Compassion, integrity and respect for others
- Responsiveness to patient needs that supersedes self interest
- Respect for patient privacy and autonomy
- Accountability to patients, society and the profession
- Sensitivity to diverse patient populations
- Ability to discuss death honestly and aid patients and families in fulfilling their wishes.

Interpersonal and Communication Skills  
**Goals and Objectives:**
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.
Residents are expected to:
- Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
- Communicate effectively with physicians, other health professionals, and health related agencies;
- Work effectively as a member or leader of a health care team or other professional group;
- Act in a consultative role to other physicians and health professionals;
- Maintain comprehensive, timely, and legible medical records;
- Develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
- Develop effective written communication skills;
- Involve patients in medical decisions;
  - Strengthen listening and non-verbal communication skills.
Department of Neurosurgery  
Pediatric Neurosurgery Rotation

**Description of Rotation**

The goal of this rotation is to acquire fundamental clinical and neurosurgical skills related to the anatomy, physiology, pathophysiology, and presentation of diseases in children which a neurosurgeon may be called upon to diagnose and treat.

**Patient Care**

**Goal**

Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents are expected to:

**Competencies**

- Gather and understand essential patient information in a timely manner
- Generate an appropriate differential diagnosis
- Implement an effective plan of management
- Prioritize and stabilize multiple patients simultaneously
- Competently perform neurosurgical operative procedures
- Manage complications
- Analyze outcomes
- Counsel and educate patients and families
- Work with health care professionals to provide patient-focused care
- Participate in the management (including critical care) and surgical care of adult and pediatric patients and experience should include the full spectrum of neurological disorders
- Evaluate patients referred for elective surgery in an outpatient environment and be involved in postsurgical care and follow-up evaluation consonant with expectations for the relevant PGY.

**Objectives**

**General**

- Perform a complete history, physical examination and assessment on newborns, infants and children; including developmental assessment
- Interpret data derived from history, physical examination, and radiologic studies to arrive at a differential diagnosis (appropriate for the disease process)
- Demonstrate significant involvement in the care of patients in the outpatient clinic, including the triage of patients and handling of outside phone calls

**Medical Knowledge**

**Goal**

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Upon starting the first rotation on the pediatric service the resident will be given a comprehensive pediatric neurosurgery textbook. It is expected that they will use the textbook along with their clinical experience to achieve the following objectives.

**Competencies**

- Generate a differential diagnosis and properly sequence critical actions for patient care, including management of complications, morbidity and mortality
- Synthesize and properly utilize acquired patient data
- Identify neurosurgical emergencies
• Know how to access current medical information
• Understand how to treat neurosurgical conditions
• Incorporate evidence-based principles
• Have experience and instruction in the basic neurosciences

Objectives
General
• Define embryological origin of normal development and pathology (where known or suspected).
• Display knowledge of known molecular biology for disease process.
• Define diagnostic evaluation of problem.
• Describe natural history of untreated entity, including incidence, epidemiology and inheritance.
• Define which disorders require surgical care and which do not.
• Display knowledge of surgical anatomy for uncomplicated case (PF/supratentorial tumors/spinal cord).
• Describe expected outcomes without and with treatment.

Malformations
• Malformations in the Brain
  Accurately review normal embryology of the brain and spinal cord.
  Dysraphism (encephalocele): list abnormalities, define embryological defects and diagnostic evaluation
• Malformations in the Spine
  Myelomeningocele, lipoma: define embryology, diagnostic evaluation and initial surgical treatment
  Tethered cord: describe the pathophysiology and presentation of tethered cord, define diagnostic evaluation and differential diagnosis, and define surgical treatments
  Split cord malformations: define embryology and diagnostic evaluation
  Other (segmentation): define embryology and diagnosis
• Chiari I Malformations: define diagnostic evaluation, differential diagnosis and surgical treatments
• Cranio-facial Syndromes: define differences between common syndromes, including inheritance and review the known molecular basis of disease
• Craniosynostosis: define the findings in different suture synostosis

Hydrocephalus
• Describe normal CSF physiology and normal ICP dynamics
• Shunting:
  Delineate different etiologies of hydrocephalus & relative incidence
  Indicate different treatment options, determine which CSF collections require surgical treatment
  Define ‘brain compliance’ and its relation to ventricular size
  Review causes of cerebral atrophy and how to differentiate between them,
  Describe the difference between ventriculomegaly/compensated hydrocephalus/pseudotumor cerebri,
  Describe the role of venous outflow obstruction in hydrocephalus
  List complications associated with each treatment option – how to diagnose – how to resolve
  List methods for accessing shunt and obtaining CSF

Neoplasia
• General
  List common tumor types in peds
  Delineate differences in peds & adult tumors
List changes in tumor types and locations with age of pt.
Describe typical presentation of tumors in peds: describe evaluation of peds tumor, discuss differential dx of:
   (a) suprasellar, (b) pineal, and (c) intraventricular tumors
Discuss complications of specific tumor types
   • Surgical Therapy
   Describe pre-operative management of patients with tumors
   Classify tumors based on surgical / non-surgical interventions
   Compare role of biopsy v subtotal resection v total resection in each tumor
   List complications of tumor treatment and discuss surgical approaches for: (a) suprasellar, (b) pineal, and (c)
       intraventricular tumors
   Describe pertinent surgical anatomy – cerebellar & hemispheric cerebral tumors
   Discuss adjunctive therapies

Infection
   • Shunt related
   Describe the presentation of a shunt infection
   List the common organisms in shunt infection
   Describe the evaluation for shunt infection
   Describe standard therapies for shunt infection
   • Non-shunt related
   List host risk factors for CNS infection
   Describe presentation of cranial and spinal infections in childhood
   Describe diagnostic evaluation for CNS infection
   Describe indications for surgery and surgical technique in CNS infection

Cerebrovascular
   • Describe pathophysiology, evaluation and treatment of IVH in neonate
   • List etiology of non-congenital aneurysms in children
   • List all presentations of Vein of Galen malformations – discuss its diagnosis, treatment
   • Define the evaluation and treatment of moyamoya
   • Define the evaluation and treatment of arteriovenous malformations
   • Define the evaluation and treatment of cavernous angiomas

Trauma
   • General
   Describe Glasgow Coma Scale and its use
   Describe evaluation of child with multi-system trauma
   Describe typical birth trauma injuries
   Describe important Hx/PE findings in non-accidental trauma
   Discuss concept of brain death – with emphasis on definition and determination
   Discuss interaction of ICP and CPP in brain/cord injury
   Discuss evaluation of comatose patient with basilar skull fx
   Discuss use of lumbar drainage, decompressive craniectomy, lobectomy in Rx of refractory ICP
   • Brain
   Discuss management of depressed skull fx’s
   Define concept of “secondary injury”
   Discuss role of all forms of invasive monitoring in head injury
Describe management of mild-moderate head injury in child
Describe ICP compliance and use in trauma

• Spine
  Discuss management of possible spine injuries in children
  Describe anatomical differences in child vs. adult spine and how that relates to spinal cord injury
  Discuss Dx and Rx of spinal cord injuries w/o radiographic injury (SCIWORA) in child

Other
• Discuss the medical and surgical treatment of spasticity
• Discuss the evaluation and treatment planning for seizures
• Identify commonly used suture material and the justification for their usages
• Identify commonly used neurosurgical instruments by name

Practice-Based Learning and Improvement

Goal
Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Residents are expected to develop skills and habits to be able to:

Competencies
• Identify strengths, deficiencies and limits in one’s knowledge and expertise
• Systematically analyze practice, using quality improvement methods, and implement changes with the goal of practice improvement
• Locate, appraise and assimilate evidence from scientific studies related to their patients’ health problems
• Use information technology to optimize learning

Objectives
• Demonstrate the use of self-evaluation to improve own practice.
• Demonstrate an ability to discuss and assess learning and improvement goals.
• Demonstrate an ability to use information sources to improve own practice.

Conferences
• The resident will run the pediatric Quality Improvement conference on a monthly basis
• The M&M cases will be screened at a prior meeting with faculty, APP, and resident representation
• The residents are expected to attend their educational conferences and will be expected to handoff coverage to an APP (or attending if necessary)

Systems Based Practice

Goal
Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:

Competencies
• Work effectively in various health care delivery settings and systems relevant to their clinical specialty
• Coordinate patient care within the health care system relevant to their clinical specialty
• Work in interprofessional teams to enhance patient safety and improve patient care quality

Objectives
• Demonstrate an intermediate level of understanding of how to coordinate care within the health care system.
• Demonstrate attention to patient safety at the individual and institutional level.
Professionalism
Goal
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to demonstrate:

Competencies
- Compassion, integrity, and respect for others
- Accountability to patients, society, and the profession
- Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation

Objectives
- Demonstrate an ability to interact professionally and respectfully with patients and their families, fellow residents, allied health care personnel, hospital staff, medical students, faculty physicians and referring physicians.
- Demonstrate integrity, empathy, respect, and a commitment to excellence.
- Create and keep current a curriculum vitae.

Interpersonal and Communication Skills
Goal
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. Residents are expected to:

Competencies
- Communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- Communicate effectively with physicians, other health professionals, and health related agencies
- Act in a consultative role to other physicians and health professionals
- Maintain comprehensive, timely, and legible medical records

Objectives
- Demonstrate an ability to communicate effectively with patients and their families, fellow residents, hospital staff, medical students, faculty physicians and referring physicians.
- Demonstrate an ability to work successfully with allied health professionals to effectively cover all work and responsibilities and ensure effective transfer of care
- Demonstrate the ability to maintain accurate and current medical records.

Consultations and documentation
- **There are no informal consults** (“curbsides”, “look at this film and let us know if we need to consult”).
- Consult notes need to be written in Epic using a “Consult” note type to be co-signed by an attending – not a progress note or an H&P (convert to H&P if being admitted to our service).
- All consults need to be staffed with an attending or chief resident by the person performing the consult. It cannot be signed out to the next call person to staff.
- A consult note should at the minimum include:
  - HPI relevant to the question for our service, not pasted in from some other specialty note
  - PMH/PSH that is relevant
  - A physical exam with an appropriately thorough neurological exam. **Avoid non-specific phrases** (e.g. “CN II-XII intact”, “5/5 motor throughout”), instead document what exactly was tested (e.g. “pupils equal and reactive to light, facies symmetric, speech clear, tongue midline”, “grips 5/5 bilaterally, no pronator drift”)


Review of pertinent imaging. This does not belong in the HPI or the A/P. It should not be pasted in from a radiology report or someone else’s note. It is our interpretation of the imaging. Appropriate comparisons should be specifically mentioned, including their dates.

An assessment and plan that reflects your understanding of the consult and is of use to other services. Do not paste in the chief complaint or HPI as the assessment. “Will staff with attending” is not an assessment. If there is a differential diagnosis for what is going on that needs to be listed in the assessment, including why one diagnosis may be favored over others. We understand that you may not be able to write a complete A/P without staffing with us first. If that is the case, pend the note and complete it when you have the information.

All of the above also applies for admission notes if we are the primary team.

- Progress notes should follow the standard SOAP format and also include a real assessment and plan.
- All notes should include the resident’s PGY-level in the note to avoid confusion as most services have fellows and residents in the past have been misidentified as being post-residency. We suggest creating a smartphrase to use.
- Outside institution consultations/transfers: during the day, outside consultations go to the PA group pager. After hours these go the on-call resident pager. We feel this is an important skill to acquire (getting appropriate history, having collegial interactions, communicating a plan). All such calls should be staffed with the on-call attending in real-time and the outside institution will then be recontacted by resident or attending as necessary. Please note that calls that go through the CHW Transport Line are all recorded and reviewed as necessary to audit interactions.

**Clinic experience**

- Residents will be expected to participate in 2-3 half-day clinics per week
- The resident should prioritize seeing
  - New patients, particularly those that are likely to require surgery
  - Follow-up patients that the resident was involved in caring for
- It is understood that the needs of the inpatient service, ED, and OR can affect the ability of the resident to participate in clinic – if necessary the APPs can cover to allow clinic participation at the discretion of the faculty

**Operative case distribution**

**Overview:**

- The current system used to distribute cases amongst residents and APPs is based on the following premises
  - The patient is best served if the assistant is familiar with the details of the patient’s history and exam. Ideally the assistant has developed a rapport/relationship with the family.
  - Becoming a neurosurgeon requires skill development both in and out of the operating room setting: the resident needs time to do ED and inpatient consults, interface with other departments, run the inpatient service, etc.
  - Surgical cases of high educational value need to be covered by residents if at all possible
- For routine cases, ideally the APP or resident who worked up the case will assist
- If the APP who performed the workup is unavailable to assist, the case would go to the on-service resident.
- If the workup was done by another resident covering night or weekend call, the case would go to the on-service resident.
- **NOTE:** This practice has historically resulted in a disproportionately greater number of the cases being assigned to the resident (which we feel is appropriate).
We will alter this assignment system for the following purposes:

- **To gain resident experience for a specific case** – the assignment system does not guarantee resident operative experience for a particular case type (e.g. one could go through a 6-month rotation and never do a spinal cord detethering).
- **To gain experience with more advanced cases as an advanced resident** (later years of training) – the more advanced residents (later years of their training) should be more involved with advanced cases; they should have an opportunity to be the primary surgeon.

**Operative cases that are unique to pediatrics, rarely seen outside of the pediatric rotation, or deemed to be of high educational value** are to be assigned to the resident regardless of who worked the patient up in an effort to ensure adequate exposure of these cases to the residents.

- Residents will be required to keep an up-to-date log of their operative experience to allow for real-time adjustments in case distribution.
- **Cases in this category include:**
  - Pediatric operative head trauma
  - Myelomeningocele closure
  - Simple spinal cord detethering (e.g. filum section)
  - Complex spinal dysraphisms
  - Pediatric brain tumors
  - Ventriculo-atrial shunts
  - AVM surgery
  - Pial synangiosis
  - Corpus callosotomy
  - Hemispherectomy
  - Endoscopic third ventriculostomy
  - Abdominal portion of ventriculoperitoneal shunt placement
  - C1-2 posterior spinal fusions
  - Stereotactic laser ablation
- Exceptions will be granted based on the resident’s case experience and will be made by the attending surgeon for that particular case. There are no set quotas.
- When exceptions are granted every effort will be made to have the resident perform the workup:
  - the resident will need to have examined the patient and met the family prior to surgery - if at all possible.

- **Senior residents (PGY-5+) will have 1st-choice with regards to the higher-end cases.**
  - It is expected that they would be doing fewer routine cases (e.g. shunts) than a junior resident.
  - Again, every effort would be made to have the resident perform the work up when possible.

**Operative experience**

**Levels of operative participation**

- Resident participation will vary depending on the procedure.
  - We will track degree of involvement to assess progress, to provide feedback, and to identify deficiencies.

- The following designations will be used (as a trial at this point). The level will be identified at the beginning of the case by the faculty so there are no misunderstandings.
- **Level I: "Show and tell":** minimal hands-on participation by resident. Faculty member is expected to give constant information during the procedure, explaining, demonstrating, etc. For first-time procedures, complex procedures, etc.
- **Level II: "Active assist":** resident actively performing simpler portions of the procedure under direct supervision, while assisting the faculty with most of the procedure
- **Level III: "Passive assist":** resident performing majority of the procedure with direct supervision and assistance from faculty
- **Level IV: "Independent":** resident performs with minimal assistance; faculty member may not be scrubbed or present for all portions of the procedure.

**Operative evaluation**
- After the procedure the faculty member and the resident will complete an evaluation
- These evaluations will be available to the resident and used for end of rotation assessments, and to identify areas to work on, to direct future case assignments, etc.
- Resident will meet with the site director regularly to assess progress, provide feedback, etc.

**PGY-2 Operative goals**

**Achievement of Level IV:**
- Scalp closure
- Spine/abd incision closure
- Ventriculostomy
- Shunt/reservoir tap
- EVD/ICP monitor placement
- Lumbar puncture
- Removal of Mayfield headholder
- Positioning for shunt and spine procedures
- Frameless stereotactic navigation registration

**Achievement of Level III:**
- Mayfield headholder application
- Shunt revision surgery
- Burr hole craniectomy for subdural drainage
- Scalp lesion removal
- VNS battery change
- VP shunt placement
FH Neurologic Intensive Care Unit (NICU) – Neurosurgery Rotator Objectives

Service Description and Overall Expectation:
- The NICU service is based at Froedtert Hospital and manages patients with critical illnesses that primarily involve the nervous system.
- Throughout the course of the training program, each resident rotates on the NICU for 3 months with the resident being expected to operate with more independence in medical-decision making, assuming a greater role in teaching of medical students and rotating junior residents and working at a higher level of efficiency during successive months.

Goals and Objectives:
- Appropriately manage common critical care neurologic disorders, including:
  - Intracranial hemorrhage
  - Status epilepticus
  - CNS infection
  - Respiratory failure from neuromuscular weakness
  - Head trauma
  - Complications of CNS neoplasms
  - Increased intracranial pressure
  - Stroke
- Appropriately interpret laboratory tests, chest x-rays, and neuroimaging (CT, MRI, and angiography) in the NICU.
- Making the first attempt in the following procedures:
  - Spinal tap
  - Radial arterial line
- Effectively manage critically ill patients in a multi-organ approach, including appropriate use of consultants.
- Interact appropriately with multidisciplinary team members (nurses, pharmacists, social workers, case managers).
- Correctly perform and interpret a clinical brain death examination.
- Demonstrate effective counseling of patients and family members about end-of-life care when appropriate.
- Communicate effectively with patients and family members regarding patient care and clinical status.
- Communicate effectively with other health care providers when handing off patient care (at sign out or when transferring off of the NICU team).
- Appropriate documentation of relevant data and medical decision making in the care of NICU patients.
- Interact professionally with supervising colleagues, including the give-and-take of constructive feedback, and appropriately seeking assistance.
- Advance the formal and informal education of medical students.

Team Composition:
- 1 Attending (on service for 1 week at a time)
- 1 NICU fellow
- 1-2 Neurology residents
- 1 EM resident rotator (10 out of 12 months)
- 1 Neurosurgery resident rotator
- 2 Advanced practice providers (APP)

NICU Schedule for Neurosurgery Resident Rotator:
- Expected to be present for clinical duties Monday-Friday. No weekend obligations.
• Excused for post-call days, Neurosurgery Grand Rounds, and when pulled to the OR (only when the ICU attending is informed in advance)
• 0600: Daily sign out (Sign out occurs in person; over the phone will not be allowed)
• 0600-0900: Pre-rounding on assigned patients
• 0900-1200: Bedside rounds with the entire NICU team
• 1200-1700: Completing progress notes, new admissions, calling consults, bedside procedures
• 1700: Sign out/evening rounds to the night float coverage (all members of the team are expected to be present, if excused from evening rounds then proper sign out should be provided to a team member who will be signing the patient out to the night float coverage)

New Admissions:
• Admissions from the Emergency Department are generally accepted by the fellow, who will then assign the patient to a resident or APP.
• Admissions will also be accepted from outside hospitals, urgent transfers from the floor, in addition to post-op/post procedure patients.
• All new admissions require an H&P and admission orders, which are expected to be completed by the assigned resident or APP.
• New admissions are expected to be staffed initially with the NICU fellow, then formally with the Attending and fellow during bedside rounds (either morning or evening pending the time of the admission).

Specific Resident Responsibilities:
• Completion of notes (H&P, progress notes) in a systems-based format (co-signed to the attending on service).
• Entering orders for patients during morning and evening bedside rounds.
• Completing the written sign out/to do list during morning and evening bedside rounds.
• Entering admission orders on assigned patients.
• Patient examinations with proper documentation.
• Post-op and post-procedure checks with proper documentation.
• Obtaining labs and imaging; following up on results.
• Provide verbal hand off when transferring patient’s out of the ICU (typically to one of the neurohospitalist APP’s or the neurology ward senior resident).
• Procedures that are expected to be learned and performed while on the NICU rotation include: arterial lines, central lines, and lumbar punctures. Other procedures such as intubations, bedside tracheostomy and bronchoscopy are usually done by fellows or senior residents under supervision of attending physicians.
• Procedure note documentation with appropriate co-signer assigned.
• Communicating with consulting services as needed.
• Update family members and patients with plan of care daily.
• Tracking duty hours.
• Carrying the NICU hot pager: expected to be rotated through all the residents on the team on a day-to-day basis. This is given to the night float coverage at sign out.
Description of Rotation

The Gamma Knife rotation folds into the resident’s interventional rotation. During this time, the resident is involved in the treatment of patients requiring treatment with gamma knife radio-surgery. During this rotation the resident learns about the neurosurgical indications for GKSRS, as well as the radiation oncology aspects of focused radiation therapy.

Resident Responsibilities:

- The resident is responsible for assisting in the delivery of gamma knife radio-surgery to patients.
- This includes reviewing the patient chart and imaging, to understand the reason for the use of radio-surgery, and participating in all the steps involved in delivery of radio surgery including applying the head frame, ensuring good quality imaging on day of treatment and assisting in the planning and delivery of the radiation.
- The resident is also responsible for independent study as well as participating in at least one clinical gamma knife project during this rotation.

Patient Care

Goals and Objectives:
Gamma Knife radio-surgery is a long one-day procedure and residents are expected to assist in all parts of the medical care during each patient’s day. Given that the majority of patients treated with radio-surgery are patients with metastatic cancer, residents are expected to assist with medical management outside the standard neurosurgical realm both on the day of treatment as well as longitudinally.

Medical Knowledge

Goals and Objectives:
The resident is expected to learn:

- the indications and contra-indications for single fraction radio-surgery in patients with primary and metastastic brain tumors, vascular malformations and facial pain
- the indications and contra-indications for repeat radio-surgery for the same indications
- the expected result of treatment with radio-surgery for the above commonly listed conditions
- the role of radio-surgery versus open surgical treatment versus standard radiation therapy options in the management of the same conditions and the factors that determine patient and physician choice to use radiosurgery
- the potential acute and chronic complications of radio-surgery and the medical and surgical management options for these complications
- the fundamentals of dose planning particularly in avoidance of critical anatomic structures
- how to place and remove the head frame independently

Practice- Based Learning and Improvement

Goals and Objectives:

- The resident works directly with the neurosurgical attending and will receive daily feedback on performance.
- The resident is expected to implement that feedback to improve performance.
- Additionally, the resident is expected to read primary literature, care for patients before and after radio surgery and to use this experience as well as the available gamma knife patient database to ask and answer clinically important questions.

Systems Based Practice

Goals and Objectives:
The delivery of radio-surgery is a multidisciplinary treatment that requires co-ordination of staff and equipment from Radiation Oncology, Diagnostic Imaging (including MRI, CT and angiography) and Radiology, Radiation Therapy, Nursing and Physics. The resident is expected to learn the role of the Neurosurgeon within this process and problem-solving skills to improve this multi-stepped outpatient treatment process.

**Professionalism**

**Goals and Objectives:**
The resident directly interacts with patients and is expected to act in a professional and sensitive manner at all times. The resident also interacts with numerous other professionals including radiation oncologists, radiation technicians, and nursing staff to provide care, and is expected to act professionally and ethically during all interactions.

**Interpersonal and Communication Skills**

**Goals and Objectives**
- The patients undergoing gamma knife procedures are awake during the procedure and thus communication with the patient needs to be on-going and requires more clarity and sensitivity in communication throughout the procedure compared with typical operative patients.
- The resident works directly with the patient and numerous other healthcare professionals.
- The resident is expected to clearly communicate with the patient to manage expectations and answer questions regarding treatment and post-treatment events in a manner they can fully comprehend.
- The resident is expected to communicate clearly with other healthcare professionals to provide appropriate care.
- The resident is expected to assist in keeping accurate documentation in the clinical chart.
Neuropathology Rotation for Neurology and Neurosurgery Residents

Dr. Elizabeth Cochran (805-8556) and Kelly Simarski (805-8450) or Marisa Boskey (805-6982), Administrative Assts.

The purpose of the neuropathology portion of this rotation is meant to give the resident a basic understanding of how the neuropathological changes of neurological diseases help to explain mechanisms and treatment. This rotation is based at FH. Much of the time spent in this rotation is self-directed, with opportunities to review neuroanatomy and to learn the major distinguishing histologic features of various neurologic disorders.

Neuropathology Rotator Responsibilities:

1. Attend weekly slide review of current neurosurgical and autopsy specimens and weekly Brain tumor board conference.
2. Attend brain cuttings.
3. Make sure to contact the Neuropathology Department, PRIOR to your first day, to work out the specific details of your availability and Dr. Cochran’s availability.

Neuropathology “Typical” Day:

1. Slide review of current neurosurgical and autopsy specimens
   Once each week, on day/time to be determined at beginning of rotation (Usually Wednesday, Thursday, or Friday afternoons).
   Multiheaded microscope room in Surgical Pathology Office Suite, lower level, Lab building
2. Brain cutting
   This occurs each Thursday afternoon at 2PM in the autopsy room, lower level, Lab building
3. Brain tumor board
   7:00AM-Each Wednesday: Brain tumor board
   CFAC, 1st floor conference room, Froedtert Hospital

Conferences:
See above

Team/Meeting Room:

• Lab building, lower level, Surgical pathology suite, Multiheaded microscope room and Autopsy room.

Work Hours:

• See above Neuropathology typical day

Pager:

• Personal FH pager

Recommended Neuropathology Reading

Neuropathology Objectives:

1. Discuss the role of the neuropathologist in the treatment and management of patients with neurological disease. *(ICS, P, SBP)*
2. Be able to identify, define, and describe the gross and microscopic normal anatomy of the nervous system. *(MK, PC)*

   a. **Gross** – External and internal landmarks of the cerebrum, cerebellum, and brainstem major gyri and sulci
   - Visual, auditory, motor, and sensory areas, etc.
   - Arterial supply and venous drainage
   - Cranial nerves
   - Divisions of the brainstem
   - Basal ganglia, thalamus, and internal capsule
   - Fornix, commissures, pineal, pituitary, choroids plexus, etc.

   b. **Microscopic:**
   - Neurons
   - Light microscopic features
     - Ultrastructural features (Nissl substance, filaments, axons, dendrites, synapses, myelin)
     - Morphology of neuronal response to injury
       - Central chromatolysis
       - Ischemic change
       - Inclusion bodies (Cowdry Type A, Negri, Lewy, LaFora, Hirano Bunina)
       - Neurofibrillary tangle
       - Granulovacuolar degeneration
       - Neuritic plaques
   - Astrocytes
     - Light microscopic features of reactive astrocitosis and morphologic aspects of neoplastic dedifferentiation
   - Oligodendrocytes and ependyma
     - Light microscopic features, function, and morphologic aspects of neoplastic dedifferentiation
   - Microglia
     - Light microscopic features, function, and morphologic aspects of neoplastic dedifferentiation
3. Given a gross or microscopic specimen, be able to identify, describe, and define the pathology of the following common disorders of the nervous system and to correlate with clinical signs and symptoms. (MK)

a. **Congenital and neonatal disorders**
   - Agenesis of corpus callosum
   - Polymicrogyria
   - Porencephaly
   - Spina bifida and myelomeningocele
   - Pachygyria/lissencephaly
   - Anencephaly
   - Encephalocoele
   - Holoprosencephaly
   - Heterotopias
   - Syringomyelia
   - Arnold Chiari
   - Dandy-Walker
   - Germinal matrix hemorrhages
   - Leukomalacia

b. **Vascular Lesions**
   - Infarction
   - Intracerebral hemorrhage
   - Superior sagittal sinus thrombosis
   - CNS vasculitis
   - CADASIL
   - Amyloid angiopathy
   - Subarachnoid hemorrhage
   - Subdural hematoma
   - Vascular malformations
     - Arterio-venous malformations
     - Capillary telangiectasia
     - Cavernous angiomas
     - Venous angiomas
   - Hippocampal sclerosis
   - Cardiac arrest
   - Carbon monoxide

c. **Trauma**
   - Coup/contrecoup
   - Contusions
   - Diffuse axonal injury
   - Fat embolism
   - Herniation syndromes

d. **Diseases of Myelin**
   - Multiple sclerosis
   - Acute disseminated encephalomyelitis (ADEM)
   - Leukodystrophies
     - Krabbe’s
     - Adrenoleucodystrophy
     - Metachromatic leukodystrophy

e. **Infectious Diseases**
   - Bacterial meningitis
• Abscess
• Mycotic infections
• Tuberculous meningitis and tuberculoma
• Viral disorders
• Viral encephalitis
• AIDS
• Herpes
• PML
• Toxoplasma

f. Degenerative (Idiopathic) Disease
• Alzheimer’s disease
• Parkinson’s disease
• Diffuse Lewy body disease
• Frontotemporal lobar atrophy
• Corticobasal degeneration
• Friedreicht’s ataxia
• Progressive supranuclear palsy
• Huntington’s chorea
• Motor neuron disease
• Multi-system atrophy

g. Toxic, Metabolic and Lipid Storage Disorders
• Tay-Sachs
• Neuronal ceroid lipofuscinoses
• Wilson’s disease
• Alexander’s disease
• Hepatic encephalopathy
• Chronic alcohol abuse
• Fetal alcohol syndrome
• Wernicke-Korsakoff syndrome
• Central pontine myelinolysis
• Subacute combined degeneration

h. Phakomatoses
• Neurofibromatosis I and II
• Sturge-Weber disease
• Von-Hippl Lindau disease
• Tuberous sclerosis

i. Neoplasia
• Gliomas
• Astrocytoma, anaplastic astrocytomas, glioblastoma multiforme
• Ependymomas
• Oligodendrogliomas
• Gangliogliomas
• Central neurocytoma
• Dysembryoplastic neuroepithelioma
• Lhermitte-Danlos syndrome
• Craniopharyngioma
• Pineocytoma
• Primitive neuroectodermal tumors
• Germ cell tumors
• Metastasis
• Meningiomas
• Schwannomas, neurofibromas, and traumatic neuroma
• Pituitary adenomas

j. **Peripheral Neuropathy**
   • Normal anatomy of peripheral nerve
   • Guillain-Barre and chronic inflammatory demyelinating polyneuropathy
   • Vasculitic neuropathy
   • Leprosy
   • Herpes zoster neuritis
   • Hereditary sensory and motor neuropathies
   • Diabetic neuropathy
   • Amputation neuroma
   • Morton’s neuroma

k. **Muscular Diseases**
   • Myopathy
     ➢ Duchenne and Becker dystrophy
     ➢ Limb girdle muscular dystrophy
     ➢ Fascioscapulohumeral dystrophy
     ➢ Myotonic dystrophy
     ➢ Congenital muscular dystrophy
     ➢ Congenital myopathies
     ➢ Inflammatory myopathies (polymyositis, dermatomyositis, and inclusion body myositis)
     ➢ Mitochondrial, lipid, and glycogen storage myopathies
   • Neurogenic atrophy

l. **Miscellaneous**
   • Sheehan syndrome
   • Inflammatory lesions of pituitary
   • Sarcoidosis
   • Rathke cleft cyst
   • Colloid cyst
   • Epidermoid/dermoid cysts

Updated April 8, 2019