WV **West Virginia University**®
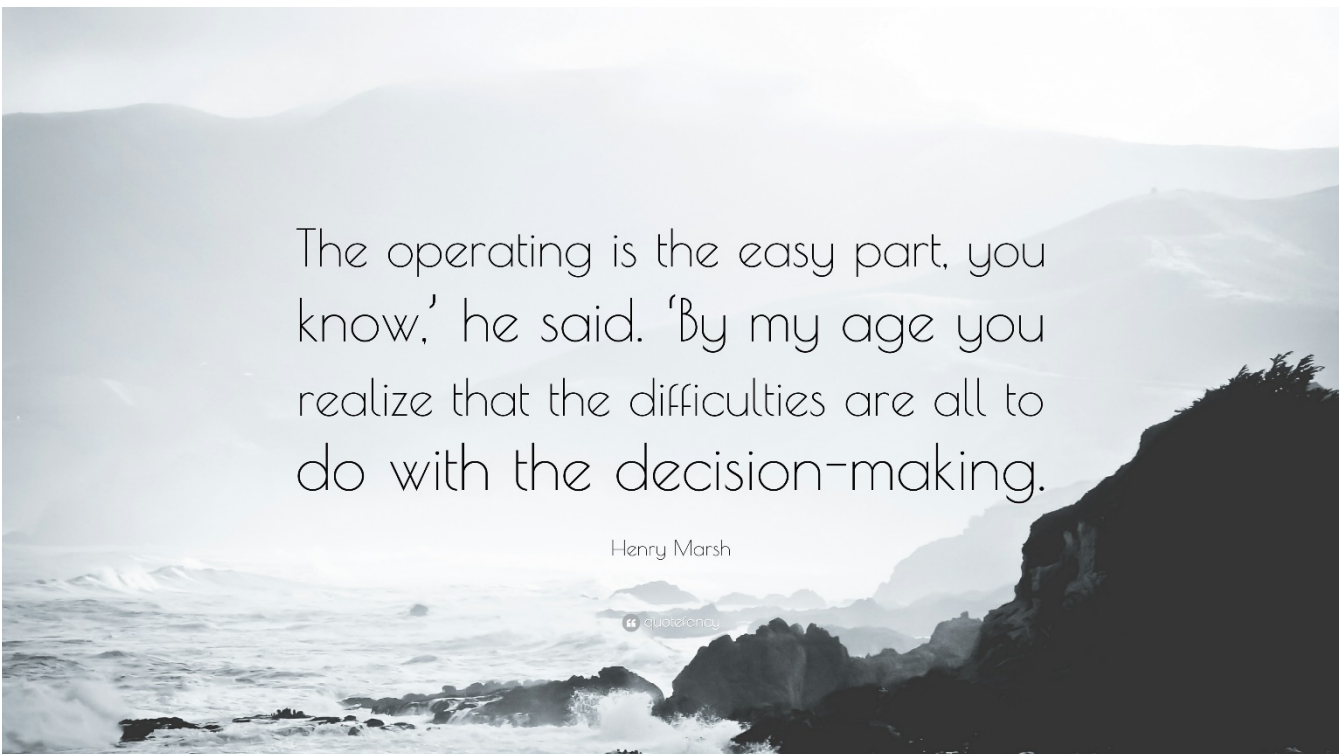
SCHOOL OF MEDICINE
DEPARTMENT OF NEUROSURGERY

Handbook
2022-2023

The operating is the easy part, you know,' he said. 'By my age you realize that the difficulties are all to do with the decision-making.

Henry Marsh

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West Virginia University Health Sciences Center
Department of Neurosurgery Resident Manual

Overview of Neurosurgical Training Program, Aims

The mission of the clinical training program is excellence in patient care, scholarship, and neurosurgical education. Program goals have been established to assure this mission is successfully executed. Residents first establish fundamental clinical and surgical skills. As training progresses, increasing neurosurgical expertise, both clinical and scholarly, is acquired. Upon completion of the neurosurgery residency training program, each graduate is highly skilled in managing the full spectrum of neurosurgical disease, and has developed the scholarly tools needed to contribute to the peer-reviewed literature. The resident is required to publish 6 PubMed indexed articles, as well as pass the ABNS Written Board Exam in order to matriculate from the program.

The WVU Neurosurgical Residency is a 7 year (84 months) program. There are 60 months of core clinical neurosurgery of which 12 months are the chief residency. In the internship, there is a six-month rotation in general care and a six-month rotation in neurocritical care. Longitudinal clinical experiences in anesthesia, neurology, pain medicine, pathology, and radiation oncology are distributed across this year. Beginning in PGY2, the resident begins to rotate on the clinical neurosurgery services. At times, Drs. Meltzer and Hamilton may function independently as a separate pediatric service with a dedicated resident when the resident curriculum schedule dictates such. The fourth year is the academic year, and is devoted to scholarly pursuit or enfolded fellowships. Academic pursuit may include graduate classes. The fifth year includes dedicated rotations in pediatrics and endovascular. The PGY6 and PGY7 split senior and chief responsibilities. The chief resident takes overall responsibility for the entire service. In summary, there are 12 months of internship, 24 months of clinical junior residency, a year of academic work, another 24 months of clinical senior rotations, and 12 months of clinical neurosurgery serving as chief resident.

Neuro-critical care experience is emphasized throughout the training, as well as extensive exposure to subspecialty services including neurovascular, neuro-oncology, epilepsy surgery, spinal neurosurgery, stereotactic radiosurgery, neurotrauma, functional neurosurgery and pediatric neurosurgery. Conferences are protected from clinical commitments and include morbidity and mortality conference, case conference, tumor board, asynchronous learning and board review, and journal club. Subspecialty conferences such as Epilepsy Conference or Spine Conference are encouraged. The anatomic dissection lab is available for scholarly work or preparation for operative cases.

Preparation of scientific manuscripts, review articles, book chapters and abstracts, as well as presentation skills and leadership/administrative skills are fostered within a structured mentored environment in a multidisciplinary fashion.

Overall Program Goals, Objectives, and Graduation Requirements

The overall goal of the residency program is to develop in our graduating residents a proficiency level appropriate for a new and independent practitioner in the six core competencies as outlined by the ACGME. We follow the standards put forth by the Neurosurgery RRC of the ACGME in the milestones project. Ideally, residents will achieve Level 4 across all of these milestones for graduation. These guidelines can be seen at ACGME Neurosurgery Milestones. (https://www.acgme.org/Portals/0/PDFs/Milestones/NeurologicalSurgeryMilestones.pdf) These milestones reflect:

- Patient care that is compassionate, appropriate, and effective for the treatment of health problems

and the promotion of health.

- Medical knowledge about the established and evolving biomedical, clinical and cognate sciences and the application of this knowledge to patient care.
- Practice based learning and improvement, which involves investigation and evaluation of patient care, the appraisal and assimilation of scientific evidence, followed by improvement in patient care.
- Interpersonal and communication skills resulting in effective information exchange with patients, their families, and other health professionals.
- Professionalism manifested through a commitment to carry out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.
- Systems-based practice as manifested by actions that demonstrate an awareness of and responsiveness to the larger context in systems of healthcare and the ability to effectively mobilize system resources to provide care that is of optimum value.

Each rotation is designed with these overall goals in mind. In order to direct progress, goals and objectives have been formulated for each rotation and approved by the PEC. Unique aspects of each rotation are outlined in this handbook, and the specific goals and objectives for each rotation are delineated in the appendix. Our assessment tools are designed to demonstrate progress towards these objectives by directly mapping to the milestones requirements using a common format.

Residents are responsible for reviewing all general and specific goals and objectives prior to beginning each rotation.

Professionalism

In keeping with the Common Program Requirements effective 7/1/2013, our GME programs wish to ensure:
1. Patients receive safe, quality care in the teaching setting now.
2. Graduating residents provide safe, high quality patient care in the unsupervised practice of medicine in the future.
3. Residents learn professionalism and altruism in a humanistic, quality, learning environment.

To that end, we recognize that patient safety, quality care, and excellent learning environments are about much more than duty hours. Therefore, we wish to underscore any policies which address all aspects of the learning environment, not just duty hours. These include:
1. Professionalism, including accepting responsibility for patient safety
2. Alertness management
3. Proper supervision
4. Transitions of care
5. Clinical responsibilities
6. Communication and teamwork
7. Health Care Disparities

Residents must take personal responsibility for and faculty must model behaviors that promote:
1. Assurance for fitness of duty
2. Assurance of the safety and welfare of patients entrusted in their care
3. Management of their time before, during, and after clinical assignments
4. Recognition of impairment, including illness and fatigue, in self and peers
5. Honest and accurate reporting of duty hours, patient outcomes, and clinical experience data

The institution further supports an environment of safety and professionalism by:

1. Providing and monitoring a standard Transitions Policy as defined at **Handoffs and Transitions of Care Policy** https://medicine.hsc.wvu.edu/media/365673/handoffsandtransitionsofcare2017logo.pdf. This policy is also available on the **SOLE GME website** (https://sole.hsc.wvu.edu/).
2. Providing and monitoring a standard policy for Duty Hours executed in E-value and defined formally on the GME website.
3. Providing and monitoring a standard Supervision Policy as defined by the **2017 ACGME policy Supervision Policy** https://medicine.hsc.wvu.edu/media/365696/supervision-policy.pdf.

A Supervision option is provided at the **Mistreatment Button** that will allow immediate anonymous reporting of inadequate supervision directly to the DIO. https://medicine.hsc.wvu.edu/gme/mistreatment-form/. Providing and monitoring a standard master scheduling policy and process that is congruent across both E-value and hospital resources.

4. Adopting an institution-wide policy that all residents and faculty must inform patients of their role in the patient's care.
5. Providing and monitoring a policy on **Alertness Management and Fatigue Mitigation** strategy that includes http://medicine.hsc.wvu.edu/media/2597/alertnessmanagementpolicy1-15-16.pdf:
   a. Online modules for faculty and residents on signs of fatigue.
   b. Fatigue mitigation, and alertness management including back up call schedules and promotion of strategic napping.
6. Assurance of available and adequate sleeping quarters when needed.
7. Requiring that programs define what situations or conditions require communication with the attending physician.

Process for implementing the Professionalism Policy

The program and institution will assure effective implementation of the Professionalism Policy by the following:
1. Program presentations of this and other policies at program and departmental meetings.
2. Core Modules for faculty and residents on Professionalism, Duty Hours, Fatigue Recognition and Mitigation, Alertness Management, and Substance Abuse and Impairment.
3. Institutional Fitness for Duty and Drug Free Workplace policies.
4. Institutional Duty Hours Policy, which adopts ACGME Duty Hours Language.
5. Language added specifically to the Resident Manual and the Resident Contract regarding Duty Hours Policies and the responsibility for and consequences of not reporting Duty Hours accurately.
6. Comprehensive Moonlighting Policy incorporating ACGME requirements. Orientation presentations on Professionalism, Transitions, Fatigue Recognition and Mitigation, and Alertness Management.

Monitoring Implementation of the Policy on Professionalism

The program and institution will monitor implementation and effectiveness of the Professionalism Policy by the following evaluations of residents and faculty including:
1. Daily rounding and observation of the resident in the patient care setting.
2. Evaluation of the residents' ability to communicate and interact with other members of the health care team by faculty, nurses, patients where applicable, and other members of the team.
3. Semi-annual competency based evaluation of the residents.
4. Semi-annual Milestone reporting to the ACGME.
5. By the institution via the Annual Program Evaluation (APE) and Special Program Review process.

6. By successful completion of modules for faculty and residents on Professionalism, Impairment, Duty Hours, Fatigue Recognition and Mitigation, Alertness Management, and others.
7. Program and Institutional monitoring of duty hours and procedure logging as well as duty hour violations in E-Value.

Recruitment Selection & Criteria Policy

1. Applications will be accepted via ERAS.
2. Applicants will be invited for interview based on a review of the following factors:
   a. performance on standardized tests,
   b. medical school performance,
   c. letters of recommendation,
   d. personal statement,
   e. extra-curricular activities,
   f. research activities.
3. Applicants will be ranked on the basis of the preceding factors in combination with a subjective evaluation of the interview by the faculty.
4. Residents will be accepted via the National Residency Matching Program.
5. If the program does not fill through the usual matching process, the position will be filled outside the match from available applicants. The most qualified individuals based on the above factors may be invited for interview.
6. There must not be any discrimination in the selection process with regard to race, age, religious affiliation, creed, sexual orientation, gender, gender identity, color, national origin, disability or veteran status.
7. Further information can be found in the institutional document **Criteria for the Selection of Candidates. (**http://medicine.hsc.wvu.edu/media/2577/criteria-for-selection-of-candidates-5-2008-nl.pdf)

Physician Licensure Requirements

As of July 2019, all residents and fellows in training programs sponsored by the West Virginia University School of Medicine must hold at all times during their training either a valid educational training permit or a valid unrestricted license by either the West Virginia Board of Medicine or the West Virginia Osteopathic Board of Medicine. It is the trainee's responsibility to request the initial permit or license from the appropriate board of medicine and to annually renew this authorization during their training.

For more information, please go to:
https://medicine.hsc.wvu.edu/media/365699/resident-physician-licensure-requirements-policy-2019.pdf

Clinical Competency Committee (CCC)

The Clinical Competency Committee serves at the invitation of the Program Director and forms the highest departmental authority in the evaluation of each resident in terms of attainment of milestones for reporting to the ACGME, and makes recommendations to the Program Director for advancement or remediation or dismissal.

All core faculty are invited for participation in the CCC. Dr. Brandmeir serves as CCC Chair.

Program Evaluation Committee (PEC)

The Program Evaluation Committee is the guidance committee which makes recommendations to the Program Director for determination or modification of the curriculum, policy, and procedures of the training program. The PEC meets at least yearly to review all program data and create action plans for program improvement. The Program Director, at the recommendation of the PEC, has authority to modify the contents of this manual at any time to respond to real or potential deficiencies in the program, as determined by the PEC. When this occurs, all residents will be notified of new policy by departmental email.

Current members of the PEC are all core faculty and one resident representative.

Duties of the Residents in Each Year

Duties of the residents in the WVU Neurosurgical Residency program are structured to provide a graduated experience and involvement in neurosurgical patient management and preoperative, intraoperative, and postoperative patient care, foster a learning environment to develop the resident as a neuroscientist, and mentor the resident to mature as a thoughtful, caring, and compassionate physician.

The WVU Department of Neurosurgery residency training program adheres to the Milestones Evaluation Standard as described by the Neurosurgery RRC of the ACGME, and the Matrix Curriculum as put forth by the Society of Neurological Surgeons.

The standard rotation schedule for neurosurgery rotations is depicted below. Note that variations will occur based on individual circumstances and personnel changes.

Curriculum

Year	Rotation	Duration
PGY-1	General Care & Clinical Neuroscience	6 months
	Neurocritical Care	6 months
PGY-2	Neurosurgery - Junior	6 months
	Neurosurgery - Junior	6 months
PGY-3	Neurosurgery - Junior Peds	3 months
	Neurosurgery - Junior	9 months
PGY-4	Academic Rotation	12 months
PGY-5	Pediatric Neurosurgery	3 months
	Neurosurgery - Senior	9 months
PGY-6	Neurosurgery – Senior/Chief Resident	12 months
PGY-7	Chief Resident & Subspecialty	12 months

PGY 1—First Year Neurosurgery Resident

The PGY1 year is divided into two six-month rotations. One rotation will be in General Care and Clinical Neurosciences, and will incorporate experiences in trauma, endovascular, radiation oncology, and gamma knife. The second block will be in Neurocritical Care, and will incorporate training in anesthesia as well. The intern is integrated into the Neurosurgical Inpatient Service throughout the year. Neurosurgical bedside procedures must be done WITH direct supervision and logged on the provided procedure tracking log before any such procedures can be done with indirect supervision. A Training License from the West Virginia Medical Board is required prior to starting the PGY1 year. **The USMLE Step 3 exam must be taken in this year.**

PGY 2-3—Second and Third Year Neurosurgery Resident

The PGY-2 and 3 years are spent on the general neurosurgery service at Ruby Memorial Hospital. The resident will take a leadership role in the primary management of the inpatient service. The resident will begin to develop the skills of neurosurgical patient management by following the patient through the course of their treatment with more involvement in surgical care as neurosurgical patient care skills develop. In addition, the 3rd year resident is expected to design an independent research curriculum for their PGY4 year (see below).

PGY 2-3 — Clinical and Academic Duties

Hospital patients are generally in the ICU or on the post-op surgical floor although some patients, including most consultation patients, are on other floors. The census generally runs from 25-40 patients. Residents make early morning rounds, evaluating and examining all patients, reviewing charts and studies, and planning dispositions. Rounds may be made with the attending in the morning, or later in the day, depending on the operative schedule and meetings, emergencies, and other factors at the direction of the attending. The residents and medical students are fully integrated into the outpatient clinics. Patients are first seen by a resident and/or medical student. The attending then sees the patient and the case is discussed with the resident. The resident will create the consultation or post op note but it will be read, corrected, and signed by the attending. When other duties permit, the junior resident is expected to report to the operating room whenever possible. The resident is allowed increasing involvement in the operation as surgical skills improve. Following or during the operation details are discussed and critiqued and recommendations for improvement made. On Friday, all residents not on vacation attend the didactic block. When possible, the resident is encouraged to attend any others of the multiple conferences at the Health Science Center. The PGY3 resident will spend 3 months on the pediatric neurosurgical service. Both PGY2 and PGY3 will take the neurosurgery written board exam for self-assessment. The PGY3 resident is expected to pass the exam prior to taking it for credit in PGY4. **The PGY2 resident must obtain a WV License prior to matriculating to PGY3**. **ECFMG residents must obtain WV License prior to matriculating to PGY4.**

PGY4—Fourth Year Neurosurgery Resident

The fourth year of training is spent in pursuit of neurosurgical scholarship or selected subspecialty offerings, often in a laboratory in the RNI or a departmental faculty member. We also encourage enfolded clinical experiences in neuro critical care for residents who have interest. The resident is expected to develop a plan well in advance with the program director. Clinical duties are limited, though call coverage is expected to maintain clinical skills through this period. This academic year is an opportunity for the resident to fine-tune their skills in academic pursuit including research design, conduct, and ethics, as well as academic professional communication skills. The content of the investigation is largely determined by the interests of the resident, but must be of high quality as determined by the program director and CCC. It is furthermore expected that the

PGY4 resident take the written board exam, and pass it, in this year.

> Graduation Requirement
> It is required prior to graduation that every resident will have at minimum 6 PubMed indexed, peer reviewed papers in print (roughly one per year).

PGY5—Fifth Year Neurosurgery Resident

In the fifth year, the resident returns to the RMH service as a senior resident, spending 3 months running the pediatric neurosurgery service, and the other 9 months on the neurosurgery service as well as experience in endovascular procedures. The resident has more autonomy in the operating room under the direction of the neurosurgical staff. Managerial skills are developed and implemented during this year. Medical student and junior resident teaching are encouraged through daily rounds and conference lectures, and the resident will receive dedicated didactic training to better fulfill these roles.

PGY6—Sixth Year Neurosurgery Resident

In the sixth year, the resident takes a leadership role on the RHM service in preparation for chief residency. When the chief resident is unavailable to take chief call, the PGY-6 will fill this role. The resident is expected to begin to assist or perform the most complex level of operative cases. The resident will begin to transition into the chief role halfway into their PGY6 year.

PGY7—Seventh Year Neurosurgery Resident

At the midway point of the PGY-6 year, the resident is amply prepared for the true chief residency. The chief resident is fully responsible for coordination of all patient care at RMH, resident manpower decisions, complication review, and the conference and call schedules. The total duration of the chief residency is 12 months, as per RRC requirements.

Clinical and Academic Duties (NS6-7)

The NS6-7 year, the resident is responsible for the day-to-day running of the neurosurgical service under the supervision of the faculty. He/she is expected to discuss and plan patient management including surgical operations with the attendings, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care. He/she is responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. He/she provides overall supervision for conferences including data collection for morbidity and mortality conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. He/she communicates with Chief Residents in other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management. At this level, the resident is responsible to be fully familiar with billing and coding, medical liability and patient safety issues, governmental regulatory concerns and practice development. It is anticipated that the finishing resident will be fully qualified to practice the highest level of neurosurgery.

Promotion, Criteria for Yearly Advancement

There are several areas where a resident must demonstrate accomplishments and proficiency to advance to the next level of training or be considered qualified to practice neurosurgery at the highest level. These are as follows: proficiency in the 6 Competencies, satisfying graduate medical requirements, satisfying ACGME Milestone requirements, successful completion of the written neurosurgical board exams for the appropriate year of training, Quality Improvement and Patient Safety (QI/PS) research project involvement, and scholarly activity (presentations and manuscript preparation).

Graduation Requirement:

The Resident must pass the written board exam when taken for self-assessment BEFORE being allowed to take the exam for credit. This effectively means that the exam must be passed for practice in the PGY3 year in order to take it for credit during the PGY4 year.

Oral examinations by the faculty will be incorporated into the CCC evaluations for each rotation. Poor performance on oral examinations may be cause for remediation, failure to advance, or dismissal. The practice of an excellent standard of medical care in each area of the six competencies is regularly evaluated through the biannual evaluation process as well as in regular clinical mentoring. Milestone evaluations are reported to the ACGME biannually. By participating with the American Board of Neurological Surgery (ABNS) examinations, the Residency Review Committee for Neurological Surgery (RRC) and the Accreditation Council for Graduate Medical Education (ACGME) oversight, the residents are assessed compared to national standards for neurosurgery. The WVU School of Medicine requires the completion of Core Curriculum Modules for resident advancement to the next year of training. Duty hours and operative case logs must be up to date daily, and medical documentation must be timely.

Scholarly Activity Requirement

It is required prior to graduation that every resident will have at minimum 6 PubMed indexed, peer reviewed papers in print (roughly one per year, excepting the chief year). Only residents who have made significant contribution to a research project will be listed as authors. Residents are encouraged to work together to carry research project to completion, however roles and authorship are to be decided and should be made clear at the beginning of collaboration. Any authorship disputes will be handled by the faculty mentor for the research. Presentation of research at national meetings is encouraged and the same authorship standards apply. The resident who plans to present the research should submit the research for consideration.

Research Procedures and Ethics

All research activities within the Department of Neurosurgery are bound by institutional research ethics. All research projects in which residents participate must be brought before the Residency Research Committee (Chair: Nick Brandmeir), be on file with Patricia Dekeseredy and/or Dan Cifarelli (Research Coordinators) and have IRB approval. All residents must have completed required training modules. All participants in a research project must be documented and approved by the faculty of record. NO PHI should be distributed in any fashion which will constitute a HIPAA violation. This includes sending PHI to medical student (MIX) email accounts. Case reports must have documented consent form signed by the patient.

Quality Improvement (QI) Project Requirements

QI projects are a required part of the residency curriculum. These may take a variety of formats. QI training takes place during the annual resident orientation. The QI project must involve all residents and involve clinically relevant topics to neurosurgery.

Conferences and Attendance

The conferences occur during a block of time protected from elective clinical activity. **Punctual attendance is required by all residents and medical students on the service.** Designated faculty are assigned to oversee each conference. All faculty members are encouraged to attend all conferences and are required to attend selected conferences. Vacation days, days off, and emergent patient care issues are the only excused absences. All residents with the exception of the chief resident must be present for the entire conference period.

Resident Core Curriculum Conference: All residents, medical students and designated faculty will attend. Lectures are given that cover the knowledge base requirements of the Neurosurgery Residency Core Curriculum. These are repeated every 3 years. Residents participate in giving grand rounds and are expected to present a thorough review of the literature in a formal power point presentation on their assigned topics.

SNS LECTURE SERIES

Topic	Category
Rhoton Anatomy	Anatomy
Cardiopulmonary Issues in the NICU (MI, Afib, CHF, Stunned Myocardium, PA Catheters)	
Fluid and Electrolytes, CSW, SIADH, Nutrition and Renal/Endocrine Issues in the ICU	Critical Care
Hematologic and Coagulation Issues in the NICU (DVT/PE, transfusion, platelet issues)	Critical Care
Pharmacology of vasoactive, anticonvulsants, diuretics, ionotropes	Critical Care
Pre-Operative Evaluation for Epilepsy	Epilepsy
DBS for Parkinsons, Tremor, Other	Functional
Parkinson's Disease, Parkinsons-like Syndromes (Diagnosis/Medical Management)	Functional
Epilepsy (syndromes, natural history, medical management, EEG)	Epilepsy
Facial Pain syndromes (Tic, Atypical, Glossopharyngeal neuralgia, hemifacial spasm, medical and surgical management)	Functional
Other movement disorders (benign essential tremor, dystonia, OCD)	Functional
Pain and Analgesia and other pain syndromes (failed back, cancer, sympathetic mediated, post-herpetic, phantom limb)	Functional
Stereotactic techniques (Frame based, frameless, applications)	Functional
Surgical management of epilepsy (presurgical workup, resection, outcomes)	Functional
History of Neurosurgery	History
Infections: meningitis, encephalitis, abscess, empyema, post op infections	Infections
Ataxias with review of cerebellar/vestibular pathology	Neurology
"Coma and altered consciousness" and brain death	Neurology
Dementia (AD, Picks, Frontotemporal, Multi-Infarct...)	Neurology
EMG/NCS	Neurology
Headache Syndromes	Neurology
Multiple Sclerosis and Variants	Neurology
Spinal Muscular Atrophy, Muscular Dystrophies, ALS	Neurology
Systemic Approach to neuromuscular disorders (Motor neuron, axon, myelin, muscle, NMJ)	Neurology
Autonomic Nervous System	Neuroscience
CSF, CBF, BBB physiology	Neuroscience
Motor system/cortical/brainstem/cerebellar control	Neuroscience

Nerve Biology I, membrane potential/ion channels	Neuroscience
Nerve Biology II, Synaptic transmission	Neuroscience
Somatic Sensory System	Neuroscience
Special Sense: Vision	Neuroscience
Special Sense: hearing, balance, smell, taste	Neuroscience
Chemotherapy (principles, apoptosis, anti-angiogenic, antiproliferative agents	Oncology
CNS Cysts (colloid, dermoid, epidermoid, arachnoid, pineal)	Oncology
CPA tumors	Oncology
Meningiomas	Oncology
Metastatic Disease	Oncology
Neurocutaneous syndromes (NF, VHL, Tuberous sclerosis, Sturge-Weber)	Oncology
Pineal Region tumors	Oncology
Primary Neoplasms I (astrocytomas, and oligodendrogliomas)	Oncology
Primary Neoplasms II (JPA, PXA, SGCA, ganglioglioma, DNET)	Oncology
Primary Neoplasms III (ependymoma, choroid plexus tumors, primary central neuroblastoma, intraventricular tumors)	Oncology
Radiation Therapy (radiation biology, fractionated, conformal)	Oncology
Radiosurgery (principles, planning, gamma knife	Oncology
Sellar/Suprasellar Tumors (Pituitary tumors, hormone syndromes, Dex Supp test, craniopharyngiomas, rathke's)	Oncology
Skull Base Approaches (Craniofascial, OX, Transtemporal, Far-Lateral)	Oncology
Skull Base Tumors and Orbital Tumors (Chordoma, chondrosarc, orbital tumors, glomus tumors)	Oncology
Tumor biology, epidemiology, genetics, risk factors, WHO grading	Oncology
Acute management of SAH and Seizures	Critical Care
Adult and Pediatric Head Trauma (CHI, GCS, herniation syndromes, ICP monitoring, decompressive craniectomy	Trauma
Spine Trauma: Evaluation and management	Spine
Ventriculostomy/ICP monitor placement	Critical Care
Surgeon Scientist	PBLI
Cortical Mapping	Pediatric
Craniosynostosis (plagiocephaly, non-syndromic, syndromic)	Pediatric
Embryology	Pediatric
Hydrocephalus I (pathophys, SVS, pseudotumor, adult and NPH)	Pediatric
Hydrocephalus II (Shunt techniques, ETV techniques, managing infection	Pediatric
Spasticity and movement disorders in children	Pediatric
Pediatric Tumors (posterior fossa)	Pediatric
Pediatric Tumors (Supratentorial)	Pediatric
Pediatric Vascular (AVM, Moya moya, VoG malformations)	Pediatric
Congenital I (spina bifida, CP, spasticity/movement disorders)	Pediatric
Congenital II (chiari malformation, syrinx)	Pediatric
Brachial Plexus and peripheral nerve injury, or lumbo-sacral plexus (types, classification, regeneration, treatment)	Peripheral nerve
Peripheral entrapment syndromes (radial, ulnar, median, peroneal, tibial, suprascapular)	Peripheral nerve
Spinal Anatomy (bone, ligamentous, craniocervical junction, vascular, spinal cord)	Spine
Biomechanics (criteria for instability, white and panjabi, denis, tumor)	Spine
Bone healing (normal bone physiology, allograft vs autograft, BMP, bone growth stimulators)	Spine
Degenerative Spinal Disease I (cervical radic, myelopathy, OPLL, ACDF, laminectomy vs laminoplasty, treatment algorithm, thoracic disc disease, approaches)	Spine
Degenerative Spinal Disease II (lumbosacral radic, DDD, spondy, discectomy, interbody fusion, evaluation, algorithm)	Spine
Spinal Infections (Diskitis, osteo, post op infections)	Spine

Oncology I (primary bone tumors, classification, treatment, metastatic disease, management algorithm)	Spine
Oncology II (intramedullary, intradural extramedullary, surgical treatment, xrt)	Spine
Other Spinal Disorders (RA, AS, DISH, osteoporosis, compression fx, vertebroplasty, kyphoplasty	Spine
Spinal cord injury (imaging, management, steroids, stem cells, rehab)	Spine
Spinal Trauma I (cervical, halo, braces, traction, fracture types, operative positioning)	Spine
Spinal Trauma II (thoracolumbar bracing, fractures, operative approaches)	Spine
Aneurysms I (unruptured, natural history, ISUIA, treatment)	Vascular
Aneurysms II (ruptured intracranial, SAH, hunt/hess, HCP, vasospasm, treatment	Vascular
AVMS (natural history, Spetzler-Martin, surgery, radiosurgery, embo, management principles	Vascular
Cerebrovascular anatomy and surgical approaches and Clipping techniques	Vascular
Evidence-based treatments for acute ischemic stroke	Vascular
Intracerebral hemorrhage	Vascular
Other malformations (cavernous, venous angiomas, dAVFs, moya moya)	Vascular
Spinal Vascular Malformations (natural history, grading, surgery, endovascular)	Vascular

M&M/Complications: Morbidity and Mortality Conference covering the cases of the previous month is held each month. This conference is held to discuss in detail surgical cases that have had associated deaths or complications. It is the responsibility of the chief resident to lead accurate data on all surgical cases, including deaths and complications, performed on the service the month prior, although generally the PGY2 resident is the presenter. Each case presentation should include:
- detailed history and physical examination of the patient
- details of the hospital course
- details of the decision process made in the care of the patient
- literature review relevant to the case
- alternative treatments
- options/suggestions to avoid complications or death in the future.
- consideration of whether the case warrants a <u>root cause analysis</u>

This is to be presented in a Power Point format. The chief resident should be able to answer questions on any of the cases included in the statistics. All residents on the service are required to attend and participate in the discussions. Psychosocial complications will also be considered in this venue alongside medical and surgical complications. Button pushes or patient complaints can be included in the case list for the month's M&M if issues pertinent for group discussion are uncovered in the routine investigation. On an average of once per quarter the chief resident will select an outcome for root cause analysis and will assign individual tasks for analysis to more junior residents. Additionally Dr. Brandmeir serves as the neurosurgical liaison to the RNI QI Committee and he will oversee M&M, meet with residents monthly to assess, and include resident participation in QI Committee discussions and activities.

Journal Club: Several recent meritorious journal articles are presented and reviewed in depth by a resident, and should be placed in context using classically quoted articles on that topic. Teaching articles for faculty development, as well as "landmark papers" may be included. Designated faculty and all residents are required to attend. An analysis of the quality of the article should be presented critically by the resident. Journal club format may change yearly depending upon resident and faculty preference.

Neurosurgery Case Conference: Cases from the two weeks prior to conference will be discussed in case conference. Indications, outcomes, surgical procedures, other options, etc. will be discussed in a multidisciplinary fashion.

Lab and operative skills curriculum: A lab and operative skills curriculum will be conducted at the conclusion of the didactic sessions, covering all areas of neurosurgery.

Evaluations

Purpose

The program recognizes the need to provide a structure by which performance related to the training program will be assessed and consideration given for promotion to the next level of training. Evaluation will be provided in accordance with Graduate Medical Education Committee policy and ACGME common program requirements.

> **Note: This policy addresses performance relating to academic program requirements and does not supersede other institutional or legal requirements that must be met by the resident to remain in a training program.**

Policy

Residents will receive written evaluation, goals and objectives from their faculty for each year and/or major rotation of their training program, as well as receive monthly "on the fly" formative feedback. All residents participating in training will be provided, at a minimum, a semi-annual formal evaluation developed by the faculty. Residents shall be allowed to review semi-annual evaluations contained in permanent records and other evaluations as determined by program policy. The formal written evaluation shall:

1. Address each of the six ACGME core competencies and RRC milestones.
2. Include scoring and rating criteria that seek to minimize subjective assessment of performance.
3. Include language indicating satisfactory performance, advancement to the next level of training (if applicable) or provide specific actions and performance requirements by the resident to return to a level of satisfactory performance or advancement to the next level of training.
4. Be signed and dated by the resident and Program Director.
5. Become a part of the permanent record file for the resident.

In addition, each resident will meet near the midpoint of each rotation with an assigned faculty advisor according to PGY year for an informal progress evaluation to assess strengths and weaknesses in performance, so that adjustments can be made over the remainder of the rotation. Each meeting with the advisor will address multiple domains on a standardized form as determined by the PEC.

Residents will be assigned evaluations to complete semi-annually. Self, peer, program and faculty evaluations must be completed in a timely manner, which is defined as within two weeks of assignment, and meet completion deadline as assigned by the Program Coordinator.

Milestones

The milestones are designed only for use in evaluation of resident physicians in the context of their participation in ACGME accredited residency or fellowship programs. The milestones provide a framework for the assessment of the development of the resident physician in key dimensions of the elements of physician competency in a specialty or subspecialty. They neither represent the entirety of the dimensions of the six domains of physician competency, nor are they designed to be relevant in any other context.

For more information about The Neurological Surgery Milestone Project, please go to:

https://www.acgme.org/portals/0/pdfs/milestones/neurologicalsurgerymilestones.pdf

Mentorship of Residents

Each resident will have a faculty advisor assigned by resident year. This faculty member will track the resident's progress through the year and will meet with the resident to perform the mid-cycle formative evaluation. The review will contain, but not be limited to, the following elements:

1. Clinic volume and mix
2. Operative Skill progression and case numbers by category
3. Humanism, Professionalism, and Communication
4. Progress on scholarly projects
5. Contribution to QI projects
6. Boards preparation

In addition, each faculty member will have a specific emphasis for the year, based upon personal interest/strengths and the needs/emphasis of each specific year of residency. The rotation is designed to have each resident develop a mentorship relationship with each faculty member.

Mandatory focus by year:

PGY1	Sedney	Integrating with multiple hospital services
PGY2	Lewis	Efficiency and teamwork
PGY3	Bhatia	Research year planning
PGY4	Cifarelli	Written boards preparation
PGY5	Brandmeir	Fellowship and career planning
PGY6	Meltzer	Humanism and professionalism
PGY7	Marsh	Leadership and operative independence

Inter-departmental Policies

Neuro ICU Admission Criteria:

The following will be admitted under neurosurgery OR NCCU Primary coverage to NCCU:
>   Primary Neurosurgery patients requiring ICU care
>   Post-op cranis
>   Cerebral aneurysms (pre-intervention, post intervention, vasospasm)
>   Operative stroke
>   Neurosurgery post op spine surgery needing ICU
>   Isolated TBI (operative and non-operative)
>   Neuro IR patients
>   Acute hemorrhage into tumors
>   Intra-parenchymal hemorrhage (hypertensive or spontaneous)
>   Post TPA patients first 24 hours
>   Primary Neurology patients requiring ICU care
>   Status Epilepticus
>   Patient with known underlying seizure disorder having seizure requiring mechanical ventilation
>   Neuromuscular Disease as primary reason requiring ICU care
>   Complicated ischemic stroke requiring ICU care

SICU will admit:
>   TBI with other injuries (trauma service and SICU)
>   Ortho Spine patients needing ICU care

MICU will admit:
>   Meningitis, encephalitis requiring ICU care
>   AMS or seizure status due to unknown origin requiring ICU

SDU:
>   Isolated TBI under 55, no anticoagulants, GCS 14/15 to do SDU on Trauma Service
>   Uncomplicated ischemic stroke without TPA – SCU or floor on Neurology Service

Patient phone calls:

All patient contact and MARS line calls must be documented in the medical chart. Summarize clinical findings as described by patient or referring provider and your recommendations. Document disposition you have recommended and why, particularly if patient is being sent to ER rather than being directly admitted to the neurosurgical service.

ER Consults and Transfers:

Brief documentation is required for ER "Side line" consults including clinical findings as described by referring provider, imaging findings if reviewed, and your recommendations. The ER may ask for help expediting MRIs or giving recommendations for type of imaging needed but consults do not have to be seen before imaging is obtained and a call back/formal consult is expected after imaging is obtained. All formal consults must be seen in a timely fashion.

Patient Safety

The Department of Neurosurgery takes patient safety seriously and works to ensure multiple layers of patient safety. The beginning of the year orientation includes a small group patient safety activity and includes the main types of patient safety threats as well as how to avoid them. During this activity we also emphasize the importance of handoffs and correct handoffs are demonstrated and role-played by the residents. The Patient Safety Net (PSN) is explained, including methods of access and reporting. Furthermore, all residents, in accordance with GME policy, complete the self-directed modules regarding patient safety from IHI.   The PSN is also outlined in our resident handbook.

Handoffs continue to be supervised by the chief resident and experienced midlevel providers. They are assessed by the PD at least monthly and hand-offs are assessed in "on the fly" faculty evaluations.

Patient safety continues to be addressed and assessed throughout the academic year. Residents are encouraged to work to improve patient care through a variety of mechanisms. Adverse events and near misses are reported. The PD or APD provide feedback to all residents involved in patient safety events. All residents and faculty participate in interprofessional, interdisciplinary, systems-based improvement efforts including patient safety event reviews and analyses which include departmental Morbidity and Mortality (M and M), review of stroke and trauma/TBI/SCI performance, and multi-departmental M and M when appropriate (e.g. neurosurgery and anesthesia when relevant). Our departmental M and M is supplemented by the attendance of an interprofessional team to ensure accurate reporting, representation, and statistical analysis and comparison to previous months and national benchmarks. Patient safety is included in the neurosurgical milestones and is assessed at mid- and end-of-year evaluations for every resident.

Well Being

The WVU Department of Neurosurgery fully supports and complies with the ACGME requirements for physician wellbeing utilizing a variety of both formal and informal programs.
https://medicine.hsc.wvu.edu/media/365698/well-being-policy.pdf

Formal programs:
1. Quarterly social events (team building exercise for residents in the summer (ropes course, escape room), Labor Day picnic in the fall, Holiday party in the winter, and social event tied to a visiting professor in the spring such as a baseball game).
2. Wellness days for independent wellness needs (done about quarterly; 5th Friday of each month)
3. Welcome letter to parents and family of residents which includes ways that they can help support their loved ones during training, as well as contact info for program faculty and staff with whom to discuss any concerns.

Informal wellness support:
In addition to the programs delineated above, the Department of Neurosurgery residency program benefits from close interactions with staff physicians and a resident-to-staff ratio of less than 1:1. As a result, individual attention and close relationships are developed which evolve over the 7 year duration of the residency program. Wellness concerns, particularly with regard to psychological wellness, have previously been successfully identified and managed through these close relationships and protocols. The main contacts for these concerns have been the PM (Melissa Acocella) and PD (Cara Sedney) both of whom have pursued additional education regarding this issue (via relevant reading: e.g. "Physician Suicide Letters" by Patricia Wimble, "Developing Resilience among Neurosurgery Residents" by Gary Simonds, and via relevant educational lectures/seminars at neurosurgical educational meetings) and participate in committee and research-level Wellness endeavors.

Diversity and Non-Discrimination

The Department of Neurosurgery Residency Program is the only neurosurgery residency program in the state, and as such has dual goals for its training program as related to diversity:

1. Attract and retain top talent reflective of a diverse world population to WVU Medicine Neurosurgery in order to provide world-class tertiary neurosurgical care to the people of West Virginia and beyond.
   a. In order to do this, the program seeks to create a community reflective of the broader world community and focused on excellence or potential in research and patient care.

2. Train and retain neurosurgeons who are culturally competent to provide care to the population of West Virginia, in particular those from the state.
   a. In order to do this, the program seeks to actively foster an interest in neurosurgery amongst students within the state, while creating opportunities for training and subsequently retention of these students, residents, and faculty within the state.

3. The WVU School of Medicine is the flagship institution of medical education, healthcare, and research for the state of West Virginia. As a land grant institution, our goal is to improve the health and wellness of West Virginia residents. The School endeavors to select a gender-balanced, diverse, and tolerant graduate student body, faculty, and staff. Our priority is to recruit key, value-added, underrepresented in medicine groups that include African-Americans, Hispanics, LGBTQ, and Native Americans/Pacific Islanders. The WVU School of Medicine also aims to recruit residents/fellows who are included in the socioeconomically and educationally disadvantaged rural Appalachian population.

https://medicine.hsc.wvu.edu/media/365745/gme-policy-on-diversity.pdf

Transition of Care

The transitions policy is created in recognition that multiple studies have shown that transitions of care create the most risk of medical errors (ACGME teleconference July 14, 2010.) In addition to the below specific policies, promotion of patient safety is further ensured by:
1. Provision of complete and accurate call schedules on the hospital intranet On Call.
2. Presence of a backup plan for those cases where a resident is unable to complete their duties.
3. The ability of residents to freely, and without fear of retribution, report their inability to carry out their clinical responsibilities due to fatigue or other causes.

Policy and Process

Residents receive educational material on Transitions during orientation as a core module. This utilizes the IPASS system.

In any instance where care of a patient is transferred to another member of the health care team (including service hand-offs or between services) an adequate transition must be used. Although transitions may require additional reporting than required in this policy, a minimum standard for transitions must include the following information:

1. Demographics
   a. Name

b. Medical Record Number
c. Unit/room number
d. Age
e. Attending physician – Phone numbers of covering physician
f. Gender
g. Allergies
h. Admit date

2. History and Problem List
   a. Primary diagnosis(es)
   b. Chronic problems (pertinent to this admission/shift)

3. Current condition/status

4. System based
   a. Pertinent Medications and Treatments
   b. Oral and IV medications
   c. IV fluids
   d. Blood products
   e. Oxygen
   f. Respiratory therapy interventions

5. Pertinent lab data

6. To do list: Check x-ray, labs, wean treatments, etc., including rationale

7. Contingency Planning – What may go wrong and what to do

8. **ANTICIPATE** what will happen to your patient.

   Example: *"If seizes > 5 minutes, give Ativan 0.05mg/kg. If still seizes, load with 5mg/kg of fosphenytoin."*

9. Difficult family or psychosocial situations

10. Code status, especially recent changes or family discussions

Handoffs should be completed in person. Occasionally, circumstances may require a phone call, but must always be completed with direct verbal communication between the two responsible providers. Whenever possible, additional members of the team, including staff, patients, families, and physician extenders, should also be included. The EMR "Hand off sheet" should be maintained.

How Monitored:
The process and effectiveness of the handoff system is monitored by direct supervision of handoffs at least monthly by faculty and by evaluation of modeled handoffs in the conference environment. Contributions of the handoff process to outcomes will be considered at the monthly Morbidity and Mortality Conference. The PEC will ultimately evaluate the effectiveness of the system in the Annual Program Evaluation (APE) on a yearly basis, and the sponsoring institution will evaluate by the Internal Review process. The institution and program will monitor this by periodic sampling of transitions.

In addition, please note the institutional policy regarding the Professionalism Standard for Interruption of Patient Care.
http://medicine.hsc.wvu.edu/media/2575/residentprofessionalismstandardforinterruptionofpatientcare2011re

A. If a resident is aware of any conflict that may arise during the course of any upcoming procedure or patient care activity, whether such a procedure or activity is scheduled or emergent, that resident must inform the attending physician and/or Residency Program Director in advance to allow the physician or service to determine whether patient safety will allow for reasonable accommodations. It may be necessary to alter a resident's rotation schedule if breaks cannot be reasonably accommodated.

B. In surgical settings and other patient care activities, residents may not scrub out of surgical procedures, leave the operatory or any patient care setting for any non-emergent reason (e.g. medical conditions, breast feeding, or child or adult care). While emergencies will sometimes arise, in the event of an unforeseen emergency, residents must appropriately notify the attending physician of the emergency and seek the necessary permission to be excused only when and if the circumstances warrant. In absolutely no instance should a resident scrub out of surgery or leave the operatory without first informing the attending physician and obtaining permission to exit. Residents are expected to be compliant with current duty hour standards and program duty hour policies and procedures.

Consequences for failure to comply will be at the discretion of the Residency Program Director.

Fatigue Prevention
Alertness Management /Fatigue Mitigation Strategies

Policy and Process

Residents and faculty are educated about alertness management and fatigue mitigation strategies on line via SOLE GME for Residents ("Fundamentals of Fatigue Prevention"), and in departmental conferences/residency orientation. For more in-depth information, please go to
https://medicine.hsc.wvu.edu/media/369320/fatiguepreventionpolicy2010-1.pdf

Alertness management and fatigue mitigation strategies include:

1. Warning Signs
    a. Falling asleep at Conference/Rounds
    b. Restless, Irritable w/ Staff, Colleagues, Family
    c. Rechecking your work constantly
    d. Difficulty Focusing on Care of the Patient
    e. Feeling "like you just don't care"
    f. *Never drive while drowsy*

2. Sleep Strategies for House Staff
    a. Pre-call Residents
        1. Don't start call with a sleep deficit – get 7-9 hours of sleep
        2. Avoid heavy meals and/or exercise within 3 hours of sleep
        3. Avoid stimulants to keep you awake
        4. Avoid ETOH to help you sleep
    b. On-Call Residents

1. Tell Chief/PD/Faculty if too sleepy to work
2. Nap whenever you can (> 30 min or < 20 min)
3. BEST Circadian Window 2PM-5PM & 2AM-5AM
4. AVOID heavy meals
5. Strategic consumption of coffee (t ½ 3-7 hours)
6. Know your own alertness/sleep pattern

   c. Post-call Residents
1. Lowest alertness 6AM –11AM after being up all night
2. Full recovery from sleep deficit takes 2 nights
3. Take 20 min. nap or coffee 30 min before driving
4. Alert your chief resident, PM, or APD, or PD for accommodations if you are unable to safely drive home. **We will help you!**

A backup plan will be devised in the event a resident must be relieved for fatigue – this may require chief resident filling in temporarily or a temporary alteration to the call schedule. The PD and PM must be notified for instructions in the event this occurs.

How Monitored:
The institution and program monitor successful completion of the on line modules. Residents are encouraged to discuss any issues related to fatigue and alertness with supervisory residents, chief residents, and the program administration. Supervisory residents will monitor lower level residents during any in house call periods for signs of fatigue. Adequate facilities for sleep during day and night periods are available in the hospital, and residents are required to notify Chief Residents and program administration if those facilities are not available as needed or properly maintained. At all transition periods, supervisory residents and faculty will monitor lower level residents for signs of fatigue during the hand off. The institution will monitor implementation of this indirectly via monitoring of duty hours violations in E-value, the Annual Resident Survey (administered by the institution to all residents and as part of the annual review of programs) and monitoring of accurate timely reporting of hours to the program coordinator and program director to ensure residents do not exceed work hour limits. http://medicine.hsc.wvu.edu/media/2598/gmebylawsrevised1-15-16.pdf

Policy Ensuring Residents Have Adequate Rest

In order to ensure residents have adequate rest between duty periods and after on –call sessions we adopt the following policies:

1. Our Duty Hours Policy contains the following relevant language:
   a. According to the Neurosurgery Review Committee, residents must be prepared to enter the unsupervised practice of medicine and care for patients over irregular or extended periods. This preparation must occur within the context of the 80-hour, maximum duty period length, and one-day-off-in seven standards. While it is desirable that residents in their final years of education have eight hours free of duty between scheduled duty periods, there may be circumstances [as defined by the Review Committee] when these residents must stay on duty to care for their patients or return to the hospital with fewer than eight hours free of duty. Circumstances or return-to-hospital activities with fewer than eight hours away from the hospital by residents in their final years of education must be reported to the program manager and the program director for monitoring.

   All of the above criteria are in the context of the other duty hours requirements.

2. All employees must abide by the **Fit for Duty Policy**:
   https://medicine.hsc.wvu.edu/media/365671/fitfordutypolicyrevisions3-24-17logo2017.pdf

This describes the expectations for employees to report to work fit and safe to work. It further defines unsafe/impaired behaviors, and the requirement for self or supervisor referral to the [Faculty Staff Assistance Program (FASP)](http://www.hsc.wvu.edu/fsap/) (http://www.hsc.wvu.edu/fsap/) and what steps are taken thereafter.

A resident physician who is suspected of being impaired for any reason is immediately subject to drug screening.

Refusal of drug screening is grounds for immediate suspension and/or termination with referral to the Faculty and Staff Assistance Program (FSAP) and/or the West Virginia Medical Professional Health Assistance Program.

3. Residents must take personal responsibility for and <u>faculty must model</u> behaviors that promote:
   a. Assurance for fitness of duty.
   b. Assurance of the safety and welfare of patients entrusted in their care.
   c. Management of their time before, during and after clinical assignments.
   d. Recognition of impairment (e.g. illness or fatigue) in self and peers.
   e. Honest and accurate reporting of duty hours, patient outcomes, and clinical experience data.
   f. Adequate sleep facilities are in place at each institution and our alertness management / fatigue mitigation policy and process encourages good sleep hygiene as well as recommending such strategies and pre-call strategies, strategic napping and post-call naps.
   g. Faculty will model behaviors that encourage fitness for duty as noted above, and our Supervision Policy requires faculty to observe for signs of fatigue especially during transitions.

Use of Strategic Napping

Strategic napping is utilized while on call to ensure that residents are able to avoid fatigue. Residents are encouraged to nap overnight especially between the hours of 10 PM through 8 AM to avoid excessive fatigue. The effectiveness of this process will be monitored by faculty responsible for patient care that the resident is involved in on the following day. Difficulties must be reported to the program director for review.

Case Logging Policy

Residents are expected to log ALL operative cases and procedures in every setting, including bedside, pain clinic, Gamma Knife, interventional radiology, ICU, etc. Case logs are expected to be kept up-to-date at least weekly and are reviewed at each formal evaluation. Meal cards may be turned off for delinquent logging practices.

> **Graduation Requirement:**
>
> All case minimums are required to be met by the 6th month of the PGY7 year. If minimums are not met, specific rotations will be crafted for the final 6 months of the chief year to meet minimum requirements.

Supervision and Progressive Responsibility Policy

SUPERVISION OF RESIDENTS

Purpose:
To ensure that residents are provided adequate and appropriate levels of supervision during the course of the educational training experience and to ensure that patient care continues to be delivered in a safe manner. http://medicine.hsc.wvu.edu/media/2598/gmebylawsrevised1-15-16.pdf

Policy and Procedure:
All program faculty members supervising residents must have a faculty or clinical faculty appointment in the School of Medicine or be specifically approved as supervisor by the Program Director. Faculty schedules will be structured to provide residents with continuous supervision and consultation.

Residents must be supervised by faculty members in a manner promoting progressively increasing responsibility for each resident according to their level of education, ability and experience. Residents are provided information addressing the method(s) to access a supervisor in a timely and efficient manner at all times while on duty.

The program provides additional information addressing the type and level of supervision for each post-graduate year in the program that is consistent with ACGME program requirements and, specifically, for supervision of residents engaged in performing invasive procedures.

1.   To provide patients with quality care and house officers with a meaningful learning experience, a supervising attending physician must be clearly identified for each patient admitted to or consulted by the neurosurgical service. It is the responsibility of the house officer to notify an attending physician that a consultation or admission has been initiated on his/her service, based on the call schedule and back-up mechanisms established in the department.

2.   The supervising attending physician is ultimately responsible for all recommendations rendered and care delivered by house officers, paramedical personnel and other trainees on the neurosurgical service.

3.   Supervision shall be readily available to all house officers on duty. Supervision should first be from the attending listed for that patient. If this physician is not immediately available, the on-call attending will be the supervising attending. A comprehensive call list of house officers and attending physicians is disseminated to all switchboard operators, hospital call centers, clinical care areas and all covering house officers on a monthly basis.

4.   Supervision shall be conducted to ensure that patients receive quality care and house officers assume progressively increased responsibility in accordance with their ability and experience, based on curriculum objectives for the respective level of training.

5.   Levels of supervision include attending physician demonstrating a procedure, assisting with the procedure, present physically in the area where intervention is performed, attending available by telephone, senior house officer or other supervisor present physically or available by telephone. The attending physician in charge of a respective procedure shall determine the level of supervision for a particular house officer and the specific invasive procedure.

6.   The responsible attending physician may delegate supervision of more junior house officer to a more senior resident as appropriate. These determinations shall be consistent with the individual house officer's knowledge base and skills, the complexity of the case and procedure, and the house officer's prior evaluations regarding levels of performance per the residency program core curriculum objectives for each level of training.

7.   House officers must request help when the need for assistance is perceived, and responsible attending physicians must respond personally when such help is requested. When a patient's attending physician is not available, a previously designated physician or the attending on call shall assume all coverage responsibilities for the patients.

8.   The Chief Resident shall relay to the Department Chair and the Program Director any incident where another house staff did not notify a responsible faculty member, a responsible faculty member was not responsive, or any other breach of supervision as outlined in this policy.

Policy and Process:

Several of the essential elements of supervision are contained in the Policy of Professionalism detailed elsewhere in this document. The specific policies for supervision are as follows.

Faculty Responsibilities for Supervision and Graded Responsibility

1. Faculty is expected to make clear to each resident that it is only the failure to seek guidance that will be considered problematic
2. Faculty is expected to respond fully and respectfully to any questions or concerns expressed by the care team, including residents, 24/7.
3. The supervising attending physician will supply timely and appropriate feedback about performance including constructive criticism about deficiencies, recognition of success, and specific suggestions for improvement.

Residents must be supervised in such a way that they assume progressive responsibility as they progress in their educational program. Progressive responsibility is determined in a number of ways including:
1. Faculty determine what level of autonomy each resident may have that ensures growth of the resident and patient safety.
2. The Program Director and faculty assess each resident's level of competence in frequent personal observation and semi-annual review of each resident.
3. Where applicable, progressive responsibility is based on specific milestones
4. Completion of the SNS Boot Camp

The expected components of supervision include:
1. Defining educational objectives.
2. Faculty assessment of the skill level of the resident by direct observation.
3. The faculty defines the course of progressive responsibility allowed, starting with close supervision and progressing to increased independence as the skill is mastered.
4. Documentation of supervision by the involved supervising faculty must be customized to the setting based on guidelines for best practice and regulations from the ACGME, JACHO and other regulatory bodies. Documentation should generally include but not be limited to:
   a.   progress notes in the chart written by or signed by the faculty
   b.   addendum to resident's notes where needed
   c.   counter-signature of notes by faculty
   d.   a medical record entry indicating the name of the supervisory faculty.
5. In addition to close observation, faculty are encouraged to give frequent formative feedback and required to give formal summative written feedback that is competency based and includes evaluation of both professionalism and effectiveness of transitions.

The levels of supervision are defined as follows:

- **Direct Supervision by Faculty** - faculty is physically present with the resident being supervised.
- **Direct Supervision by Senior Resident** is same as above but resident is the direct supervisor.
- **Indirect with Direct Supervision IMMEDIATELY Available** – Faculty – the supervising physician is physically present within the hospital or other site of patient care and is immediately available to provide Direct Supervision.
- **Indirect with Direct Supervision IMMEDIATELY Available** – Resident - same but direct supervisor is resident.
- **Indirect with Direct Supervision Available** - the supervising physician is not physically present within the hospital or other site of patient care, but is immediately available by means of telephonic and/or electronic modalities, and is available to provide Direct Supervision.
- **Oversight** The supervising physician is available to provide review of procedures/encounters with feedback provided after care is delivered.
- **Retaliatory supervision will not be tolerated.**

Neurosurgery Residents Clinical Responsibilities and Procedural Supervision Requirements

NOTE:
PGY-I – A – Delineates those procedures that must be performed with direct supervision until a benchmark number of supervised procedures are performed.

Neurosurgery	PGY-I	PGY-II	PGY-III	PGY-IV	PGY-V	PGY-VI	PGY-VII
Arterial Sampling – Peripheral	X	X	X	X	X	X	X
Arterial Line Placements – Peripheral	A	X	X	X	X	X	X
Arterial Line Placements – Central							
Central Venous Line	A	X	X	X	X	X	X
Swan-Ganz (Pulmonary Artery) Line							
Lumbar Puncture/Lumbar Drain	A	X	X	X	X	X	X
Paracentesis							
Venous Sampling Central							
Endotracheal Intubation							
Peripheral Venous Access	X	X	X	X	X	X	X
Gastric Tubes – NG/Dobhoff	X	X	X	X	X	X	X
Wound Debridement	X	X	X	X	X	X	X
Incision and Drainage of Superficial Abscess	X	X	X	X	X	X	X
Laceration Repair – Complex, Simple	X	X	X	X	X	X	X
Cervical Reduction and Tong Placement		X	X	X	X	X	X

Externalization of VP Shunts		X	X	X	X	X	X
Halo Placement		X	X	X	X	X	X
Intracranial Pressure Monitor Placement	A	X	X	X	X	X	X
Subdural Drain Placement	A	X	X	X	X	X	X
Twist Drill Craniotomy	A	X	X	X	X	X	X
Ventriculoperitoneal Shunt Tap	A	X	X	X	X	X	X

Inpatient Services

PGY Level	Direct by Faculty	Direct by Senior Residents	Indirect but immediately available - faculty	Indirect but immediately available - residents	Indirect available	Oversight
I	X	X				
II	X	X	X	X		
III - VII	X	X	X	X	X	X

Intensive Care Units

Skill Level	Direct by Faculty	Direct by senior residents	Indirect but immediately available - faculty	Indirect but immediately available - residents	Indirect available	Oversight
I	X	X				
II	X	X	X	X		
III - VII	X	X	X	X	X	X

Ambulatory Settings

PGY	Direct by Faculty	Direct by senior residents	Indirect but immediately available - faculty	Indirect but immediately available - residents	Indirect available	Oversight
I	X	X				
II	X	X	X	X		
III - VII	X	X	X	X	X	X

Operating Rooms:

PGY	Direct by Faculty	Direct by senior residents	Indirect but immediately available - faculty	Indirect but immediately available - residents	Indirect available	Oversight
I	X	X	X			
II	X	X	X			
III - VII	X	X	X			

Mandatory Notification of Faculty

How monitored
The Chief Resident and faculty will monitor by checking for proper implementation on daily rounds. The Program Director and the Program Manager will solicit reports from faculty on lack of appropriate use of the policy.

Continuity of Care when a Resident is Unable to Perform Duties
If a resident is unable to perform, the faculty responsible for patient care assumes responsibility for continuity of care. The effectiveness of this policy will be reported to and reviewed by the program director, and any cases will be reviewed at the monthly morbidity and mortality conference to ensure optimal patient care, and at the annual Program Evaluation to determine any needed changes in policy.

Guidelines for Resident Mandatory Communication with Attending
The following situations require mandatory direct communication with the faculty responsible for patient care, both during routine working hours, and after hours and weekends. "Faculty responsible for patient care" means the staff of record for the patient, except in events when the faculty is physically out of town or can't be contacted, in which case the on call faculty should be notified. The staff of record should also be notified as soon as is feasible:

1. Death
2. DNR or other end of life decision
3. Suicide attempt
4. Violence requiring physical restraints
5. Emergency surgery
6. Acute drastic change in course
7. Unanticipated invasive or diagnostic procedure
8. Pregnancy
9. Transfer of care to another medical or surgical service, including transfer to ICU
10. Any serious adverse event
11. Any complex decision making process that the resident does not feel adequately qualified to undertake without immediate input from faculty

Any lapse in this process will be reported to the program director, who will monitor the reporting process and review monthly.

Moonlighting

Purpose
To ensure that professional activities falling outside the course and scope of the training program are consistent with policies and guidelines set forth by the Accrediting Council for Graduate Medical Education (ACGME) and Graduate Medical Education Committee. Moonlighting is defined as any professional activity not considered an integral part or required rotation of the curriculum for a postgraduate training program, irrespective of remuneration.

Policy
In-house moonlighting may be allowed for residents after their chief year concludes, at the discretion of the program director. By decree of the ECFMG, trainees on J-1 Visas are not permitted to moonlight.

Time Away, Vacation, Holiday, and Sick Time Policies

Vacations, Sick Leave Policies

Each resident will accrue 15 hours of vacation per month in every academic year. Vacations are assigned or selected based upon seniority. If there are questions or concerns from any of the resident staff, they are welcome to contact the Program Director at any time

Full time residents/fellows will accrue 1.5 sick days per month. Sick leave must be accrued prior to using it. Sick leave may be used by an employee who is ill or injured, when a member of the immediate family is seriously ill, or when a death occurs in the immediate family. The resident must notify the Chief Resident or Co-Chief, the Program Manager, and the Program Director.

Residents must live within 20 minutes of the hospital, and should have a winter weather-capable vehicle. For more information about annual or sick leave, holidays, and the inclement weather policy, please go to: https://medicine.hsc.wvu.edu/media/365677/annual-leave-policy.pdf

Professional Days

The department will allow 5 professional days, separate from vacation days, for professional development in the form of interviews for fellowship or faculty positions, or for conference attendance in the continental US in which the resident is not presenting. Interview travel costs will be covered by the resident or interviewing institution. ALL days must receive prior approval by the Chief Resident, PM, and PD.

Meetings

The Department will pay reasonable travel expenses for neurosurgical conferences within the continental US in which the resident is presenting their research, or for those days encompassed within the professional day policy above (5 days/continental US). Travel arrangements should be made through the residency coordinator. Reasonable expenses up to +/-$2000 for conference attendance (travel, hotel, and registration) will be covered by the department for this purpose. ALL days must receive prior approval by the Chief Resident, PM, and PD.

Maternity/Paternity Leave

The West Virginia University Department of Neurosurgery complies with all federal and GME policies regarding maternity/paternity leave. Leaves of absence may potentially extend training.

Resident Schedules, Meals, Email, and Pagers

Rotations

Resident rotations are designed to optimize the educational experience of each individual resident, to allow progression per curriculum objectives and to satisfy the requirements of the ACGME in Neurological Surgery.

On all neurosurgical rotations, all residents are required to participate in the call schedule unless on vacation.

The rotation schedules are generally available in advance. Residents will be notified at the earliest possible time if necessary changes are made in the schedule. All residents should feel free to contact the Program Director with questions or other concerns regarding the rotations. The rotation schedule cannot be changed without the knowledge and consent of the Program Director.

Surgical House Staff

Surgical interns and house staff assigned to the neurosurgical service shall be integrated under the oversight of neurosurgery residents. They shall assist in clinical and call activities, although the priority of assignment to surgical procedures shall be for neurosurgery residents.

Call Schedules

The call schedule is primarily the responsibility of the PGY 5 resident. Patient care and educational objectives must be monitored, and if long weekends are too great a burden for a given resident, this option will no longer be allowed. On-call rooms are available for resident use. Resident work hours will be monitored by the program coordinator and program director on an on-going basis, with the aim of modifying call policies and manpower decisions to ensure continued full compliance with the ACGME requirements.

Meals

Meal assistance is available via the meal cards. Questions regarding the policy should be directed to the Program Manager. If policy is not followed or requested information is not provided, the Program Manager may freeze the meal card account until policy is followed.

Email

Departmental email is an official form of departmental communication. Residents are required to check email daily and respond to departmental messages within 24 hours.

Pagers

WVU provides digital pagers for the residents. Residents will usually retain the same pager number for the duration of their training. Extra batteries are available from the secretarial staff in the neurosurgery offices. If a pager is lost or stolen please contact the Program Manager immediately for replacement. In this situation, the resident may be held responsible for the replacement cost.

Clinical and Educational Work Hours

The Department of Neurosurgery supports the letter and spirit of the most recent iteration of the clinical and educational workhours policy of the ACGME. Specific requirements are included below:

Maximum Hours of Work Per Week
Work hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities and all moonlighting.

Mandatory Time Free of Duty
Residents must be scheduled for a minimum of one day free of duty every week (when averaged over four weeks). At-home call cannot be assigned on these free days.

Maximum Duty Period Length
Duty periods may be scheduled to a maximum of 24 hours of continuous duty in the hospital. We encourage residents to use alertness management strategies in the context of patient care responsibilities. Strategic napping, especially after 16 hours of continuous duty and between the hours of 10:00 p.m. and 8:00 a.m., is strongly suggested.

It is essential for patient safety and resident education that effective transitions in care occur. Residents may be allowed to remain on-site in order to accomplish these tasks; however, this period of time must be no longer than an additional four hours.

Residents must not be assigned additional clinical responsibilities after 24 hours of continuous in-house duty.

In unusual circumstances, residents, on their own initiative, may remain beyond their scheduled period of duty to continue to provide care to a single patient. Justifications for such extensions of duty are limited to reasons of required continuity for a severely ill or unstable patient, academic importance of the events transpiring, or humanistic attention to the needs of a patient or family. Under those circumstances, the resident must:

- Appropriately hand over the care of all other patients to the team responsible for their continuing care; and,
- Document the reasons for remaining to care for the patient in question and submit that documentation in every circumstance to the program director.
- The program director must review each submission of additional service, and track both individual resident and program-wide episodes of additional duty.

Minimum Time Off between Scheduled Duty Periods
PGY-2 residents, as defined by the Neurosurgery Review Committee, should have 10 hours free of duty, between scheduled duty periods (this data is collected by the Program Director although not a current ACGME rule). They must have at least 14 hours free of duty after 24 hours of in-house duty.

Residents in the final years of education, PGY-3 and above, as defined by the Neurosurgery Review Committee, must be prepared to enter the unsupervised practice of medicine and care for patients over irregular or extended periods.

This preparation must occur within the context of the 80-hour, maximum duty period length, and one-day- off-in seven standards. While it is desirable that residents in their final years of education have eight hours free of duty between scheduled duty periods, there may be circumstances [as defined by the Review Committee] when these residents must stay on duty to care for their patients or return to the hospital with fewer than eight hours free of duty.

Circumstances or return-to-hospital activities with fewer than eight hours away from the hospital by residents in their final years of education will be monitored by the program director.

Maximum In-House On-Call Frequency
PGY-2 residents and above must be scheduled for in-house call no more frequently than every-third-night (when averaged over a four-week period).

At-Home Call
Time spent in the hospital by residents on at-home call must count towards the 80-hours maximum weekly hour limit. The frequency of at-home call is not subject to the every-third-night limitation, but must satisfy the requirement for one-day-in-seven free of duty, when averaged over four weeks.

At-home call must not be as 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 care for new or established patients. Each episode of this type of care, while it must be included in the 80-hour weekly maximum, will not initiate a new "off-duty period."

Duty Hour Logging Policy

Residents are required to log all duty hours in E-value daily. This includes at home clinical duties such as answering pages and charting. Those who fail to log duty hours or log erroneous duty hours are subject to disciplinary action.

The institution as well as each program is required to monitor and document compliance with these

requirements for all trainees. This policy applies to any site where trainees rotate, even in elective situations.

Academic Disciplinary Policy and Procedures, Grievance

The Neurosurgery Department adheres to the Academic Discipline and Dismissal Bylaws, which can be found at https://medicine.hsc.wvu.edu/media/367468/gmebylawsrevised-1-15-16-oct2017-21318-2-repaired-fix.pdf

Within this document can be found bylaws regarding:
- Academic Grievance
- Harassment
- Guidelines for Appropriate Use of the Internet
  https://medicine.hsc.wvu.edu/media/365672/policy-for-appropriate-use-of-the-internet.pdf

PRELIMINARY INTERVENTION

Substandard disciplinary and/or academic performance is determined by the Program Director with the assistance of the faculty and particularly the CCC. Corrective action for minor academic deficiencies or disciplinary offenses which do not warrant remediation as defined below, shall be determined and administered by the Program Director under this guidance. Corrective action may include oral or written counseling or any other action deemed appropriate by the Department under the circumstances. Corrective action for such minor deficiencies and/or offenses are not subject to appeal.

PROBATION and REMEDIATION

House Officers may be placed on probation for issuance of a warning or reprimand; or for imposition of a remedial program. Remediation refers to an attempt to correct deficiencies which, if left uncorrected, may lead to a non- reappointment or disciplinary action. In the event a House Officer's performance, at any time, is determined by the Program Director to require remediation, the Program Director shall notify the House Officer in writing of the need for remediation. A remediation plan will be developed that outlines the terms of remediation and the length of the remediation process. Failure of the House Officer to comply with the remediation plan may result in termination or non-renewal of the House Officer's appointment.

A House Officer who is dissatisfied with a departmental decision to issue a warning or reprimand, impose a remedial program, or impose probation may appeal that decision to the Department Head informally by meeting with the Department Head and discussing the basis of the House Officer's dissatisfaction within five (5) working days of receiving notice of the departmental action. The decision of the Department Head shall be final, subject to appeal according to grievance policy of the university.

CONDITIONS FOR REAPPOINTMENT

Programs will provide notice in writing of the intent to non-renew or non-promote residents 4 months prior to the end of the current contract, except in the case when the cause for non-promotion/non-reappointment occurred within the final 4 months, or when the decision is made in the context of an in-process probation or remediation. In such cases house officers will be notified in writing with as much notice as possible.

TERMINATION, NON-REAPPOINTMENT, AND OTHER ADVERSE ACTION

A House Officer may be dismissed or other adverse action may be taken for cause, including but not limited to:
  i) unsatisfactory academic or clinical performance;
  ii) failure to comply with the policies, rules, and regulations of the House Officer Program or University or other facilities where the House Officer is trained;

iii)   revocation, expiration or suspension of license;
iv)   violation of federal and/or state laws, regulations, or ordinances;
v)   acts of moral turpitude;
vi)   insubordination;
vii)   conduct that is detrimental to patient care;
viii) unprofessional conduct.

The Program Director may take any of the following adverse actions:
i)   issue a warning or reprimand;
ii)   impose terms of remediation or a requirement for additional training, consultation or treatment;
iii)   institute, continue, or modify an existing summary suspension of a House Officer's appointment;
iv)   terminate, limit or suspend a House Officer's appointment or privileges;
v)   non-renewal of a House Officer's appointment;
vi)   dismiss a House Officer from the Program;
vii)   or any other action that the Program Director deems is appropriate under the circumstances.

DUE PROCESS

All communication regarding due process will occur by either official campus email, certified letter, or hand delivery. Dismissals, non-reappointments, non-promotion or other adverse actions including probation which could significantly jeopardize a House Officer's intended career development are subject to appeal as delineated in the **GME Bylaws, XXV. Employment Grievance Procedure** (page 32).

Employment Grievance Procedure for Non-Academic Issues: Resident is encouraged to seek resolution of non- academic employment-related grievances relating to Resident's appointment or responsibilities, including any differences between Resident and WVUH, or WVU School of Medicine with respect to the interpretation of, application of, or compliance with the provision of the agreement, in accordance with the grievance procedures set forth on the WVU website. Forms and procedures are available from the Human Resources Department.

http://medicine.hsc.wvu.edu/media/2598/gmebylawsrevised1-15-16.pdf

OTHER GRIEVANCE PROCEDURES

Grievances other than those departmental actions described above or discrimination should be directed to the Program Director for review, investigation, and/or possible resolution. Complaints alleging violations of the sexual harassment policy should be directed to the appropriate supervisor or the Program Director.
http://medicine.hsc.wvu.edu/media/2598/gmebylawsrevised1-15-16.pdf

Resident complaints and grievances related to the work environment or issues related to the program or faculty that are not addressed satisfactorily at the program or departmental level should be directed to the DIO. For those cases that the resident feels can't be addressed directly to the program he/she should contact the office of the DIO.

Employment Grievance Procedure for Non-Academic Issues

Resident is encouraged to seek resolution of non-academic employment related grievances relating to Resident's appointment or responsibilities, including any differences between Resident and WVUH, or WVU School of Medicine with respect to the interpretation of, application of, or compliance with the provision of the agreement, in accordance with the grievance procedures set forth on the WVU website (https://grievanceprocedure.wvu.edu/). Forms and procedures are available from the Human Resources Department.

Internet, Electronic Networking and Other Media

Social and business networking Web sites or on-line communities are being used increasingly by faculty, students, residents and staff to communicate with each other, and to post events and profiles to reach external audiences. As part of the sponsoring institution's commitment to building a community in which all persons can work together in an atmosphere free of all forms of harassment, exploitation, or intimidation, resident physicians and resident dentists are expected to act with honesty, integrity, and respect for the rights, privileges, privacy, sensibilities, and property of others.

The capacity to record, store and transmit information in electronic format brings responsibilities to those working in healthcare with respect to privacy of patient information and ensuring public trust in our participating hospitals, institutions and practice sites. Significant educational benefits can be derived from this technology but physicians need to be aware that there are also potential problems and liabilities associated with its use. Material that identifies patients, institutions or colleagues and is intentionally or unintentionally placed in the public domain may constitute a breach of standards of professionalism and confidentiality that damages the profession and our institution. Guidance for resident physicians and resident dentists in the appropriate use of the Internet and electronic publication is necessary to avoid problems while maintaining freedom of expression. The sponsoring institution is committed to maintaining respect for patient privacy. Compliance with these guidelines help our residents obtain skills with the ACGME competencies of Interpersonal Communication Skills (ICS), Professionalism (P), and Systems Based Practice (SBP). https://medicine.hsc.wvu.edu/media/365672/policy-for-appropriate-use-of-the-internet.pdf

Institutional or Program Closure and Reduction

In the event a decision is made that the program must decrease in size or close, the Chair and PD will inform the DIO, GMEC, and the residents as soon as possible following the decision. Closure will preferentially be structured to allow enrolled residents to complete the program, and where this is impossible, the Chair and PD will work to assist residents to enroll in another accredited program to continue their education.

https://medicine.hsc.wvu.edu/media/365687/closure-and-reduction-policy.pdf

Practitioner Health Committee

The purpose of the Practitioner Health Committee is to serve as the primary resource in the management of impaired Practitioners. Policies can be found in Appendix One of the GME Bylaws:

http://medicine.hsc.wvu.edu/media/2598/gmebylawsrevised1-15-16.pdf

WVU Medicine Resident Physician Manual

Additional information about residency at WVU can be found at:
https://medicine.hsc.wvu.edu/media/363579/2017residentphysicianmanual.pdf

Patient Safety

The PSN is utilized to report patient safety events and near misses.

1.   Access CONNECT http://connect.wvuhealthcare.com/
2.   On the left hand menu, choose "Safety Reports"
3.   Chose Patient Safety Net (PSN)
4.   Choose "This web-based reporting tool" link
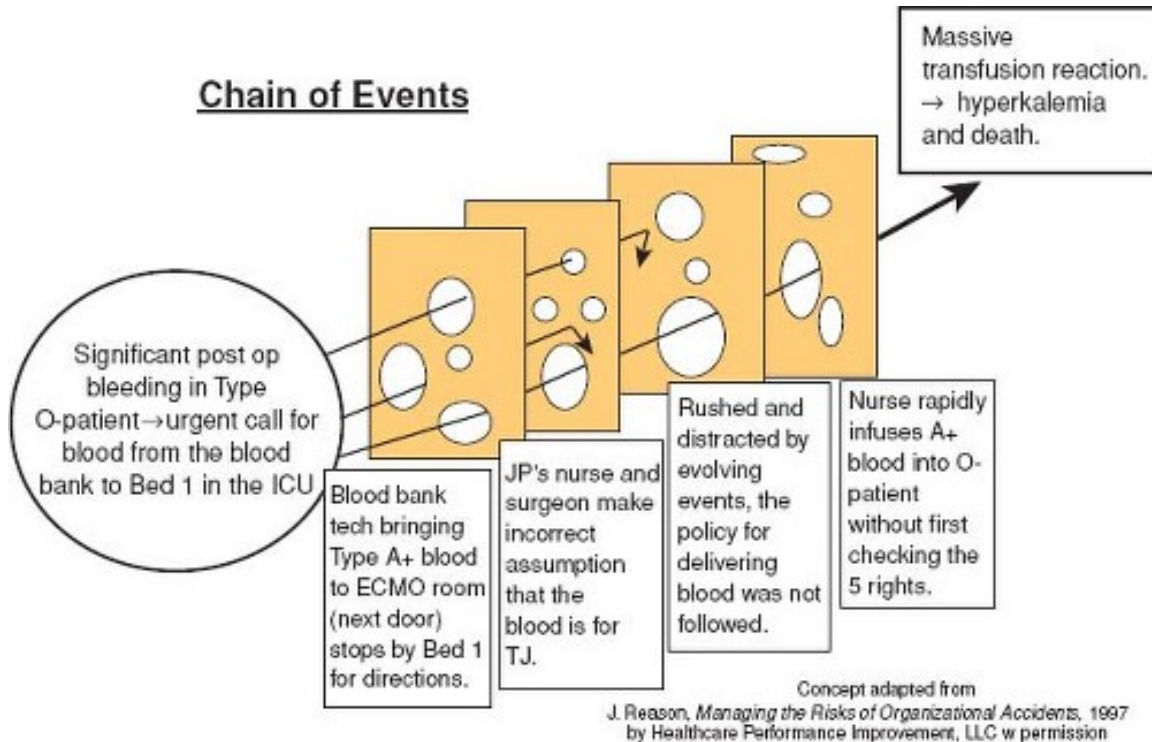
Things Patient Safety Champions Should Know

1) **What is a Patient Safety Champion?** Patient Safety Champions are involved with and enthusiastic about hospital patient safety initiatives and committees, and a wealth of information for their peers.

2) **What Patient Safety Event Reporting system do we use?** Patient Safety Net (PSN), though we are scheduled to pilot a new system in approximately 4 months.

3) **How do you access the PSN?**
a. Go to http://connect.wvuhealthcare.com/
b. In the left hand menu, choose *Safety Reports*
c. Choose "This web-based reporting tool".

4) **Define Patient Safety Event:** An event, incident, or condition that *could have* resulted, or *did* result, in harm to a patient.

5) **Types of Patient Safety Events:**
a. <u>Adverse Event</u>: A patient safety event that results in harm to a patient.
b. <u>No-harm event</u>: A patient safety event that reaches the patient but DOES NOT cause harm.
c. <u>Close call (or "near miss", or "good catch") event</u>: A patient safety event that does NOT reach the patient due to "luck", or "chance".
d. <u>Hazardous (or "unsafe"), condition</u>: A circumstance (other than patient's own disease process or condition) that increases the probability that an adverse event will occur.
e. <u>Sentinel Event</u>: An event (not primarily related to the natural course of the patient's illness or underlying condition), that reaches a patient and results in death, permanent harm, or severe temporary harm.

6) **Why is it helpful to report Close Call, or Near Miss events?**
Frequently near misses are the result of a flawed system and/or protocol. Failure to report near misses results in a higher likelihood of repeated Near Misses – or, even worse, an adverse event.

When Near Misses are NOT reported, those with the power to fix flawed systems and protocols are never alerted that there is a problem until it reaches the point of patient harm.

7) What is the Swiss Cheese Model?

The model graphically illustrates how catastrophic patient safety system failures happen. Each slice of cheese represents a safety barrier that is supposed to stop adverse events before they happen. But, no single barrier is foolproof. In the event that all of the barrier holes line up, the result is patient harm.

Massive transfusion reaction.
→ hyperkalemia and death.

Chain of Events

Significant post op bleeding in Type O-patient→urgent call for blood from the blood bank to Bed 1 in the ICU

Blood bank tech bringing Type A+ blood to ECMO room (next door) stops by Bed 1 for directions.

JP's nurse and surgeon make incorrect assumption that the blood is for TJ.

Rushed and distracted by evolving events, the policy for delivering blood was not followed.

Nurse rapidly infuses A+ blood into O-patient without first checking the 5 rights.

Concept adapted from
J. Reason, *Managing the Risks of Organizational Accidents*, 1997
by Healthcare Performance Improvement, LLC w permission

8) What is a Just Culture?

An organizational environment in which leadership holds individuals accountable for their actions, but does NOT punish individuals for issues attributed to flawed systems or processes.

9) What is a Culture of Safety?

The result of *an organizational commitment to safety* permeating all levels from frontline personnel to executive management.

10) What are some indicators of a Culture of Safety?
a. Acknowledgment of the high-risk, error-prone nature of healthcare organizations
b. Open and honest communications (transparency) regarding patient safety issues, "lessons learned", and initiatives
c. A just and fair environment where individuals are able to report errors and near misses without fear
d. An expectation of inter-professional collaboration where ALL ranks are empowered to speak up when they see something wrong *without* fear of

reprisal.

11) What are some of the behaviors/conditions that disrupt/hinder a Culture of Safety?

a. Inappropriate communications – *insulting, demeaning, disrespectful, intimidating, profane, and/or abusive language*
b. Inappropriate behaviors – *aggression and/or violence; abruptly ended consultations (i.e. slamming down a phone); slamming doors; throwing items; yelling and/or "raised" voices*
c. Shaming others for negative outcomes
d. Dishonest or unjustified comments, complaints, reports, and/or gossip about members of the healthcare team
e. Rigid or inflexible barriers to requests for assistance or cooperation
f. Refusal to promptly return pages and/or calls
g. Refusal to comply with known and generally accepted practice standards
h. Refusal to collaborate and/or cooperate inter-professionally

Mistreatment and Professionalism Reporting

Faculty are expected to provide an appropriate level of clinical supervisions required of all residents during all clinically relevant educational activities. https://medicine.hsc.wvu.edu/media/365696/supervision-policy.pdf

To report issues:
1.   Access the Office of GME website: https://medicine.hsc.wvu.edu/gme/gme-policies/
2.   On the right side of the screen, scroll down to find either **Mistreatment** or **Professionalism**
3.   Click on relevant button to submit report.

Interactions with Vendor Representatives

The purpose of this policy is to establish guidelines for interactions with industry representatives for residents in graduate medical education programs sponsored by the West Virginia University School of Medicine. Interactions with industry occur in a variety of contexts, including marketing of new pharmaceutical products, medical devices, and research equipment as well as on-site training of newly purchased devices. Many aspects of these interactions are positive and important for promoting the educational, clinical and research missions of the institution. However, these interactions must be ethical and cannot create conflicts of interest that could endanger patient safety, data integrity, and the integrity of our education and training programs.

https://medicine.hsc.wvu.edu/media/365697/vendor-interaction-policy2017logo.pdf

West Virginia University School of Medicine GME International Rotation Policy

In order for a resident physician enrolled in any graduate medical education training program sponsored by the West Virginia University School of Medicine to obtain permission to complete an International Health Rotation for academic credit, this approval process must be followed:

https://medicine.hsc.wvu.edu/media/2588/internationalrotationpolicy7-2014.pdf

Institutional Disaster Policy

In the event of a disaster or the declaration of extraordinary circumstances by the ACGME (i.e. abrupt hospital closing, natural disasters, catastrophic loss of funding) impacting the graduate medical education programs sponsored by the West Virginia University School of Medicine, the GMEC establishes this policy to protect the well-being, safety and educational experience of residents enrolled in our training programs.

The definition of a disaster/extraordinary circumstances will be determined by the ACGME as defined in their published policies and procedures. Following declaration of a disaster/extraordinary circumstances, the GMEC working with the DIO and other sponsoring institution leadership will strive to restructure or reconstitute the educational experience as quickly as possible following the disaster.

In the event of a disaster or the declaration of extraordinary circumstances, please see the GME policy: https://medicine.hsc.wvu.edu/media/365668/disasterresponsepolicy2017logo.pdf

Resident Spending Guidelines

Purpose:
We recognize that expenditures for professional development, both expected and unexpected, arise along the course of residency training, and funds are available for professional development. Guidelines for professional development spending, including surgical loupes, is described in the departmental <u>Guidelines for Resident Professional Development Funds</u>, which can be obtained from the program manager.

Policy:

<u>Educational Fund</u>
Each resident will be given a limit in the amount of $1,500 with which to have book(s) purchased for them each year. The process for having the book(s) purchased will be as follows:

1) Residents will identify the books and email the residency program manager with the following information (title of book; author of book; edition of book; ISBN (if available) as well as any other pertinent information).
2) The program manager will place the order.
3) The program manager will notify residents once their books have arrived.

Additional texts and online educational tools will be purchased according to departmental guidelines by year utilizing these funds. Similarly, educational courses at which a resident is not presenting may be supported by professional development funds.

The educational fund may be used for neurosurgical books and learning materials (including courses, CME materials including online lectures) and all expenditures must be approved by the program director or APD, who have the discretion to deny any request. Certain required educational expenditures will be taken from the book fund including the required reading texts and didactic courses from the intern year, books being utilized in the weekly conference activities, and the "General" question bank board prep questions from SANS. Non-educational materials and professional expenses are, in general, not appropriate for the use of the educational fund (but may be purchased with resident incentive funds referenced above).

<u>Lab Coats</u>
The hospital will fund the purchase of up to 2 lab coats every other year. The hospital provides a cleaning service. Drop lab coats in the linen closet, basement level of HSC. The process for having the lab coat(s) purchased will be as follows:
1) Residents will email the program manager with the size of the lab coat needed.
2) The program manager will place the order for the lab coat.
3) The program manager will notify the residents once their lab coat has arrived.

<u>Licensure</u>
Payment of licensure will be covered by the department.

<u>Travel</u>
For all program-funded trips, the resident should make an appointment with the program coordinator to make travel arrangements at least 4 weeks prior to the date of travel.

Any other requests or deviations from the department's guidelines must go through the program director and department head for approval.

Graduate Medical Education Policy on Supervision from GME Bylaws

XIV. Supervision and Accountability

Programs must provide a professional, respectful, and civil environment that is free from mistreatment, abuse, and coercion of residents, faculty, and staff. All GME-related supervision will be provided in a non-retaliatory and supportive manner. Programs, in partnership with their Sponsoring Institution, must have a process for education of residents and faculty regarding inappropriate and unprofessional behavior, *especially* when exhibited toward a trainee who is requesting supervision and guidance. *[VI.B.6. – with slight edits]*

Although the attending physician is ultimately responsible for the care of the patient, every physician shares in the responsibility and accountability for their efforts in the provision of care. Effective programs, in partnership with their Sponsoring Institution, define, widely communicate, and monitor a structured chain of responsibility and accountability as it relates to the supervision of all patient care. *[VI.A.2.a)]*

Supervision in the setting of graduate medical education provides: safe and effective care to patients; ensures each resident's development of the skills, knowledge, and attitudes required to enter the unsupervised practice of medicine; and establishes a foundation for continued professional growth. *[VI.A.2.a)]*

Each patient must have an identifiable, appropriately-credentialed and privileged, attending physician (or licensed independent practitioner as specified by the applicable Review Committee) who is responsible and accountable for the patient's care. This information must be available to residents, faculty members, other members of the health care team, and patients. Residents and faculty members must inform each patient of their respective roles in that patient's care when providing direct patient care. *[Section VI.A.2.a).(1)]*

Supervision may be exercised through a variety of methods. For many aspects of patient care, the supervising physician may be a more advanced resident or fellow. Other portions of care provided by the resident can be adequately supervised by the immediate availability of the supervising faculty member, fellow, or senior resident physician, either on site, or by means of telephonic and/or electronic modalities. Some activities require the physical presence of the supervising faculty member. In some circumstances, supervision may include post-hoc review of resident delivered care with feedback. *[VI.A.2.b)]*

The program must demonstrate that the appropriate level of supervision in place for all residents is based on each resident's level of training and ability, as well as patient complexity and acuity. Supervision may be exercised through a variety of methods, as appropriate to the situation. [The Review Committee may specify which activities require different levels of supervision.] *[VI.A.2.b).(1)]*

Levels of Supervision *[Section VI.A.2.c)]*
        To promote oversight of resident supervision while providing for graded authority and responsibility, the program must use the following classifications of supervision:

        Direct Supervision:
                The supervising physician is physically present with the resident and patient.
        Indirect Supervision:
                …with direct supervision immediately available:
                        The supervising physician is physically within the hospital or other site of patient care, and is immediately available to provide Direct Supervision.

                …with direct supervision available:
                        The supervising physician is not physically present within the hospital or other site of patient care, but is immediately available by means of telephonic and/or electronic modalities, and is available to provide Direct Supervision.

        Oversight:
                The supervising physician is available to provide review of procedures/encounters with feedback provided after care is delivered.

        The privilege of progressive authority and responsibility, conditional independence, and a supervisory role in patient care delegated to each resident must be assigned by the program director and faculty members. *[VI.A.2.d)]*

        The program director must evaluate each resident's abilities based on specific criteria, guided by the Milestones. *[VI.A.2.d).(1)]*

        Faculty members functioning as supervising physicians must delegate portions of care to residents, based on the needs of the patient and the skills of each resident. *(Has changed from Detail to Core)* Senior residents or fellows should serve in a supervisory role of junior residents in recognition of their progress toward independence, based on the needs of each patient and the skills of the individual resident or fellow. *[VI.A.2.d).(2) & (3)]*

        Programs must set guidelines for circumstances and events in which residents must communicate with the supervising faculty member(s). *[VI.A.2.e)]*

        Each resident must know the limits of their scope of authority, and the circumstances under which the resident is permitted to act with conditional independence. Initially, PGY-1 residents must be supervised either directly or indirectly with direct supervision immediately available. [Each Review Committee may describe the conditions and the achieved competencies under which PGY-1 residents may progress to be supervised indirectly with direct supervision available.] [*VI.A.2.e).(1).(a)]*

        Faculty supervision assignments must be of sufficient duration to assess the

knowledge and skills of each resident and to delegate to the resident the appropriate level of patient care authority and responsibility. *(Has changed from Detail to Core) [VI.A.2.f)]*

Approved by GMEC Taskforce
July 5, 2017 Approved by GMEC
July 14, 2017
West Virginia University School of Medicine

https://medicine.hsc.wvu.edu/media/363881/gmebylawsrevised-1-15-16-oct2017-21318-2-repaired.pdf

PGY1

Introduction

The WVU Neurosurgical Residency is a 7 year (91 Cycle) program. There are 65 Cycles of core clinical neurosurgery of which 13 cycles (12 months) are the chief residency. In the internship, there is a 7-cycle rotation in general care and a 6-cycle rotation in neurocritical care. Longitudinal clinical experiences in anesthesia, neurology, pain medicine, pathology, and radiation oncology are distributed across this year. Beginning in PGY2, the resident begins to rotate on the clinical neurosurgery services. At times, Drs. Meltzer and Hamilton may function independently as a separate pediatric service with a dedicated resident when the resident curriculum schedule dictates such. The fourth year is the academic year, and is devoted to scholarly pursuit or enfolded fellowships. Academic pursuit may include graduate classes. The fifth year includes dedicated rotations in pediatrics and endovascular. The PGY6 and PGY7 split senior and chief responsibilities. The chief resident takes overall responsibility for the entire service. In summary, there are 13 cycles of internship, 26 cycles of clinical junior residency, a year of academic work, another 26 cycles of clinical senior rotations, and 13 cycles of clinical neurosurgery serving as chief resident.

Neuro-critical care experience is emphasized throughout the training, as well as extensive exposure to subspecialty services including neurovascular, neuro-oncology, epilepsy surgery, spinal neurosurgery, stereotactic radiosurgery, neurotrauma, functional neurosurgery and pediatric neurosurgery. Conferences are protected from clinical commitments and include morbidity and mortality conference, case conference, tumor board, asynchronous learning and board review, and journal club. Subspecialty conferences such as Epilepsy Conference or Spine Conference are encouraged. The anatomic dissection lab is available for scholarly work or preparation for operative cases.

Qualifications

Candidates must have the following qualifications to be considered for this residency program:
- Completion of USMLE Step 1, Step 2 CK, and Step 2 CS
- Completion of Medical School Training
- Excellent academic and clinical record
- US Citizen, permanent resident, or ability to obtain J1 Visa
- Ability to obtain WV State Medical License or Training Permit, one of which must be obtained in advance of residency start date

Expectations

PGY1 residents in this program are expected to:
- Obtain a valid WV State Medical License or Training Permit, for the duration of the academic year
- Achieve appropriate levels of proficiency in each of the six ACGME Core Competencies
- Achieve expected levels of progress in each of the ACGME Neurosurgery Milestones

- Successful completion of the written neurosurgical board exam for the PGY1 year of training
- Quality Improvement and Patient Safety (QI/PS) research project involvement
- Scholarly activity (presentations and manuscript preparation)
- Daily logging of duty hours in the E-Value system
- Have an understanding of each of the ACGME Duty Hour regulations and adhere to the departmental policies and procedures that are designed to keep residents in compliance with all of the duty hour requirements.
- Mandatory attendance at all educational conferences, didactic sessions, etc., unless excused or absent for the day
- PGY1 Residents are expected to focus on improvement with efficiency and teamwork during the course of the academic year
- Maintain a healthy level of mental and physical wellness by adhering to the Fit For Duty guidelines, outlined in the Neurosurgery Handbook, and report any concerns with wellness immediately to the Program Director
- Residents will be assigned evaluations to complete semi-annually. Self, peer, program and faculty evaluations must be completed in a timely manner, which is defined as within two weeks of assignment, and meet completion deadline as assigned by the Program Coordinator.
- The USMLE Step 3 exam must be taken and successfully passed by the end of this academic year.
- Must attend a course called BOOT CAMP 1, which is held in Mount Sinai, NY, which is a surgical innovation laboratory focusing on micro-surgery skills and gross anatomy and is sponsored by the SNS
- Completion of a research project specific to an NCCU topic, with the guidance of Dr. Matthew Smith
- Assigned Reading: SICU Handbook (Marino), Handbook of Neurosurgery (Greenberg), The Practice of Emergency and Critical Care Neurology (Wijdicks)

Core Competency Educational Objectives for PGY1

Develop graduating residents that possess a proficiency level appropriate for a new and independent neurological practitioner in the six core competencies as outlined by the ACGME.

Patient Care	1. Perform a history and physical examination in patients with a brain tumor.
	2. Place an external ventricular drain, assist with setup, opening and closing for brain tumor craniotomies
	3. Provide routine perioperative care for brain tumor patients
	4. Perform a history and physical examination in patients with epilepsy or movement disorders
	5. Perform stereotactic frame placement or frameless navigation registration, assist with set up, opening, and closing for functional neurosurgical procedures.
	6. Provide routine perioperative care for movement disorders and epilepsy patients.
	7. Perform a history and physical examination in patients with chronic pain or a peripheral nerve disorder.
	8. Interrogate and program implanted devices, assists with set up, opening, and closing for chronic pain and peripheral nerve procedures
	9. Provide routine perioperative care for chronic pain or peripheral nerve disorder patients.

	10. Perform a history and physical examination in patients with degenerative, traumatic, or neoplastic spinal disorders.
	11. Implement spinal bracing or traction, assists with set up, opening, and closing for spinal surgery procedures.
	12. Provide routine perioperative care for spinal surgery patients.
	13. Perform a history and physical examination in patients with ischemic or hemorrhagic stroke or vascular neurosurgical disorders.
	14. Manage and obtain CSF samples from external ventricular drains, assists with set up, opening, and closing for vascular neurosurgical and endovascular procedures.
	15. Provide routine perioperative care for vascular neurosurgical and endovascular patients.
	16. Perform an age-appropriate history and physical examination with developmental assessment, including for non-accidental trauma.
	17. Perform CSF shunt tap and valve programming, assists with set up, opening, and closing for pediatric neurosurgical procedures.
	18. Provide routine perioperative care for pediatric neurosurgical patients.
	19. Perform a history and physical examination in patients with severe TBI and assigns a GCS.
	20. Place an intracranial pressure monitor, assists with set up, opening, and closing for neurotrauma procedures.
	21. Provide routine perioperative care for patients with TBI.
	22. Perform a history and physical examination in critically-ill patients
	23. Insert arterial and central venous catheters.
	24. Manage neurocritical care unit admissions and discharges.
Medical Knowledge	1. Correlate normal neuroanatomy and physiology with function
	2. Gather, interpret, and report basic diagnostic test results (serology, chest radiographs, brain and spine CT, etc.)
	3. List a differential diagnosis for common clinical presentations
	4. List therapeutic options for common clinical presentations.
Systems Based Practice	1. Describe principles of patient safety, perform safe and effective handoffs and transitions in routine clinical situations
	2. Describe basic quality improvement methods and metrics
	3. Describe principles of US health payment systems
Practice Based Learning	1. Apply institutional treatment guidelines I basic patient care, identify and report complications
	2. Formulate hypotheses and investigative approaches to clinical or basic science problems
	3. Demonstrate self-awareness and identifies gaps in knowledge, skills, and experience and incorporate feedback.
Professionalism	1. Behaves ethically and professionally and takes responsibility for personal conduct
	2. Employ ethical and legal principles (informed consent, advance directives, confidentiality, error disclosure, resource stewardship) and seek advice appropriately.
	3. Describes the importance of personal and professional well-being, manages sleep and deprivation and fatigue.
Interpersonal Communication	1. Use language and non-verbal behavior to exhibit respect, establish rapport, and demonstrate cultural competency.

	2. Establish therapeutic relationships in straightforward encounters using active listening and clear language.
	3. Accurately record information in the patient record and safeguard protected health information, coordinate care within the neurosurgical service.
	4. Communicate orally and in writing in a respectful, organized, clear, concise, and timely manner with all the members of the interprofessional health care team, coordinate care with consulting services.

General Duties

The Neurosurgery Residency is a seven-year training program. Duties and assignments for each PGY level are outlined in the Goals & Objectives for that level, which includes progressive patient care responsibilities for the day-to-day running of the neurosurgical service under the supervision of the faculty. At all levels, residents are expected to discuss and plan patient management, including surgical operations with the Attending's, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care, as appropriate. The PGY6 and PGY7 residents are responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. In addition the PG6 and PG7 residents provide overall supervision for conferences, including data collection for morbidity and mortality conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. It is also the responsibility of the Chief Residents (PG6 and PG7) to communicate with Chief Residents from other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management.

Rotations

The neurosurgery residency is divided into thirteen 4-week cycles in each academic year. Each cycle at the PGY1 level consists of a 28-day curriculum that is based on PGY Level and educational progression in general Neurosurgery. Each resident performance is assessed semi-annually at Clinical Competency Committee Meetings for Core Competency achievement, as well as Milestone progression.

Mandatory Rotation

General Patient Care, PGY-1

6 cycles of 28 days each (168 days)

Supervisors: Cara Sedney, MD

Location: Ruby Memorial Hospital, Physician Office Center

The educational experience for these cycles will include rotations on Trauma, Pain, Neurology, Interventional Radiology, Gamma Knife, and Radiation Oncology with a focus to ensure that residents have the experiences that enable them to demonstrate the following outcomes:

- Develop the knowledge, attitudes, and skills needed to formulate principles and assess, plan, and initiate treatment of patients with surgical and medical problems;

- Be involved in the care of patients with surgical and medical emergencies, multiple organ system trauma, and nervous system injuries and diseases;
- Gain experience in the care of critically-ill surgical and medical patients;
- Participate in the pre-, intra-, and post-operative care of surgical patients; and,
- Develop basic surgical skills and an understanding of surgical anesthesia, including anesthetic risks and the management of intra-operative anesthetic complications.

Rotation Objectives:

Patient Care	1. Perform a history and physical examination in patients with a brain tumor.
	2. Provide routine perioperative care for brain tumor patients
	3. Perform a history and physical examination in patients with epilepsy or movement disorders
	4. Perform stereotactic frame placement or frameless navigation registration, assist with set up, opening, and closing for functional neurosurgical procedures.
	5. Provide routine perioperative care for movement disorders and epilepsy patients.
	6. Perform a history and physical examination in patients with chronic pain or a peripheral nerve disorder.
	7. Interrogate and program implanted devices, assists with set up, opening, and closing for chronic pain and peripheral nerve procedures
	8. Provide routine perioperative care for chronic pain or peripheral nerve disorder patients.
	9. Perform a history and physical examination in patients with degenerative, traumatic, or neoplastic spinal disorders.
	10. Implement spinal bracing or traction, assists with set up, opening, and closing for spinal surgery procedures.
	11. Perform a history and physical examination in patients with severe TBI and assigns a GCS.
	12. Place an intracranial pressure monitor, assists with set up, opening, and closing for neurotrauma procedures.
	13. Provide routine perioperative care for patients with TBI.
	14. Insert arterial and central venous catheters.
	15. Manage neurocritical care unit admissions and discharges.
Medical Knowledge	1. Correlate normal neuroanatomy and physiology with function
	2. Gather, interpret, and report basic diagnostic test results (serology, chest radiographs, brain and spine CT, etc.)
	3. List a differential diagnosis for common clinical presentations
	4. List therapeutic options for common clinical presentations.
Systems Based Practice	1. Describe principles of patient safety, perform safe and effective handoffs and transitions in routine clinical situations
	2. Describe basic quality improvement methods and metrics
	3. Describe principles of US health payment systems
Practice Based Learning	1. Apply institutional treatment guidelines I basic patient care, identify and report complications

	2. Formulate hypotheses and investigative approaches to clinical or basic science problems 3. Demonstrate self-awareness and identifies gaps in knowledge, skills, and experience and incorporate feedback.
Professionalism	1. Behaves ethically and professionally and takes responsibility for personal conduct 2. Employ ethical and legal principles (informed consent, advance directives, confidentiality, error disclosure, resource stewardship) and seek advice appropriately. 3. Describes the importance of personal and professional well-being, manages sleep and deprivation and fatigue.
Interpersonal Communication	1. Use language and non-verbal behavior to exhibit respect, establish rapport, and demonstrate cultural competency. 2. Establish therapeutic relationships in straightforward encounters using active listening and clear language. 3. Accurately record information in the patient record and safeguard protected health information, coordinate care within the neurosurgical service. 4. Communicate orally and in writing in a respectful, organized, clear, concise, and timely manner with all the members of the interprofessional health care team, coordinate care with consulting services.

Mandatory Rotation

Neuro Critical Care (NCCU) – Junior, PGY-1

6 cycles of 28 days each (168 days)

Supervisors: Matthew Smith, MD

Location: Ruby Memorial Hospital, Physician Office Center

The focus for these cycles will be neurocritical care and neuro-anesthesia with the expectation that the PGY1 resident will cover both neurology AND neurosurgery patients for NCCU rounds, and will be an integrated team member with the NCCU. Endovascular cases may be included when relevant, and with permission of Dr. Smith while on NCCU. The PGY1 resident is expected to participate in all ICU learning experiences, including Tuesday afternoon combined ICU didactics. Additionally, prior to completion of the Neuro Critical Care Rotations, the PGY1 resident is expected to prepare a research project pertinent to an NCCU topic – Dr. Smith will provide additional guidance and details for this. Also, as part of the requirements for the NCCU Rotations, PGY1 residents will be expected to participate in Neuro-Anesthesia cases, as assigned by the NCCU Service. Lastly, the PGY1 resident will begin to take supervised overnight call with the neurosurgery service while on this rotation. This will include interaction with the NCCU team during that time. Calls will include 2 Saturday calls per month, as well as one weekday call per week. Calls will be supervised by an in-house midlevel resident in January with potential for loosening that supervisory requirement as they progress in skill and knowledge attainment.

Rotation Objectives:

Patient Care	1. Place an external ventricular drain, assist with setup, opening and closing for brain tumor craniotomies 2. Provide routine perioperative care for brain tumor patients 3. Perform a history and physical examination in patients with ischemic or hemorrhagic stroke or vascular neurosurgical disorders. 4. Manage and obtain CSF samples from external ventricular drains, assists with set up, opening, and closing for vascular neurosurgical and endovascular procedures. 5. Provide routine perioperative care for vascular neurosurgical and endovascular patients. 6. Perform a history and physical examination in patients with severe TBI and assigns a GCS. 7. Place an intracranial pressure monitor, assists with set up, opening, and closing for neurotrauma procedures. 8. Provide routine perioperative care for patients with TBI. 9. Perform a history and physical examination in critically-ill patients 10. Insert arterial and central venous catheters. 11. Manage neurocritical care unit admissions and discharges.
Medical Knowledge	1. Correlate normal neuroanatomy and physiology with function 2. Gather, interpret, and report basic diagnostic test results (serology, chest radiographs, brain and spine CT, etc.) 3. List a differential diagnosis for common clinical presentations 4. List therapeutic options for common clinical presentations.
Systems Based Practice	1. Describe principles of patient safety, perform safe and effective handoffs and transitions in routine clinical situations 2. Describe basic quality improvement methods and metrics 3. Describe principles of US health payment systems
Practice Based Learning	1. Apply institutional treatment guidelines I basic patient care, identify and report complications 2. Formulate hypotheses and investigative approaches to clinical or basic science problems 3. Demonstrate self-awareness and identifies gaps in knowledge, skills, and experience and incorporate feedback.
Professionalism	1. Behaves ethically and professionally and takes responsibility for personal conduct 2. Employ ethical and legal principles (informed consent, advance directives, confidentiality, error disclosure, resource stewardship) and seek advice appropriately. 3. Describes the importance of personal and professional well-being, manages sleep and deprivation and fatigue.
Interpersonal Communication	1. Use language and non-verbal behavior to exhibit respect, establish rapport, and demonstrate cultural competency. 2. Establish therapeutic relationships in straightforward encounters using active listening and clear language. 3. Accurately record information in the patient record and safeguard protected health information, coordinate care within the neurosurgical service. 4. Communicate orally and in writing in a respectful, organized, clear, concise, and timely manner with all the members of the

	interprofessional health care team, coordinate care with consulting services.

Mandatory Rotation

Neurosurgery – Junior, PGY-1

1 cycles of 28 days each (28 days)

Supervisors: Cara Sedney, MD

Location: Ruby Memorial Hospital, Physician Office Center

This rotation will consist of 1 cycle of 28 days at the end of the PGY1 academic year. This rotation will be spent entirely on the neurosurgical service with a focus on patient care and transitioning the knowledge obtained on the neuro ICU service to the inpatient primary service.

Rotation Objectives:

Patient Care	1. Perform a history and physical examination in patients with a brain tumor.
	2. Provide routine perioperative care for brain tumor patients
	3. Perform a history and physical examination in patients with epilepsy or movement disorders
	4. Provide routine perioperative care for movement disorders and epilepsy patients.
	5. Perform a history and physical examination in patients with degenerative, traumatic, or neoplastic spinal disorders.
	6. Implement spinal bracing or traction, assists with set up, opening, and closing for spinal surgery procedures.
	7. Provide routine perioperative care for spinal surgery patients.
	8. Provide routine perioperative care for vascular neurosurgical and endovascular patients.
	9. Perform a history and physical examination in patients with severe TBI and assigns a GCS.
	10. Place an intracranial pressure monitor, assists with set up, opening, and closing for neurotrauma procedures.
	11. Provide routine perioperative care for patients with TBI.
Medical Knowledge	1. Correlate normal neuroanatomy and physiology with function
	2. Gather, interpret, and report basic diagnostic test results (serology, chest radiographs, brain and spine CT, etc.)
	3. List a differential diagnosis for common clinical presentations
	4. List therapeutic options for common clinical presentations.
Systems Based Practice	1. Describe principles of patient safety, perform safe and effective handoffs and transitions in routine clinical situations
	2. Describe basic quality improvement methods and metrics
	3. Describe principles of US health payment systems
Practice Based Learning	1. Apply institutional treatment guidelines I basic patient care, identify and report complications

	2. Formulate hypotheses and investigative approaches to clinical or basic science problems
	3. Demonstrate self-awareness and identifies gaps in knowledge, skills, and experience and incorporate feedback.
Professionalism	1. Behaves ethically and professionally and takes responsibility for personal conduct
	2. Employ ethical and legal principles (informed consent, advance directives, confidentiality, error disclosure, resource stewardship) and seek advice appropriately.
	3. Describes the importance of personal and professional well-being, manages sleep and deprivation and fatigue.
Interpersonal Communication	1. Use language and non-verbal behavior to exhibit respect, establish rapport, and demonstrate cultural competency.
	2. Establish therapeutic relationships in straightforward encounters using active listening and clear language.
	3. Accurately record information in the patient record and safeguard protected health information, coordinate care within the neurosurgical service.
	4. Communicate orally and in writing in a respectful, organized, clear, concise, and timely manner with all the members of the interprofessional health care team, coordinate care with consulting services.

Operative Experiences

Throughout this year of training, the resident will log all operative cases and procedures in every setting, including bedside, pain clinic, Gamma Knife, interventional radiology, ICU, etc. in the Op-Log system of ACGME. Case logs are expected to be kept up to date at least weekly and are reviewed at each formal evaluation. Meal cards may be turned off for delinquent logging practices. Listed here are the minimum expectations by procedure, for completion at the end of the PGY1 year, compared to the minimum expectations upon graduation.

Category	PGY1 Expectations	Lead and Senior Minimums
ALL DEFINED CASE PROCEDURES		
Cranial		
Cranial: Tumor General	NA	60
Cranial: Tumor Sellar/Parasellar	NA	20
Cranial: Trauma/Other	NA	60
Cranial: Vascular Open	NA	10
Cranial: Vascular Endovascular	10	10
Cranial: Vascular Total	NA	60
Cranial: CSF Diversion/ETV/Other	NA	20
Cranial/Extracranial: Pain	NA	10
Cranial/Extracranial: Functional Disorders	NA	10
Cranial/Extracranial: Epilepsy	NA	10
Total Cranial	NA	300
Spinal		

Spinal: Anterior Cervical	NA	30
Spinal: Posterior Cervical	NA	30
Spinal: Thoracic/Lumbar/Sacral Instrumentation Fusion	NA	30
Spinal: Lumbar Laminectomy/Laminotomy	NA	30
Spinal: Stimulation/Lesion/Pump/Other	NA	10
Total Spinal	NA	300
Other		
Peripheral Nerve	10	10
Radiosurgery	10	10
Peripheral Device Management	20	20
Total Other	0	0
Critical Care		
Airway Management	10	0
Angiography	20	0
Arterial Line Placement	10	0
CVP Line Placement	10	0
EVD/Transdural Monitor Placement	30	0
Lumbar/Other Puncture/Drain Placement	10	0
Percutaneous Tap of CSF Reservoir	10	0
Total Critical Care	100	0
Pediatric		
Pediatric: Cranial Tumor	NA	5
Pediatric: Cranial Trauma/Other	NA	10
Pediatric: CSF Diversion/ETV/Other	NA	10
Pediatric: Spinal	NA	5
Total Pediatric	NA	40
Total	NA	800

Didactics and Assigned Learning

Didactic learning in the PGY1 year consists of:

- Curriculum-based Educational Sessions, which are held during protected didactic time on Friday mornings from 7:00am to 1:00pm. The educational sessions are divided into unique educational experiences, such as:
    - o Tumor Board
    - o Curriculum Lectures
    - o Visiting Professor Grand Rounds
    - o Case Conference
    - o Journal Club
    - o Board Review
    - o Operative Skills Lab
    - o Cadaver Labs
    - o The Greenberg Presentation and Case Conference

- Experiential Learning Sessions, which are held during protected didactic time on Wednesday mornings from 7:00am – 8:00am and include sessions for:
  - M&M Conference
  - Oral Board Review
  - Neuro I/R Conference
  - NCCU Conference
  - Research

Milestones

PGY1 Residents are expected to be familiar with the ACGME Neurosurgery Milestones and are expected to work towards progress in mastering the individual skills/knowledge listed for each. The Clinical Competency Committee will meet twice each year, once in December, and once in June, to review Milestone progress for each resident and to assess a current level of mastery for each, for each resident. It is expected at the June meeting, the resident who will be completing their PGY1 year at that time, should have achieved the following Milestone levels:

PGY1 Milestone Expectations		
PC1	Brain Tumor	1.0
PC2	Surgical Treatment of Epilepsy and Movement Disorders	1.0
PC3	Pain and Peripheral Nerve Disorders	1.0
PC4	Spinal Neurological Surgery	1.0
PC5	Vascular Neurological Surgery	1.0
PC6	Pediatric Neurological Surgery	1.0
PC7	Traumatic Brain Injury	1.0
PC8	Critical Care	1.0
MK1	Information Gathering and Interpretation	1.0
MK2	Critical Thinking for Diagnosis and Therapy	1.0
SBP1	Patient Safety	1.0
SBP2	Quality Improvement	1.0
SBP 3	Health Care Systems Awareness	1.0
PBL1	Evidence-Based Practice	1.0
PBL2	Research	1.0

PBL3	Mentorship and Teaching	1.0
PRO1	Ethical Behavior	2.0
PRO2	Well-Being	1.0
ICS1	Patient and Family Communication	2.0
ICS2	Communication in Coordination of Care	2.0

Resident Supervision

It is expected that residents are provided adequate and appropriate levels of supervision during the course of the educational training experience to ensure that patient care is delivered in a safe and effective manner.   All program faculty members that supervise residents, must have a faculty or clinical faculty appointment in the School of Medicine or be specifically approved as a supervising attending by the Program Director. Faculty schedules will be structured to provide residents with continuous supervision and consultation.

Residents must be supervised by faculty members in a manner promoting progressively increasing responsibility for each resident according to their level of education, ability and experience. Residents are provided information addressing the method(s) to access a supervisor in a timely and efficient manner at all times while on duty.

The program provides additional information addressing the type and level of supervision for each post-graduate year in the program that is consistent with ACGME program requirements and, specifically, for supervision of residents engaged in performing invasive procedures.

All PGY 1 residents must be supervised by either faculty or more senior residents in the hospital setting, for a minimum of 5 successful occurrences for each of the five procedures outlined below. Each PGY1 resident will be provided with a procedural card for each of these five procedures: Lumbar Puncture, Lumbar Drain, EVD, Camino, Subdural Drain/SEPS, and will be expected to complete each card with a minimum of 5 successfully performed procedures, by a supervising faculty or senior-resident. Once each card is complete, the PGY1 resident will submit the completed form to the Residency Program Manager, at which point the PD will approve the resident for performing these procedures, without direct supervision, moving forward. The procedure cards that will be used, will appear as such:

Neurosurgical Bedside Procedure: _____ Resident
(to be signed off by senior/chief resident or staff)

Lumbar Puncture

MRN	Date	Initial

Lumbar Drain

MRN	Date	Initial

EVD

MRN	Date	Initial

Camino

MRN	Date	Initial

Subdural Drain/SEPS

MRN	Date	Initial

Notes:

The following general supervision guidelines will be expected for residents in their PGY1 level of training:

PGY1 Resident Supervision	Inpatient Service	Intensive Care Units	Ambulatory Settings	Operating Rooms
Direct by Faculty	X	X	X	X
Direct by Senior Residents	X	X	X	X
Indirect, but immediately available Faculty				
Indirect, but immediately available Senior Residents				
Indirect available				
Oversight				

Guidelines for Resident Mandatory Communication with Attending

The following situations require mandatory direct communication with the faculty responsible for patient care, both during routine working hours, and after hours and weekends. "Faculty responsible for patient care" means the staff of record for the patient, except in events when the faculty is physically out of town or can't be contacted, in which case the on call faculty should be notified. The staff of record should also be notified as soon as is feasible:

- Death
- DNR or other end of life decision
- Suicide attempt
- Violence requiring physical restraints

- Emergency surgery
- Acute drastic change in course
- Unanticipated invasive or diagnostic procedure
- Pregnancy
- Transfer of care to another medical or surgical service, including transfer to ICU
- Any serious adverse event
- Any complex decision making process that the resident does not feel adequately qualified to undertake without immediate input from faculty

Teaching Expectations

PGY1 Residents are expected to use this academic year to hone their teaching skills, which they will do by providing one-on-one guidance and instruction to both medical students rotating on our service, and lower level residents from Neurosurgery. It is expected that PGY1 residents function as both a learner and a teacher, as appropriate, during the course of each rotation, and are expected to provide ongoing teaching experiences to lower level learners.

Scholarship Requirements

In pursuit of scholarly activity, the PGY1 resident will be expected plan and carry out a scholarly project and/or to participate in research projects that will enable him/her to meet the requirement for obtaining a minimum of 6 PubMed indexed, peer reviewed papers in print (roughly one per year, excepting the chief year). Only residents who have made significant contribution to a research project will be listed as authors. Residents are encouraged to work together to carry research project to completion, however roles and authorship are to be decided and should be made clear at the beginning of collaboration. Any authorship disputes will be handled by the faculty mentor for the research. Presentation of research at national meetings is encouraged and the same authorship standards apply. The resident who plans to present the research should submit the research for consideration.

All research activities within the Department of Neurosurgery are bound by institutional research ethics. All research projects in which residents participate must be brought before the Residency Research Committee (Chair: Nick Brandmeir), be on file with Patricia Dekeseredy and/or Dan Cifarelli (Research Coordinators) and have IRB approval. All residents must have completed required training modules. All participants in a research project must be documented and approved by the faculty of record. NO PHI should be distributed in any fashion which will constitute a HIPAA violation. This includes sending PHI to medical student (MIX) email accounts. Case reports must have documented consent form signed by the patient.

QI projects are a required part of the residency curriculum. These may take a variety of formats. QI training takes place during the annual resident orientation.

Assessment Methods

The neurosurgery program provides a structure by which performance related to the training program will be assessed semi-annually, and consideration given for promotion to the next level of training, prior to the end of each academic year. Evaluation will be provided in accordance with Graduate Medical Education Committee policy and ACGME common program requirements.

Residents will receive written goals and objectives from the program annually, which will outline the expectations and objectives for each major rotation of the training program. In order to assess the attainment of the expectations outlined in the goals and objectives, the following assessment methods will be utilized:

- Formative Feedback from faculty at the end of each 4-week block
- 360 degree performance evaluations by peers, departmental faculty, NCCU, Anesthesia, nurses and staff, semiannually.
- Direct observation and precepting by faculty supervisors with ongoing feedback
- Clinical precepting evaluations performed on a quarterly basis by supervising faculty.
- Conference presentation evaluations (by residents, faculty, students and staff).
- Self-assessment and reflection form semiannually
- Neurosurgery Written In-Service Board Exam
- Semi-Annual Milestone evaluations by faculty
- Written evaluation by faculty supervisor semiannually

All residents participating in training will be provided, at a minimum, a semi-annual formal evaluation developed by the faculty, CCC, and Program Director. Residents shall be allowed to review all evaluations contained in permanent records. At a minimum, the Formal Written Evaluation shall:

- Address each of the six ACGME core competencies and RRC milestones.
- Include scoring and rating criteria that seek to minimize subjective assessment of performance.
- Include language indicating satisfactory performance, advancement to the next level of training (if applicable) or provide specific actions and performance requirements by the resident to return to a level of satisfactory performance or advancement to the next level of training.
- Be signed and dated by the resident and Program Director.
- Become a part of the permanent record file for the resident.

In addition, each resident will meet, near the midpoint of each rotation, with an assigned faculty advisor according to PGY year, for an informal progress evaluation to assess strengths and weaknesses in performance, so that adjustments can be made over the remainder of the rotation. Each meeting with the advisor will address multiple domains on a standardized form as determined by the PEC.

All of the above listed assessment methods will be used by the departmental Clinical Competency Committee to determine overall educational progress for the resident for the academic year, and will be part of the consideration for promotion to the next level of training, retention at the current level, remediation, probation, and non-renewal. All determinations for educational progress will be made a part of the resident's permanent educational file.

PGY2

Introduction

The WVU Neurosurgical Residency is a 7 year (91 Cycle) program. There are 65 Cycles of core clinical neurosurgery of which 13 cycles months are the chief residency. In the internship, there is a 7-cycle rotation in general care and a 6-cycle rotation in neurocritical care. Longitudinal clinical experiences in anesthesia, neurology, pain medicine, pathology, and radiation oncology are distributed across this year. Beginning in PGY2, the resident begins to rotate on the clinical neurosurgery services. At times, Drs. Meltzer and Hamilton may function independently as a separate pediatric service with a dedicated resident when the resident curriculum schedule dictates such. The fourth year is the academic year, and is devoted to scholarly pursuit or enfolded fellowships. Academic pursuit may include graduate classes. The fifth year includes dedicated rotations in pediatrics and endovascular. The PGY6 and PGY7 split senior and chief responsibilities. The chief resident takes overall responsibility for the entire service. In summary, there are 13 cycles of internship, 26 cycles of clinical junior residency, a year of academic work, another 26 cycles of clinical senior rotations, and 13 cycles of clinical neurosurgery serving as chief resident.

Neuro-critical care experience is emphasized throughout the training, as well as extensive exposure to subspecialty services including neurovascular, neuro-oncology, epilepsy surgery, spinal neurosurgery, stereotactic radiosurgery, neurotrauma, functional neurosurgery and pediatric neurosurgery. Conferences are protected from clinical commitments and include morbidity and mortality conference, case conference, tumor board, asynchronous learning and board review, and journal club. Subspecialty conferences such as Epilepsy Conference or Spine Conference are encouraged. The anatomic dissection lab is available for scholarly work or preparation for operative cases.

Expectations

PGY2 residents in this program are expected to:

- Obtain a valid WV State Medical License or Training Permit, for the duration of the academic year
- Achieve appropriate levels of proficiency in each of the six ACGME Core Competencies
- Achieve expected levels of progress in each of the ACGME Neurosurgery Milestones
- Successful completion of the written neurosurgical board exam for the PGY2 year of training
- Quality Improvement and Patient Safety (QI/PS) research project involvement
- Scholarly activity (presentations and manuscript preparation)
- Read the Handbook of Neurosurgery by Mark S. Greenberg in the course of the academic year, and prepare didactic sessions to present to fellow residents, for each chapter
- Successfully complete the Anatomy Exam provided by the Congress of Neurologic Surgeons prior to the December 31st deadline
- Gather M&M data monthly and work with assigned faculty members to prepare and present a didactic learning session about the data.
- Daily logging of duty hours in the E-Value system

- Have an understanding of each of the ACGME Duty Hour regulations and adhere to the departmental policies and procedures that are designed to keep residents in compliance with all of the duty hour requirements.
- Every resident is strongly encouraged to participate in one academic paper yearly. Residents are highly encouraged to participate in and make significant contribution to a research project, during the academic year, in order to be listed as an author on a submitted publication.
- Mandatory attendance at all educational conferences, didactic sessions, etc., unless excused or absent for the day
- PGY2 Residents are expected to focus on improvement with efficiency and teamwork during the course of the academic year
- Maintain a healthy level of mental and physical wellness by adhering to the Fit For Duty guidelines, outlined in the Neurosurgery Handbook, and report any concerns with wellness immediately to the Program Director
- Residents will be assigned evaluations to complete semi-annually. Self, peer, program and faculty evaluations must be completed in a timely manner, which is defined as within two weeks of assignment, and meet completion deadline as assigned by the Program Coordinator.
- Resident is expected to attend the course called BOOT CAMP 2 at Weil Cornell University in New York, NY, which is a surgical innovation laboratory focusing on micro-surgery skills and gross anatomy and is sponsored by the SNS

Core Competency Educational Objectives for PGY2 year/ PGY2 Neurosurgery Rotation

Develop graduating residents that possess a proficiency level appropriate for a new and independent neurological practitioner in the six core competencies as outlined by the ACGME.

Patient Care	1. Perform a history and physical examination in patients with a brain tumor.
	2. Place an external ventricular drain, assist with setup, opening and closing for brain tumor craniotomies
	3. Provide routine perioperative care for brain tumor patients
	4. Perform a history and physical examination in patients with epilepsy or movement disorders
	5. Perform stereotactic frame placement or frameless navigation registration, assist with set up, opening, and closing for functional neurosurgical procedures.
	6. Provide routine perioperative care for movement disorders and epilepsy patients.
	7. Perform a history and physical examination in patients with chronic pain or a peripheral nerve disorder.
	8. Interrogates and programs implanted devices, assists with set up, opening, and closing for chronic pain and peripheral nerve procedures
	9. Provide routine perioperative care for chronic pain or peripheral nerve disorder patients.

	10. Perform a history and physical examination in patients with degenerative, traumatic, or neoplastic spinal disorders. 11. Implement spinal bracing or traction, assists with set up, opening, and closing for spinal surgery procedures. 12. Provide routine perioperative care for spinal surgery patients. 13. Perform a history and physical examination in patients with ischemic or hemorrhagic stroke or vascular neurosurgical disorders. 14. Manage and obtain CSF samples from external ventricular drains, assists with set up, opening, and closing for vascular neurosurgical and endovascular procedures. 15. Provide routine perioperative care for vascular neurosurgical and endovascular patients. 16. Perform an age-appropriate history and physical examination with developmental assessment, including for non-accidental trauma. 17. Perform CSF shunt tap and valve programming, assists with set up, opening, and closing for pediatric neurosurgical procedures. 18. Provide routine perioperative care for pediatric neurosurgical patients. 19. Perform a history and physical examination in patients with severe TBI and assigns a GCS. 20. Place an intracranial pressure monitor, assists with set up, opening, and closing for neurotrauma procedures. 21. Provide routine perioperative care for patients with TBI. 22. Perform a history and physical examination in critically-ill patients 23. Insert arterial and central venous catheters. 24. Manage neurocritical care unit admissions and discharges.
Medical Knowledge	1. Correlates pathological neuroanatomy and physiology with function 2. Describes indications for standard diagnostic testing 3. Provides a comprehensive differential diagnosis for a wide range of clinical presentations 4. Explains advantages and drawbacks of standard therapeutic options
Systems Based Practice	1. Recognizes and reports patient safety events; performs safe and effective hand-offs and transitions of care in complex clinical situations 2. Participates in local quality improvement initiatives (e.g., surgical site infection (SSI) reduction, care pathway implementation)
Practice Based Learning	1. Applies published treatment guidelines in standard patient care; tracks personal clinical care outcomes 2. Participates effectively in clinical or basic scientific research 3. Teaches medical students, other residents, and patients in informal settings; develops faculty mentorship of self
Professionalism	1. Performs tasks in a thorough, timely, and respectful manner in complex or stressful situations and takes ownership of team outcomes

	2. Evaluates personal and professional well-being; seeks appropriate personal help and fatigue mitigation when needed
Interpersonal Communication	1. Establishes therapeutic relationships, thoughtfully delivers information, and strives for consensus in challenging patient encounters
	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

General Duties

The Neurosurgery Residency is a seven-year training program. Duties and assignments for each PGY level are outlined in the Goals & Objectives for that level, which includes progressive patient care responsibilities for the day-to-day running of the neurosurgical service under the supervision of the faculty. At all levels, residents are expected to discuss and plan patient management, including surgical operations with the Attending's, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care, as appropriate. The PGY6 and PGY7 residents are responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. In addition the PG6 and PG7 residents provide overall supervision for conferences, including data collection for morbidity and mortality conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. It is also the responsibility of the Chief Residents (PG6 and PG7) to communicate with Chief Residents from other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management.

Rotations

The neurosurgery residency is divided into thirteen 4-week cycles in each academic year. Each cycle at the PGY2 level consists of a 28-day curriculum that is based on PGY Level and educational progression in general Neurosurgery. Each resident performance is assessed semi-annually at Clinical Competency Committee Meetings for Core Competency achievement, as well as Milestone progression.

Mandatory Rotation (entire academic year)

Neurosurgery – Junior, PGY-2

13 cycles of 28 days each (365 days)

Supervisors: Cara Sedney, MD

Location: Ruby Memorial Hospital, Physician Office Center

The PGY-2 year is spent on the neurosurgery service at Ruby Memorial Hospital. The resident will take a leadership role in the primary management of the inpatient service. The resident will begin to develop the skills of neurosurgical patient management by following the patient through the course of their treatment with more involvement in surgical care as neurosurgical patient care skills develop.

PGY 2 Clinical and Academic Duties: Hospital patients are generally in the ICU or on the post-op surgical floor although some patients, including most consultation patients, are on other floors. The census generally runs from 40-60 patients daily. Residents make early morning rounds, evaluating and examining all patients, reviewing charts and studies, and planning dispositions. Rounds may be made with the attending in the morning, or later in the day, depending on the operative schedule and meetings, emergencies, and other factors, at the direction of the attending. The residents and medical students are fully integrated into the outpatient clinics. Patients are first seen by a resident and/or medical student. The attending then sees the patient and the case is discussed with the resident. The resident will create the consultation or post op note but it will be read, corrected, and signed by the attending. When other duties permit, the junior resident is expected to report to the operating room, whenever possible. The resident is allowed increasing involvement in the OR as surgical skills improve. Following or during the operation details are discussed and critiqued and recommendations for improvement made.

Operative Experiences

Throughout this year of training, the resident will log all operative cases and procedures in every setting, including bedside, pain clinic, Gamma Knife, interventional radiology, ICU, etc. in the Op-Log system of ACGME. Case logs are expected to be kept up to date at least weekly and are reviewed at each formal evaluation. Meal cards may be turned off for delinquent logging practices. Listed here are the minimum expectations by procedure, for completion at the end of the PGY2 year, compared to the minimum expectations upon graduation.

Category	PGY2 Expectations	Lead and Senior Minimums
ALL DEFINED CASE PROCEDURES		
Cranial		
Cranial: Tumor General	NA	60
Cranial: Tumor Sellar/Parasellar	NA	20
Cranial: Trauma/Other	NA	60
Cranial: Vascular Open	NA	10
Cranial: Vascular Endovascular	10	10
Cranial: Vascular Total	NA	60
Cranial: CSF Diversion/ETV/Other	NA	20
Cranial/Extracranial: Pain	NA	10
Cranial/Extracranial: Functional Disorders	NA	10
Cranial/Extracranial: Epilepsy	NA	10
Total Cranial	NA	300
Spinal		
Spinal: Anterior Cervical	NA	30
Spinal: Posterior Cervical	NA	30
Spinal: Thoracic/Lumbar/Sacral Instrumentation Fusion	NA	30
Spinal: Lumbar Laminectomy/Laminotomy	NA	30
Spinal: Stimulation/Lesion/Pump/Other	NA	10
Total Spinal	NA	300
Other		
Peripheral Nerve	10	10
Radiosurgery	10	10
Peripheral Device Management	20	20
Total Other	0	0
Critical Care		

Airway Management	10	0
Angiography	20	0
Arterial Line Placement	10	0
CVP Line Placement	10	0
EVD/Transdural Monitor Placement	30	0
Lumbar/Other Puncture/Drain Placement	10	0
Percutaneous Tap of CSF Reservoir	10	0
Total Critical Care	100	0
Pediatric		
Pediatric: Cranial Tumor	NA	5
Pediatric: Cranial Trauma/Other	NA	10
Pediatric: CSF Diversion/ETV/Other	NA	10
Pediatric: Spinal	NA	5
Total Pediatric	NA	40
Total	NA	800

Didactics and Assigned Learning

Didactic learning in the PGY2 year consists of:

- Curriculum-based Educational Sessions, which are held during protected didactic time on Friday mornings from 7:00am to 1:00pm. The educational sessions are divided into unique educational experiences, such as:
    - Tumor Board
    - Curriculum Lectures
    - Visiting Professor Grand Rounds
    - Case Conference
    - Journal Club
    - Board Review
    - Operative Skills Lab
    - Cadaver Labs
    - The Greenberg Presentation and Case Conference
- Experiential Learning Sessions, which are held during protected didactic time on Wednesday mornings from 7:00am – 8:00am and include sessions for:
    - M&M Conference
    - Oral Board Review
    - Neuro I/R Conference
    - NCCU Conference
    - Research
- The PGY-2 resident, in collaboration with assigned faculty members, will be responsible for the preparation and presentation of monthly M&M Cases. The PGY-2 resident is responsible for gathering all

necessary data for the conference and working with the supervising faculty to prepare and present the cases during M&M Conference.

- The PGY-2 resident is expected to read the entirety of the Handbook of Neurosurgery by Mark S. Greenberg in the course of the academic year, and will be assigned dates to present a review of each chapter during the Greenberg Presentation and Case Conference sessions on Friday mornings.

Milestones

PGY2 Residents are expected to be familiar with the ACGME Neurosurgery Milestones and are expected to work towards progress in mastering the individual skills/knowledge listed for each. The Clinical Competency Committee will meet twice each year, once in December, and once in June, to review Milestone progress for each resident and to assess a current level of mastery for each, for each resident. It is expected at the June meeting, the resident who will be completing their PGY2 year at that time, should have achieved the following Milestone levels:

PGY2 Milestone Expectations		
PC1	Brain Tumor	1.0
PC2	Surgical Treatment of Epilepsy and Movement Disorders	1.0
PC3	Pain and Peripheral Nerve Disorders	1.0
PC4	Spinal Neurological Surgery	1.0
PC5	Vascular Neurological Surgery	1.0
PC6	Pediatric Neurological Surgery	1.0
PC7	Traumatic Brain Injury	1.0
PC8	Critical Care	1.0
MK1	Information Gathering and Interpretation	2.0
MK2	Critical Thinking for Diagnosis and Therapy	2.0
SBP1	Patient Safety	2.0
SBP2	Quality Improvement	2.0
SBP 3	Health Care Systems Awareness	2.0
PBL1	Evidence-Based Practice	2.0
PBL2	Research	2.0
PBL3	Mentorship and Teaching	2.0
PRO1	Ethical Behavior	3.0
PRO2	Well-Being	2.0

ICS1	Patient and Family Communication	3.0
ICS2	Communication in Coordination of Care	2.0

Resident Supervision

It is expected that residents are provided adequate and appropriate levels of supervision during the course of the educational training experience to ensure that patient care is delivered in a safe and effective manner.   All program faculty members that supervise residents, must have a faculty or clinical faculty appointment in the School of Medicine or be specifically approved as a supervising attending by the Program Director. Faculty schedules will be structured to provide residents with continuous supervision and consultation.

Residents must be supervised by faculty members in a manner promoting progressively increasing responsibility for each resident according to their level of education, ability and experience. Residents are provided information addressing the method(s) to access a supervisor in a timely and efficient manner at all times while on duty.

The program provides additional information addressing the type and level of supervision for each post-graduate year in the program that is consistent with ACGME program requirements and, specifically, for supervision of residents engaged in performing invasive procedures.

The following general supervision guidelines will be expected for residents in their PGY2 level of training:

PGY2 Resident Supervision	Inpatient Service	Intensive Care Units	Ambulatory Settings	Operating Rooms
Direct by Faculty	X	X	X	X
Direct by Senior Residents	X	X	X	X
Indirect, but immediately available Faculty	X	X	X	X
Indirect, but immediately available Senior Residents	X	X	X	
Indirect available				
Oversight				

Guidelines for Resident Mandatory Communication with Attending

The following situations require mandatory direct communication with the faculty responsible for patient care, both during routine working hours, and after hours and weekends. "Faculty responsible for patient care" means

the staff of record for the patient, except in events when the faculty is physically out of town or can't be contacted, in which case the on call faculty should be notified. The staff of record should also be notified as soon as is feasible:

- Death
- DNR or other end of life decision
- Suicide attempt
- Violence requiring physical restraints
- Emergency surgery
- Acute drastic change in course
- Unanticipated invasive or diagnostic procedure
- Pregnancy
- Transfer of care to another medical or surgical service, including transfer to ICU
- Any serious adverse event
- Any complex decision making process that the resident does not feel adequately qualified to undertake without immediate input from faculty

Teaching Expectations

PGY2 Residents are expected to use this academic year to hone their teaching skills, which they will do by providing one-on-one guidance and instruction to both medical students rotating on our service, and lower level residents from Neurosurgery. It is expected that PGY2 residents function as both a learner and a teacher, as appropriate, during the course of each rotation, and are expected to provide ongoing teaching experiences to lower level learners. In addition, the PGY2 resident is expected to serve in a formal teaching capacity during M&M Conferences, as well as during Anatomy presentations given by the resident throughout the year.

Scholarship Requirements

In pursuit of scholarly activity, the PGY2 resident will be expected plan and carry out a scholarly project and/or to participate in research projects that will enable him/her to meet the requirement for obtaining a minimum of 6 PubMed indexed, peer reviewed papers in print (roughly one per year, excepting the chief year). Only residents who have made significant contribution to a research project will be listed as authors. Residents are encouraged to work together to carry research project to completion, however roles and authorship are to be decided and should be made clear at the beginning of collaboration. Any authorship disputes will be handled by the faculty mentor for the research. Presentation of research at national meetings is encouraged and the same authorship standards apply. The resident who plans to present the research should submit the research for consideration.

All research activities within the Department of Neurosurgery are bound by institutional research ethics. All research projects in which residents participate must be brought before the Residency Research Committee (Chair: Nick Brandmeir), be on file with Patricia Dekeseredy and/or Dan Cifarelli (Research Coordinators) and have IRB approval. All residents must have completed required training modules. All participants in a research project must be documented and approved by the faculty of record. NO PHI should be distributed in any fashion which will constitute a HIPAA violation. This includes sending PHI to medical student (MIX) email accounts. Case reports must have documented consent form signed by the patient.

QI projects are a required part of the residency curriculum. These may take a variety of formats. QI training takes place during the annual resident orientation.

Assessment Methods

The neurosurgery program provides a structure by which performance related to the training program will be assessed semi-annually, and consideration given for promotion to the next level of training, prior to the end of each academic year. Evaluation will be provided in accordance with Graduate Medical Education Committee policy and ACGME common program requirements.

Residents will receive written goals and objectives from the program annually, which will outline the expectations and objectives for each major rotation of the training program. In order to assess the attainment of the expectations outlined in the goals and objectives, the following assessment methods will be utilized:

- Formative Feedback from faculty at the end of each 4-week block
- 360 degree performance evaluations by peers, departmental faculty, NCCU, Anesthesia, nurses and staff, semiannually.
- Direct observation and precepting by faculty supervisors with ongoing feedback
- Clinical precepting evaluations performed on a quarterly basis by supervising faculty.
- Conference presentation evaluations (by residents, faculty, students and staff).
- Self-assessment and reflection form semiannually
- Neurosurgery Written In-Service Board Exam
- Semi-Annual Milestone evaluations by faculty
- Written evaluation by faculty supervisor semiannually
- Anatomy Exam provided by the Congress of Neurologic Surgeons

All residents participating in training will be provided, at a minimum, a semi-annual formal evaluation developed by the faculty, CCC, and Program Director. Residents shall be allowed to review all evaluations contained in permanent records. At a minimum, the Formal Written Evaluation shall:

- Address each of the six ACGME core competencies and RRC milestones.
- Include scoring and rating criteria that seek to minimize subjective assessment of performance.
- Include language indicating satisfactory performance, advancement to the next level of training (if applicable) or provide specific actions and performance requirements by the resident to return to a level of satisfactory performance or advancement to the next level of training.
- Be signed and dated by the resident and Program Director.
- Become a part of the permanent record file for the resident.

In addition, each resident will meet, near the midpoint of each rotation, with an assigned faculty advisor according to PGY year, for an informal progress evaluation to assess strengths and weaknesses in performance, so that adjustments can be made over the remainder of the rotation. Each meeting with the advisor will address multiple domains on a standardized form as determined by the PEC.

All of the above listed assessment methods will be used by the departmental Clinical Competency Committee to determine overall educational progress for the resident for the academic year, and will be part of the consideration for promotion to the next level of training, retention at the current level, remediation, probation, and non-renewal. All determinations for educational progress will be made a part of the resident's permanent educational file.

PGY3

Introduction

The WVU Neurosurgical Residency is a 7 year (91 4-week cycles) program. There are 65 cycles of core clinical neurosurgery of which 13 cycles are considered the chief residency. In the internship, there is a 7-block rotation in general care and a 6-block rotation in neurocritical care. Longitudinal clinical experiences in anesthesia, neurology, pain medicine, pathology, and radiation oncology are distributed across this year. Beginning in PGY2, the resident begins to rotate on the clinical neurosurgery services. At times, Drs. Meltzer and Hamilton may function independently as a separate pediatric service with a dedicated resident when the resident curriculum schedule dictates such. The fourth year is the academic year, and is devoted to scholarly pursuit or enfolded fellowships. Academic pursuit may include graduate classes. The fifth year includes dedicated rotations in pediatrics and endovascular. The PGY6 and PGY7 split senior and chief responsibilities. The chief resident takes overall responsibility for the entire service. In summary, there are 13-cycles of internship, 26 cycles of clinical junior residency, a year of academic work, another 26 cycles of clinical senior rotations, and 13 cycles of clinical neurosurgery, serving as chief resident.

Neuro-critical care experience is emphasized throughout the training, as well as extensive exposure to subspecialty services including neurovascular, neuro-oncology, epilepsy surgery, spinal neurosurgery, stereotactic radiosurgery, neurotrauma, functional neurosurgery and pediatric neurosurgery. Conferences are protected from clinical commitments and include morbidity and mortality conference, case conference, tumor board, asynchronous learning and board review, and journal club. Subspecialty conferences such as Epilepsy Conference or Spine Conference are encouraged. The anatomic dissection lab is available for scholarly work or preparation for operative cases.

Expectations

PGY3 residents in this program are expected to:
- Obtain a valid WV State Medical License or Training Permit, for the duration of the academic year
- Achieve appropriate levels of proficiency in each of the six ACGME Core Competencies
- Achieve expected levels of progress in each of the ACGME Neurosurgery Milestones
- Successful completion of the written neurosurgical board exam for the PGY3 year of training
- Quality Improvement and Patient Safety (QI/PS) research project involvement
- Scholarly activity (presentations and manuscript preparation)
- Daily logging of duty hours in the E-Value system
- Have an understanding of each of the ACGME Duty Hour regulations and adhere to the departmental policies and procedures that are designed to keep residents in compliance with all of the duty hour requirements.
- Every resident is strongly encouraged to participate in one academic paper yearly. Residents are highly encouraged to participate in and make significant contribution to a research project, during the academic year, in order to be listed as an author on a submitted publication.

- Mandatory attendance at all educational conferences, didactic sessions, etc., unless excused or absent for the day
- PGY3 Residents are expected to focus on improvement with efficiency and teamwork during the course of the academic year
- Maintain a healthy level of mental and physical wellness by adhering to the Fit For Duty guidelines, outlined in the Neurosurgery Handbook, and report any concerns with wellness immediately to the Program Director
- Residents will be assigned evaluations to complete semi-annually. Self, peer, program and faculty evaluations must be completed in a timely manner, which is defined as within two weeks of assignment, and meet completion deadline as assigned by the Program Coordinator.
- Resident is expected to attend the RUNN Conference in Woods Hole, MA, which provides them with intensive exposure to Neuroscience.

Core Competency Educational Objectives

Develop graduating residents that possess a proficiency level appropriate for a new and independent neurological practitioner in the six core competencies as outlined by the ACGME.

Patient Care	1. Explains the risks and benefits of craniotomy for brain tumor
	2. Assists with routine craniotomy for brain tumor
	3. Recognizes and initiates work-up of routine complications associated with brain tumors (e.g., air embolism (CSF fistula, hematoma)
	4. Explains the risks and benefits of Functional Neurosurgical procedures.
	5. Assists with routine functional neurosurgical procedures.
	6. Recognizes and initiates work-up of routine complications associated for functional neurosurgical procedures (e.g., seizures, device infection)
	7. Explains the risks and benefits of chronic pain and peripheral nerve procedures
	8. Assists with routine chronic pain and peripheral nerve procedures
	9. Recognizes and initiates work-up of routine complications associated with peripheral nerve procedures (e.g., implanted device failure or infection)
	10. Explains the risks and benefits of spinal surgery
	11. Assists with routine spinal surgery procedures
	12. Recognizes and initiates work-up of routine complications associated with spinal surgery procedures (e.g., pain, surgical site infection)
	13. Explains the risks and benefits of vascular neurosurgical and endovascular procedures
	14. Assists with routine vascular neurosurgical and endovascular procedures
	15. Recognizes and initiates work-up of routine complications associated with routine vascular neurosurgical and endovascular procedures (e.g., seizure, hydrocephalus)
	16. Explains the risks and benefits of pediatric neurosurgical procedures; adapts diagnoses to age related variations
	17. Assists with routine pediatric neurosurgical procedures
	18. Recognizes and initiates work-up of routine complications associated with routine pediatric neurosurgical procedures, including in pre-verbal children (e.g., CSF shunt failure, seizure)

	19. Explains risks and benefits of trauma neurosurgical procedures; evaluates patients with multiple trauma 20. Assists with routine procedures for patients with TBI 21. Recognizes and initiates work-up of routine complications in patients with traumatic brain injury (e.g., sinus injury, air embolus) 22. Manages transient intracranial hypertension (e.g., hyperosmolar agents, CSF drainage) 23. Assists with routine neurocritical care unit procedures; manages airway and performs endotracheal intubation 24. Recognizes and initiates work-up of routine systemic complications (e.g., pneumonia, infection, pulmonary embolus, cardiac dysrhythmia, myocardial infarction)
Medical Knowledge	1. Identifies anatomical and temporal patterns of disease occurrence 2. Prioritizes, orders, and interprets diagnostic tests appropriate to clinical urgency and complexity 3. Provides a focused differential diagnosis based on individual patient presentation 4. Justifies optimal therapeutic option based on individual patient presentation
Systems Based Practice	4. Discloses patient safety events; supervises hand-offs and transitions of care 5. Identifies quality improvement opportunities and assists in the development, implementation, and analysis of a quality improvements project 6. Seeks information about neurosurgical career options and identifies professional mentor(s)
Practice Based Learning	4. Critically adapts guideline recommendations to individual patient specifies and preferences; evaluates and applies available outcomes data to improve patient care 5. Contributes to peer-reviewed clinical or basic scientific literature 6. Teaches health professionals in formal settings (e.g., nursing in-service training, residency teaching conference); mentors medical students
Professionalism	4. Performs tasks in a thorough, timely, and respectful manner in complex o9r stressful situations and takes ownership of team outcomes 5. Evaluates personal and professional well-being; seeks appropriate help and fatigue mitigation when needed
Interpersonal Communication	5. Establishes therapeutic relationships, thoughtfully delivers information, and strives for consensus in challenging patient encounters 6. Effectively manages complex, team-based clinical care; coordinates care within a hospital system

General Duties

The Neurosurgery Residency is a seven-year training program. Duties and assignments for each PGY level are outlined in the Goals & Objectives for that level, which includes progressive patient care responsibilities for the day-to-day running of the neurosurgical service under the supervision of the faculty. At all levels, residents are expected to discuss and plan patient management, including surgical operations with the Attending's, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care, as appropriate. The PGY6 and PGY7 residents are responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. In addition

the PG6 and PG7 residents provide overall supervision for conferences, including data collection for morbidity and mortality conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. It is also the responsibility of the Chief Residents (PG6 and PG7) to communicate with Chief Residents from other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management.

Rotations

The neurosurgery residency is divided into thirteen 4-week cycles in each academic year. Each cycle at the PGY3 level consists of a 28-day curriculum that is based on PGY Level and educational progression in general Neurosurgery. Each resident performance is assessed semi-annually, at Clinical Competency Committee Meetings for Core Competency achievement, as well as Milestone progression.

Mandatory Rotation

Neurosurgery – Junior, PGY-3
7 blocks per year (196 days)
Supervisors: Cara Sedney, MD
Location: Ruby Memorial Hospital, Physician Office Center

Patient Care	- 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 associated with brain tumors (e.g., air embolism (CSF fistula, hematoma) - Explains the risks and benefits of Functional Neurosurgical procedures. - Assists with routine functional neurosurgical procedures. - Recognizes and initiates work-up of routine complications associated for functional neurosurgical procedures (e.g., seizures, device infection) - 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 associated with peripheral nerve procedures (e.g., implanted device failure or infection) - Explains the risks and benefits of spinal surgery - Assists with routine spinal surgery procedures - Recognizes and initiates work-up of routine complications associated with spinal surgery procedures (e.g., pain, surgical site infection) - 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 in patients with traumatic brain injury (e.g., sinus injury, air embolus) - Manages transient intracranial hypertension (e.g., hyperosmolar agents, CSF drainage)

	17. Assists with routine neurocritical care unit procedures; manages airway and performs endotracheal intubation
	18. Recognizes and initiates work-up of routine systemic complications (e.g., pneumonia, infection, pulmonary embolus, cardiac dysrhythmia, myocardial infarction)
Medical Knowledge	1. Identifies anatomical and temporal patterns of disease occurrence
	2. Prioritizes, orders, and interprets diagnostic tests appropriate to clinical urgency and complexity
	3. Provides a focused differential diagnosis based on individual patient presentation
	4. Justifies optimal therapeutic option based on individual patient presentation
Systems Based Practice	1. Discloses patient safety events; supervises hand-offs and transitions of care
	2. Identifies quality improvement opportunities and assists in the development, implementation, and analysis of a quality improvements project
	3. Seeks information about neurosurgical career options and identifies professional mentor(s)
Practice Based Learning	1. Critically adapts guideline recommendations to individual patient specifies and preferences; evaluates and applies available outcomes data to improve patient care
	2. Contributes to peer-reviewed clinical or basic scientific literature
	3. Teaches health professionals in formal settings (e.g., nursing in-service training, residency teaching conference); mentors medical students
Professionalism	1. Performs tasks in a thorough, timely, and respectful manner in complex o9r stressful situations and takes ownership of team outcomes
	2. Evaluates personal and professional well-being; seeks appropriate help and fatigue mitigation when needed
Interpersonal Communication	1. Establishes therapeutic relationships, thoughtfully delivers information, and strives for consensus in challenging patient encounters
	2. Effectively manages complex, team-based clinical care; coordinates care within a hospital system

Mandatory Rotation

Pediatric Neurosurgery – Junior, PGY-3

3 blocks per year (84 days)
Supervisors: Hal Meltzer, MD, Section Chief; Kimberly Hamilton, MD
Location: Ruby Memorial Hospital, Physician Office Center

Patient Care	1. Explains the risks and benefits of pediatric neurosurgical procedures; adapts diagnoses to age related variations
	2. Assists with routine pediatric neurosurgical procedures

	3. Recognizes and initiates work-up of routine complications associated with routine pediatric neurosurgical procedures, including in pre-verbal children (e.g., CSF shunt failure, seizure)
Medical Knowledge	1. Identifies anatomical and temporal patterns of disease occurrence 2. Prioritizes, orders, and interprets diagnostic tests appropriate to clinical urgency and complexity 3. Provides a focused differential diagnosis based on individual patient presentation 4. Justifies optimal therapeutic option based on individual patient presentation
Systems Based Practice	1. Discloses patient safety events; supervises hand-offs and transitions of care 2. Identifies quality improvement opportunities and assists in the development, implementation, and analysis of a quality improvements project 3. Seeks information about neurosurgical career options and identifies professional mentor(s)
Practice Based Learning	1. Critically adapts guideline recommendations to individual patient specifies and preferences; evaluates and applies available outcomes data to improve patient care 2. Contributes to peer-reviewed clinical or basic scientific literature 3. Teaches health professionals in formal settings (e.g., nursing in-service training, residency teaching conference); mentors medical students
Professionalism	1. Performs tasks in a thorough, timely, and respectful manner in complex o9r stressful situations and takes ownership of team outcomes 2. Evaluates personal and professional well-being; seeks appropriate help and fatigue mitigation when needed
Interpersonal Communication	1. Establishes therapeutic relationships, thoughtfully delivers information, and strives for consensus in challenging patient encounters 2. Effectively manages complex, team-based clinical care; coordinates care within a hospital system

Mandatory Rotation

Endovascular Neurosurgery – Junior, PGY-3

3 blocks per year (84 days)
Supervisors: Ansaar Rai, MD, Section Chief
Location: Ruby Memorial Hospital, Physician Office Center

Patient Care	1. Explains the risks and benefits of vascular neurosurgical and endovascular procedures 2. Assists with routine vascular neurosurgical and endovascular procedures

	3. Recognizes and initiates work-up of routine complications associated with routine vascular neurosurgical and endovascular procedures (e.g., seizure, hydrocephalus)
Medical Knowledge	1. Identifies anatomical and temporal patterns of disease occurrence 2. Prioritizes, orders, and interprets diagnostic tests appropriate to clinical urgency and complexity 3. Provides a focused differential diagnosis based on individual patient presentation 4. Justifies optimal therapeutic option based on individual patient presentation
Systems Based Practice	1. Discloses patient safety events; supervises hand-offs and transitions of care 2. Identifies quality improvement opportunities and assists in the development, implementation, and analysis of a quality improvements project 3. Seeks information about neurosurgical career options and identifies professional mentor(s)
Practice Based Learning	1. Critically adapts guideline recommendations to individual patient specifies and preferences; evaluates and applies available outcomes data to improve patient care 2. Contributes to peer-reviewed clinical or basic scientific literature 3. Teaches health professionals in formal settings (e.g., nursing in-service training, residency teaching conference); mentors medical students
Professionalism	1. Performs tasks in a thorough, timely, and respectful manner in complex o9r stressful situations and takes ownership of team outcomes 2. Evaluates personal and professional well-being; seeks appropriate help and fatigue mitigation when needed
Interpersonal Communication	1. Establishes therapeutic relationships, thoughtfully delivers information, and strives for consensus in challenging patient encounters 2. Effectively manages complex, team-based clinical care; coordinates care within a hospital system

Overview

The PGY-3 year is split between 7 blocks on General Neurosurgery, 3 blocks on Pediatric Neurosurgery, and 3 blocks on Endovascular Neurosurgery at Ruby Memorial Hospital and the out-patient clinic located at the Physician's Office Center. The PGY3 resident will take a leadership role in the primary management of the inpatient service. The PGY3 resident will begin to develop the skills of neurosurgical patient management, by following the patient through the course of their treatment with more involvement in surgical care, as neurosurgical patient care skills develop. In addition, the 3rd year resident is expected to design an independent research curriculum that they will use, as part of their PGY4 Year.

Clinical and Academic Duties

Hospital patients are generally in the ICU or on the post-op surgical floor, although some patients, including most consultation patients, are on other floors. The census generally runs from 25-40 patients. Residents make early morning rounds, evaluating and examining all patients, reviewing charts and studies, and planning dispositions. Rounds may be made with the attending on the service, in the morning, or later in the day, depending on the operative schedule, meetings, emergencies, and other factors at the direction of the attending. The residents and medical students are fully integrated into the outpatient clinics. Patients are first seen by a resident and/or medical student. The attending then sees the patient and the case is discussed with the resident. The resident will create the consultation or post op note but it will be read, corrected, and signed by the attending. When other duties permit, the junior resident is expected to report to the operating room whenever possible. The resident is allowed increasing involvement in the OR, as surgical skills improve. Following or during each operation, details are discussed and critiqued and recommendations for improvement made. On Friday, all residents not on vacation, attend the didactic block. When possible, the resident is encouraged to attend any other multi-discipline conferences at the Health Science Center. PGY3 residents will be expected to take the neurosurgery written board exam for self-assessment. The PGY3 resident is expected to pass the exam prior to taking it for credit in PGY4. The PGY2 resident must obtain a WV License prior to matriculating to PGY3. ECFMG residents must obtain WV License prior to matriculating to PGY4.

Operative Experiences

Throughout this year of training, the resident will log all operative cases and procedures in every setting, including bedside, pain clinic, Gamma Knife, interventional radiology, ICU, etc. in the Op-Log system of ACGME. Case logs are expected to be kept up to date at least weekly, and are reviewed at each formal evaluation. Meal cards may be turned off for delinquent logging practices. Listed here are the minimum expectations by procedure, for completion at the end of the PGY3 year, compared to the minimum expectations upon graduation.

Category	PGY3 Expectations	Lead and Senior Minimums
ALL DEFINED CASE PROCEDURES		
Cranial		
Cranial: Tumor General	NA	60
Cranial: Tumor Sellar/Parasellar	NA	20
Cranial: Trauma/Other	NA	60
Cranial: Vascular Open	NA	10
Cranial: Vascular Endovascular	10	10
Cranial: Vascular Total	NA	60
Cranial: CSF Diversion/ETV/Other	NA	20
Cranial/Extracranial: Pain	NA	10
Cranial/Extracranial: Functional Disorders	NA	10
Cranial/Extracranial: Epilepsy	NA	10
Total Cranial	NA	300
Spinal		
Spinal: Anterior Cervical	NA	30
Spinal: Posterior Cervical	NA	30
Spinal: Thoracic/Lumbar/Sacral Instrumentation Fusion	NA	30
Spinal: Lumbar Laminectomy/Laminotomy	NA	30
Spinal: Stimulation/Lesion/Pump/Other	NA	10
Total Spinal	NA	300

Other		
Peripheral Nerve	10	10
Radiosurgery	10	10
Peripheral Device Management	20	20
Total Other	0	0
Critical Care		
Airway Management	10	0
Angiography	20	0
Arterial Line Placement	10	0
CVP Line Placement	10	0
EVD/Transdural Monitor Placement	30	0
Lumbar/Other Puncture/Drain Placement	10	0
Percutaneous Tap of CSF Reservoir	10	0
Total Critical Care	100	0
Pediatric		
Pediatric: Cranial Tumor	NA	5
Pediatric: Cranial Trauma/Other	NA	10
Pediatric: CSF Diversion/ETV/Other	NA	10
Pediatric: Spinal	NA	5
Total Pediatric	NA	40
Total	NA	800

Didactics and Assigned Learning

Didactic learning in the PGY3 year consists of:

- Curriculum-based Educational Sessions, which are held during protected didactic time on Friday mornings from 7:00am to 1:00pm. The educational sessions are divided into unique educational experiences, such as:
    - Tumor Board
    - Curriculum Lectures
    - Visiting Professor Grand Rounds
    - Case Conference
    - Journal Club
    - Board Review
    - Operative Skills Lab
    - Cadaver Labs
- Experiential Learning Sessions, which are held during protected didactic time on Wednesday mornings from 7:00am – 8:00am and include sessions for:
    - M&M Conference
    - Oral Board Review
    - Neuro I/R Conference
    - NCCU Conference
    - Research

Milestones

PGY3 Residents are expected to be familiar with the ACGME Neurosurgery Milestones and are expected to work towards progress in mastering the individual skills/knowledge listed for each. The Clinical Competency Committee will meet twice each year, once in December, and once in June, to review Milestone progress for each resident and to assess a current level of mastery for each, for each resident. It is expected at the June meeting, the resident who will be completing their PGY3 year at that time, should have achieved the following Milestone levels:

PGY3 Milestone Expectations		
PC1	Brain Tumor	2.0
PC2	Surgical Treatment of Epilepsy and Movement Disorders	2.0
PC3	Pain and Peripheral Nerve Disorders	2.0
PC4	Spinal Neurological Surgery	2.0
PC5	Vascular Neurological Surgery	2.0
PC6	Pediatric Neurological Surgery	2.0
PC7	Traumatic Brain Injury	2.0
PC8	Critical Care	2.0
MK1	Information Gathering and Interpretation	3.0
MK2	Critical Thinking for Diagnosis and Therapy	3.0
SBP1	Patient Safety	3.0
SBP2	Quality Improvement	3.0
SBP 3	Health Care Systems Awareness	3.0
PBL1	Evidence-Based Practice	3.0
PBL2	Research	3.0
PBL3	Mentorship and Teaching	3.0
PRO1	Ethical Behavior	3.0
PRO2	Well-Being	2.0
ICS1	Patient and Family Communication	3.0
ICS2	Communication in Coordination of Care	3.0

Resident Supervision

It is expected that residents are provided adequate and appropriate levels of supervision during the course of the educational training experience to ensure that patient care is delivered in a safe and effective manner. All program faculty members that supervise residents, must have a faculty or clinical faculty appointment in the

School of Medicine or be specifically approved as a supervising attending by the Program Director. Faculty schedules will be structured to provide residents with continuous supervision and consultation.

Residents must be supervised by faculty members in a manner promoting progressively increasing responsibility for each resident according to their level of education, ability and experience. Residents are provided information addressing the method(s) to access a supervisor in a timely and efficient manner at all times while on duty.

The program provides additional information addressing the type and level of supervision for each post-graduate year in the program that is consistent with ACGME program requirements and, specifically, for supervision of residents engaged in performing invasive procedures.

The following general supervision guidelines will be expected for residents in their PGY3 level of training:

PGY3 Resident Supervision	Inpatient Service	Intensive Care Units	Ambulatory Settings	Operating Rooms
Direct by Faculty	X	X	X	X
Direct by Senior Residents	X	X	X	X
Indirect, but immediately available Faculty	X	X	X	X
Indirect, but immediately available Senior Residents	X	X	X	
Indirect available	x	x	x	
Oversight	x	x	x	

Guidelines for Resident Mandatory Communication with Attending

The following situations require mandatory direct communication with the faculty responsible for patient care, both during routine working hours, and after hours and weekends. "Faculty responsible for patient care" means the staff of record for the patient, except in events when the faculty is physically out of town or can't be contacted, in which case the on call faculty should be notified. The staff of record should also be notified as soon as is feasible:

- Death
- DNR or other end of life decision
- Suicide attempt
- Violence requiring physical restraints
- Emergency surgery
- Acute drastic change in course
- Unanticipated invasive or diagnostic procedure
- Pregnancy
- Transfer of care to another medical or surgical service, including transfer to ICU
- Any serious adverse event

- Any complex decision making process that the resident does not feel adequately qualified to undertake without immediate input from faculty

Teaching Expectations

PGY3 Residents are expected to use this academic year to hone their teaching skills, which they will do by providing one-on-one guidance and instruction to both medical students rotating on our service, and lower level residents from Neurosurgery. It is expected that PGY3 residents function as both a learner and a teacher, as appropriate, during the course of each rotation, and are expected to provide ongoing teaching experiences to lower level learners.

Scholarship Requirements

In pursuit of scholarly activity, the PGY3 resident will be expected plan and carry out a scholarly project and/or to participate in research projects that will enable him/her to meet the requirement for obtaining a minimum of 6 PubMed indexed, peer reviewed papers in print (roughly one per year, excepting the chief year). Only residents who have made significant contribution to a research project will be listed as authors. Residents are encouraged to work together to carry research project to completion, however roles and authorship are to be decided and should be made clear at the beginning of collaboration. Any authorship disputes will be handled by the faculty mentor for the research. Presentation of research at national meetings is encouraged and the same authorship standards apply. The resident who plans to present the research should submit the research for consideration.

All research activities within the Department of Neurosurgery are bound by institutional research ethics. All research projects in which residents participate must be brought before the Residency Research Committee (Chair: Nick Brandmeir), be on file with Patricia Dekeseredy and/or Dan Cifarelli (Research Coordinators) and have IRB approval. All residents must have completed required training modules. All participants in a research project must be documented and approved by the faculty of record. NO PHI should be distributed in any fashion which will constitute a HIPAA violation. This includes sending PHI to medical student (MIX) email accounts. Case reports must have documented consent form signed by the patient.

QI projects are a required part of the residency curriculum. These may take a variety of formats. QI training takes place during the annual resident orientation.

Assessment Methods

The neurosurgery program provides a structure by which performance related to the training program will be assessed semi-annually, and consideration given for promotion to the next level of training, prior to the end of each academic year. Evaluation will be provided in accordance with Graduate Medical Education Committee policy and ACGME common program requirements.

Residents will receive written goals and objectives from the program annually, which will outline the expectations and objectives for each major rotation of the training program. In order to assess the attainment of the expectations outlined in the goals and objectives, the following assessment methods will be utilized:

- Formative Feedback from faculty at the end of each 4-week block
- 360 degree performance evaluations by peers, departmental faculty, NCCU, Anesthesia, nurses and staff, semiannually.
- Direct observation and precepting by faculty supervisors with ongoing feedback

- Clinical precepting evaluations performed on a quarterly basis by supervising faculty.
- Conference presentation evaluations (by residents, faculty, students and staff).
- Self-assessment and reflection form semiannually
- Neurosurgery Written In-Service Board Exam
- Semi-Annual Milestone evaluations by faculty
- Written evaluation by faculty supervisor semiannually

All residents participating in training will be provided, at a minimum, a semi-annual formal evaluation developed by the faculty, CCC, and Program Director. Residents shall be allowed to review all evaluations contained in permanent records. At a minimum, the Formal Written Evaluation shall:
- Address each of the six ACGME core competencies and RRC milestones.
- Include scoring and rating criteria that seek to minimize subjective assessment of performance.
- Include language indicating satisfactory performance, advancement to the next level of training (if applicable) or provide specific actions and performance requirements by the resident to return to a level of satisfactory performance or advancement to the next level of training.
- Be signed and dated by the resident and Program Director.
- Become a part of the permanent record file for the resident.

In addition, each resident will meet, near the midpoint of each rotation, with an assigned faculty advisor according to PGY year, for an informal progress evaluation to assess strengths and weaknesses in performance, so that adjustments can be made over the remainder of the rotation. Each meeting with the advisor will address multiple domains on a standardized form as determined by the PEC.

All of the above listed assessment methods will be used by the departmental Clinical Competency Committee to determine overall educational progress for the resident for the academic year, and will be part of the consideration for promotion to the next level of training, retention at the current level, remediation, probation, and non-renewal. All determinations for educational progress will be made a part of the resident's permanent educational file.

Introduction

The WVU Neurosurgical Residency is a 7 year (91 4-week cycles) program. There are 65 cycles of core clinical neurosurgery of which 13 cycles are considered the chief residency. In the internship, there is a 7-block rotation in general care and a 6-block rotation in neurocritical care. Longitudinal clinical experiences in anesthesia, neurology, pain medicine, pathology, and radiation oncology are distributed across this year. Beginning in PGY2, the resident begins to rotate on the clinical neurosurgery services. At times, Drs. Meltzer and Hamilton may function independently as a separate pediatric service with a dedicated resident when the resident curriculum schedule dictates such. The fourth year is the academic year, and is devoted to scholarly pursuit or enfolded fellowships. Academic pursuit may include graduate classes. The fifth year includes dedicated rotations in pediatrics and endovascular. The PGY6 and PGY7 split senior and chief responsibilities. The chief resident takes overall responsibility for the entire service. In summary, there are 13-cycles of internship, 26 cycles of clinical junior residency, a year of academic work, another 26 cycles of clinical senior rotations, and 13 cycles of clinical neurosurgery, serving as chief resident.

Neuro-critical care experience is emphasized throughout the training, as well as extensive exposure to subspecialty services including neurovascular, neuro-oncology, epilepsy surgery, spinal neurosurgery, stereotactic radiosurgery, neurotrauma, functional neurosurgery and pediatric neurosurgery. Conferences are protected from clinical commitments and include morbidity and mortality conference, case conference, tumor board, asynchronous learning and board review, and journal club. Subspecialty conferences such as Epilepsy Conference or Spine Conference are encouraged. The anatomic dissection lab is available for scholarly work or preparation for operative cases.

Expectations

PGY4 residents in this program are expected to:
- Obtain a valid WV State Medical License or Training Permit, for the duration of the academic year
- Achieve appropriate levels of proficiency in each of the six ACGME Core Competencies
- Achieve expected levels of progress in each of the ACGME Neurosurgery Milestones
- Successful completion of the written neurosurgical board exam for the PGY4 year of training
- Quality Improvement and Patient Safety (QI/PS) research project involvement
- Scholarly activity (presentations and manuscript preparation)
- Daily logging of duty hours in the E-Value system
- Have an understanding of each of the ACGME Duty Hour regulations and adhere to the departmental policies and procedures that are designed to keep residents in compliance with all of the duty hour requirements.
- Every resident is strongly encouraged to participate in one academic paper yearly. Residents are highly encouraged to participate in and make significant contribution to a research project, during the academic year, in order to be listed as an author on a submitted publication.

- Mandatory attendance at all educational conferences, didactic sessions, etc., unless excused or absent for the day.
- Maintain a healthy level of mental and physical wellness by adhering to the Fit For Duty guidelines, outlined in the Neurosurgery Handbook, and report any concerns with wellness immediately to the Program Director.
- Residents will be assigned evaluations to complete semi-annually. Self, peer, program and faculty evaluations must be completed in a timely manner, which is defined as within two weeks of assignment, and meet completion deadline as assigned by the Program Coordinator.
- Resident is expected to attend AANS Chicago Review Course, which is a comprehensive board review course.

Core Competency Educational Objectives for PG4

Develop graduating residents that possess a proficiency level appropriate for a new and independent neurological practitioner in the six core competencies as outlined by the ACGME.

Patient Care	1. Explains the risks and benefits of craniotomy for brain tumor
	2. Assists with routine craniotomy for brain tumor
	3. Recognizes and initiates work-up of routine complications for brain tumors(e.g., air embolism, CSF fistula, hematoma)
	4. Explains the risks and benefits of functional neurosurgical procedures
	5. Assists with routine functional neurosurgical procedures
	6. Recognizes and initiates work-up of routine complications for routine functional neurosurgical procedures (e.g., seizures, device infection)
	7. Explains the risks and benefits of chronic pain and peripheral nerve procedures
	8. Assists with routine chronic pain and peripheral nerve procedures
	9. Recognizes and initiates work-up of routine complications for chronic pain and peripheral nerve procedures (e.g., implanted device failure or infection)
	10. Explains the risks and benefits of spinal surgery
	11. Assists with routine spinal surgery procedures
	12. Recognizes and initiates work-up of routine complications associated with routine spinal surgery procedures (e.g., pain, surgical site infection)
	13. Explain the risks and benefits of vascular neurosurgical and endovascular procedures
	14. Assists with routine vascular neurosurgical and endovascular procedures
	15. Recognizes and initiates work-up of routine complications associated with routine vascular neurosurgical and endovascular procedures (e.g., seizure, hydrocephalus)
	16. Explains the risks and benefits of pediatric neurosurgical procedures; adapts diagnoses to age-related variations
	17. Assists with routine pediatric neurosurgical procedures
	18. Recognizes and initiates work-up of routine complications associated with pediatric neurosurgical procedures, including in pre-verbal children (e.g., CSF shunt failure, seizure)

	19. Explains risks and benefits of trauma neurosurgical procedures; evaluates patients with multiple trauma
	20. Assists with routine procedures for patients with TBI
	21. Recognizes and initiates work-up of routine complications associated with traumatic brain injuries (e.g., sinus injury, air embolus)
	22. Manages transient intracranial hypertension (e.g., hyperosmolar agents, CSF drainage)
	23. Assists with routine neurocritical care unit procedures; manages airway and performs endotracheal intubation
	24. Recognizes and initiates work-up of routine systemic complications (e.g., pneumonia, infection, pulmonary embolus, cardiac dysrhythmia, myocardial infarction)
Medical Knowledge	1. Identifies anatomical and temporal patterns of disease occurrence
	2. Prioritizes, orders, and interprets diagnostic tests appropriate to clinical urgency and complexity
	3. Provides a focused differential diagnosis based on individual patient presentation
	4. Justifies optimal therapeutic option based on individual patient presentation
Systems Based Practice	1. Discloses patient safety events; supervises hand-offs and transitions of care
	2. Identifies quality improvement opportunities and assists in the development, implementation, and analysis of a quality improvement project
	3. Seeks information about neurosurgical career options and identifies professional mentor(s)
Practice Based Learning	1. Critically adapts guideline recommendations to individual patient specifics and preferences; evaluates and applies available outcomes data to improve patient care
	2. Leads a clinical or basic scientific research effort, including application for funding
	3. Organizes educational activities at the program level; mentors residents and other health care professionals
Professionalism	1. Performs tasks in a thorough, timely, and respectful manner in complex or stressful situations and takes ownership of team outcomes
	2. Monitors and attempts to optimize professional well-being of the team; adjusts team assignments to mitigate fatigue and promote wellness
Interpersonal Communication	1. Consistently models and mentors others in optimal patient and family communications
	2. Effectively manages complex, team-based clinical care; coordinates care within a hospital system

General Duties

The Neurosurgery Residency is a seven-year training program. Duties and assignments for each PGY level are outlined in the Goals & Objectives for that level, which includes progressive patient care responsibilities for the day-to-day running of the neurosurgical service under the supervision of the faculty. At all levels, residents are expected to discuss and plan patient management, including surgical operations with the Attending's, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care, as appropriate. The PGY6 and PGY7 residents are responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. In addition

the PG6 and PG7 residents provide overall supervision for conferences, including data collection for morbidity and mortality conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. It is also the responsibility of the Chief Residents (PG6 and PG7) to communicate with Chief Residents from other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management.

Rotations

The neurosurgery residency is divided into thirteen 4-week cycles in each academic year. Each cycle at the PGY4 level consists of a 28-day curriculum that is primarily dedicated to advancing progress on their individualized research curriculum that was previously agreed upon by the Program Director, as well as patient care activities that are based on PGY Level and educational progression in general Neurosurgery. Each resident performance is assessed semi-annually at Clinical Competency Committee Meetings for Core Competency achievement, as well as Milestone progression.

Mandatory Rotation

Research Curriculum – Junior, PGY-4

13 Cycles of weeks each (365 days)

Supervisors: Cara Sedney, MD

Location: various

Rotation Objectives:

Systems Based Practice	1. Identifies quality improvement opportunities and assists in the development, implementation, and analysis of a quality improvement project 2. Seeks information about neurosurgical career options and identifies professional mentor(s)
Practice Based Learning	1. Critically adapts guideline recommendations to individual patient specifics and preferences; evaluates and applies available outcomes data to improve patient care 2. Leads a clinical or basic scientific research effort, including application for funding 3. Organizes educational activities at the program level; mentors residents and other health care professionals
Professionalism	1. Performs tasks in a thorough, timely, and respectful manner in complex or stressful situations and takes ownership of team outcomes 2. Monitors and attempts to optimize professional well-being of the team; adjusts team assignments to mitigate fatigue and promote wellness
Interpersonal Communication	1. Consistently models and mentors others in optimal patient and family communications 2. Effectively manages complex, team-based clinical care; coordinates care within a hospital system

Overview

The fourth year of training is spent in pursuit of neurosurgical scholarship or selected subspecialty offerings, often in a laboratory, in the RNI, or a departmental faculty member. We also encourage enfolded clinical experiences in neuro critical care for residents who have interest. The resident is expected to develop a plan well in advance with the program director. Clinical duties are limited, though call coverage is expected to maintain clinical skills through this period. This academic year is an opportunity for the resident to fine-tune their skills in academic pursuit including research design, conduct, and ethics, as well as academic professional communication skills. The content of the investigation is largely determined by the interests of the resident, but must be of high quality as determined by the program director and CCC. It is furthermore expected that the PGY4 resident take the written board exam, and pass it, in this year.

Operative Experiences

Throughout this year of training, the resident will log all operative cases and procedures in every setting, including bedside, pain clinic, Gamma Knife, interventional radiology, ICU, etc. in the Op-Log system of ACGME. Case logs are expected to be kept up to date at least weekly and are reviewed at each formal evaluation. Meal cards may be turned off for delinquent logging practices. Listed here are the minimum expectations by procedure, for completion at the end of the PGY4 year, compared to the minimum expectations upon graduation.

Category	PGY4 Expectations	Lead and Senior Minimums
ALL DEFINED CASE PROCEDURES		
Cranial		
Cranial: Tumor General	NA	60
Cranial: Tumor Sellar/Parasellar	NA	20
Cranial: Trauma/Other	NA	60
Cranial: Vascular Open	NA	10
Cranial: Vascular Endovascular	10	10
Cranial: Vascular Total	NA	60
Cranial: CSF Diversion/ETV/Other	NA	20
Cranial/Extracranial: Pain	NA	10
Cranial/Extracranial: Functional Disorders	NA	10
Cranial/Extracranial: Epilepsy	NA	10
Total Cranial	NA	300
Spinal		
Spinal: Anterior Cervical	NA	30
Spinal: Posterior Cervical	NA	30
Spinal: Thoracic/Lumbar/Sacral Instrumentation Fusion	NA	30
Spinal: Lumbar Laminectomy/Laminotomy	NA	30
Spinal: Stimulation/Lesion/Pump/Other	NA	10
Total Spinal	NA	300
Other		
Peripheral Nerve	10	10
Radiosurgery	10	10
Peripheral Device Management	20	20
Total Other	0	0
Critical Care		
Airway Management	10	0

Angiography	20	0
Arterial Line Placement	10	0
CVP Line Placement	10	0
EVD/Transdural Monitor Placement	30	0
Lumbar/Other Puncture/Drain Placement	10	0
Percutaneous Tap of CSF Reservoir	10	0
Total Critical Care	100	0
Pediatric		
Pediatric: Cranial Tumor	NA	5
Pediatric: Cranial Trauma/Other	NA	10
Pediatric: CSF Diversion/ETV/Other	NA	10
Pediatric: Spinal	NA	5
Total Pediatric	NA	40
Total	NA	800

Didactics and Assigned Learning

Didactic learning in the PGY4 year consists of:

- Curriculum-based Educational Sessions, which are held during protected didactic time on Friday mornings from 7:00am to 1:00pm. The educational sessions are divided into unique educational experiences, such as:
    - Tumor Board
    - Curriculum Lectures
    - Visiting Professor Grand Rounds
    - Case Conference
    - Journal Club
    - Board Review
    - Operative Skills Lab
    - Cadaver Labs

- Experiential Learning Sessions, which are held during protected didactic time on Wednesday mornings from 7:00am – 8:00am and include sessions for:
    - M&M Conference
    - Oral Board Review
    - Neuro I/R Conference
    - NCCU Conference
    - Research

Milestones

PGY4 Residents are expected to be familiar with the ACGME Neurosurgery Milestones and are expected to work towards progress in mastering the individual skills/knowledge listed for each. The Clinical Competency Committee will meet twice each year, once in December, and once in June, to review Milestone progress for each resident and to assess a current level of mastery for each, for each resident. It is expected at the June meeting, the resident who will be completing their PGY4 year at that time, should have achieved the following Milestone levels:

PGY4 Milestone Expectations		
PC1	Brain Tumor	2.0
PC2	Surgical Treatment of Epilepsy and Movement Disorders	2.0
PC3	Pain and Peripheral Nerve Disorders	2.0
PC4	Spinal Neurological Surgery	2.0
PC5	Vascular Neurological Surgery	2.0
PC6	Pediatric Neurological Surgery	2.0
PC7	Traumatic Brain Injury	2.0
PC8	Critical Care	2.0
MK1	Information Gathering and Interpretation	3.0
MK2	Critical Thinking for Diagnosis and Therapy	3.0
SBP1	Patient Safety	3.0
SBP2	Quality Improvement	3.0
SBP 3	Health Care Systems Awareness	3.0
PBL1	Evidence-Based Practice	3.0
PBL2	Research	4.0
PBL3	Mentorship and Teaching	4.0
PRO1	Ethical Behavior	3.0
PRO2	Well-Being	3.0
ICS1	Patient and Family Communication	4.0
ICS2	Communication in Coordination of Care	3.0

Resident Supervision

It is expected that residents are provided adequate and appropriate levels of supervision during the course of the educational training experience to ensure that patient care is delivered in a safe and effective manner.   All program faculty members that supervise residents, must have a faculty or clinical faculty appointment in the School of Medicine or be specifically approved as a supervising attending by the Program Director. Faculty schedules will be structured to provide residents with continuous supervision and consultation.

Residents must be supervised by faculty members in a manner promoting progressively increasing responsibility for each resident according to their level of education, ability and experience. Residents are provided information addressing the method(s) to access a supervisor in a timely and efficient manner at all times while on duty.

The program provides additional information addressing the type and level of supervision for each post-graduate year in the program that is consistent with ACGME program requirements and, specifically, for supervision of residents engaged in performing invasive procedures.

The following general supervision guidelines will be expected for residents in their PGY4 level of training:

PGY2 Resident Supervision	Inpatient Service	Intensive Care Units	Ambulatory Settings	Operating Rooms
Direct by Faculty	X	X	X	X
Direct by Senior Residents	X	X	X	X
Indirect, but immediately available Faculty	X	X	X	X
Indirect, but immediately available Senior Residents	X	X	X	
Indirect available	X	X	X	
Oversight	X	X	X	

Guidelines for Resident Mandatory Communication with Attending

The following situations require mandatory direct communication with the faculty responsible for patient care, both during routine working hours, and after hours and weekends. "Faculty responsible for patient care" means the staff of record for the patient, except in events when the faculty is physically out of town or can't be contacted, in which case the on call faculty should be notified. The staff of record should also be notified as soon as is feasible:
- Death
- DNR or other end of life decision
- Suicide attempt
- Violence requiring physical restraints

- Emergency surgery
- Acute drastic change in course
- Unanticipated invasive or diagnostic procedure
- Pregnancy
- Transfer of care to another medical or surgical service, including transfer to ICU
- Any serious adverse event
- Any complex decision making process that the resident does not feel adequately qualified to undertake without immediate input from faculty

Teaching Expectations

PGY4 Residents are expected to use this academic year to hone their teaching skills, which they will do by providing one-on-one guidance and instruction to both medical students rotating on our service, and lower level residents from Neurosurgery. It is expected that PGY4 residents function as both a learner and a teacher, as appropriate, during the course of each rotation, and are expected to provide ongoing teaching experiences to lower level learners.

Scholarship Requirements

In pursuit of scholarly activity, the PGY4 resident will be expected plan and carry out a scholarly project and/or to participate in research projects that will enable him/her to meet the requirement for obtaining a minimum of 6 PubMed indexed, peer reviewed papers in print (roughly one per year, excepting the chief year). Only residents who have made significant contribution to a research project will be listed as authors. Residents are encouraged to work together to carry research project to completion, however roles and authorship are to be decided and should be made clear at the beginning of collaboration. Any authorship disputes will be handled by the faculty mentor for the research. Presentation of research at national meetings is encouraged and the same authorship standards apply. The resident who plans to present the research should submit the research for consideration.

All research activities within the Department of Neurosurgery are bound by institutional research ethics. All research projects in which residents participate must be brought before the Residency Research Committee (Chair: Nick Brandmeir), be on file with Patricia Dekeseredy and/or Dan Cifarelli (Research Coordinators) and have IRB approval. All residents must have completed required training modules. All participants in a research project must be documented and approved by the faculty of record. NO PHI should be distributed in any fashion which will constitute a HIPAA violation. This includes sending PHI to medical student (MIX) email accounts. Case reports must have documented consent form signed by the patient.

QI projects are a required part of the residency curriculum. These may take a variety of formats. QI training takes place during the annual resident orientation.

Assessment Methods

The neurosurgery program provides a structure by which performance related to the training program will be assessed semi-annually, and consideration given for promotion to the next level of training, prior to the end of each academic year. Evaluation will be provided in accordance with Graduate Medical Education Committee policy and ACGME common program requirements.

Residents will receive written goals and objectives from the program annually, which will outline the expectations and objectives for each major rotation of the training program. In order to assess the attainment of the expectations outlined in the goals and objectives, the following assessment methods will be utilized:

- Formative Feedback from faculty at the end of each 4-week block
- 360 degree performance evaluations by peers, departmental faculty, NCCU, Anesthesia, nurses and staff, semiannually.
- Direct observation and precepting by faculty supervisors with ongoing feedback
- Clinical precepting evaluations performed on a quarterly basis by supervising faculty.
- Conference presentation evaluations (by residents, faculty, students and staff).
- Self-assessment and reflection form semiannually
- Neurosurgery Written In-Service Board Exam
- Semi-Annual Milestone evaluations by faculty
- Written evaluation by faculty supervisor semiannually

All residents participating in training will be provided, at a minimum, a semi-annual formal evaluation developed by the faculty, CCC, and Program Director. Residents shall be allowed to review all evaluations contained in permanent records. At a minimum, the Formal Written Evaluation shall:
- Address each of the six ACGME core competencies and RRC milestones.
- Include scoring and rating criteria that seek to minimize subjective assessment of performance.
- Include language indicating satisfactory performance, advancement to the next level of training (if applicable) or provide specific actions and performance requirements by the resident to return to a level of satisfactory performance or advancement to the next level of training.
- Be signed and dated by the resident and Program Director.
- Become a part of the permanent record file for the resident.

In addition, each resident will meet, near the midpoint of each rotation, with an assigned faculty advisor according to PGY year, for an informal progress evaluation to assess strengths and weaknesses in performance, so that adjustments can be made over the remainder of the rotation. Each meeting with the advisor will address multiple domains on a standardized form as determined by the PEC.

All of the above listed assessment methods will be used by the departmental Clinical Competency Committee to determine overall educational progress for the resident for the academic year, and will be part of the consideration for promotion to the next level of training, retention at the current level, remediation, probation, and non-renewal. All determinations for educational progress will be made a part of the resident's permanent educational file.

WVU DEPARTMENT OF NEUROSURGERY
In collaboration with the
ROCKEFELLER NEURSCIENCES INSTITUTE
Educational Goals & Objectives
PGY5

Introduction

The WVU Neurosurgical Residency is a 7 year (91 4-week cycles) program. There are 65 cycles of core clinical neurosurgery of which 13 cycles are considered the chief residency. In the internship, there is a 7-block rotation in general care and a 6-block rotation in neurocritical care. Longitudinal clinical experiences in anesthesia, neurology, pain medicine, pathology, and radiation oncology are distributed across this year. Beginning in PGY2, the resident begins to rotate on the clinical neurosurgery services. At times, Drs. Meltzer and Hamilton may function independently as a separate pediatric service with a dedicated resident when the resident curriculum schedule dictates such. The fourth year is the academic year, and is devoted to scholarly pursuit or enfolded fellowships. Academic pursuit may include graduate classes. The fifth year includes dedicated rotations in pediatrics and endovascular. The PGY6 and PGY7 split senior and chief responsibilities. The chief resident takes overall responsibility for the entire service. In summary, there are 13-cycles of internship, 26 cycles of clinical junior residency, a year of academic work, another 26 cycles of clinical senior rotations, and 13 cycles of clinical neurosurgery, serving as chief resident.

Neuro-critical care experience is emphasized throughout the training, as well as extensive exposure to subspecialty services including neurovascular, neuro-oncology, epilepsy surgery, spinal neurosurgery, stereotactic radiosurgery, neurotrauma, functional neurosurgery and pediatric neurosurgery. Conferences are protected from clinical commitments and include morbidity and mortality conference, case conference, tumor board, asynchronous learning and board review, and journal club. Subspecialty conferences such as Epilepsy Conference or Spine Conference are encouraged. The anatomic dissection lab is available for scholarly work or preparation for operative cases.

Expectations

PGY5 residents in this program are expected to:
- Obtain a valid WV State Medical License or Training Permit, for the duration of the academic year
- Achieve appropriate levels of proficiency in each of the six ACGME Core Competencies
- Achieve expected levels of progress in each of the ACGME Neurosurgery Milestones
- Successful completion of the written neurosurgical board exam during the PGY5 year of training
- Quality Improvement and Patient Safety (QI/PS) research project involvement
- Scholarly activity (presentations and manuscript preparation)
- Daily logging of duty hours in the E-Value system
- Have an understanding of each of the ACGME Duty Hour regulations and adhere to the departmental policies and procedures that are designed to keep residents in compliance with all of the duty hour requirements.
- Every resident is strongly encouraged to participate in one academic paper yearly. Residents are highly encouraged to participate in and make significant contribution to a research project, during the academic year, in order to be listed as an author on a submitted publication.

- Mandatory attendance at all educational conferences, didactic sessions, etc., unless excused or absent for the day
- Maintain a healthy level of mental and physical wellness by adhering to the Fit For Duty guidelines, outlined in the Neurosurgery Handbook, and report any concerns with wellness immediately to the Program Director
- Residents will be assigned evaluations to complete semi-annually. Self, peer, program and faculty evaluations must be completed in a timely manner, which is defined as within two weeks of assignment, and meet completion deadline as assigned by the Program Coordinator.

Core Competency Educational Objectives

Develop graduating residents that possess a proficiency level appropriate for a new and independent neurological practitioner in the six core competencies as outlined by the ACGME.

Patient Care	1. Formulates a diagnostic and treatment plan for a patient with a brain or spinal cord tumor
	2. Performs routine craniotomy for brain tumor; assists with complex craniotomy for brain tumor
	3. Manages routine complications and recognizes complex complications for patients with brain tumors (e.g., refractory cerebral edema, major vascular injury)
	4. Formulates a diagnostic and treatment plan for a patient with epilepsy or a movement disorder
	5. Performs routine functional neurosurgical procedures; assists with complex functional neurosurgical procedures
	6. Manages routine complications and recognizes complex complications of patients with epilepsy or a movement disorder (e.g., status epilepticus, dystonia)
	7. Formulates a diagnostic and treatment plan for patients with chronic pain or peripheral nerve disorders
	8. Performs routine chronic pain and peripheral nerve procedures; assists with complex chronic pain and peripheral nerve procedures
	9. Manages routine complications and recognizes complex complications associated with complex chronic pain and peripheral nerve procedures (e.g., intrathecal drug overdose or withdrawal)
	10. Formulates a diagnostic and treatment plan for a patient with degenerative, traumatic, or neoplastic spinal disorders
	11. Performs routine spinal surgery procedures; assists with complex spinal surgery procedures
	12. Manages routine complications and recognizes complex complications in patients with spinal surgery procedures (e.g., myelopathy, cerebrospinal fluid (CSF) leak, instrument failure/malposition)
	13. Formulates a diagnostic and treatment plan for a patient with ischemic or hemorrhagic stroke or vascular neurosurgical disorders
	14. Performs routine vascular neurosurgical and endovascular procedures; assists with complex vascular neurosurgical and endovascular procedures
	15. Manages routine complications and recognizes complex complications associated with patients with ischemic or hemorrhagic strokes, or vascular

	neurosurgical disorders (e.g., cerebral vasospasm, herniation syndrome, intra-operative aneurysm rupture)
	16. 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
	17. Performs routine pediatric neurosurgical procedures; assists with complex pediatric neurosurgical procedures
	18. Manages routine complications and recognizes complex complications in sever brain injury (e.g., hematoma, CSF leak)
	19. Selects patients for operative intervention in TBI; prioritizes the management of injuries in patients with multiple trauma
	20. Performs routine procedures for patients with TBI; assists with complex procedures for patients with TBI
	21. Manages routine complications and recognizes complex complications for patients with TBI (e.g., cerebral herniation syndrome, persistent CSF fistula)
	22. Manages refractory intracranial hypertension (e.g., cerebral perfusion pressure directed therapy, advanced monitoring, decompressive craniectomy)
	23. Performs routine and assists with complex neurocritical care unit procedures; manages difficult and emergency airways
	24. Manages routine systemic complications and prioritizes simultaneous critical clinical events
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence
	2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography)
	3. Interprets anomalous presentations and rare disorders
	4. Adapts therapeutic choice to anomalous or rare patient presentations
Systems Based Practice	1. Analyzes patient safety events and offers error prevention strategies; advocates for safe and effective transitions of care within and across health care systems
	2. Advances multiple quality improvement initiatives through participation in a quality improvement working group or committee
	3. Prepares for transition to practice (e.g. information technology, risk management, billing and coding, financial, personnel)
Practice Based Learning	1. Participates in the creation and implementation of institutional guidelines or evidence-based practice protocols; analyzes and reports outcomes data
	2. Leads a clinical or basic scientific research effort, including application for funding
	3. Organizes educational activities at the program level; mentors residents and other health care professionals
Professionalism	1. Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others
	2. Monitors and attempts to optimize professional well-being of the team; adjusts team assignments to mitigate fatigue and promote wellness
Interpersonal Communication	1. Consistently models and mentors others in optimal patient and family communications
	2. Models and mentors others in effective communication, including bidirectional feedback and conflict resolution; coordinates long-term care, including rehabilitation

General Duties

The Neurosurgery Residency is a seven-year training program. Duties and assignments for each PGY level are outlined in the Goals & Objectives for that level, which includes progressive patient care responsibilities for the day-to-day running of the neurosurgical service under the supervision of the faculty. At all levels, residents are expected to discuss and plan patient management, including surgical operations with the Attending's, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care, as appropriate. The PGY6 and PGY7 residents are responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. In addition the PG6 and PG7 residents provide overall supervision for conferences, including data collection for morbidity and mortality conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. It is also the responsibility of the Chief Residents (PG6 and PG7) to communicate with Chief Residents from other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management.

Rotations

The neurosurgery residency is divided into thirteen 4-week cycles in each academic year. Each cycle at the PGY5 level consists of a 28-day curriculum that is based on PGY Level and educational progression in general Neurosurgery. Each resident performance is assessed semi-annually at Clinical Competency Committee Meetings for Core Competency achievement, as well as Milestone progression.

Mandatory Rotation

Neurosurgery – Senior, PGY-5

6 cycles per year (168 days)

Supervisors: Cara Sedney, MD

Location: Ruby Memorial Hospital, Physician Office Center

Patient Care	1. Formulates a diagnostic and treatment plan for a patient with a brain or spinal cord tumor 2. Performs routine craniotomy for brain tumor; assists with complex craniotomy for brain tumor 3. Manages routine complications and recognizes complex complications for patients with brain tumors (e.g., refractory cerebral edema, major vascular injury) 4. Formulates a diagnostic and treatment plan for a patient with epilepsy or a movement disorder 5. Performs routine functional neurosurgical procedures; assists with complex functional neurosurgical procedures 6. Manages routine complications and recognizes complex complications of patients with epilepsy or a movement disorder (e.g., status epilepticus, dystonia) 7. Formulates a diagnostic and treatment plan for patients with chronic pain or peripheral nerve disorders 8. Performs routine chronic pain and peripheral nerve procedures; assists with complex chronic pain and peripheral nerve procedures

	9. Manages routine complications and recognizes complex complications associated with complex chronic pain and peripheral nerve procedures (e.g., intrathecal drug overdose or withdrawal) 10. Formulates a diagnostic and treatment plan for a patient with degenerative, traumatic, or neoplastic spinal disorders 11. Performs routine spinal surgery procedures; assists with complex spinal surgery procedures 12. Manages routine complications and recognizes complex complications in patients with spinal surgery procedures (e.g., myelopathy, cerebrospinal fluid (CSF) leak, instrument failure/malposition) 13. Manages routine complications and recognizes complex complications in sever brain injury (e.g., hematoma, CSF leak) 14. Selects patients for operative intervention in TBI; prioritizes the management of injuries in patients with multiple trauma 15. Performs routine procedures for patients with TBI; assists with complex procedures for patients with TBI 16. Manages routine complications and recognizes complex complications for patients with TBI (e.g., cerebral herniation syndrome, persistent CSF fistula) 17. Manages refractory intracranial hypertension (e.g., cerebral perfusion pressure directed therapy, advanced monitoring, decompressive craniectomy) 18. Performs routine and assists with complex neurocritical care unit procedures; manages difficult and emergency airways 19. Manages routine systemic complications and prioritizes simultaneous critical clinical events
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence 2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography) 3. Interprets anomalous presentations and rare disorders 4. Adapts therapeutic choice to anomalous or rare patient presentations
Systems Based Practice	1. Analyzes patient safety events and offers error prevention strategies; advocates for safe and effective transitions of care within and across health care systems 2. Advances multiple quality improvement initiatives through participation in a quality improvement working group or committee 3. Prepares for transition to practice (e.g. information technology, risk management, billing and coding, financial, personnel)
Practice Based Learning	1. Participates in the creation and implementation of institutional guidelines or evidence-based practice protocols; analyzes and reports outcomes data 2. Leads a clinical or basic scientific research effort, including application for funding 3. Organizes educational activities at the program level; mentors residents and other health care professionals
Professionalism	1. Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others 2. Monitors and attempts to optimize professional well-being of the team; adjusts team assignments to mitigate fatigue and promote wellness
Interpersonal Communication	1. Consistently models and mentors others in optimal patient and family communications

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

Mandatory Rotation

Pediatric Neurosurgery – Senior, PGY-5

3 cycles per year (84 days)

Supervisors: Hal Meltzer, MD, Section Chief; Kimberly Hamilton, MD

Location: Ruby Memorial Hospital, Physician Office Center

Rotation objectives:

Patient Care	1. 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 2. Performs routine pediatric neurosurgical procedures; assists with complex pediatric neurosurgical procedures
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence 2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography) 3. Interprets anomalous presentations and rare disorders 4. Adapts therapeutic choice to anomalous or rare patient presentations
Systems Based Practice	1. Analyzes patient safety events and offers error prevention strategies; advocates for safe and effective transitions of care within and across health care systems 2. Advances multiple quality improvement initiatives through participation in a quality improvement working group or committee 3. Prepares for transition to practice (e.g. information technology, risk management, billing and coding, financial, personnel)
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Professionalism	1. Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others 2. Monitors and attempts to optimize professional well-being of the team; adjusts team assignments to mitigate fatigue and promote wellness
Interpersonal Communication	1. Consistently models and mentors others in optimal patient and family communications 2. Models and mentors others in effective communication, including bidirectional feedback and conflict resolution; coordinates long-term care, including rehabilitation

Mandatory Rotation

Endovascular Neurosurgery – Senior, PGY-5

4 cycles per year (112 days)

Supervisors: Ansaar Rai, MD, Section Chief

Location: Ruby Memorial Hospital, Physician Office Center

Patient Care	1. Formulates a diagnostic and treatment plan for a patient with ischemic or hemorrhagic stroke or vascular neurosurgical disorders 2. Performs routine vascular neurosurgical and endovascular procedures; assists with complex vascular neurosurgical and endovascular procedures 3. Manages routine complications and recognizes complex complications associated with patients with ischemic or hemorrhagic strokes, or vascular neurosurgical disorders (e.g., cerebral vasospasm, herniation syndrome, intra-operative aneurysm rupture)
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence 2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography) 3. Interprets anomalous presentations and rare disorders 4. Adapts therapeutic choice to anomalous or rare patient presentations
Professionalism	1. Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others 2. Monitors and attempts to optimize professional well-being of the team; adjusts team assignments 3. to mitigate fatigue and promote wellness
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Overview

The PGY-3 year is split between 7 blocks on General Neurosurgery, 3 blocks on Pediatric Neurosurgery, and 3 blocks on Endovascular Neurosurgery at Ruby Memorial Hospital and the out-patient clinic located at the Physician's Office Center. The PGY3 resident will take a leadership role in the primary management of the inpatient service. The PGY3 resident will begin to develop the skills of neurosurgical patient management, by following the patient through the course of their treatment with more involvement in surgical care, as neurosurgical patient care skills develop. In addition, the 3rd year resident is expected to design an independent research curriculum that they will use, as part of their PGY4 Year.

In the fifth year, the resident returns to the Ruby Memorial Hospital, as a senior resident, spending 3 cycles running the pediatric neurosurgery service, 4 cycles running the endovascular neurosurgery service, and the remaining 6 cycles on the neurosurgery service. At this level of training, the resident is expected to have more autonomy in the operating room under the direction of the neurosurgical staff. Managerial skills are developed and implemented during this year. Medical student and junior resident teaching is encouraged through daily rounds and conference lectures, and the resident will receive dedicated didactic training to better fulfill these roles.

PGY5 residents are expected to oversee the Journal Club presentations and activities for the department, and will choose and assign article presentations as necessary, to all residents, on a monthly basis.

Operative Experiences

Throughout this year of training, the resident will log all operative cases and procedures in every setting, including bedside, pain clinic, Gamma Knife, interventional radiology, ICU, etc. in the Op-Log system of ACGME. Case logs are expected to be kept up to date at least weekly and are reviewed at each formal evaluation. Meal cards may be turned off for delinquent logging practices. Listed here are the minimum expectations by procedure, for completion at the end of the PGY5 year, compared to the minimum expectations upon graduation.

Category	PGY5 Expectations	Lead and Senior Minimums
ALL DEFINED CASE PROCEDURES		
Cranial		
Cranial: Tumor General	NA	60
Cranial: Tumor Sellar/Parasellar	NA	20
Cranial: Trauma/Other	NA	60
Cranial: Vascular Open	NA	10
Cranial: Vascular Endovascular	10	10
Cranial: Vascular Total	NA	60
Cranial: CSF Diversion/ETV/Other	NA	20
Cranial/Extracranial: Pain	NA	10
Cranial/Extracranial: Functional Disorders	NA	10
Cranial/Extracranial: Epilepsy	NA	10
Total Cranial	NA	300
Spinal		
Spinal: Anterior Cervical	NA	30
Spinal: Posterior Cervical	NA	30
Spinal: Thoracic/Lumbar/Sacral Instrumentation Fusion	NA	30
Spinal: Lumbar Laminectomy/Laminotomy	NA	30
Spinal: Stimulation/Lesion/Pump/Other	NA	10
Total Spinal	NA	300
Other		
Peripheral Nerve	10	10
Radiosurgery	10	10
Peripheral Device Management	20	20
Total Other	0	0
Critical Care		
Airway Management	10	0
Angiography	20	0
Arterial Line Placement	10	0
CVP Line Placement	10	0
EVD/Transdural Monitor Placement	30	0
Lumbar/Other Puncture/Drain Placement	10	0
Percutaneous Tap of CSF Reservoir	10	0
Total Critical Care	100	0
Pediatric		
Pediatric: Cranial Tumor	NA	5
Pediatric: Cranial Trauma/Other	NA	10

Pediatric: CSF Diversion/ETV/Other	NA	10
Pediatric: Spinal	NA	5
Total Pediatric	NA	40
Total	NA	800

Didactics and Assigned Learning

Didactic learning in the PGY5 year consists of:

- Curriculum-based Educational Sessions, which are held during protected didactic time on Friday mornings from 7:00am to 1:00pm. The educational sessions are divided into unique educational experiences, such as:

    o Tumor Board

    o Curriculum Lectures

    o Visiting Professor Grand Rounds

    o Case Conference

    o Journal Club

    o Board Review

    o Operative Skills Lab

    o Cadaver Labs

- Experiential Learning Sessions, which are held during protected didactic time on Wednesday mornings from 7:00am – 8:00am and include sessions for:

    o M&M Conference

    o Oral Board Review

    o Neuro I/R Conference

    o NCCU Conference

    o Research

Milestones

PGY5 Residents are expected to be familiar with the ACGME Neurosurgery Milestones and are expected to work towards progress in mastering the individual skills/knowledge listed for each. The Clinical Competency Committee will meet twice each year, once in December, and once in June, to review Milestone progress for each resident and to assess a current level of mastery for each, for each resident. It is expected at the June meeting, the resident who will be completing their PGY5 year at that time, should have achieved the following Milestone levels:

	PGY5 Milestone Expectations	
PC1	Brain Tumor	3.0
PC2	Surgical Treatment of Epilepsy and Movement Disorders	3.0
PC3	Pain and Peripheral Nerve Disorders	3.0
PC4	Spinal Neurological Surgery	3.0
PC5	Vascular Neurological Surgery	3.0
PC6	Pediatric Neurological Surgery	3.0
PC7	Traumatic Brain Injury	3.0
PC8	Critical Care	3.0
MK1	Information Gathering and Interpretation	4.0
MK2	Critical Thinking for Diagnosis and Therapy	4.0
SBP1	Patient Safety	4.0
SBP2	Quality Improvement	4.0
SBP 3	Health Care Systems Awareness	4.0
PBL1	Evidence-Based Practice	4.0
PBL2	Research	4.0
PBL3	Mentorship and Teaching	4.0
PRO1	Ethical Behavior	4.0
PRO2	Well-Being	3.0
ICS1	Patient and Family Communication	4.0
ICS2	Communication in Coordination of Care	4.0

Resident Supervision

It is expected that residents are provided adequate and appropriate levels of supervision during the course of the educational training experience to ensure that patient care is delivered in a safe and effective manner. All program faculty members that supervise residents, must have a faculty or clinical faculty appointment in the School of Medicine or be specifically approved as a supervising attending by the Program Director. Faculty schedules will be structured to provide residents with continuous supervision and consultation.

Residents must be supervised by faculty members in a manner promoting progressively increasing responsibility for each resident according to their level of education, ability and experience. Residents are provided information addressing the method(s) to access a supervisor in a timely and efficient manner at all times while on duty.

The program provides additional information addressing the type and level of supervision for each post-graduate year in the program that is consistent with ACGME program requirements and, specifically, for supervision of residents engaged in performing invasive procedures.

The following general supervision guidelines will be expected for residents in their PGY5 level of training:

PGY2 Resident Supervision	Inpatient Service	Intensive Care Units	Ambulatory Settings	Operating Rooms
Direct by Faculty	X	X	X	X
Direct by Senior Residents	X	X	X	X
Indirect, but immediately available Faculty	X	X	X	X
Indirect, but immediately available Senior Residents	X	X	X	
Indirect available	X	X	X	
Oversight	X	X	X	

Guidelines for Resident Mandatory Communication with Attending

The following situations require mandatory direct communication with the faculty responsible for patient care, both during routine working hours, and after hours and weekends. "Faculty responsible for patient care" means the staff of record for the patient, except in events when the faculty is physically out of town or can't be contacted, in which case the on call faculty should be notified. The staff of record should also be notified as soon as is feasible:
- Death
- DNR or other end of life decision
- Suicide attempt
- Violence requiring physical restraints
- Emergency surgery
- Acute drastic change in course
- Unanticipated invasive or diagnostic procedure
- Pregnancy
- Transfer of care to another medical or surgical service, including transfer to ICU
- Any serious adverse event
- Any complex decision making process that the resident does not feel adequately qualified to undertake without immediate input from faculty

Teaching Expectations

PGY5 Residents are expected to use this academic year to hone their teaching skills, which they will do by providing one-on-one guidance and instruction to both medical students rotating on our service, and lower level residents from Neurosurgery. It is expected that PGY5 residents function as both a learner and a teacher, as appropriate, during the course of each rotation, and are expected to provide ongoing teaching experiences to lower level learners.

Scholarship Requirements

In pursuit of scholarly activity, the PGY5 resident will be expected plan and carry out a scholarly project and/or to participate in research projects that will enable him/her to meet the requirement for obtaining a minimum of 6 PubMed indexed, peer reviewed papers in print (roughly one per year, excepting the chief year). Only residents who have made significant contribution to a research project will be listed as authors. Residents are encouraged to work together to carry research project to completion, however roles and authorship are to be decided and should be made clear at the beginning of collaboration. Any authorship disputes will be handled by the faculty mentor for the research. Presentation of research at national meetings is encouraged and the same authorship standards apply. The resident who plans to present the research should submit the research for consideration.

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- Written evaluation by faculty supervisor semiannually

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Neuro-critical care experience is emphasized throughout the training, as well as extensive exposure to subspecialty services including neurovascular, neuro-oncology, epilepsy surgery, spinal neurosurgery, stereotactic radiosurgery, neurotrauma, functional neurosurgery and pediatric neurosurgery. Conferences are protected from clinical commitments and include morbidity and mortality conference, case conference, tumor board, asynchronous learning and board review, and journal club. Subspecialty conferences such as Epilepsy Conference or Spine Conference are encouraged. The anatomic dissection lab is available for scholarly work or preparation for operative cases.

Expectations

PGY6 residents in this program are expected to:
- Obtain a valid WV State Medical License or Training Permit, for the duration of the academic year
- Achieve appropriate levels of proficiency in each of the six ACGME Core Competencies
- Achieve expected levels of progress in each of the ACGME Neurosurgery Milestones
- Successful completion of the written neurosurgical board exam for the PGY6 year of training
- Quality Improvement and Patient Safety (QI/PS) research project involvement
- Scholarly activity (presentations and manuscript preparation)
- Daily logging of duty hours in the E-Value system
- Have an understanding of each of the ACGME Duty Hour regulations and adhere to the departmental policies and procedures that are designed to keep residents in compliance with all of the duty hour requirements.
- Every resident is strongly encouraged to participate in one academic paper yearly. Residents are highly encouraged to participate in and make significant contribution to a research project, during the academic year, in order to be listed as an author on a submitted publication.

- Mandatory attendance at all educational conferences, didactic sessions, etc., unless excused or absent for the day
- Maintain a healthy level of mental and physical wellness by adhering to the Fit For Duty guidelines, outlined in the Neurosurgery Handbook, and report any concerns with wellness immediately to the Program Director
- Residents will be assigned evaluations to complete semi-annually. Self, peer, program and faculty evaluations must be completed in a timely manner, which is defined as within two weeks of assignment, and meet completion deadline as assigned by the Program Coordinator.

Core Competency Educational Objectives

Develop graduating residents that possess a proficiency level appropriate for a new and independent neurological practitioner in the six core competencies as outlined by the ACGME.

Patient Care	1. Adapts standard treatment plans and techniques to special circumstances for brain tumors (e.g., recurrence, bone marrow suppression)
	2. Performs complex craniotomy for brain tumor; assists with advanced craniotomy for brain tumor
	3. Manages complex complications for patients with brain tumors
	4. Adapts standard treatment plans and techniques to special circumstances for the surgical treatment of Epilepsy and Movement Disorders (e.g., Parkinson's plus, multifocal epilepsy)
	5. Performs complex functional neurosurgical procedures; assists with advanced functional neurosurgical procedures
	6. Manages complex complications for the surgical treatment of epilepsy and movement disorders
	7. Adapts standard treatment plans and techniques to special circumstances for patients with pain and peripheral nerve disorders (e.g., cancer pain, deafferentation pain)
	8. Performs complex chronic pain and peripheral nerve procedures; assists with advanced chronic pain and peripheral nerve procedures
	9. Manages complex complications in patients with pain and peripheral nerve disorders
	10. Adapts standard treatment plans and techniques to special circumstances for spinal neurological surgery (e.g., spinal deformity, post-irradiated spine, or infection)
	11. Performs complex spinal surgery procedures; assists with advanced spinal surgery and reconstructive procedures
	12. Manages complex complications for patients having spinal neurological surgery
	13. Adapts standard treatment plans and techniques to special circumstances for vascular neurological surgery (e.g., vasculitis, ischemic heart disease)
	14. Performs complex vascular neurosurgical and endovascular procedures; assists with advanced vascular neurosurgical and endovascular procedures

	15. Manages complex complications for patients having vascular neurological surgery
	16. Adapts standard treatment plans and techniques to special circumstances for pediatric neurological surgery (e.g., very young children and infants)
	17. Performs complex pediatric neurosurgical procedures; assists with advanced pediatric neurosurgical procedures
	18. Manages complex complications of patients with pediatric neurosurgical procedures
	19. Adapts standard treatment plans to special circumstances for patients with traumatic brain injury (e.g., medical co-morbidity, coagulopathy)
	20. Performs complex procedures for patients with TBI; assists with advanced procedures for patients with TBI
	21. Manages complex complications for patient with TBI
	22. Diagnoses and initiates management of acute respiratory distress syndrome
	23. Performs complex and assists with advanced neurocritical care unit procedures; manages or initiates management of surgical airways
	24. Manages metabolic and nutritional support for critically-ill patients
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence
	2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography)
	3. Interprets anomalous presentations and rare disorders
	4. Adapts therapeutic choice to anomalous or rare patient presentations
Systems Based Practice	1. Analyzes patient safety events and offers error prevention strategies; advocates for safe and effective transitions of care within and across health care systems
	2. Advances multiple quality improvement initiatives through participation in a quality improvement working group or committee
	3. Prepares for transition to practice (e.g. information technology, risk management, billing and coding, financial, personnel)
Practice Based Learning	1. Participates in the creation and implementation of institutional guidelines or evidence-based practice protocols; analyzes and reports outcomes data
	2. Leads a clinical or basic scientific research effort, including application for funding
	3. Organizes educational activities at the program level; mentors residents and other health care professionals
Professionalism	1. Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others
	2. Coaches and assists others in meeting professional expectations; recognizes and responds to physical impairment in self and others
Interpersonal Communication	1. Consistently models and mentors others in optimal patient and family communications
	2. Models and mentors others in effective communication, including bidirectional feedback and conflict resolution; coordinates long-term care, including rehabilitation

General Duties

The Neurosurgery Residency is a seven-year training program. Duties and assignments for each PGY level are outlined in the Goals & Objectives for that level, which includes progressive patient care responsibilities for the day-to-day running of the neurosurgical service under the supervision of the faculty. At all levels, residents are expected to discuss and plan patient management, including surgical operations with the Attending's, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care, as appropriate. The PGY6 and PGY7 residents are responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. In addition the PG6 and PG7 residents provide overall supervision for conferences, including data collection for morbidity and mortality conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. It is also the responsibility of the Chief Residents (PG6 and PG7) to communicate with Chief Residents from other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management.

Rotations

The PGY6 year is divided into thirteen 4-week cycles, 6 of which are dedicated to general Neurosurgery, and 7 of which are dedicated to Chief Resident activities. Each cycle at the PGY6 level consists of a 28-day curriculum that is based on PGY Level and educational progression. Each resident performance is assessed semi-annually at Clinical Competency Committee Meetings for Core Competency achievement, as well as Milestone progression.

Mandatory Rotation

General Neurosurgery –PGY-6

6 cycles of 28 days, each

Supervisors: Cara Sedney, MD

Location: Ruby Memorial Hospital, Physician Office Center

Rotation Objectives:

Patient Care	1. Adapts standard treatment plans and techniques to special circumstances for brain tumors (e.g., recurrence, bone marrow suppression)
	2. Performs complex craniotomy for brain tumor; assists with advanced craniotomy for brain tumor
	3. Manages complex complications for patients with brain tumors
	4. Adapts standard treatment plans and techniques to special circumstances for the surgical treatment of Epilepsy and Movement Disorders (e.g., Parkinson's plus, multifocal epilepsy)
	5. Performs complex functional neurosurgical procedures; assists with advanced functional neurosurgical procedures
	6. Manages complex complications for the surgical treatment of epilepsy and movement disorders
	7. Adapts standard treatment plans and techniques to special circumstances for patients with pain and peripheral nerve disorders (e.g., cancer pain, deafferentation pain)

	8. Performs complex chronic pain and peripheral nerve procedures; assists with advanced chronic pain and peripheral nerve procedures
	9. Manages complex complications in patients with pain and peripheral nerve disorders
	10. Adapts standard treatment plans and techniques to special circumstances for spinal neurological surgery (e.g., spinal deformity, post-irradiated spine, or infection)
	11. Performs complex spinal surgery procedures; assists with advanced spinal surgery and reconstructive procedures
	12. Manages complex complications for patients having spinal neurological surgery
	13. Adapts standard treatment plans and techniques to special circumstances for vascular neurological surgery (e.g., vasculitis, ischemic heart disease)
	14. Performs complex vascular neurosurgical and endovascular procedures; assists with advanced vascular neurosurgical and endovascular procedures
	15. Manages complex complications for patients having vascular neurological surgery
	16. Adapts standard treatment plans and techniques to special circumstances for pediatric neurological surgery (e.g., very young children and infants)
	17. Performs complex pediatric neurosurgical procedures; assists with advanced pediatric neurosurgical procedures
	18. Manages complex complications of patients with pediatric neurosurgical procedures
	19. Adapts standard treatment plans to special circumstances for patients with traumatic brain injury (e.g., medical co-morbidity, coagulopathy)
	20. Performs complex procedures for patients with TBI; assists with advanced procedures for patients with TBI
	21. Manages complex complications for patient with TBI
	22. Diagnoses and initiates management of acute respiratory distress syndrome
	23. Performs complex and assists with advanced neurocritical care unit procedures; manages or initiates management of surgical airways
	24. Manages metabolic and nutritional support for critically-ill patients
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence
	2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography)
	3. Interprets anomalous presentations and rare disorders
	4. Adapts therapeutic choice to anomalous or rare patient presentations

Mandatory Rotation

Chief Resident Neurosurgery –PGY-6

7 cycles of 28 days, each

Supervisors: Cara Sedney, MD

Location: Ruby Memorial Hospital, Physician Office Center

Rotation Objectives:

Patient Care	1. Adapts standard treatment plans and techniques to special circumstances for brain tumors (e.g., recurrence, bone marrow suppression)
	2. Performs complex craniotomy for brain tumor; assists with advanced craniotomy for brain tumor
	3. Manages complex complications for patients with brain tumors
	4. Adapts standard treatment plans and techniques to special circumstances for the surgical treatment of Epilepsy and Movement Disorders (e.g., Parkinson's plus, multifocal epilepsy)
	5. Performs complex functional neurosurgical procedures; assists with advanced functional neurosurgical procedures
	6. Manages complex complications for the surgical treatment of epilepsy and movement disorders
	7. Adapts standard treatment plans and techniques to special circumstances for patients with pain and peripheral nerve disorders (e.g., cancer pain, deafferentation pain)
	8. Performs complex chronic pain and peripheral nerve procedures; assists with advanced chronic pain and peripheral nerve procedures
	9. Manages complex complications in patients with pain and peripheral nerve disorders
	10. Adapts standard treatment plans and techniques to special circumstances for spinal neurological surgery (e.g., spinal deformity, post-irradiated spine, or infection)
	11. Performs complex spinal surgery procedures; assists with advanced spinal surgery and reconstructive procedures
	12. Manages complex complications for patients having spinal neurological surgery
	13. Adapts standard treatment plans and techniques to special circumstances for vascular neurological surgery (e.g., vasculitis, ischemic heart disease)
	14. Performs complex vascular neurosurgical and endovascular procedures; assists with advanced vascular neurosurgical and endovascular procedures
	15. Manages complex complications for patients having vascular neurological surgery
	16. Adapts standard treatment plans and techniques to special circumstances for pediatric neurological surgery (e.g., very young children and infants)
	17. Performs complex pediatric neurosurgical procedures; assists with advanced pediatric neurosurgical procedures

	18. Manages complex complications of patients with pediatric neurosurgical procedures 19. Adapts standard treatment plans to special circumstances for patients with traumatic brain injury (e.g., medical co-morbidity, coagulopathy) 20. Performs complex procedures for patients with TBI; assists with advanced procedures for patients with TBI 21. Manages complex complications for patient with TBI 22. Diagnoses and initiates management of acute respiratory distress syndrome 23. Performs complex and assists with advanced neurocritical care unit procedures; manages or initiates management of surgical airways 24. Manages metabolic and nutritional support for critically-ill patients
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence 2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography) 3. Interprets anomalous presentations and rare disorders 4. Adapts therapeutic choice to anomalous or rare patient presentations
Systems Based Practice	1. Analyzes patient safety events and offers error prevention strategies; advocates for safe and effective transitions of care within and across health care systems 2. Advances multiple quality improvement initiatives through participation in a quality improvement working group or committee 3. Prepares for transition to practice (e.g. information technology, risk management, billing and coding, financial, personnel)
Practice Based Learning	1. Participates in the creation and implementation of institutional guidelines or evidence-based practice protocols; analyzes and reports outcomes data 2. Leads a clinical or basic scientific research effort, including application for funding 3. Organizes educational activities at the program level; mentors residents and other health care professionals
Professionalism	1. Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others 2. Coaches and assists others in meeting professional expectations; recognizes and responds to physical impairment in self and others
Interpersonal Communication	1. Consistently models and mentors others in optimal patient and family communications 2. Models and mentors others in effective communication, including bidirectional feedback and conflict resolution; coordinates long-term care, including rehabilitation

In the sixth year, the resident completes 6 cycles on General Neurosurgery Rotations. Upon successful completion of the 6th cycle in the PGY6 year, the resident moves to the role of Chief Resident, and completes the final 7 cycles in the academic year, in Chief Resident Neurosurgery Rotations. All rotations in this year are completed at Ruby Memorial Hospital and the Physician's Office Center. During the Chief Resident rotations, the PGY6 resident will begin to take chief call and will begin to assist or perform the most complex level of operative cases.

During the PGY-6 year, the resident is responsible for the day-to-day running of the neurosurgical service under the supervision of the faculty. He/she is expected to discuss and plan patient management including surgical operations with the attendings, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care. He/she is responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. He/she provides overall supervision for conferences including data collection for morbidity and mortality conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. He/she communicates with Chief Residents in other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management. At this level, the resident is responsible to be fully familiar with billing and coding, medical liability and patient safety issues, governmental regulatory concerns and practice development.

Operative Experiences

Throughout this year of training, the resident will log all operative cases and procedures in every setting, including bedside, pain clinic, Gamma Knife, interventional radiology, ICU, etc. in the Op-Log system of ACGME. Case logs are expected to be kept up to date at least weekly and are reviewed at each formal evaluation. Meal cards may be turned off for delinquent logging practices. Listed here are the minimum expectations by procedure, for completion at the end of the PGY6 year, compared to the minimum expectations upon graduation.

Category	PGY6 Expectations	Lead and Senior Minimums
ALL DEFINED CASE PROCEDURES		
Cranial		
Cranial: Tumor General	30	60
Cranial: Tumor Sellar/Parasellar	10	20
Cranial: Trauma/Other	30	60
Cranial: Vascular Open	5	10
Cranial: Vascular Endovascular	5	10
Cranial: Vascular Total	30	60
Cranial: CSF Diversion/ETV/Other	10	20
Cranial/Extracranial: Pain	5	10
Cranial/Extracranial: Functional Disorders	5	10
Cranial/Extracranial: Epilepsy	5	10
Total Cranial	NA	300
Spinal		
Spinal: Anterior Cervical	15	30
Spinal: Posterior Cervical	15	30
Spinal: Thoracic/Lumbar/Sacral Instrumentation Fusion	15	30
Spinal: Lumbar	15	30

Laminectomy/Laminotomy		
Spinal: Stimulation/Lesion/Pump/Other	5	10
Total Spinal	NA	300
Other		
Peripheral Nerve	10	10
Radiosurgery	10	10
Peripheral Device Management	20	20
Total Other	0	0
Critical Care		
Airway Management	10	0
Angiography	20	0
Arterial Line Placement	10	0
CVP Line Placement	10	0
EVD/Transdural Monitor Placement	30	0
Lumbar/Other Puncture/Drain Placement	10	0
Percutaneous Tap of CSF Reservoir	10	0
Total Critical Care	100	0
Pediatric		
Pediatric: Cranial Tumor	5	5
Pediatric: Cranial Trauma/Other	10	10
Pediatric: CSF Diversion/ETV/Other	10	10
Pediatric: Spinal	5	5
Total Pediatric	NA	40
Total	NA	800

Didactics and Assigned Learning

Didactic learning in the PGY6 year consists of:

- Curriculum-based Educational Sessions, which are held during protected didactic time on Friday mornings from 7:00am to 1:00pm. The educational sessions are divided into unique educational experiences, such as:

    o Tumor Board

    o Curriculum Lectures

    o Visiting Professor Grand Rounds

    o Case Conference

    o Journal Club

    o Board Review

    o Operative Skills Lab

    o Cadaver Labs

- Experiential Learning Sessions, which are held during protected didactic time on Wednesday mornings from 7:00am – 8:00am and include sessions for:
  - M&M Conference
  - Oral Board Review
  - Neuro I/R Conference
  - NCCU Conference
  - Research

Milestones

PGY6 Residents are expected to be familiar with the ACGME Neurosurgery Milestones and are expected to work towards progress in mastering the individual skills/knowledge listed for each. The Clinical Competency Committee will meet twice each year, once in December, and once in June, to review Milestone progress for each resident and to assess a current level of mastery for each, for each resident. It is expected at the June meeting, the resident who will be completing their PGY6 year at that time, should have achieved the following Milestone levels:

PGY6 Milestone Expectations		
PC1	Brain Tumor	4.0
PC2	Surgical Treatment of Epilepsy and Movement Disorders	4.0
PC3	Pain and Peripheral Nerve Disorders	4.0
PC4	Spinal Neurological Surgery	4.0
PC5	Vascular Neurological Surgery	4.0
PC6	Pediatric Neurological Surgery	4.0
PC7	Traumatic Brain Injury	4.0
PC8	Critical Care	4.0
MK1	Information Gathering and Interpretation	4.0
MK2	Critical Thinking for Diagnosis and Therapy	4.0
SBP1	Patient Safety	4.0
SBP2	Quality Improvement	4.0
SBP 3	Health Care Systems Awareness	4.0
PBL1	Evidence-Based Practice	4.0
PBL2	Research	4.0
PBL3	Mentorship and Teaching	4.0

PRO1	Ethical Behavior	4.0
PRO2	Well-Being	4.0
ICS1	Patient and Family Communication	4.0
ICS2	Communication in Coordination of Care	4.0

Resident Supervision

It is expected that residents are provided adequate and appropriate levels of supervision during the course of the educational training experience to ensure that patient care is delivered in a safe and effective manner. All program faculty members that supervise residents, must have a faculty or clinical faculty appointment in the School of Medicine or be specifically approved as a supervising attending by the Program Director. Faculty schedules will be structured to provide residents with continuous supervision and consultation.

Residents must be supervised by faculty members in a manner promoting progressively increasing responsibility for each resident according to their level of education, ability and experience. Residents are provided information addressing the method(s) to access a supervisor in a timely and efficient manner at all times while on duty.

The program provides additional information addressing the type and level of supervision for each post-graduate year in the program that is consistent with ACGME program requirements and, specifically, for supervision of residents engaged in performing invasive procedures.

The following general supervision guidelines will be expected for residents in their PGY6 level of training:

PGY2 Resident Supervision	Inpatient Service	Intensive Care Units	Ambulatory Settings	Operating Rooms
Direct by Faculty	X	X	X	X
Direct by Senior Residents	X	X	X	X
Indirect, but immediately available Faculty	X	X	X	X
Indirect, but immediately available Senior Residents	X	X	X	
Indirect available	X	X	X	
Oversight	X	X	X	

Guidelines for Resident Mandatory Communication with Attending

The following situations require mandatory direct communication with the faculty responsible for patient care, both during routine working hours, and after hours and weekends. "Faculty responsible for patient care" means the staff of record for the patient, except in events when the faculty is physically out of town or can't be contacted, in which case the on call faculty should be notified. The staff of record should also be notified as soon as is feasible:

- Death
- DNR or other end of life decision
- Suicide attempt
- Violence requiring physical restraints
- Emergency surgery
- Acute drastic change in course
- Unanticipated invasive or diagnostic procedure
- Pregnancy
- Transfer of care to another medical or surgical service, including transfer to ICU
- Any serious adverse event
- Any complex decision making process that the resident does not feel adequately qualified to undertake without immediate input from faculty

Teaching Expectations

PGY6 Residents are expected to use this academic year to hone their teaching skills, which they will do by providing one-on-one guidance and instruction to both medical students rotating on our service, and lower level residents from Neurosurgery. It is expected that PGY6 residents function as both a learner and a teacher, as appropriate, during the course of each rotation, and are expected to provide ongoing teaching experiences to lower level learners.

Scholarship Requirements

In pursuit of scholarly activity, the PGY6 resident will be expected plan and carry out a scholarly project and/or to participate in research projects that will enable him/her to meet the requirement for obtaining a minimum of 6 PubMed indexed, peer reviewed papers in print (roughly one per year, excepting the chief year). Only residents who have made significant contribution to a research project will be listed as authors. Residents are encouraged to work together to carry research project to completion, however roles and authorship are to be decided and should be made clear at the beginning of collaboration. Any authorship disputes will be handled by the faculty mentor for the research. Presentation of research at national meetings is encouraged and the same authorship standards apply. The resident who plans to present the research should submit the research for consideration.

All research activities within the Department of Neurosurgery are bound by institutional research ethics. All research projects in which residents participate must be brought before the Residency Research Committee (Chair: Nick Brandmeir), be on file with Patricia Dekeseredy and/or Dan Cifarelli (Research Coordinators) and have IRB approval. All residents must have completed required training modules. All participants in a research project must be documented and approved by the faculty of record. NO PHI should be distributed in any fashion which will constitute a HIPAA violation. This includes sending PHI to medical student (MIX) email accounts. Case reports must have documented consent form signed by the patient.

QI projects are a required part of the residency curriculum. These may take a variety of formats. QI training takes place during the annual resident orientation.

Assessment Methods

The neurosurgery program provides a structure by which performance related to the training program will be assessed semi-annually, and consideration given for promotion to the next level of training, prior to the end of each academic year. Evaluation will be provided in accordance with Graduate Medical Education Committee policy and ACGME common program requirements.

Residents will receive written goals and objectives from the program annually, which will outline the expectations and objectives for each major rotation of the training program. In order to assess the attainment of the expectations outlined in the goals and objectives, the following assessment methods will be utilized:

- Formative Feedback from faculty at the end of each 4-week block
- 360 degree performance evaluations by peers, departmental faculty, NCCU, Anesthesia, nurses and staff, semiannually.
- Direct observation and precepting by faculty supervisors with ongoing feedback
- Clinical precepting evaluations performed on a quarterly basis by supervising faculty.
- Conference presentation evaluations (by residents, faculty, students and staff).
- Self-assessment and reflection form semiannually
- Neurosurgery Written In-Service Board Exam
- Semi-Annual Milestone evaluations by faculty
- Written evaluation by faculty supervisor semiannually

All residents participating in training will be provided, at a minimum, a semi-annual formal evaluation developed by the faculty, CCC, and Program Director. Residents shall be allowed to review all evaluations contained in permanent records. At a minimum, the Formal Written Evaluation shall:

- Address each of the six ACGME core competencies and RRC milestones.
- Include scoring and rating criteria that seek to minimize subjective assessment of performance.

Include language indicating satisfactory performance, advancement to the next level of training (if applicable) or provide specific actions and performance requirements by the resident to return to a level of satisfactory performance or advancement to the next level of training.

- Be signed and dated by the resident and Program Director.
- Become a part of the permanent record file for the resident.

In addition, each resident will meet, near the midpoint of each rotation, with an assigned faculty advisor according to PGY year, for an informal progress evaluation to assess strengths and weaknesses in performance, so that adjustments can be made over the remainder of the rotation. Each meeting with the advisor will address multiple domains on a standardized form as determined by the PEC.

All of the above listed assessment methods will be used by the departmental Clinical Competency Committee to determine overall educational progress for the resident for the academic year, and will be part of the consideration for promotion to the next level of training, retention at the current level, remediation, probation, and non-renewal. All determinations for educational progress will be made a part of the resident's permanent educational file.

Introduction

The WVU Neurosurgical Residency is a 7 year (91 Cycle) program. There are 65 Cycles of core clinical neurosurgery of which 13 cycles months are the chief residency. In the internship, there is a 7-cycle rotation in general care and a 6-cycle rotation in neurocritical care. Longitudinal clinical experiences in anesthesia, neurology, pain medicine, pathology, and radiation oncology are distributed across this year. Beginning in PGY2, the resident begins to rotate on the clinical neurosurgery services. At times, Drs. Meltzer and Hamilton may function independently as a separate pediatric service with a dedicated resident when the resident curriculum schedule dictates such. The fourth year is the academic year, and is devoted to scholarly pursuit or enfolded fellowships. Academic pursuit may include graduate classes. The fifth year includes dedicated rotations in pediatrics and endovascular. The PGY6 and PGY7 split senior and chief responsibilities. The chief resident takes overall responsibility for the entire service. In summary, there are 13 cycles of internship, 26 cycles of clinical junior residency, a year of academic work, another 26 cycles of clinical senior rotations, and 13 cycles of clinical neurosurgery serving as chief resident.

Neuro-critical care experience is emphasized throughout the training, as well as extensive exposure to subspecialty services including neurovascular, neuro-oncology, epilepsy surgery, spinal neurosurgery, stereotactic radiosurgery, neurotrauma, functional neurosurgery and pediatric neurosurgery. Conferences are protected from clinical commitments and include morbidity and mortality conference, case conference, tumor board, asynchronous learning and board review, and journal club. Subspecialty conferences such as Epilepsy Conference or Spine Conference are encouraged. The anatomic dissection lab is available for scholarly work or preparation for operative cases.

Expectations

PGY7 residents in this program are expected to:

- Obtain a valid WV State Medical License or Training Permit, for the duration of the academic year
- Achieve appropriate levels of proficiency in each of the six ACGME Core Competencies
- Achieve expected levels of progress in each of the ACGME Neurosurgery Milestones
- Successful completion of the written neurosurgical board exam for the PGY7 year of training
- Quality Improvement and Patient Safety (QI/PS) research project involvement
- Scholarly activity (presentations and manuscript preparation)
- Daily logging of duty hours in the E-Value system
- Have an understanding of each of the ACGME Duty Hour regulations and adhere to the departmental policies and procedures that are designed to keep residents in compliance with all of the duty hour requirements.
- Every resident is strongly encouraged to participate in one academic paper yearly. Residents are highly encouraged to participate in and make significant contribution to a research project, during the academic year, in order to be listed as an author on a submitted publication.

- Mandatory attendance at all educational conferences, didactic sessions, etc., unless excused or absent for the day
- Maintain a healthy level of mental and physical wellness by adhering to the Fit For Duty guidelines, outlined in the Neurosurgery Handbook, and report any concerns with wellness immediately to the Program Director
- Residents will be assigned evaluations to complete semi-annually. Self, peer, program and faculty evaluations must be completed in a timely manner, which is defined as within two weeks of assignment, and meet completion deadline as assigned by the Program Coordinator.

Core Competency Educational Objectives

Develop graduating residents that possess a proficiency level appropriate for a new and independent neurological practitioner in the six core competencies as outlined by the ACGME.

Patient Care	1. Adapts standard treatment plans and techniques to special circumstances for brain tumors (e.g., recurrence, bone marrow suppression) 2. Performs complex craniotomy for brain tumor; assists with advanced craniotomy for brain tumor 3. Manages complex complications for brain tumors 4. Adapts standard treatment plans and techniques to special circumstances in the surgical treatment of epilepsy and movement disorders (e.g., Parkinson's plus, multifocal epilepsy) 5. Performs complex functional neurosurgical procedures; assists with advanced functional neurosurgical procedures 6. Manages complex complications in the surgical treatment of epilepsy and movement disorders 7. Adapts standard treatment plans and techniques to special circumstances for patients with pain and peripheral nerve disorders (e.g., cancer pain, deafferentation pain) 8. Performs complex chronic pain and peripheral nerve procedures; assists with advanced chronic pain and peripheral nerve procedures 9. Manages complex complications for patients with chronic pain and peripheral nerve procedures. 10. Adapts standard treatment plans and techniques to special circumstances for spinal neurological surgery(e.g., spinal deformity, post- irradiated spine, or infection) 11. Performs complex spinal surgery procedures; assists with advanced spinal surgery and reconstructive procedures 12. Manages complex complications for patients with spinal surgery procedures 13. Adapts standard treatment plans and techniques to special circumstances for vascular neurological surgery (e.g., vasculitis, ischemic heart disease) 14. Performs complex vascular neurosurgical and endovascular procedures; assists with advanced vascular neurosurgical and endovascular procedures 15. Manages complex complications for patients with vascular neurological surgery 16. Adapts standard treatment plans and techniques to special circumstances for pediatric neurological surgery (e.g., very young children and infants) 17. Performs complex pediatric neurosurgical procedures; assists with advanced pediatric neurosurgical procedures

	18. Manages complex complications for pediatric patients with neurological surgery
	19. Adapts standard treatment plans to special circumstances for patients with traumatic brain injury (e.g., medical co- morbidity, coagulopathy)
	20. Performs complex procedures for patients with TBI; assists with advanced procedures for patients with TBI
	21. Manages complex complications in patients with traumatic brain injury
	22. Diagnoses and initiates management of acute respiratory distress syndrome
	23. Performs complex and assists with advanced neurocritical care unit procedures; manages or initiates management of surgical airways
	24. Manages metabolic and nutritional support for critically-ill patients
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence
	2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography)
	3. Interprets anomalous presentations and rare disorders
	4. Adapts therapeutic choice to anomalous or rare patient presentations
Systems Based Practice	1. Analyzes patient safety events and offers error prevention strategies; advocates for safe and effective transitions of care within and across health care systems
	2. Advances multiple quality improvement initiatives through participation in a quality improvement working group or committee
	3. Prepares for transition to practice (e.g. information technology, risk management, billing and coding, financial, personnel)
Practice Based Learning	1. Participates in the creation and implementation of institutional guidelines or evidence-based practice protocols; analyzes and reports outcomes data
	2. Leads a clinical or basic scientific research effort, including application for funding
	3. Organizes educational activities at the program level; mentors residents and other health care professionals
Professionalism	1. Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others
	2. Coaches and assists others in meeting professional expectations; recognizes and responds to physical impairment in self and others
Interpersonal Communication	1. Consistently models and mentors others in optimal patient and family communications
	2. Models and mentors others in effective communication, including bidirectional feedback and conflict resolution; coordinates long-term care, including rehabilitation

General Duties

The Neurosurgery Residency is a seven-year training program. Duties and assignments for each PGY level are outlined in the Goals & Objectives for that level, which includes progressive patient care responsibilities for the day-to-day running of the neurosurgical service under the supervision of the faculty. At all levels, residents are expected to discuss and plan patient management, including surgical operations with the Attending's, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care, as appropriate. The PGY6 and PGY7 residents are responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. In addition the PG6 and PG7 residents provide overall supervision for conferences, including data collection for morbidity and

mortality conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. It is also the responsibility of the Chief Residents (PG6 and PG7) to communicate with Chief Residents from other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management.

Rotations

The neurosurgery residency is divided into thirteen 4-week cycles in each academic year. Each cycle at the PGY7 level consists of a 28-day curriculum that is based on PGY Level and educational progression in general Neurosurgery and Capstone experience in elective specialties, as desired and approved.   Each resident performance is assessed semi-annually at Clinical Competency Committee Meetings for Core Competency achievement, as well as Milestone progression.

Mandatory Rotation

Chief Resident Neurosurgery –Senior - PGY-7

6 cycles of 28 days each (168 days)

Supervisors: Cara Sedney, MD

Location: Ruby Memorial Hospital, Physician Office Center

Rotation Objectives:

Patient Care	1. Adapts standard treatment plans and techniques to special circumstances for brain tumors (e.g., recurrence, bone marrow suppression) 2. Performs complex craniotomy for brain tumor; assists with advanced craniotomy for brain tumor 3. Manages complex complications for brain tumors 4. Adapts standard treatment plans and techniques to special circumstances in the surgical treatment of epilepsy and movement disorders (e.g., Parkinson's plus, multifocal epilepsy) 5. Performs complex functional neurosurgical procedures; assists with advanced functional neurosurgical procedures 6. Manages complex complications in the surgical treatment of epilepsy and movement disorders 7. Adapts standard treatment plans and techniques to special circumstances for patients with pain and peripheral nerve disorders (e.g., cancer pain, deafferentation pain) 8. Performs complex chronic pain and peripheral nerve procedures; assists with advanced chronic pain and peripheral nerve procedures 9. Manages complex complications for patients with chronic pain and peripheral nerve procedures. 10. Adapts standard treatment plans and techniques to special circumstances for spinal neurological surgery(e.g., spinal deformity, post- irradiated spine, or infection) 11. Performs complex spinal surgery procedures; assists with advanced spinal surgery and reconstructive procedures 12. Manages complex complications for patients with spinal surgery procedures 13. Adapts standard treatment plans and techniques to special circumstances for vascular neurological surgery (e.g., vasculitis, ischemic heart disease)

	15. Performs complex vascular neurosurgical and endovascular procedures; assists with advanced vascular neurosurgical and endovascular procedures
	16. Manages complex complications for patients with vascular neurological surgery
	17. Adapts standard treatment plans and techniques to special circumstances for pediatric neurological surgery (e.g., very young children and infants)
	18. Performs complex pediatric neurosurgical procedures; assists with advanced pediatric neurosurgical procedures
	19. Manages complex complications for pediatric patients with neurological surgery
	20. Adapts standard treatment plans to special circumstances for patients with traumatic brain injury (e.g., medical co- morbidity, coagulopathy)
	21. Performs complex procedures for patients with TBI; assists with advanced procedures for patients with TBI
	22. Manages complex complications in patients with traumatic brain injury
	23. Diagnoses and initiates management of acute respiratory distress syndrome
	24. Performs complex and assists with advanced neurocritical care unit procedures; manages or initiates management of surgical airways
	25. Manages metabolic and nutritional support for critically-ill patients
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence
	2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography)
	3. Interprets anomalous presentations and rare disorders
	4. Adapts therapeutic choice to anomalous or rare patient presentations
Systems Based Practice	1. Analyzes patient safety events and offers error prevention strategies; advocates for safe and effective transitions of care within and across health care systems
	2. Advances multiple quality improvement initiatives through participation in a quality improvement working group or committee
	3. Prepares for transition to practice (e.g. information technology, risk management, billing and coding, financial, personnel)
Practice Based Learning	1. Participates in the creation and implementation of institutional guidelines or evidence-based practice protocols; analyzes and reports outcomes data
	2. Leads a clinical or basic scientific research effort, including application for funding
	3. Organizes educational activities at the program level; mentors residents and other health care professionals
Professionalism	1. Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others
	2. Coaches and assists others in meeting professional expectations; recognizes and responds to physical impairment in self and others
Interpersonal Communication	1. Consistently models and mentors others in optimal patient and family communications
	2. Models and mentors others in effective communication, including bidirectional feedback and conflict resolution; coordinates long-term care, including rehabilitation

Mandatory Rotation

Capstone –Senior - PGY-7

7 cycles of 28 days each (196 days)

Supervisors: Cara Sedney, MD

Location: Ruby Memorial Hospital, Physician Office Center

Rotation Objectives:

Patient Care	1. Leads interdisciplinary discussion in neurosurgical subspecialty of choice (tumor, epilepsy, functional, pediatrics, trauma, vascular, etc) 2. Performs advanced procedures in subspecialty of choice 3. Utilizes patient outcome data for quality improvement and new care pathways in subspecialty of choice
Medical Knowledge	1. Interprets unusual variations in patterns of disease occurrence 2. Prioritizes, orders, and interprets complex diagnostic studies (e.g., SPECT, cerebral perfusion, MR tractography) 3. Interprets anomalous presentations and rare disorders 4. Adapts therapeutic choice to anomalous or rare patient presentations
Systems Based Practice	1. Prepares for transition to practice (e.g. information technology, risk management, billing and coding, financial, personnel)
Practice Based Learning	1. Organizes educational activities at the program level; mentors residents and other health care professionals
Professionalism	1. Coaches and assists others in meeting professional expectations; recognizes and responds to physical impairment in self and others
Interpersonal Communication	1. Models and mentors others in effective communication, including bidirectional feedback and conflict resolution; coordinates long-term care, including rehabilitation

In the seventh and final year of training, the PGY7 resident completes 6 cycles of Chief Resident Neurosurgery Rotations. In the second half of the academic year, the resident is permitted to enhance their educational training by completing the final 7 cycles in their training, with experiences from other specialties. The final 7 cycles of this academic year, is referred to as Capstone Rotations, and is unique to each resident, based on requests submitted and approved by the Program Director. All rotations in this year are completed at Ruby Memorial Hospital and the Physician's Office Center.

The PGY7 resident is fully responsible for coordination of all patient care at RMH, resident manpower decisions, complication review, and the conference and call schedules. The total duration of the chief residency is 12 months, as per RRC requirements.

Clinical and Academic Duties

The PGY-7 year, the resident is responsible for the day-to-day running of the neurosurgical service under the supervision of the faculty. He/she is expected to discuss and plan patient management including surgical operations with the attendings, take leading roles in patient evaluation, planning of treatment, surgical procedures, and postoperative care. He/she is responsible for supervising resident assignments to the clinic and operating room, reviewing call and vacation schedules, and supervising the junior residents and medical students. He/she provides overall supervision for conferences including data collection for morbidity and mortality

conferences, and works with the Chairman of Neurosurgery and the Program Director to support the academic learning experience. He/she communicates with Chief Residents in other medical and surgical specialties to coordinate consultations, manage multi-trauma or other cases requiring team management. At this level, the resident is responsible to be fully familiar with billing and coding, medical liability and patient safety issues, governmental regulatory concerns and practice development. It is anticipated that the finishing resident will be fully qualified to practice the highest level of neurosurgery.

Operative Experiences

Throughout this year of training, the resident will log all operative cases and procedures in every setting, including bedside, pain clinic, Gamma Knife, interventional radiology, ICU, etc. in the Op-Log system of ACGME. Case logs are expected to be kept up to date at least weekly and are reviewed at each formal evaluation. Meal cards may be turned off for delinquent logging practices. Listed here are the minimum expectations by procedure, for completion at the end of the PGY7 year, compared to the minimum expectations upon graduation.

Category	PGY7 Expectations	Lead and Senior Minimums
ALL DEFINED CASE PROCEDURES		
Cranial		
Cranial: Tumor General	60	60
Cranial: Tumor Sellar/Parasellar	20	20
Cranial: Trauma/Other	60	60
Cranial: Vascular Open	10	10
Cranial: Vascular Endovascular	10	10
Cranial: Vascular Total	60	60
Cranial: CSF Diversion/ETV/Other	20	20
Cranial/Extracranial: Pain	10	10
Cranial/Extracranial: Functional Disorders	10	10
Cranial/Extracranial: Epilepsy	10	10
Total Cranial	NA	300
Spinal		
Spinal: Anterior Cervical	30	30
Spinal: Posterior Cervical	30	30
Spinal: Thoracic/Lumbar/Sacral Instrumentation Fusion	30	30
Spinal: Lumbar Laminectomy/Laminotomy	30	30
Spinal: Stimulation/Lesion/Pump/Other	10	10
Total Spinal	NA	300
Other		
Peripheral Nerve	10	10
Radiosurgery	10	10
Peripheral Device Management	20	20
Total Other	0	0
Critical Care		
Airway Management	10	0
Angiography	20	0

Arterial Line Placement	10	0
CVP Line Placement	10	0
EVD/Transdural Monitor Placement	30	0
Lumbar/Other Puncture/Drain Placement	10	0
Percutaneous Tap of CSF Reservoir	10	0
Total Critical Care	100	0
Pediatric		
Pediatric: Cranial Tumor	5	5
Pediatric: Cranial Trauma/Other	10	10
Pediatric: CSF Diversion/ETV/Other	10	10
Pediatric: Spinal	5	5
Total Pediatric	NA	40
Total	NA	800

Didactics and Assigned Learning

Didactic learning in the PGY7 year consists of:

- Curriculum-based Educational Sessions, which are held during protected didactic time on Friday mornings from 7:00am to 1:00pm. The educational sessions are divided into unique educational experiences, such as:

  o Tumor Board

  o Curriculum Lectures

  o Visiting Professor Grand Rounds

  o Case Conference

  o Journal Club

  o Board Review

  o Operative Skills Lab

  o Cadaver Labs

  o The Greenberg Presentation and Case Conference

- Experiential Learning Sessions, which are held during protected didactic time on Wednesday mornings from 7:00am – 8:00am and include sessions for:

  o M&M Conference

  o Oral Board Review

  o Neuro I/R Conference

  o NCCU Conference

  o Research

Milestones

PGY7 Residents are expected to be familiar with the ACGME Neurosurgery Milestones and are expected to work towards progress in mastering the individual skills/knowledge listed for each. The Clinical Competency Committee will meet twice each year, once in December, and once in June, to review Milestone progress for each resident and to assess a current level of mastery for each, for each resident. It is expected at the June meeting, the resident who will be completing their PGY7 year at that time, should have achieved the following Milestone levels:

	PGY4 Milestone Expectations	
PC1	Brain Tumor	4.0
PC2	Surgical Treatment of Epilepsy and Movement Disorders	4.0
PC3	Pain and Peripheral Nerve Disorders	4.0
PC4	Spinal Neurological Surgery	4.0
PC5	Vascular Neurological Surgery	4.0
PC6	Pediatric Neurological Surgery	4.0
PC7	Traumatic Brain Injury	4.0
PC8	Critical Care	4.0
MK1	Information Gathering and Interpretation	4.0
MK2	Critical Thinking for Diagnosis and Therapy	4.0
SBP1	Patient Safety	4.0
SBP2	Quality Improvement	4.0
SBP 3	Health Care Systems Awareness	4.0
PBL1	Evidence-Based Practice	4.0
PBL2	Research	4.0
PBL3	Mentorship and Teaching	4.0
PRO1	Ethical Behavior	4.0
PRO2	Well-Being	4.0
ICS1	Patient and Family Communication	4.0
ICS2	Communication in Coordination of Care	4.0

Resident Supervision

It is expected that residents are provided adequate and appropriate levels of supervision during the course of the educational training experience to ensure that patient care is delivered in a safe and effective manner.   All program faculty members that supervise residents, must have a faculty or clinical faculty appointment in the School of Medicine or be specifically approved as a supervising attending by the Program Director. Faculty schedules will be structured to provide residents with continuous supervision and consultation.

Residents must be supervised by faculty members in a manner promoting progressively increasing responsibility for each resident according to their level of education, ability and experience. Residents are provided information addressing the method(s) to access a supervisor in a timely and efficient manner at all times while on duty.

The program provides additional information addressing the type and level of supervision for each post-graduate year in the program that is consistent with ACGME program requirements and, specifically, for supervision of residents engaged in performing invasive procedures.

The following general supervision guidelines will be expected for residents in their PGY7 level of training:

PGY2 Resident Supervision	Inpatient Service	Intensive Care Units	Ambulatory Settings	Operating Rooms
Direct by Faculty	X	X	X	X
Direct by Senior Residents	X	X	X	X
Indirect, but immediately available Faculty	X	X	X	X
Indirect, but immediately available Senior Residents	X	X	X	
Indirect available	X	X	X	
Oversight	X	X	X	

Guidelines for Resident Mandatory Communication with Attending

The following situations require mandatory direct communication with the faculty responsible for patient care, both during routine working hours, and after hours and weekends. "Faculty responsible for patient care" means the staff of record for the patient, except in events when the faculty is physically out of town or can't be contacted, in which case the on call faculty should be notified. The staff of record should also be notified as soon as is feasible:
- Death
- DNR or other end of life decision
- Suicide attempt
- Violence requiring physical restraints
- Emergency surgery

- Acute drastic change in course
- Unanticipated invasive or diagnostic procedure
- Pregnancy
- Transfer of care to another medical or surgical service, including transfer to ICU
- Any serious adverse event
- Any complex decision making process that the resident does not feel adequately qualified to undertake without immediate input from faculty

Teaching Expectations

PGY7 Residents are expected to use this academic year to hone their teaching skills, which they will do by providing one-on-one guidance and instruction to both medical students rotating on our service, and lower level residents from Neurosurgery. It is expected that PGY7 residents function as both a learner and a teacher, as appropriate, during the course of each rotation, and are expected to provide ongoing teaching experiences to lower level learners.

Scholarship Requirements

In pursuit of scholarly activity, the PGY7 resident will be expected plan and carry out a scholarly project and/or to participate in research projects that will enable him/her to meet the requirement for obtaining a minimum of 6 PubMed indexed, peer reviewed papers in print (roughly one per year, excepting the chief year). Only residents who have made significant contribution to a research project will be listed as authors. Residents are encouraged to work together to carry research project to completion, however roles and authorship are to be decided and should be made clear at the beginning of collaboration. Any authorship disputes will be handled by the faculty mentor for the research. Presentation of research at national meetings is encouraged and the same authorship standards apply. The resident who plans to present the research should submit the research for consideration.

All research activities within the Department of Neurosurgery are bound by institutional research ethics. All research projects in which residents participate must be brought before the Residency Research Committee (Chair: Nick Brandmeir), be on file with Patricia Dekeseredy and/or Dan Cifarelli (Research Coordinators) and have IRB approval. All residents must have completed required training modules. All participants in a research project must be documented and approved by the faculty of record. NO PHI should be distributed in any fashion which will constitute a HIPAA violation. This includes sending PHI to medical student (MIX) email accounts. Case reports must have documented consent form signed by the patient.

QI projects are a required part of the residency curriculum. These may take a variety of formats. QI training takes place during the annual resident orientation.

Assessment Methods

The neurosurgery program provides a structure by which performance related to the training program will be assessed semi-annually, and consideration given for promotion to the next level of training, prior to the end of each academic year. Evaluation will be provided in accordance with Graduate Medical Education Committee policy and ACGME common program requirements.

Residents will receive written goals and objectives from the program annually, which will outline the expectations and objectives for each major rotation of the training program. In order to assess the attainment of the expectations outlined in the goals and objectives, the following assessment methods will be utilized:

- Formative Feedback from faculty at the end of each 4-week block
- 360 degree performance evaluations by peers, departmental faculty, NCCU, Anesthesia, nurses and staff, semiannually.
- Direct observation and precepting by faculty supervisors with ongoing feedback
- Clinical precepting evaluations performed on a quarterly basis by supervising faculty.
- Conference presentation evaluations (by residents, faculty, students and staff).
- Self-assessment and reflection form semiannually
- Neurosurgery Written In-Service Board Exam
- Semi-Annual Milestone evaluations by faculty
- Written evaluation by faculty supervisor semiannually

All residents participating in training will be provided, at a minimum, a semi-annual formal evaluation developed by the faculty, CCC, and Program Director. Residents shall be allowed to review all evaluations contained in permanent records. At a minimum, the Formal Written Evaluation shall:

- Address each of the six ACGME core competencies and RRC milestones.
- Include scoring and rating criteria that seek to minimize subjective assessment of performance.
- Include language indicating satisfactory performance, advancement to the next level of training (if applicable) or provide specific actions and performance requirements by the resident to return to a level of satisfactory performance or advancement to the next level of training.
- Be signed and dated by the resident and Program Director.
- Become a part of the permanent record file for the resident.

In addition, each resident will meet, near the midpoint of each rotation, with an assigned faculty advisor according to PGY year, for an informal progress evaluation to assess strengths and weaknesses in performance, so that adjustments can be made over the remainder of the rotation. Each meeting with the advisor will address multiple domains on a standardized form as determined by the PEC.

All of the above listed assessment methods will be used by the departmental Clinical Competency Committee to determine overall educational progress for the resident for the academic year, and will be part of the consideration for promotion to the next level of training, retention at the current level, remediation, probation, and non-renewal. All determinations for educational progress will be made a part of the resident's permanent educational file.