Yale University School of Medicine
Yale-New Haven Hospital

Department of Neurosurgery

Resident Handbook

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Introduction

The Yale Neurosurgery Residency Program is designed to provide a broad neurosurgical background and an exposure to subspecialty neurosurgery as well as an opportunity to engage in both clinical and basic research such that the individual resident may choose the clinical or academic practice of neurosurgery.

Education is the binding theme of the Department’s effort. The Department requires residents to learn, not just to be taught; it expects all participants to actively contribute to the learning process, not passively accept it. Personal contact with the faculty provides for individual evaluation of the resident’s performance in seminars, on the wards, in the operating room, in the clinics and in the laboratory. The faculty can then best understand each resident’s needs, potential, and productivity.

The Neurosurgical Residency Program at the Yale-New Haven Hospital is a seven-year program under the direction of the Department of Neurosurgery, Yale School of Medicine and the Office of Graduate Medical Education, Yale-New Haven Hospital.

While it is expected that those entering the program will complete their residency, all appointments to the program are for one year with advancement based on continuing acceptable performance. Residents are evaluated continuously by the faculty and senior residents in accordance with the requirements of these institutions and the ACGME.

Application to the Program

Application to the Program is strictly through Electronic Residency Application Service (ERAS) and the match for neurosurgery is through the National Resident Match Program (NRMP). Details of the process may be found at each of their websites, [http://www.aamc.org/students/eras/](http://www.aamc.org/students/eras/) and [http://www.nrmp.org/](http://www.nrmp.org/). Our Program matches 2 positions each year. Applications are reviewed by the faculty and invitations are offered for interviews. The two-day interview takes place between November and January during selected weeks. Every effort is made to accommodate applicant travel schedules. Applicants are strongly encouraged to consider a subinternship experience prior to application.

Recruitment of women into neurosurgery and particularly into academic neurosurgical careers is of great importance to our Department and to Neurosurgery in the U.S. Applications by individuals from groups under-represented in medicine are encouraged to apply. In compliance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act, it is the policy of Yale University and Yale-New Haven Medical Center to provide reasonable accommodation for applicants with disabilities.

The Yale Department of Neurosurgery has always been on the forefront of recruiting underrepresented minorities and women into the training program. Nationally, among the pool of neurosurgery residency applicants, these two groups represent less than 10% and 12%, respectively. In contrast, of the 31 residents finishing the Yale program in the last 15 years or currently in the program, 16% are from underrepresented minorities and 23% are female.

Educational Goals of the Program

The primary educational goals of the Yale Neurosurgery Residency Program are to produce outstanding clinical neurosurgeons, educators and researchers. These men and women are bright, dedicated and enthusiastic. Providing them with an education that will foster those intellectual skills necessary to succeed in clinical care, laboratory techniques and clinical trials and a mechanistic understanding of scientific inquiry will enable them to lessen the burden of neurologic disease in our country today.


Peggy McLaughlin, Residency Coordinator

Charles C. Duncan, MD, Program Director

Revised 2014
AFTER THE MATCH

After the Match you will receive a contract to sign and return. The House Staff office will send a list of online courses to complete prior to your arrival. You will be paid for this time. You will need to plan a visit to New Haven to arrange housing. Current residents, House Staff Office and our Residency Coordinator, Mrs. McLaughlin, as well as your friends can be helpful resources.

Orientation is with the Department of Surgery.

The Program sequence is detailed below.

BLOCK DIAGRAMS

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Following orientation residents begin monthly rotations consisting of Neuro-Critical Care, Neurosurgery Fundamentals, Day Float and Night Float. Goals and Objectives for these rotations follow. During the summer there is weekly clinical neuroscience fundamentals lecture series and a two-day Boot Camp in Boston. For the first 6 months PGY 1 residents will attend a Neurology Clinic each week as noted on the block schedule. During the second half of the year PGY 1s attend a neurosurgery specialty clinic each week except when Day or Night Float. Throughout the year PGY 1s attend the Didactic Lecture series on Friday afternoons unless Night Float. Near the end of the PGY 1 year there is a second national resident course with greater depth in operative management and leadership skills. You will attend the one in New York. For the first 6 months residents are generally directly supervised.

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**Notes**

1. Precise dates are on Master Block Diagram.
2. For the first 6 months PGY 1’s attend a weekly Neurology Specialty Clinic.
3. For the second 6 months PGY 1’s attend at Neurosurgery Specialty Clinic.
4. Orientation is with the Department of Surgery and during the summer PGY 1’s attend the Neurology Fundamentals Course.
5. For the first half of the year blocks are 4 week and in the second half they are monthly.
FUNDAMENTALS (NEUROSURGERY/NICU)

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

Resident Responsibilities:

The neurosurgery rotation is designed such that you run ICU rounds in the AM. Your responsibility is to write all the ICU notes.

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

Patient Care - Goals and Objectives:

1. Perform a competent and comprehensive neurological evaluation including relevant history and detailed neurological examination.
2. Adapt the evaluation to pertinent positives and negatives related to traumatic brain injury, spinal injury, and ischemic and hemorrhagic stroke.
3. Perform comprehensive systemic assessment in relation to these same clinical entities. Recognize the need for diagnostic studies and their prioritization in relation to common presentations of trauma, hemorrhagic and ischemic stroke.
4. Recognize the need for laboratory studies related to multi-system homeostasis and other clinical assessment of these entities.
5. Recognize the common expected clinical course of patients with traumatic brain injury, spinal injury, ischemic and hemorrhagic stroke.
6. Recognize phases of illness with common systemic and neurologic complications (including periods of vulnerability to respiratory, hemodynamic, cardiac and other common complications).
7. Recognize specifically the clinical course of anticipated edema following traumatic brain injury, spinal injury and stroke, and its general principles of management. Recognize specifically the time course and management principles of vasospasm following subarachnoid hemorrhage.
8. Perform a specific, rapid assessment of patients during neurologic emergencies, and the priorities of airway, hemodynamic, and neurologic resuscitation.
9. Recognize the indications and timing of operative intervention for traumatic brain injury, spinal injury, and hemorrhagic and ischemic stroke. Initiate appropriate pre-operative testing for emergency surgical intervention. Interpret pre-operative diagnostic studies and relation to common emergent and elective surgical interventions for trauma and stroke.
10. Understand and apply assessment and intervention paradigms for abnormal respiratory function, cardiac and hemodynamic function, and elevated intracranial pressure.
11. Understand and apply protocols for barbiturate induced coma, including timing of intervention and management of therapy and its common complications.

12. Perform placement of arterial catheters, central venous catheters, pulmonary artery catheters, and burr hole/twist–drill ventricular catheter placement, including indications, landmarks, performance of the procedure (supervised at least five, unsupervised at least five) and post-procedure verification of placement accuracy and application of the devices to the patient care plan.

Medical Knowledge - Goals and Objectives:
1. Recognize the principles, indications, and interpretation of normal and common pathologic findings on x-rays of the cervical, thoracic and lumbar spine, skull and chest. Recognize adequate and inadequate x-ray studies and common pathologic abnormalities on these respective x-rays, in association with trauma, stroke, and common complications in the intensive care unit.

2. Understand the fundamentals of computerized tomographic imaging and magnetic resonance imaging (CT and MRI), normal findings, general localization of pathology in relation to neuro-anatomic structures and vascular structures, and the appearance of pathologic findings in association with trauma and stroke.

3. Recognize the indications for non-invasive vascular imaging with ultrasound, MRA, and CT contrast studies, the emergency use of these modalities and their common interpretation, and limitations of non-invasive vascular imaging. Interpret carotid ultrasound and transcranial doppler diagnostic findings in the setting of trauma, stroke, and clinical vasospasm.

4. Understand the indications for catheter angiography, its general principles (including anatomic vascular access) and the broad interpretation of angiographic findings in ischemic and hemorrhagic cerebrovascular disease.

5. Correlate the location of focal cranial and spinal pathology to the region of the neuraxis, and ability to localize this region using anatomic landmarks, x-ray, and stereotactic guidance.

6. Perform routine lumbar puncture, and tapping of reservoirs and shunts.

Practice-Based Learning and Improvement – Goals and Objectives:

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

Residents are expected to develop skills and habits to be able to meet the following goals:
1) identify strengths, deficiencies, and limits in one’s knowledge and expertise;
2) set learning and improvement goals;
3) identify and perform appropriate learning activities;
4) systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;
5) incorporate formative evaluation feedback into daily practice;
6) locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems;
7) use information technology to optimize learning; and,
8) participate in the education of patients, families, students, residents and other health professionals.
9) apply knowledge of study design and statistical methods to critically appraise the medical literature;
10) Facilitate the learning of students and other health care professionals
10). (a) Resident participation in undergraduate medical education is desirable.
Systems-Based Practice – Goals and Objectives:

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

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

Professionalism – Goals and Objectives:

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to demonstrate:
(1) compassion, integrity, and respect for others
(2) responsiveness to patient needs that supersedes self-interest;
(3) respect for patient privacy and autonomy;
(4) accountability to patients, society and the profession; and,
(5) sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.
(6) treat patients/family/staff/ paraprofessional personnel with respect;
(7) demonstrate sensitivity to patient’s pain, emotional state, and gender/ethnicity issues;
(8) discuss death honestly, sensitively, patiently, and compassionately;
(9) exemplify integrity;
(10) accept responsibility/accountability;
(11) demonstrate reliability;
(12) maintain calm, even temperament;
(13) exhibit self-awareness and knowledge of limits;
(14) respond to the comments of other team members, patients, families, and peers openly and responsibly; and,
(14).(a) Graduate training in neurological surgery requires a commitment to continuity of patient care, as practiced by qualified neurological surgeons. This continuity of care must take precedence-without regard to the time of day, day of the week, number of hours already worked, or on-call schedules. At the same time, patients have a right to expect a healthy, alert, responsible, and responsive physician dedicated to delivering effective and appropriate care.

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

Residents are expected to:
(1) communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
(2) communicate effectively with physicians, other health professionals, and health related agencies;
(3) work effectively as a member or leader of a health care team or other professional group;
(4) act in a consultative role to other physicians and health professionals; and,
(5) maintain comprehensive, timely, and legible medical records.
(6) develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
(7) develop effective written communication skills;
(8) involve patients in medical decisions; and,
(9) strengthen listening and non-verbal communication skills.
Responsibilities of Neurocritical Care Team Members

Mission
The Yale Neuroscience Intensive Care Unit aims to provide the most sophisticated, empathic care possible to critically ill patients with nervous system injuries.

Goal of the Educational Experience
The goal of service in the Neuroscience ICU is to first provide patients with the best care possible and in parallel, to provide all members of the team with a unique opportunity to learn and apply critical care principles to neurologically injured patients. This will be accomplished in a multi-disciplinary setting.

Neuroscience ICU Attending
The Neuroscience ICU attending is responsible for coordinating and supervising all activities in the ICU. These responsibilities include but are not limited to: patient care, triage of inter and intra hospital transfers, team supervision and teaching, and communication between all colleagues, in and out of the unit. It is expected that the attending will be either physically present in the neuroscience ICU or reachable at the bedside within 5 minutes of a call throughout the day. If an attending is unable to be available for an extended period of time, arrangements should be made for coverage. During evening hours, attendings should be available and are expected to return pages within 10 minutes. In addition, ICU attendings are expected to make every effort to support trainees’ attendance at educational conferences and working in a timely manner so that the ICU can operate efficiently. Attendings are also responsible for inviting bedside nurses for ICU rounds on every patient as they are critical members of the ICU team. Finally, attendings will be expected to meet with family members on a regular basis. Any conflicts in patient management between the ICU team and parent services (neurology, neurosurgery) should be brought to the attention of the medical director of the ICU immediately (24/7/365).

Neuroscience Critical Care Fellow
The critical care fellow, under the supervision of the attending, is the primary physician responsible for coordinating the care of the patients in the Neuroscience ICU. The fellow will not routinely be expected to act as the primary physician for individual patients; however, (s)he will do so when the unit volume is high and available providers are limited. Otherwise, medical students, residents, and APPs are expected to pre-round, formulate and present the differential diagnosis, problem assessment, and management plan for each patient. The fellow is responsible for directing and coordinating the assignment of providers to patients and also for filling any gaps in coverage.

With progressive responsibility, the fellow will supervise residents and APPs, review and comment on individual patient plans, and be responsible for formal and informal teaching throughout the day. The fellow may be asked to assist and supervise residents/APPs with procedures, and they may learn procedural skills from attending physicians or APPs that have been signed off per local policy. They will share in night call with the attending physician over the fellowship period and also contribute to ongoing research activities in the unit. When the fellow leaves the unit for conferences or extended periods of time, (s)he will notify team members or the charge nurse. In general, the weekday daily work flow for the fellow is as follows:

- **0600-0630** – The fellow will arrive onto the unit for neurosurgery rounds. They will review individual plans for neurosurgical patients and participate in neurosurgery rounds in the ICU.
- **0700-0800** – The fellow will assist in any ongoing issues for patients, assist ICU team members in preparing for rounds, and facilitate, with the charge nurse and attending physician, any pending transfers in or out of the ICU. They will also check in with individual nurses and patients that are not critically ill and that the entire ICU team may not round on (eg patients waiting for floor bed).
- **0800-1130** – Multidisciplinary ICU rounds and follow up with related services (eg ICU EEG).
- **1130-1300** – With occasional exceptions and for fellow conferences, the fellow will remain proximal to the ICU to facilitate patient flow and will work with the APP group to cover residents for any educational conferences.
- **1300-1730** – The fellow will attend any educational activities but otherwise have primary responsibility and immediate supervision of patient care in the ICU.
- **1730-1800** – The fellow will supervise and support evening signout.

Advanced Practice Providers
Along with the fellow, they are the consistent, full time providers of patient care in the neuroscience ICU. The APPs will be the primary practitioner for individual patients. APPs will perform patient related procedures once competency has been achieved,
and along with the fellow, they will also participate in the coverage of patients when residents are off the unit for educational conferences. On-service APPs will participate in all ICU based conferences. They will admit and follow both neurology and neurosurgery patients, up to 5-8 patients. This means that they will be responsible for:

1. Obtaining and maintaining the history and physical for each patient.
2. Pre-rounding each morning which includes a thorough examination of the patient, collection and review of all pharmacologic, laboratory, diagnostic and radiographic data, assembly of a proposed plan, organized by organ system or problem, as well as initial documentation of the above prior to ICU rounds.
3. Presenting the above to the ICU team during rounds and implementation of patient care throughout the day.
4. Communicating with the fellow and attending regarding individual patient status, admission and transfer.
5. Participating in daily team signout and patient signout according to service requirements (eg neurology, neurosurgery) when the patient is discharged from the ICU.

In general, the daily work flow is as follows:
- **0600** – The APP will arrive onto the unit and receive overnight signout overnight provider.
- **0630-0800** – Pre-round as defined above and prepare for ICU team rounds, including review of EPIC data and preparation of ICU note.
- **0800-1130** – Participate in multidisciplinary ICU rounds. Consults and orders should be entered by a dedicated member of the team when not presenting.
- **1130-1730** – Perform all activities related to immediate patient care for primary patients.
- **1730-1800** – Participate in evening signout.

The expectation for overnight coverage is that the ICU is supported so that patient care activities can occur safely 24/7. The APP will be available to cover all unit patients but will work with housestaff where appropriate. Specifically, APPs will be expected to follow up and implement any plans discussed on evening sign out, follow up on ICU protocols for patients, perform the initial intake and stabilization for any patient admitted to the unit along with the primary admitting service, respond to all ICU patients, and prepare template notes for the ICU team. The APP will be readily available for immediate orders and communication from nursing. They will contact the covering resident as appropriate and in the following circumstances: urgent need for a procedure, new patient admission, clinical deterioration, unexpected test result.

The overnight work flow is as follows:
- **1730-1830** – Participate in evening signout.
- **1900-0000** – Follow up on any post-operative patients, and briefly check in with every bedside nurse. Implement any plans discussed at evening signout, including ventilator changes, fluid management, follow up of imaging studies.
- **0000-0600** – Review and ensure that all ICU best practices are implemented on all patients (eg prophylaxis, optimal restraint and sedation regimens, foley catheter removal, diet status), medication reconciliation, review and edit ICU notes for morning rounds.
- **0000-0600** – Perform any new patient admissions, contact fellow or attending for any new admissions, changes in patient status, or new data. Ensure that transfer orders and summaries are in place. If this is not the case, the fellow should be notified immediately at morning signout rounds.

APPs will have access to an organized educational program as a source for key consensus guidelines, book chapters, reviews, and landmark clinical trials relevant to day-to-day Neuro ICU clinical practice.

**Neurology & Neurosurgery Residents**
Neurology and neurosurgery residents function as members of the ICU team caring for “neuroscience” patients while a member of the ICU team. They will be the primary practitioner for individual patients. Residents will perform patient related procedures once competency has been achieved. Residents will participate in all ICU based conferences. They will admit and follow both neurology and neurosurgery patients, up to 5-8 patients. Residents will also be responsible for any medical student rotators for whom they will serve as a primary preceptor. For day-to-day activities, they will be responsible for:

1. Obtaining and maintaining the history and physical for each patient.
2. Pre-rounding each morning which includes a thorough examination of the patient, review and collection of all pharmacologic, laboratory, diagnostic and radiographic data, assembly of a proposed plan, organized by organ system or problem, as well as initial documentation of the above prior to ICU rounds.
3. Presenting the above to the ICU team during rounds and implementation of patient care throughout the day.
4. Communicating with the fellow and attending regarding individual patient status, admission and transfer.
5. Participating in daily team signout and patient signout according to service requirements (eg neurology, neurosurgery) when the patient is discharged from the ICU.

In general, the daily work flow is as follows:
1. 0600 – Residents will arrive onto the unit and receive overnight signout from the overnight provider.
2. 0630-0800 – Pre-round as defined above and prepare for ICU team rounds, including review of EPIC data and preparation of ICU note.
3. 0800-1130 – Multidisciplinary ICU rounds. Consults and orders should be entered by a dedicated member of the team when not presenting.
4. 1130-1730 – Perform all activities related to immediate patient care for primary patients as well as covered patients if a team member is off unit for extended period of time.
5. 1730-1800 – Participate in evening signout.

Residents will review the description and educational objectives of the neuroscience ICU rotation. In addition, they will use the organized online resident link as a source for key consensus guidelines, book chapters, reviews, and landmark clinical trials relevant to day-to-day Neuro ICU clinical practice.

Medical Students
Third and fourth year medical students will be assigned patients. They are expected to admit, evaluate, and manage patients under the immediate supervision of housestaff and fellows. Students are expected to introduce themselves to the attending at the beginning of the week and develop a plan for mid and end of rotation feedback. Students are expected to notify residents and fellows at the beginning of the week of all scheduled educational activities.

Guidelines for Neuro-ICU Presentations
Because ICU patients can be complicated, presentations on morning rounds are most effective when they are structured and well-organized. The role of the presenting provider is to convey a coherent picture of what has been "going on" with the patient to the rest of the team. This serves as a take off point for examination of the patient, review of imaging studies, and discussion. The end-point of each discussion is to formulate a plan for the day. We expect the resident (not the fellow or attending) to initiate the discussion of a plan by systems. A systems format for organizing morning presentations follows:

EVENTS OF PRECEEDING 24 HOURS: (For new admissions this is replaced by a complete CC, HPI, PMH, Meds, All, SH, FH, ROS. Otherwise this should include spontaneous breathing trial performance, interventions, diagnostic test results, deterioration, etc...)

VITAL SIGNS: HR, BP, RR, Temp, ICP, CPP, I+O's including EVD output and vent setting / recent ABGs, hemodynamic values if appropriate [CVP, PAD, PCWP, CO, SVR].

DRIPS AND INFUSIONS: fluids, vasoactive and sedative meds (by dose not cc/hr), feeds

LABS: BMP, Mag/Phos/Ca, CBC, AED levels, etc...

IMAGING/MONITORING:
1. CT, MRI, Angio, TCDs
2. EEG
3. Other Studies:
   a. CXR/CT
   b. ECG
   c. ECHO

BEDSIDE EXAM: Resident provides summary of findings, and then the entire team examines the patient together.

PLAN BY SYSTEMS (in this order):

Revised 2014
NEUROLOGICAL: (What do you think is going on with the patient? How do you explain the findings? Are further diagnostic studies are needed? LP, TCDs, CT, MRI, cEEG? What are the therapeutic goals for the day? Do we need to adjust any on-going therapies, including osmotherapy, sedation, antiepileptics, pain control, and mobilization?) Are PT/OT and speech ordered?

CARDIOVASCULAR: (Is cardiac performance optimized for achieving neuro goals? What is the pump function? What is the goal BP (MAP)?, Did review of telemetry reveal new arrhythmias? ) Do BP meds or pressors need to be adjusted? Does the patient need to be evaluated for ischemia?

PULMONARY: (Do vent settings need to be adjusted? What is the vital capacity/minute ventilation? , How are the secretions/CXR/ABG?, Is the patient ready for weaning, extubation or in need of a trach?.

RENAL/ FLUIDS/ELECTROLYTES: (Acute and/or chronic kidney failure do meds need renal dosing adjustments, etc… Have all the lytes been repleted? Is the patient euvoletic? What are our sodium and/or fluid balance goals? Is the foley still necessary?)

INFECTIOUS DISEASE: (WBC, Fever, antibiotics [day#], culture results, CSF surveillance, Is the patient on chlorhexadine while intubated? Does the patient have a VAP, CAUTI or CLABSI?).

GI: (Is the patient receiving adequate nutritional support? Is the patient on a PPI/H2 blocker? Do they need to be? When was the last BM? Does the patient need a formal swallow eval or PEG?)

ENDOCRINE: (Is the serum glucose level well controlled? Is the patient in DI? Do we need to adjust e.g. diabetes mellitus or diabetes insipidus management?)

HEMATOLOGIC: (Hct & platelets, coags, transfusions, Is the patient on DVT ppx? Is the patient on full anticoagulation? If so, have the ASA and subcutaneous heparin or loveneox been discontinued? Does the patient need dopplers?)

PSYCHOSOCIAL: (Is the family involved? Has the patient’s PMD been contacted? Does the patient need a social work and/or care coordination consult?)

SKIN: (Is there any skin breakdown? Does the patient need a wound consult?)

ACCESS: (Day # of a-lines and central lines, Does the patient still need them? Is it time for a PICC or can the nurse get peripherals?)

CODE STATUS: (All patients should have this identified within first 24 hours of admission)
DAY FLOAT

Description:
1. Oversees all neurosurgical patients, operative cases, procedures, and consults during day shift. Is in constant communication with residents and attendings as well as other services to ensure appropriate patient care.
2. In charge of obtaining sign out from all 4 neurosurgical services, and working closely with mid-levels, interns, residents, and attendings to execute daily plans.
3. Updates chief residents and attendings about changes in patient care.
4. In charge of executing all bedside procedures.

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

Patient Care – Goals and Objectives:
1. Develop effective communication skills with patients and their families as well as develop ability to communicate plans to patients.
2. Interpret diagnostic imaging studies.
3. Perform initial stabilization and management of patients.
4. Respond in timely fashion to patient needs.

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

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

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

Residents are expected to develop skills and habits to be able to meet the following goals:
1. Interpret diagnostic imaging studies.
2. Perform initial stabilization and management of critically ill ICU and emergency room patients.

Revised 2014
3. Basic skills for all bedside procedures

**Professionalism – Goals and Objectives:**

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

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

**Interpersonal and Communication Skills – Goals and Objectives:**
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Residents are expected to:

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

Revised 2014
NIGHT FLOAT

Description: The night float resident carries the Neurosurgery consult pager and is responsible for managing the entire Neurosurgery service - including primary floor patients, ICU patients, and consult patients - overnight.

Resident Responsibilities:
1. Collect sign out from the day team and NICU team on all patients on the Neurosurgery service
2. Carry the Neurosurgery consult pager and see all consults that are called in overnight. This includes discussing clinical data and plans with the on-call chief resident and attending surgeon
3. Act as the point person and manage all primary floor and ICU patients (in conjunction with overnight NICU team)
4. Perform all bed-side procedures required on all floor, ICU (in conjunction with overnight NICU team), and consult patients
5. Sign out to the day team in the morning

Patient Care – Goals and Objectives:
1. Become proficient in the comprehensive neurosurgical history and physical examination
2. Interpret diagnostic imaging studies with neuroradiology fellows and attendings
3. Develop the ability to recognize neurosurgical and clinical emergencies
4. Perform initial stabilization and management of critically ill ICU and emergency room patients.
5. Develop basic technical and operative decision making skills.

Medical Knowledge – Goals and Objectives:
1. Participate in daily teaching by senior residents during work rounds
2. Read standard neurosurgery texts and landmark articles.

Practice-Based Learning and Improvement – Goals and Objectives: Residents are expected to:
1. Demonstrate the ability to investigate and evaluate their care of patients,
2. Appraise and assimilate scientific evidence
3. Continuously improve patient care based on constant self-evaluation and life-long learning
4. Track procedures, operations, and outcomes in a centralized database.
5. Learn operating skills through constant attending and senior resident feedback during procedures.
6. Plan research activities and write grant applications.

Systems-Based Practice – Goals and Objectives: Residents are expected to:
1. Demonstrate an awareness of and responsiveness to the larger context and system of health care
2. Call effectively on other resources in the system to provide optimal health care
3. Appreciate the value of system-based practice and learn to study, improve, and contribute to the system

Professionalism – Goals and Objectives:
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.
Residents are expected to:
1. Maintain a professional demeanor towards patients, health professionals on collaborating services, and hospital staff under stressful circumstances
2. Respond promptly to pages and consults
3. Communicate effectively with collaborating hospital services

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

Residents are expected to:
1. Respond promptly to pages and consults
2. Communicate pertinent clinical information to the on call chief resident and attending in a clinically appropriate time frame
3. Communicate in an effective and timely manner with collaborating healthcare professionals and hospital services
4. Develop comfort in providing diagnosis and treatment plans to patients and their families
5. Develop comfort in delivering bad news and leading end-of-life discussions with patients and their families
This year is marked by greater patient management and operative responsibilities. It consists of Day Float, Night Float, VA, Gamma Knife and operative rotations. Outpatient experiences are at the VA and Gamma Knife. Goals and Objectives for each rotation follow.

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**DAY FLOAT**

**Description:**
1. Oversees all neurosurgical patients, operative cases, procedures, and consults during day shift. Is in constant communication with residents and attendings as well as other services to ensure appropriate patient care.
2. In charge of obtaining sign out from all 4 neurosurgical services, and working closely with mid-levels, interns, residents, and attendings to execute daily plans.
3. Updates chief residents and attendings about changes in patient care.
4. In charge of executing all bedside procedures.

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

**Patient Care – Goals and Objectives:**
1. Develop effective communication skills with patients and their families as well as develop ability to communicate plans to patients.
2. Interpret diagnostic imaging studies.
3. Perform initial stabilization and management of patients.
4. Respond in timely fashion to patient needs

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

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

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

Residents are expected to develop skills and habits to be able to meet the following goals:
1. Interpret diagnostic imaging studies
2. Perform initial stabilization and management of critically ill ICU and emergency room patients
3. Basic skills for all bedside procedures

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

Residents are expected to:
1. Develop relationship with other services
2. Develop insight on when to contact chief residents and/or attendings regarding larger patient issues that require complex health care resources

Interpersonal and Communication Skills – Goals and Objectives:
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Residents are expected to:
1. Develop communication skills to effectively obtain as well as effectively deliver information to midlevels, attendings, and other services
2. Develop insight on when to seek help and/or provide information to chief residents and/or attendings regarding important time-sensitive patient information
3. Become comfortable in providing diagnosis and treatment plans to patients and their families
4. Develop comfort in goals of care discussion, specifically leading the discussion for critically ill patients
NIGHT FLOAT

**Description:** The night float resident carries the Neurosurgery consult pager and is responsible for managing the entire Neurosurgery service - including primary floor patients, ICU patients, and consult patients - overnight.

**Resident Responsibilities:**

1. Collect sign out from the day team and NICU team on all patients on the Neurosurgery service
2. Carry the Neurosurgery consult pager and see all consults that are called in overnight. This includes discussing clinical data and plans with the on-call chief resident and attending surgeon
3. Act as the point person and manage all primary floor and ICU patients (in conjunction with overnight NICU team)
4. Perform all bed-side procedures required on all floor, ICU (in conjunction with overnight NICU team), and consult patients
5. Sign out to the day team in the morning

**Patient Care – Goals and Objectives:**

Become proficient in the comprehensive neurosurgical history and physical examination.

1. Interpret diagnostic imaging studies with neuroradiology fellows and attendings
2. Develop the ability to recognize neurosurgical and clinical emergencies
3. Perform initial stabilization and management of critically ill ICU and emergency room patients.
4. Develop basic technical and operative decision making skills.

**Medical Knowledge – Goals and Objectives:**

1. Participate in daily teaching by senior residents during work rounds
2. Read standard neurosurgery texts and landmark articles.

**Practice-Based Learning and Improvement – Goals and Objectives:**

**Residents are expected to:**

1. Demonstrate the ability to investigate and evaluate their care of patients,
2. Appraise and assimilate scientific evidence
3. Continuously improve patient care based on constant self-evaluation and life-long learning
4. Track procedures, operations, and outcomes in a centralized database.
5. Learn operating skills through constant attending and senior resident feedback during procedures.
6. Plan research activities and write grant applications.

**Systems-Based Practice – Goals and Objectives:**

**Residents are expected to:**
1. Demonstrate an awareness of and responsiveness to the larger context and system of health care
2. Call effectively on other resources in the system to provide optimal health care
3. Appreciate the value of system-based practice and learn to study, improve, and contribute to the system

Professionalism – Goals and Objectives:
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to:
1. Maintain a professional demeanor towards patients, health professionals on collaborating services, and hospital staff under stressful circumstances
2. Respond promptly to pages and consults
3. Communicate effectively with collaborating hospital services

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

Residents are expected to:
1. Respond promptly to pages and consults
2. Communicate pertinent clinical information to the on call chief resident and attending in a clinically appropriate time frame
3. Communicate in an effective and timely manner with collaborating healthcare professionals and hospital services
4. Develop comfort in providing diagnosis and treatment plans to patients and their families
5. Develop comfort in delivering bad news and leading end-of-life discussions with patients and their families
Description: The VA rotation is an integral part of training for Yale Neurosurgery Residents. Residents rotate at the VA for a total of 6 months during PGY-2 and PGY-3. At this time, the resident has already had ample experience in the management of inpatient floor, inpatient ICU patients, and in seeing ED and inpatient consults under the supervision of both the chief resident and attending neurosurgeon. During the VA rotation, residents are further transitioned towards independence in that they work more directly with the neurosurgery attending, and are expected to demonstrate more independence in patient care in and out of the operating room. Additionally, there is a more substantive outpatient clinical experience during this rotation than in prior rotations.

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

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

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

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

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

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

Interpersonal and Communication Skills – Goals and Objectives
The VA resident interacts with patients and other health care professionals throughout the rotation. The resident is expected to demonstrate and refine interpersonal and communication skills across a wide range of interactions including: communication with patients and families before and after an operative intervention which includes conveying the pathology and explanations of treatment options, consequences, and complications in a manner in which they are able to fully understand; communication with other health professionals including support staff (i.e. with nursing to ensure the patients are obtaining proper care), other MDs during consultations and cross-disciplinary care, and the neurosurgery attending to keep them adequately appraised of each patient’s status and plan of care.
GAMMA KNIFE

Description: The Gamma Knife rotation consists of one day per week during the resident’s VA rotation. During this time, the resident is involved in the treatment of patients requiring treatment with gamma knife radio-surgery. During this rotation the resident learns about the neurosurgical indications for GKSRS, as well as the radiation oncology aspects of focused radiation therapy.

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

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

Medical Knowledge – Goals and Objectives:
The resident is expected to learn:
1. the indications and contra-indications for single fraction radio-surgery in patients with primary and metastastic brain tumors, vascular malformations and facial pain
2. the indications and contra-indications for repeat radio-surgery for the same indications
3. the expected result of treatment with radio-surgery for the above commonly listed conditions
4. the role of radio-surgery versus open surgical treatment versus standard radiation therapy options in the management of the same conditions and the factors that determine patient and physician choice to use radio-surgery
5. the potential acute and chronic complications of radio-surgery and the medical and surgical management options for these complications
6. the fundamentals of dose planning particularly in avoidance of critical anatomic structures
7. how to place and remove the head frame independently

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

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

Professionalism – Goals and Objectives:
Revised 2014
The resident directly interacts with patients and is expected to act in a professional and sensitive manner at all times. The resident also interacts with numerous other professionals including radiation oncologists, radiation technicians, and nursing staff to provide care, and is expected to act professionally and ethically during all interactions.

**Interpersonal and Communication Skills – Goals and Objectives**

The patients undergoing gamma knife procedures are awake during the procedure and thus communication with the patient needs to be on-going and requires more clarity and sensitivity in communication throughout the procedure compared with typical operative patients. The resident works directly with the patient and numerous other healthcare professionals. The resident is expected to clearly communicate with the patient to manage expectations and answer questions regarding treatment and post-treatment events in a manner they can fully comprehend. The resident is expected to communicate clearly with other healthcare professionals to provide appropriate care. The resident is expected to assist in keeping accurate documentation in the clinical chart.
OR – Yale and St. Raphael’s Campus (SRC)

Description: The OR resident is Junior resident to the functional/tumor service. S/He participates in daily rounds and physical examination of floor patients on the tumor/functional service. S/He is responsible for rounding on the ICU patients with the chief resident. After rounding, the resident will go to assigned cases for the day and after that can stay in cases all day. If the resident is not in the OR, s/he is responsible for helping day float and night float during 5:30PM sign out. The OR resident is also responsible for Wednesday AM presentations and VA outpatient clinic on Wednesday PM. The resident is on call for St Raphael’s campus consults/patients. This is usually home call. Residents are expected to take an increasingly active role in interpreting complex patient presentations, and planning for their care, as well as executing established plans independently.

Resident Responsibilities:
1. Daily rounds on floor patients on the tumor/functional service
2. Daily rounds with the chief resident on ICU patients on the tumor and functional service
3. Consults, usually 2 weekends a month
4. Home call for St Raphael’s campus
5. Wednesday AM presentation
6. VA clinic on Wednesday PM
7. Daily OR cases

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

Medical Knowledge – Goals and Objectives:
1. Becoming proficient in the comprehensive neurosurgical history and physical examination.
2. Interpreting diagnostic imaging studies with neuroradiology fellows and attendings.
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5. Understand common post-operative complications and management
6. Understanding when the inform the chief resident and attending on changes in their patients
7. Manage a service of about 10 – 20 patients and report to the chief resident
8. Understand basic spinal operations including positioning, drill work and closure
9. Understand the pathophysiology of most neurosurgical diseases

Practice-Based Learning and Improvement – Goals and Objectives:
Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.
Residents are expected to develop skills and habits to be able to meet the following goals:
1. Identify strengths, deficiencies, and limits in one’s knowledge and expertise;
2. Set learning and improvement goals;
3. Identify and perform appropriate learning activities;
4. Systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;
5. Incorporate formative evaluation feedback into daily practice;
6. Locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems;
7. Use information technology to optimize learning; and,
8. Participate in the education of patients, families, students, residents and other health professionals.
9. Apply knowledge of study design and statistical methods to critically appraise the medical literature;
10. Facilitate the learning of students and other health care professionals.
11. Resident participation in undergraduate medical education is desirable.

Systems-Based Practice – Goals and Objectives:
Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Residents are expected to:
1. Work effectively in various health care delivery settings and systems relevant to their clinical specialty;
2. Coordinate patient care within the health care system relevant to their clinical specialty;
3. Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;
4. Advocate for quality patient care and optimal patient care systems;
5. Work in inter-professional teams to enhance patient safety and improve patient care quality;
6. Participate in identifying system errors and implementing potential systems solutions;
7. Understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal neurosurgical care;
8. Understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;
9. Practice cost-effective health care and resource allocation that does not compromise quality of care;
10. Advocate, coordinate, and facilitate patient care;
11. Understand principles of and advance practices for patient safety at the institutional and individual level.

Professionalism – Goals and Objectives:
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to demonstrate:
1. Compassion, integrity, and respect for others;
2. Responsiveness to patient needs that supersedes self-interest;
3. Respect for patient privacy and autonomy;
4. Accountability to patients, society and the profession; and,
5. Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation;
6. Treat patients/family/staff/ paraprofessional personnel with respect;
7. Demonstrate sensitivity to patient’s pain, emotional state, and gender/ethnicity issues.
8. Discuss death honestly, sensitively, patiently, and compassionately
9. Exemplify integrity
10. Accept responsibility/accountability
11. Demonstrate reliability
12. Maintain calm, even temperament
13. Exhibit self-awareness and knowledge of limits
14. Respond to the comments of other team members, patients, families, and peers openly and responsibly;
15. Graduate training in neurological surgery requires a commitment to continuity of patient care, as practiced by qualified neurological surgeons. This continuity of care must take precedence-without regard to the time of day, day of the week, number of hours already worked, or on-call schedules. At the same time, patients have a right to expect a healthy, alert, responsible, and responsive physician dedicated to delivering effective and appropriate care.

Interpersonal and Communication Skills – Goals and Objectives:
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Residents are expected to:
1. Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
2. Communicate effectively with physicians, other health professionals, and health related agencies;
3. Work effectively as a member or leader of a health care team or other professional group;
4. Act in a consultative role to other physicians and health professionals; and,
5. Maintain comprehensive, timely, and legible medical records.
6. Develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
7. Develop effective written communication skills;
8. Involve patients in medical decisions; and,
9. Strengthen listening and non-verbal communication skills.
PGY 3

Residents at this level are considered senior residents and are expected to knowledgeably manage a wide range of patient issues and have considerable skill in team leadership. While the rotations of Night Float, VA, Gamma Knife and operative are titled the same the expectations are that the resident will now be far more advanced in his or her skills and understanding of the neurosurgical patient. Outpatient assignments are at the VA and Gamma Knife. PGY 3 residents attend the RUNN Course and are expected to pass the Primary Examination for self-assessment. The final 3 months of the year begins the academic interval. Residents have utilized this time in a wide range of activities as listed in the Academic Section. These have included in-folded fellowship experiences, advanced degrees, clinical research and basic neuroscience. This time represents a major stepping-stone for career development and requires thoughtful planning and advice.

### NIGHT FLOAT

**Description:** The night float resident carries the Neurosurgery consult pager and is responsible for managing the entire Neurosurgery service - including primary floor patients, ICU patients, and consult patients - overnight.

**Resident Responsibilities:**

1. Collect sign out from the day team and NICU team on all patients on the Neurosurgery service
2. Carry the Neurosurgery consult pager and see all consults that are called in overnight. This includes discussing clinical data and plans with the on-call chief resident and attending surgeon
3. Act as the point person and manage all primary floor and ICU patients (in conjunction with overnight NICU team)
4. Perform all bedside procedures required on all floor, ICU (in conjunction with overnight NICU team), and consult patients
5. Sign out to the day team in the morning

**Patient Care – Goals and Objectives:**

1. Become proficient in the comprehensive neurosurgical history and physical examination
2. Interpret diagnostic imaging studies with neuroradiology fellows and attendings
3. Develop the ability to recognize neurosurgical and clinical emergencies
4. Perform initial stabilization and management of critically ill ICU and emergency room patients.
5. Develop basic technical and operative decision making skills.

**Medical Knowledge – Goals and Objectives:**

1. Participate in daily teaching by senior residents during work rounds

Revised 2014
2. Read standard neurosurgery texts and landmark articles.

Practice-Based Learning and Improvement – Goals and Objectives:
Residents are expected to:
1. Demonstrate the ability to investigate and evaluate their care of patients,
2. Appraise and assimilate scientific evidence
3. Continuously improve patient care based on constant self-evaluation and life-long learning
4. Track procedures, operations, and outcomes in a centralized database.
5. Learn operating skills through constant attending and senior resident feedback during procedures.
6. Plan research activities and write grant applications.

Systems-Based Practice – Goals and Objectives:
Residents are expected to:
1. Demonstrate an awareness of and responsiveness to the larger context and system of health care
2. Call effectively on other resources in the system to provide optimal health care
3. Appreciate the value of system-based practice and learn to study, improve, and contribute to the system

Professionalism – Goals and Objectives:
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to:
1. Maintain a professional demeanor towards patients, health professionals on collaborating services, and hospital staff under stressful circumstances
2. Respond promptly to pages and consults
3. Communicate effectively with collaborating hospital services

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

Residents are expected to:
1. Respond promptly to pages and consults
2. Communicate pertinent clinical information to the on call chief resident and attending in a clinically appropriate time frame
3. Communicate in an effective and timely manner with collaborating healthcare professionals and hospital services
4. Develop comfort in providing diagnosis and treatment plans to patients and their families
5. Develop comfort in delivering bad news and leading end-of-life discussions with patients and their families
VETERANS’ ADMINISTRATION HOSPITAL

Description: The VA rotation is an integral part of training for Yale Neurosurgery Residents. Residents rotate at the VA for a total of 6 months during PGY-2 and PGY-3. At this time, the resident has already had ample experience in the management of inpatient floor, inpatient ICU patients, and in seeing ED and inpatient consults under the supervision of both the chief resident and attending neurosurgeon. During the VA rotation, residents are further transitioned towards independence in that they work more directly with the neurosurgery attending, and are expected to demonstrate more independence in patient care in and out of the operating room. Additionally, there is a more substantive outpatient clinical experience during this rotation than in prior rotations.

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

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

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

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

Revised 2014
**Systems-Based Practice – Goals and Objectives:**
During the VA rotation, the resident has increased experience along the entire continuum of patient care. The resident is expected to manage all aspects of patient care. This includes working closely with program coordinators to schedule clinic visits, arrange for preoperative workups, schedule operative procedures including assessment and facilitation of necessary operative resources such as intraoperative tools (fluoroscopy, hardware vendors, neuro-navigation, operative table selection, etc), appropriate level of care required post-operation (i.e. ICU vs step-down vs floor). The resident is expected to take into account the level of urgency for different patients and to allocate available resources appropriately (i.e. booking more urgent cases first).

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

**Interpersonal and Communication Skills – Goals and Objectives**
The VA resident interacts with patients and other health care professionals throughout the rotation. The resident is expected to demonstrate and refine interpersonal and communication skills across a wide range of interactions including: communication with patients and families before and after an operative intervention which includes conveying the pathology and explanations of treatment options, consequences, and complications in a manner in which they are able to fully understand; communication with other health professionals including support staff (i.e. with nursing to ensure the patients are obtaining proper care), other MDs during consultations and cross-disciplinary care, and the neurosurgery attending to keep them adequately appraised of each patient’s status and plan of care.
GAMMA KNIFE

Description: The Gamma Knife rotation consists of one day per week during the resident’s VA rotation. During this time, the resident is involved in the treatment of patients requiring treatment with gamma knife radio-surgery. During this rotation the resident learns about the neurosurgical indications for GKSRS, as well as the radiation oncology aspects of focused radiation therapy.

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

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

Medical Knowledge – Goals and Objectives:
The resident is expected to learn:
1. the indications and contra-indications for single fraction radio-surgery in patients with primary and metastatic brain tumors, vascular malformations and facial pain
2. the indications and contra-indications for repeat radio-surgery for the same indications
3. the expected result of treatment with radio-surgery for the above commonly listed conditions
4. the role of radio-surgery versus open surgical treatment versus standard radiation therapy options in the management of the same conditions and the factors that determine patient and physician choice to use radio-surgery
5. the potential acute and chronic complications of radio-surgery and the medical and surgical management options for these complications
6. the fundamentals of dose planning particularly in avoidance of critical anatomic structures
7. how to place and remove the head frame independently

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

Systems-Based Practice – Goals and Objectives:
Revised 2014

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

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

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

**Description:** The OR resident is Junior resident to the functional/tumor service. S/He participates in daily rounds and physical examination of floor patients on the tumor/functional service. S/He is responsible for rounding on the ICU patients with the chief resident. After rounding, the resident will go to assigned cases for the day and after that can stay in cases all day. If the resident is not in the OR, s/he is responsible for helping day float and night float during 5:30PM sign out. The OR resident is also responsible for Wednesday AM presentations and VA outpatient clinic on Wednesday PM. The resident is on call for St Raphael’s campus consults/patients. This is usually home call. Residents are expected to take an increasingly active role in interpreting complex patient presentations, and planning for their care, as well as executing established plans independently.

**Resident Responsibilities:**
1. Daily rounds on floor patients on the tumor/functional service
2. Daily rounds with the chief resident on ICU patients on the tumor and functional service
3. Consults, usually 2 weekends a month
4. Home call for St Raphael’s campus
5. Wednesday AM presentation
6. VA clinic on Wednesday PM
7. Daily OR cases

**Patient Care – Goals and Objectives:**
1. Becoming proficient in the comprehensive neurosurgical history and physical examination.
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8. Understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient
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Revised 2014
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5. Maintain comprehensive, timely, and legible medical records.
6. Develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
7. Develop effective written communication skills;
8. Involve patients in medical decisions; and,
9. Strengthen listening and non-verbal communication skills.
PGY 4 & 5

Residents have utilized this time in a wide range of activities as listed in the Academic Section. These have included in-folded fellowship experiences, advanced degrees, clinical research and basic neuroscience. This time represents a major stepping-stone for career development and requires thoughtful planning and advice.

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ACADEMICS

Historically, for over 20 years, Yale Neurosurgery residents have spent 2 of their 7-year residency program in research. While they have wide latitude in their chosen scholarly activity, essentially all have worked on translational neurosciences research as detailed below in the listing of current and former residents. This interval is designed to be as much like a postdoctoral research experience as possible. In preparation for this experience, residents attend the Research Update in Neurosciences for Neurosurgeons, RUNN Course, write research proposals and grants, and are mentored by the Yale Neurosurgery and Neuroscience Faculty. Clinical responsibilities during these two research years are minimized.

Currently, our residents in the laboratory are funded by Yale-New Haven Hospital. As a result, they spend a small proportion of their time in clinical activities, taking weekend day or overnight call and covering the service as needed. Recognizing this as a major disruption to their research training and scholarly experience, we have made various attempts to minimize this negative effect. >25% of our graduates have received NIH funding in the last 16 years.

In addition to this “protected time” residents are expected to engage in scholarly activities throughout their residency careers. This includes publications, teaching and developing investigative expertise. While there is no mandatory N for publications each year, residents are expected to be regularly engaged and productive in this currency of the academic enterprise.
**Introduction by Charles Greer, PhD, Vice-Chair for Research**

During PGY 4 and 5 residents are provided the opportunity to develop their scholarly and academic interests. This often means joining a research laboratory pursuing questions of interest to the resident. However, alternative models are also available and may include, for example, the Robert Wood Johnson Program, fellowships in health care policy at NIH, or the development of novel scholarly programs designed by the resident.

The resources available at Yale for academic and research development cover the breadth and depth of the neurosciences. With over 100 labs identified as neuroscience research and over 400 members of the Society for Neuroscience, there are few areas of interest that are not represented. Learning about the opportunities available begins with casual conversations among the residents, moves on to discussions with the faculty, leading to a meeting with Dr. Greer who will guide the resident through the process of establishing themselves in the scholarly environment they have selected.

Residents are expected to pursue independent grant supported funding during the academic rotation. Development of good writing skills, specifically good grant writing skills, is a prerequisite for an academic career. Dr. Greer and other members of the faculty are always available to discuss possible sources of funding and the development of a formal proposal. In addition, the faculty should be recruited to review and critique early drafts of proposals and to do so in a manner that helps the resident develop their writing skills.

Throughout the residency, beginning in PGY 2, residents will be asked to present to the faculty and their peers at the annual Resident Research Symposium. This serves to keep the members of the department informed about ongoing activities and should also be seen as a prelude to the submission of papers for publication or abstracts for presentation at national and international congresses.

**Recent Yale Neurosurgery Residency Program Research**

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<th>Current Residents</th>
<th>Year</th>
<th>Position</th>
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<tr>
<td>Elena Fomchenko, MD, PhD</td>
<td>PGY 1</td>
<td>Resident</td>
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<tr>
<td>Ramana Gorrepati, MD</td>
<td>PGY 1</td>
<td>Resident</td>
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<tr>
<td>Gregory Kuzmik, MD</td>
<td>PGY 2</td>
<td>Resident</td>
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<tr>
<td>Jacky Yeung, MD</td>
<td>PGY 2</td>
<td>Resident</td>
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<tr>
<td>Branden Cord, MD, PhD</td>
<td>PGY 3</td>
<td>Resident</td>
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<td>Joaquin Camara-Quintana, MD</td>
<td>PGY 3</td>
<td>Resident</td>
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<td>Eyiemisi Damisah, MD</td>
<td>PGY 4</td>
<td>Resident</td>
<td>Epilepsy Research, Yale University</td>
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<td>Ryan Grant, MD</td>
<td>PGY 5</td>
<td>Resident</td>
<td>William Cafferty Lab – Yale University</td>
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<td>David Gimbel, MD</td>
<td>PGY 5</td>
<td>Resident</td>
<td>Strittmatter Lab, Yale University</td>
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<tr>
<td>Luis Kolb, MD</td>
<td>PGY 6</td>
<td>Resident</td>
<td>Gunel Lab, Yale University</td>
</tr>
<tr>
<td>Bulent Omay, MD</td>
<td>PGY 6</td>
<td>Resident</td>
<td>Gunel Lab, Yale University</td>
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<tr>
<td>Ryan Hebert, MD</td>
<td>PGY 7</td>
<td>Resident</td>
<td>Enfolded Interventional Fellowship</td>
</tr>
<tr>
<td>Brian Kelley, MD, PhD</td>
<td>PGY 7</td>
<td>Resident</td>
<td>Strittmatter Lab, Neurotrauma</td>
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<table>
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<tr>
<th>Completed Residency</th>
<th>Year</th>
<th>Position</th>
<th>Program/Department</th>
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<tbody>
<tr>
<td>Brian McHugh, MD</td>
<td>2014</td>
<td>Fellow</td>
<td>Hospital for Special Surgery, NY</td>
</tr>
<tr>
<td>Juan Torres-Reveron, MD</td>
<td>2014</td>
<td>Fellow</td>
<td>Epilepsy, Yale University</td>
</tr>
<tr>
<td>Toral Patel, MD</td>
<td>2013</td>
<td>Asst. Prof.</td>
<td>Univ of TX Southwestern</td>
</tr>
<tr>
<td>Ali Ozturk, MD</td>
<td>2013</td>
<td>Asst. Prof.</td>
<td>Neurogenetics, Gunel Lab</td>
</tr>
<tr>
<td>Willard Kasoff, MD, MPH</td>
<td>2012</td>
<td>Asst Prof, Univ</td>
<td>Epilepsy Fellow, MPH</td>
</tr>
<tr>
<td>Jennifer Moliterno, MD</td>
<td>2012</td>
<td>Asst Prof, Yale</td>
<td>RWJ Clinical Scholars Prog, Neuro-Onc Clinical</td>
</tr>
<tr>
<td>Name</td>
<td>Year</td>
<td>Position/Institute</td>
<td>Lab/Research Area</td>
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<tr>
<td>Nduka Amankulor, MD</td>
<td>2011</td>
<td>Asst. Prof, Pittsburgh</td>
<td>Eric Holland Lab, Neuro-Oncology</td>
</tr>
<tr>
<td>Grahame Gould, MD</td>
<td>2011</td>
<td>Asst Prof, Thomas Jefferson Univ</td>
<td></td>
</tr>
<tr>
<td>Eylem Ocal, MD</td>
<td>2010</td>
<td>Assist Prof, University of Arkansas</td>
<td>Flora Vaccarino Lab, Developmental Neurobiology</td>
</tr>
<tr>
<td>Maxwell Laurans, MD, MBA</td>
<td>2010</td>
<td>Assist Prof Yale</td>
<td>MBA at Harvard, Operations Research</td>
</tr>
<tr>
<td>Michael Diluna, MD</td>
<td>2009</td>
<td>Assist Prof Yale</td>
<td>Tian Xu Lab and Murat Gunel Lab</td>
</tr>
<tr>
<td>Andy Redmond, MD</td>
<td>2009</td>
<td>Practice</td>
<td>Erin Lavik Lab, Bioengineering</td>
</tr>
<tr>
<td>Louis Marotti, MD, PhD</td>
<td>2008</td>
<td>Practice</td>
<td>Pfizer Fellow, Drug Discovery Unit</td>
</tr>
<tr>
<td>Ty Thaiyananthan, MD</td>
<td>2007</td>
<td>Assist Professor UC Irvine</td>
<td>James Duncan Lab, Bioengineering</td>
</tr>
<tr>
<td>Michael Stoffman, M.D.</td>
<td>2006</td>
<td>Private Practice</td>
<td>P03, Brain Tumor Outcomes Research</td>
</tr>
<tr>
<td>Hahnah Kasowski, MD</td>
<td>2005</td>
<td>Instructor Cornell</td>
<td>Eric Holland Lab</td>
</tr>
<tr>
<td>Randall Johnson, MD, PhD</td>
<td>2004</td>
<td>Private Practice</td>
<td>Maria Donohue Lab, Neurobiology</td>
</tr>
<tr>
<td>Sung Lee, MD</td>
<td>2003</td>
<td>Private Practice</td>
<td>AANS Foundation Award, Anne Williamson Lab, Electrophysiology</td>
</tr>
<tr>
<td>Elizabeth Claus, MD, PhD</td>
<td>2002</td>
<td>Assoc Prof Harvard</td>
<td>Multiple R01s as resident and current, Cancer Epidemiology and Statistical Genetics</td>
</tr>
<tr>
<td>Kenneth Vives, MD</td>
<td>2001</td>
<td>Assoc Professor Yale</td>
<td>R01, Co-P.I., Dennis Spencer Lab, Basic Mechanisms of Epilepsy</td>
</tr>
<tr>
<td>Juan Bartolomei, MD</td>
<td>2000</td>
<td>Assist Professor Yale</td>
<td>Charles Greer Lab, Neurobiology</td>
</tr>
<tr>
<td>Veronica Chiang, MD</td>
<td>1999</td>
<td>Assist Professor Yale</td>
<td>Susan Hockfield Lab, Neurobiology</td>
</tr>
<tr>
<td>J. Nozipo Maraire, MD</td>
<td>1998</td>
<td>Private Practice</td>
<td>EPH Graduate Studies</td>
</tr>
<tr>
<td>Murat Gunel, MD</td>
<td>1997</td>
<td>Professor Yale</td>
<td>Multiple R01s now, Neurogenetics, Richard Lifton Lab, as resident</td>
</tr>
</tbody>
</table>
OR – Yale and SRC

Description: The OR resident is Junior resident to the functional/tumor service. S/He participates in daily rounds and physical examination of floor patients on the tumor/functional service. S/He is responsible for rounding on the ICU patients with the chief resident. After rounding, the resident will go to assigned cases for the day and after that can stay in cases all day. If the resident is not in the OR, s/he is responsible for helping day float and night float during 5:30PM sign out. The OR resident is also responsible for Wednesday AM presentations and VA outpatient clinic on Wednesday PM. The resident is on call for St Raphael’s campus consults/patients. This is usually home call. Residents are expected to take an increasingly active role in interpreting complex patient presentations, and planning for their care, as well as executing established plans independently.

Resident Responsibilities:
1. Daily rounds on floor patients on the tumor/functional service
2. Daily rounds with the chief resident on ICU patients on the tumor and functional service
3. Consults, usually 2 weekends a month
4. Home call for St Raphael’s campus
5. Wednesday AM presentation
6. VA clinic on Wednesday PM
7. Daily OR cases

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

Medical Knowledge – Goals and Objectives:
1. Becoming proficient in the comprehensive neurosurgical history and physical examination.
2. Interpreting diagnostic imaging studies with neuroradiology fellows and attendings.
3. Performing initial stabilization and management of critically ill ICU and emergency room patients.
4. Understand basic cranial approaches in the OR including positioning, opening and closing cases.
5. Understand common post-operative complications and management
6. Understanding when to inform the chief resident and attending on changes in their patients
7. Manage a service of about 10 – 20 patients and report to the chief resident
8. Understand basic spinal operations including positioning, drill work and closure
9. Understand the pathophysiology of most neurosurgical diseases

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

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

**Systems-Based Practice – Goals and Objectives:**
**Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.**

**Residents are expected to:**
1. Work effectively in various health care delivery settings and systems relevant to their clinical specialty;
2. Coordinate patient care within the health care system relevant to their clinical specialty;
3. Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;
4. Advocate for quality patient care and optimal patient care systems;
5. Work in inter-professional teams to enhance patient safety and improve patient care quality;
6. Participate in identifying system errors and implementing potential systems solutions.
7. Understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal neurosurgical care;
8. Understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;
9. Practice cost-effective health care and resource allocation that does not compromise quality of care;
10. Advocate, coordinate, and facilitate patient care;
11. Understand principles of and advance practices for patient safety at the institutional and individual level.

**Professionalism – Goals and Objectives:**
**Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.**

**Residents are expected to demonstrate:**
1. Compassion, integrity, and respect for others;
2. Responsiveness to patient needs that supersedes self-interest;
3. Respect for patient privacy and autonomy;
4. Accountability to patients, society and the profession; and,
5. Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation;
6. Treat patients/family/staff/paraprofessional personnel with respect;
7. Demonstrate sensitivity to patient’s pain, emotional state, and gender/ethnicity issues;
8. Discuss death honestly, sensitively, patiently, and compassionately;
9. Exemplify integrity;
10. Accept responsibility/accountability.
11. Demonstrate reliability
12. Maintain calm, even temperament
13. Exhibit self-awareness and knowledge of limits
14. Respond to the comments of other team members, patients, families, and peers openly and responsibly;
15. Graduate training in neurological surgery requires a commitment to continuity of patient care, as practiced by qualified neurological surgeons. This continuity of care must take precedence-without regard to the time of day, day of the week, number of hours already worked, or on-call schedules. At the same time, patients have a right to expect a healthy, alert, responsible, and responsive physician dedicated to delivering effective and appropriate care.

Interpersonal and Communication Skills – Goals and Objectives:
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Residents are expected to:
1. Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
2. Communicate effectively with physicians, other health professionals, and health related agencies;
3. Work effectively as a member or leader of a health care team or other professional group;
4. Act in a consultative role to other physicians and health professionals; and,
5. Maintain comprehensive, timely, and legible medical records.
6. Develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
7. Develop effective written communication skills;
8. Involve patients in medical decisions; and,
9. Strengthen listening and non-verbal communication skills.
PGY 6

Senior residents function as chiefs on the Pediatric and Spine services during the year and share chief call with the PGY 7’s. Outpatient experience is with the service assignment. Goals and Objectives of these rotations are discussed below. These may be in 3 or 6-month blocks.

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<tr>
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<td>Vascular &amp; Functional</td>
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SPINE

Description: Residents will work closely with the Spine faculty throughout their training in the clinic setting, operating room, and multidisciplinary case conferences. In general, this will be divided into a Junior and Senior/Chief resident experience. During these rotations residents will develop a broad knowledge base and gain extensive clinical experience in pediatric and adult spine surgery. Additionally, residents will participate in teaching the principles of spinal disorders and their management to their fellow neurosurgery residents and medical students. Finally, they will participate in research on the spine while improving research skills and furthering the development of the current body of knowledge concerning spinal disorders.

Patient Care – Goals and Objectives:

The spine rotation seeks to provide all residents with wide-ranging experience and thorough training in the diagnosis and treatment of the full spectrum of spine-related problems and disorders. Toward that end, academic, clinical, and operative goals of the rotation will include:

1. Emphasis on proper patient evaluation, to include physical examination, diagnostic work-up, image application, and treatment alternatives, both operative and non-operative.
2. Regular and broad outpatient experience at Yale New Haven Hospital and the West Haven Veteran’s Hospital.
3. Outpatient experience includes pre-op and post-op evaluations by attendance in private office settings.
4. An ongoing series of didactic lectures and case presentations delivered by both Attendings and residents for weekly and monthly Service and Department conferences.
5. Junior resident rotations will focus on the basics of spine surgery. As their knowledge and experience grows, residents perform increasingly more complex aspects of spinal surgery, including but not limited to lumbar discectomy, lumbar pedicle screw insertion, and anterior cervical discectomy and fusion.

Revised 2014
6. Senior resident rotations focus on a more advanced understanding of the indications and outcomes of all spinal procedures. Resident’s surgical experience will continually enlarge to encompass more complex spine procedures for the treatment of Degenerative Disc Disease, Deformity/Scoliosis, and Infection. Procedures include but are not limited to revision spine surgery, anterior and posterior spine surgery, minimally invasive techniques and more complex revision and oncologic surgery.

**Medical Knowledge – Goals and Objectives:**

1. Upon completion of the spine rotations all residents will be able to demonstrate an appropriate medical knowledge base of spine anatomy and physiology, histology, biomechanics, and pathophysiology. (NASS Education Guidelines)
2. Residents will demonstrate a working knowledge of the natural history of degenerative, osteoporotic, infectious, and deformity type spinal disorders.
3. Residents will be able to appropriately perform routine diagnostic work up for common spinal disorders (e.g. X-ray, MRI, CT scan, EMG, Discography, Dxa Scan)
4. Residents will have a comprehensive understanding of non-operative spine care: physical therapy, back school/education, therapeutic injections, medications, activity alterations, exercise and non-standardized treatment alternatives.
5. Understand complications associated with caring for the spine surgery patient.
6. Review and analyze peer-reviewed research from various spine journals and texts

**Practice-Based Learning and Improvement – Goals and Objectives:**

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

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

1. Perform Preoperative Planning of all surgical cases
2. Adopt an evidence based approach to clinical decision making.
3. Senior residents will supervise Junior residents, and Junior residents, in turn, will supervise medical students on inpatient rounds, consults, admissions, and discharge planning.
4. Senior residents will incorporate their biomechanical and pathophysiologic knowledge of the spine into the teaching of Junior residents and medical students.

**Systems-Based Practice – Goals and Objectives:**

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

Residents are expected to:
1. Work with health care managers (Floor managers, OR managers, etc) and other providers to assess care, discuss improvements, and help devise and implement solutions.
2. Present data for case management review to supervisors at formal Morbidity and Mortality conferences, and, on occasion, insurers in peer-to-peer discussions through various Spine clinics.
3. Identify methods to control costs for inpatient care in the health care system.
4. Work comfortably with the interdisciplinary team in overall patient care.
5. Identify System errors and address these errors with the necessary health care providers.
6. Safeguard Patient safety by meeting with patients and their families and encouraging informed decision-making.
7. Ensure patient safety through diligent implementation of medication reconciliation protocols; observing O.R. “time-out” rules; Sign and Marking of preoperative patients.
8. Exhibit rational and cost-effective management of low back pain and disability in the outpatient spine care experience.
9. Identify and refer spine patients to social services as appropriate and assist patients in dealing with system complexities. Understand what is available in the community as well as internally with regard to services for patients and family.

Professionalism – Goals and Objectives:

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to demonstrate:

1. Maintain professional and compassionate relationships with patients and their families
2. Maintain professional relationships with other members of the care team: consulting physicians, midlevel providers, Nurses, support staff, etc.
3. Demonstrate honesty, respect, a sensitivity for ethnic and cultural concerns, a responsible attitude, punctuality, and appropriate personal hygiene.

Interpersonal and Communication Skills – Goals and Objectives

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

Residents are expected to:

1. Listen and communicate effectively with patients, colleagues, and other members of the care team.
2. Play an active role as a member of a multidisciplinary team. Interact, listen, and contribute in a collegial manner with all members of said team.
3. Document in the clinic, inpatient wards, and OR clearly and rationally in a manner consistent with hospital practice guidelines.
PEDiatric NEUROSURGERY

Description: Residents will learn fundamental skills related to the care of pediatric patients (age < 18 years) as they pertain to neurosurgical and critical care issues. Residents will demonstrate an understanding of the anatomy, physiology, pathophysiology, and presentation of diseases in children for which a neurosurgeon may be called upon to diagnose and treat. Residents will also demonstrate the ability to formulate and implement diagnostic and treatment plans for these diseases.

Resident Responsibilities:

Junior residents will coordinate medical decision-making and implementation of treatment plans in conjunction with senior / chief residents and attendings. They are responsible for seeing all consults in the Emergency Room (including all spine-related issues), Newborn ICU, and pediatric floor. They will perform histories and physical exams, review pertinent imaging, and provide initial recommendations for additional work up when deficiencies exist. They are responsible for contacting senior / chief residents and providing a synopsis of neurosurgical issues as well as thoughts for additional care. Following senior / chief resident input and refinement, they will contact attendings to review the consult and discuss treatment recommendations.

Senior / Chief residents are responsible for the day-to-day service requirements including daily rounds, medical documentation, and coordinated care among the various pediatric and consulting services. They will discuss all patients with attendings, develop treatment plans on a daily basis, and communicate these plans to the Junior resident following consultation with attendings. They are also responsible for ensuring the fluidity of the pediatric OR including addressing pre-operative issues, ensuring proper OR set up, and coordination of post-operative care. OR autonomy will be at the discretion of the attending physician.

Patient Care – Goals and Objectives:

Residents will help facilitate the highest level of care to pediatric patients for a broad range of neurosurgical issues. They will also interact with parents / relatives / caregivers to ensure proper communication of information related to the patient’s diagnosis and prognosis. They will also coordinate care with pediatric and appropriate consulting services.

I:

1. Perform complete history, physical examination and assessment of newborns, infants, and children.
2. Interpret results of the physical examination, laboratory and radiological studies to formulate a differential diagnosis.
4. Perform shunt taps.
5. Perform twist drill or burr holes for subdural, parenchymal, or ventricular access or as part of a craniotomy.
6. Perform craniotomies or craniectomies for evacuation of subdural or epidural lesion.
7. Perform craniectomies as part of skull biopsies.
8. Perform craniotomies for elevation of depressed skull fractures.
9. Place ventriculoperitoneal, jugular, and/or pleural shunts.
10. Revise ventriculoperitoneal, jugular, and/or pleural shunts.
11. Perform cranioplasties with artificial material or homologous material.
13. Position patients for intracranial or intraspinal surgery.
14. Demonstrate an ability to open and close cranial and spinal wounds to include dural opening and repair.
15. Perform craniosynostosis repair.

II:
1. Close open spinal or cranial neural tube defects.
2. Repair intracranial encephaloceles.
3. Perform the opening for a complex craniofacial repair.
4. Perform the exposure for supratentorial and infratentorial lesions (excluding pineal, suprasellar and intraventricular locations).
5. Perform the exposure for spinal exploration in a patient with abnormal spinal anatomy or reoperation.
7. Accomplish endoscopic third ventriculostomy in uncomplicated settings.
8. Apply and utilize frameless or framed stereotactic modalities for lesion location and shunt placement.
10. Accomplish an uncomplicated detethering procedure.
11. Perform cranial vault expansion.
12. Perform placement of baclofen type pumps.
13. Perform spinal fusion without instrumentation.
14. Apply a vagal nerve stimulator.

III:
1. Perform exposure for suprasellar, pineal and intraventricular lesion (including orbito-frontal, transcallosal and supracerebellar).
2. Remove uncomplicated posterior fossa and supratentorial lesions.
3. Repair complex tethered cords (e.g. lipomyelomeningocele, retethering, and diastematomyelia).
4. Accomplish exposure for intradural spinal neoplasms.
5. Utilize an endoscope to communicate trapped CSF spaces.
6. Remove intracranial vascular malformation less than 3 cm in size and in non-eloquent brain.
7. Perform placement of grids for seizure monitoring.
8. Perform rhizotomy for spasticity.
10. Perform stereotactic biopsy of supratentorial lesion.
11. Perform spinal fusion utilizing instrumentation.

Medical Knowledge – Goals and Objectives:

Revised 2014

50
I:
Myelomeningocele and its variants, Meningocele, Encephalocele, Chiari Malformations, Occult Spinal Dysraphism, Split Cord Anomalies, Segmentation Anomalies, Craniofacial Syndromes and Phakomatosis

1. Review the embryology of the central nervous system (CNS) and its supporting structures.
2. List the abnormalities a neurosurgeon may treat which are congenital / developmental in nature and classify them with respect to their embryology defect.
3. Describe the incidence, epidemiology and inheritance patterns.
4. State other disorders associated with this set of diseases.
5. Describe the anatomic and pathophysiologic parameters which distinguish among these diseases.
6. Develop a diagnostic treatment plan along with prognostication of outcome with optimal management.
7. List disorders which may be referred for neurosurgical care but do not require surgery.
8. Display current knowledge of the molecular basis for these diseases where known.
9. Describe the expected outcome if treatment is not undertaken (ie. natural history of disease)

Hydrocephalus and other disorders of CSF circulation

1. Describe the normal physiology of CSF.
2. Delineate the different etiologies of hydrocephalus and their relative incidence.
3. Explain how to differentiate between CSF collections which require treatment and those which do not.
4. Indicate the various treatment options for the management of hydrocephalus.
5. Distinguish between treatment options for hydrocephalus with normal CSF and contaminated (e.g. infection, blood) CSF.
6. List the complications associated with each treatment option for hydrocephalus as well as the diagnosis and treatment of issues related to these options.
7. Differentiate between low-pressure and high-pressure hydrocephalus.
8. Describe the presentation and diagnostic approach to a patient with suspected shunt malfunction.
9. Define how the diagnosis of hydrocephalus is made.
10. List nonsurgical diseases which may be mistaken for hydrocephalus but require treatment different than surgery.
11. Review the causes of cerebral atrophy.

Neoplasia

1. Delineate the differences between pediatric and adult tumors.
2. List the common tumor occurring in children and their typical locations.
3. Describe the changing tumor type and location based upon age.
4. Identify lesions which require biopsy as part of a treatment / diagnostic plan.
5. Describe the typical presentations of tumors.
6. Describe appropriate evaluation for patients suspected of having a tumor.
7. Classify tumor types as to degree of malignancy, role of surgical vs. nonsurgical therapy, and outcomes of optimal treatment.
8. Discuss the possible complications associated with specific tumors.
9. Describe the pertinent anatomy related to surgical treatment of midline or hemispheric cerebral / cerebellar tumors.
10. Discuss appropriate preoperative management of patients with tumors.
11. Compare the role of biopsy, subtotal resection and total resection in the management of tumors.
12. List possible complications of treatment options as well as their diagnostic evaluation and treatment.

Infection

1. Describe the presentations of shunt infection.
2. List the indications for ventricular lumbar and subarachnoid CSF sampling.
3. List the common organisms seen in shunt infections.
4. Outline treatment plans for shunt infection.
5. List risk factors for shunt infection and the proper diagnostic protocol to establish the presence of a shunt infection.
6. Describe common presentations of intracranial and intraspinal suppuration.
7. List host risk factors which are associated with CNS infections.
8. Describe appropriate diagnostic protocol to establish the presence of CNS infection.
9. Discuss the timeliness and utility of surgical therapy for the treatment of CNS infection, both shunt and non-shunt related.

Other

1. Delineate the various types of spasticity and movement disorders seen in children.
2. Describe seizure types.
3. Describe surgical lesions which may be related to seizures.
4. Describe surgical and non-surgical treatment options regarding the alleviation of spasticity in children.
5. Discuss the pathophysiology and surgical indications / treatment options for the various craniosynostoses.

Cerebrovascular

1. Delineate the possible causes of an atraumatic intracerebral or subarachnoid hemorrhage.
2. Delineate the possible causes of cerebral infarction / ischemia.
3. Discuss the common locations of arteriovenous shunts and their presentation, evaluation, and treatment (including dural AVM).
4. Discuss the embryology of the cerebral and spinal vasculature and its possible role in vascular anomalies in children.
5. Describe the common locations and types of aneurysms seen in children and how they differ from those seen in adults.
6. List the possible presentations of Vein of Galen aneurysms, their diagnosis and management.
7. List the possible causes of aneurysms in children (non-congenital).
8. Describe the pathophysiology, treatment, and outcomes for intraventricular hemorrhage in neonates.

Trauma

Revised 2014
1. List the appropriate diagnostic tests to evaluate a child who has sustained multisystem trauma.
2. Describe the Glasgow Coma Scale (as well as pediatric variant) and its use.
3. List the salient historical and exam features which lead one to the diagnosis of non-accidental trauma.
4. Discuss the management of the cervical spine in a child who is comatose.
5. Describe the anatomy of the child's spine which causes the epidemiology of spinal cord injury to differ from adults.
6. Describe the common injuries seen as a result of birth trauma and discuss their diagnosis and management.
7. Describe the use of antibiotics and anticonvulsants in CNS trauma.
8. Review the evaluation and management of a child who has sustained a head injury with loss of consciousness but is now awake.
9. Discuss the management of depressed skull fractures, both open and closed.
10. Describe the diagnosis and management of spinal column injury.
11. Discuss the diagnosis and management of spinal cord injury without radiologic abnormality (SCIWORA).
12. Describe the intracranial pressure (ICP) compliance curve and discuss its utility in the management of head injury.
13. List the parameters needed to decide on letting an athlete who has sustained a CNS injury return to activity.
14. Discuss the concept of "brain death", its diagnosis and role in organ donation.
15. Discuss the importance and interplay between ICP and cerebral perfusion pressure (CPP) in the management of head and spinal cord injury.
16. Define the concept of "secondary injury".
17. Discuss the role and indications for invasive monitoring in closed head injury (CHI) / traumatic brain injury (TBI).

II:
Myelomeningocele and its variants, Meningocele, Encephalocele, Chiari Malformations, Occult Spinal Dysraphism, Split Cord Anomalies, Segmentation Anomalies, Craniofacial Syndromes and Phakomatosis

1. Enumerate the indications for surgery, surgical options and expected outcomes for each disease entity.
2. Explain the indications for and utility of intraoperative monitoring.
3. Describe appropriate timing of various interventions and their rationale.
4. Describe the pathophysiology and presentation of the tethered cord syndrome.

Hydrocephalus and other disorders of CSF circulation

1. Describe normal ICP dynamics and their relation to establishing a differential diagnosis of CSF flow disturbance.
2. Define "slit ventricle system / syndrome" and how it is diagnosed and treated.
3. Define "brain compliance" and relate how that can affect ventricular size.
4. List indications for and describe technique of accessing a shunt for CSF samples.
5. List disease states which are commonly associated with hydrocephalus.
Neoplasia

1. Discuss the differential diagnosis and evaluation of tumors located in the following areas:
   1. suprasellar
   2. pineal region
   3. intraventricular
   4. supratentorial
   5. cerebellar / infratentorial
2. Discuss the treatment / diagnostic options for tumors in each location listed in #1 including surgical approaches.
3. Describe the appropriate evaluation and treatment of patients with neoplastic processes associated with:
   1. neurofibromatosis
   2. tuberous sclerosis
   3. von Hippel Lindau
4. Discuss the appropriate use of skull base approaches for specific tumor locations.
5. List tumors which will require adjunctive therapy and describe those therapies and potential complications thereof.
6. Discuss the global management of tumoral hydrocephalus.
7. Cite the long-term outcome and complications for treatment of common cerebellar and supratentorial hemispheric tumors.

Infection

1. Compare the differing patterns of infection as seen in immune-compromised patients to those with a functioning immune system.
2. Discuss the sequelae of CNS infection, both shunt and non-shunt related.
3. List all acceptable treatment options for CNS infection including strengths / weaknesses of each plan.
4. Demonstrate an understanding of the different etiologies for subdural / epidural empyema and brain abscess as well as differing treatments thereof.
5. Provide a complete differential diagnosis regarding infectious disease for ring-enhancing brain lesions.
6. Discuss the role of osteomyelitis in CNS infection.
7. Differentiate radiographically between infection and tumor.

Other

1. Discuss variance in the surgical management of tumoral vs. non-tumoral seizure foci.
2. Discuss surgical options, indications and outcome for non-lesional approaches (e.g., callosotomy).
3. Discuss various surgical options for the management of spasticity.
4. Discuss preoperative evaluation and planning for seizure treatment.
5. Discuss preoperative evaluation and planning for treatment of spasticity and postoperative management.

Cerebrovascular

Revised 2014
1. Describe the nomenclature for congenital vascular anomalies and what, if any, role inheritance plays.
2. Describe the pathology, risk factors, diagnosis and treatment of moyamoya in children.
3. List the phakomatoses which have vascular anomalies associated with them and their treatment.

Trauma

1. Discuss the role of apoptosis in brain and spinal cord injury.
2. Compare the utility of epidural, subdural, parenchymal, and intraventricular ICP monitoring.
3. Differentiate between retinal hemorrhages and Terson's syndrome.
4. Describe the role of electrophysiological monitoring in the management and prognostication of the CNS injured patient.
5. Discuss the evidence for and role of steroid therapy in CNS injury.
6. Discuss the prognosis and management of penetrating injuries to the brain and spine.
7. Discuss the management of CSF leaks after head injury.
8. Describe the diagnosis and treatment of a traumatic leptomeningeal cyst.

III: Myelomeningocele and its variants, Meningocele, Encephalocele, Chiari Malformations, Occult Spinal Dysraphism, Split Cord Anomalies, Segmentation Anomalies, Craniofacial Syndromes and Phakomatosis

1. Differentiate between the use of rigid and non-rigid skeletal fixation in the appropriate surgical setting for this group of disorders.
2. Explain the rationale for surgical treatment of a symptomatic disease.

Hydrocephalus and other disorders of CSF circulation

1. Discuss the utility of expansion craniotomy in the treatment of hydrocephalus.
2. Differentiate between ventriculomegaly, compensated hydrocephalus, and pseudotumor cerebri.
3. Describe the pertinent anatomy of the ventricular system and prepontine cisterns.
4. Describe the role of venous outflow obstruction in hydrocephalus.

Neoplasia

1. Describe the pertinent surgical anatomy for approaches to tumors in the following locations:
   1. suprasellar
   2. pineal region
   3. intraventricular
   4. supratentorial
   5. cerebellar / infratentorial
2. Discuss the role of endoscopic third ventriculostomy (ETV) in management of tumoral hydrocephalus.
3. Cite the long-term outcome and complications of all treatment options for tumors arising in the following locations:
   1. suprasellar
   2. pineal region
3. intraventricular
4. supratentorial
5. cerebellar / infratentorial

4. Discuss the utility of preoperative embolization and/or chemotherapy in the surgical management of specific tumors.
5. Discuss the role of stereotactic radiosurgery in the management of selected tumors.
6. Describe the presentations of hypothalamic hamartomas and the role of surgery in management.
7. Describe options for CNS monitoring during surgical therapy and its efficacy.
8. Discuss options for treatment and expected outcomes for recurrent tumors.

Infection

1. Describe in detail the differential diagnosis, evolution and treatment options of an immune-compromised patient with a ring-enhancing brain lesion.
2. List the important aspects of the patient's history which may lead one to entertain the diagnosis of CNS infection, both shunt and non-shunt related.
3. List diagnostic tools, other than CSF culture, which are utilized to diagnose a shunt infection.

Cerebrovascular

1. List the locations for traumatic vascular lesions and their risk factors, diagnosis, and treatment.

Trauma

1. Discuss the potential complications and evaluation of comatose patients with skull base fractures.
2. Discuss the utility of lumbar drains and expansion craniectomy and the removal of frontal or temporal lobe in the management of refractory elevated ICP.
3. Describe the approaches to the management of traumatic ICH and its supporting data, both surgical and non-surgical.
4. List the vascular and endocrine complications seen after head injury.
5. Discuss the long-term management of a child who has sustained CNS trauma including rehabilitation and neuro-cognitive issues.
6. Discuss the management of peripheral nerve injuries in a child.

Practice-Based Learning and Improvement – Goals and Objectives:

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

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

Systems-Based Practice – Goals and Objectives:

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

Residents are expected to:
1. Work effectively in various health care delivery settings and systems relevant to their clinical specialty;
2. Coordinate patient care within the health care system relevant to their clinical specialty;
3. Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;
4. Advocate for quality patient care and optimal patient care systems;
5. Work in interprofessional teams to enhance patient safety and improve patient care quality; and,
6. Participate in identifying system errors and implementing potential systems solutions.
7. Understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal neurosurgical care;
8. Understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;
9. Practice cost-effective health care and resource allocation that does not compromise quality of care;
10. Advocate, coordinate, and facilitate patient care; and,
11. Understand principles of and advance practices for patient safety at the institutional and individual level.

Professionalism – Goals and Objectives:
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to demonstrate:
1. Compassion, integrity, and respect for others;
2. Responsiveness to patient needs that supersedes self-interest;
3. Respect for patient privacy and autonomy;
4. Accountability to patients, society and the profession;
5. Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.
6. Treat patients / family /staff / ancillary personnel with respect;
7. Demonstrate sensitivity to patient’s pain, emotional state, and gender / ethnicity issues;
8. Discuss death honestly, sensitively, patiently, and compassionately;
9. exemplify integrity;
10 Accept responsibility/accountability;
11. Demonstrate reliability;
12. Maintain calm, even temperament;
13. Exhibit self-awareness and knowledge of limits;
14. respond to the comments of other team members, patients, families, and peers openly and responsibly; and,
15. Graduate training in neurological surgery requires a commitment to continuity of patient care, as practiced by qualified neurological surgeons. This continuity of care must take precedence without regard to the time or day of the week. Patients have a right to expect a healthy, alert, responsible, and responsive physician dedicated to delivering effective and appropriate care.

Interpersonal and Communication Skills – Goals and Objectives

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

Residents are expected to:
1. Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
2. Communicate effectively with physicians, other health professionals, and health related agencies;
3. Work effectively as a member or leader of a health care team or other professional group;
4. Act in a consultative role to other physicians and health professionals;
5. Maintain comprehensive, timely, and legible medical records;
6. Develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
7. Develop effective written communication skills;
8. Involve patients in medical decisions;
9. Strengthen listening and non-verbal communication skills.
PGY 7

These individuals are the formal Chief Residents of the service. The rotations are in Neuro-Oncology and Vascular/Functional. These may be in 3 or 6-month blocks. These residents alternate as administrative chief and the chief with the major educational responsibilities. Detailed goals and objectives follow. Outpatient experiences are by rotation. These residents have the opportunity to take the Gamma Knife Certification course.

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NEURO-ONCOLOGY

Description: The neuro-oncology rotation exposes residents to the management and operative skills necessary to evaluate and care for oncological patients.

Resident Responsibilities:

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

Residents must:

1. Gather essential information in a timely manner
2. Generate a differential diagnosis and understand the management of associated oncological conditions including hydrocephalus, radiation necrosis and seizures.
3. Appropriately evaluate and manage pre- and post-operative patients including management in the critical care setting
4. Describe the important clinical signs and symptoms for patients that require emergency intervention for a brain tumor.
5. Understand the signs and symptoms of meningeal carcinomatosis.
6. Understand the variations in patient positioning for brain tumor surgery.
7. Perform neurosurgical operative procedures including:
   o brain biopsies
Medical Knowledge – Goals and Objectives:
Residents must demonstrate knowledge of established and evolving biomedical advances in the field of neuro-oncology. This includes:

1. Understand the epidemiology, natural history, common locations and incidence of primary brain tumors including hereditary syndromes.
2. Understand the basics of tumor biology including proliferation, invasiveness and vascularization.
3. Describe the important MRI and CT findings for the differential diagnosis of primary brain tumors.
4. Understand the principle histological findings that characterize different gliomas and the criteria for astrocytoma grading.
5. List the common metastatic tumors that are found in the CNS according to their frequency.
6. Describe the more common locations and characteristics of meningiomas.
7. Understand the orientation of cranial nerves entering the cavernous sinus, internal auditory canal and jugular fossa.
8. Describe the origin of craniopharyngiomas and Rathke’s cleft cyst.
9. Understand the clinical presentations for pituitary tumors including hormonally active and inactive lesions.
10. Describe the appropriate use of medications for brain tumor surgery including steroids, mannitol, antibiotics and hormone replacement.
11. Demonstrate the external landmarks used for intracranial surgery including the pterion, asterion, and inion and how to localize the superior sagittal sinus, transverse sinus and sigmoid sinus.

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

Residents are expected to develop skills and habits to be able to meet the following goals:
1. Identify strengths, deficiencies and limits in one’s knowledge and expertise
2. Set learning and improvement goals
3. Identify and perform appropriate learning activities including but not limited to grand rounds, journal club and seminars
4. Locate evidence and apply to patient’s health problems
5. Use information technology to optimize learning
6. Participate in the education of patients, families, residents and other health professionals.

Systems-Based Practice – Goals and Objectives:
Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.
Residents are expected to:
1. Work effectively in various healthcare delivery systems
2. Coordinate patient care within the health care system relevant to their specialty
3. Consider cost and risk-benefit analysis in patient care, particularly during end-of-life decisions in oncological care
4. Advocate for quality patient care and optimal patient care systems
5. Work in inter-professional teams to enhance patient safety and quality of care
6. Participate in identifying system errors and implementing potential systems solutions
7. Participate in residency improvement forums at both the department and institutional level

**Professionalism – Goals and Objectives:**

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to demonstrate:
1. Compassion, integrity and respect for others
2. Responsiveness to patient needs that supersedes self interest
3. Respect for patient privacy and autonomy
4. Accountability to patients, society and the profession
5. Sensitivity to diverse patient populations
6. Ability to discuss death honestly and aid patients and families in fulfilling their wishes.

**Interpersonal and Communication Skills – Goals and Objectives:**

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

**Residents are expected to:**
1. Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
2. Communicate effectively with physicians, other health professionals, and health related agencies;
3. Work effectively as a member or leader of a health care team or other professional group;
4. Act in a consultative role to other physicians and health professionals;
5. Maintain comprehensive, timely, and legible medical records;
6. Develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
7. Develop effective written communication skills;
8. Involve patients in medical decisions;
9. Strengthen listening and non-verbal communication skills.
FUNCTIONAL

Description: The functional/epilepsy rotation exposes residents to the management and operative skills necessary to evaluate and care for patients with movement disorders, trigeminal neuralgia, spasticity and epilepsy.

Patient Care and Procedural Skills – Goals and Objectives:

Residents must:
1. Gather a comprehensive history and physical in patients with motor disorders and be able to differentiate between Parkinson’s disease, essential tremor and dystonia
2. Perform an adequate background and risk assessment in patient’s with epilepsy
3. Perform an appropriate examination of a patient with facial pain and be able to differentiate between trigeminal neuralgia and other causes of pain.
4. Identify spasticity and differentiate from hemiparesis or plegia.
5. Identify seizures in the critical care patient and develop a management paradigm
6. Perform neurosurgical operative procedures including:
   - microvascular decompression
   - stereotactic radiation for trigeminal neuralgia
   - deep brain stimulation in STN and/ or Gpi
   - medial temporal lobectomy with complete hippocampectomy
   - functional cortical resections and topectomies
   - placement of depth and subdural electrodes for intracranial seizure monitoring
   - initial placement and replacement of baclofen pumps
   - placement of batteries for vagal nerve and deep brain stimulation

Medical Knowledge – Goals and Objectives:

Residents should:
1. Understand the non-operative management of Parkinson’s disease, essential tremor and epilepsy
2. Understand the steps needed for the presurgical evaluation of epilepsy patients
3. Be able to describe the different modalities for the treatment of trigeminal neuralgia including stereotactic radiation, rhizotomy and microvascular decompression
4. Identify and differentiate simple and partial complex seizures
5. Understand the effect of seizures in the critical care patient
6. Identify and manage side effects of antiepileptic medications
7. Be cognizant of the emerging role of stimulation on epilepsy patients
8. Understand the non-operative management of spasticity

Chief Residency: Chief residents are expected to perform independently the steps necessary for placement of deep brain stimulators including the management of complications as well as be able to plan a temporal lobectomy and understand the intraoperative modifications necessary based on motor, language mapping and electrocorticography. The also participate in microvascular decompressions and are expected to independently develop a plan for stereotactic radiosurgery of cranial nerve V. They are also in charge of guiding junior residents in the placement of baclofen pumps and batteries.
VASCULAR

Description:
The neurovascular section is a multidisciplinary program between neurosurgeons, the neuroscience ICU team and neuroradiologists. Both open and neurosurgical endovascular techniques are utilized to treat neurovascular disease.

One of the fundamental goals of the rotation is to teach residents the decision making process when selecting patients for endovascular versus open treatment. They learn the benefits and the drawbacks of the current technologies in the context of traditional surgical and medical management. An emphasis is placed on ensuring that residents become proficient in the interpretation of cerebral angiograms. They are also exposed to CT angiography and MR angiography and gain an understanding of the benefits and limitations of the various imaging modalities. This includes gaining an appreciation of the potential complications of administering radiographic contrast agents.

Technically, progressive responsibility is given to the residents for performing cerebral angiography. By the conclusion of the rotation, most residents demonstrate proficiency in diagnostic cerebral angiography with minimal supervision. They are exposed to the state of the art treatment of vascular lesions utilizing coils, open-cell stents, flow-diverting stents, Onyx, and NBCA. They develop an understanding and an appreciation for the optimal conditions for using the various available technologies.

Understand the detailed anatomy of the extracranial and intracranial vertebral, carotid and spinal circulation including arterial branches, the venous system, and their nomenclature. Learn to recognize these structures on angiographic films. Learn to correlate the location of the vasculature with the respective neural compartments and supplied territory as visualized on imaging studies (CT and MRI).

Understand the concepts of cerebral blood flow, ischemic thresholds, intracranial pressure, cerebral perfusion pressure, and the impact of intracranial mass lesions.

Recognize common mechanisms of brain ischemia and their clinical manifestations and correlates on diagnostic imaging. Recognize common mechanisms of intracranial hemorrhage, their etiologies, and their clinical manifestations and correlates on diagnostic imaging. Understand pathophysiologic mechanisms associated with the spectrum of traumatic brain injury, spinal injury, and stroke. Recognize the broad spectrum of lesions responsible for subarachnoid hemorrhage, intracranial hemorrhage, and ischemic stroke. Understand the major principles of fluid, electrolytes, respiratory, coagulation, cardiac, and nutritional physiology and pathophysiology in relation to the neurologically injured patient, the stroke patient, and the post-operative patient. Understand the general epidemiologic principles of traumatic brain injury, spinal cord injury, and stroke.

Resident Responsibilities:

Patient Care – Goals and Objectives:

1. Understand the detailed anatomy of the extra-cranial and intra-cranial vertebral, carotid and spinal circulation including arterial branches, the venous system, and their nomenclature. Learn to recognize these structures on angiographic films. Learn to correlate the location of the vasculature with the respective neural compartments and supplied territory as visualized on imaging studies (CT and MRI).
2. Understand the concepts of cerebral blood flow, ischemic thresholds, intracranial pressure, cerebral perfusion pressure, and the impact of intracranial mass lesions.
3. Recognize common mechanisms of brain ischemia and their clinical manifestations and correlates on diagnostic imaging.
4. Recognize common mechanisms of intracranial hemorrhage, their etiologies, and their clinical manifestations and correlates on diagnostic imaging.
5. Understand the general epidemiologic principles of traumatic brain injury, spinal cord injury, and stroke.

Medical Knowledge – Goals and Objectives:

1. Understand pathophysiologic mechanisms associated with the spectrum of traumatic brain injury, spinal injury, and stroke.
2. Recognize the broad spectrum of lesions responsible for subarachnoid hemorrhage, intracranial hemorrhage, and ischemic stroke.
3. Understand the major principles of fluid, electrolytes, respiratory, coagulation, cardiac, and nutritional physiology and pathophysiology in relation to the neurologically injured patient, the stroke patient, and the post-operative patient.
4. Describe the radiologic anatomy of the extracranial and intracranial vessels, including the carotid and vertebral arterial circulations; to understand and describe common and uncommon vascular variants.
5. Understand and describe the major cerebral venous system structures.
6. Understand and describe the arterial supply and venous drainage of the spinal cord and adjacent vertebrae.
7. Correlate the angiographic anatomy on CTA, MRA, and digital subtraction angiography and to understand the advantages, disadvantages and limitations of imaging methods and imaging strategies for various disease processes.
8. Understand and recognize the signs and symptoms of disorders amenable to diagnosis and treatment by endovascular surgical neuroradiology techniques.
9. Understand the clinical indications, risks, contraindications and limitations of endovascular surgical/ neurointerventional procedures.
10. To become familiar with the use of needles, catheters, guidewires, and endovascular devices and materials for endovascular procedures, both diagnostic and therapeutic.
11. To understand basic radiologic science related to image production, including radiation physics and radiation protection (safety)
12. To understand the clinical pharmacologic aspects of radiographic contrast materials, including toxicity and the management aspects of contrast allergy and renal toxicity prophylaxis and treatment.
13. To understand the use and administration of analgesics, antibiotics, anticoagulation, anticoagulants, and anesthetic agents commonly utilized in endovascular surgical neuroradiology procedures.
14. To understand clinical aspects of patient assessment, treatment planning, and management specific to endovascular neurosurgical treatments including the use of invasive monitoring and neurointensive care management, and the special considerations related to the use of anti-platelet agents, heparin, rTPA, and other thrombolytic agents.
15. To understand- the choices of embolic materials and devices for the endovascular treatment of disorders of the head, neck and spine, including indications, limitations, risks, benefits and complication avoidance.

Practice-Based Learning and Improvement – Goals and Objectives:

Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and
Resident participation in undergraduate medical education is desirable.

**Systems-Based Practice – Goals and Objectives:**

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

Residents are expected to:

1. Work effectively in various health care delivery settings and systems relevant to their clinical specialty;
2. Coordinate patient care within the health care system relevant to their clinical specialty;
3. Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;
4. Advocate for quality patient care and optimal patient care systems;
5. Work in inter-professional teams to enhance patient safety and improve patient care quality; and,
6. Participate in identifying system errors and implementing potential systems solutions.
7. Understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal neurosurgical care;
8. Understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;
9. Practice cost-effective health care and resource allocation that does not compromise quality of care;
10. Advocate, coordinate, and facilitate patient care; and,
11. Understand principles of and advance practices for patient safety at the institutional and individual level.

**Professionalism – Goals and Objectives:**

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to demonstrate:

1. Compassion, integrity, and respect for others
2. Responsiveness to patient needs that supersedes self-interest;
3. Respect for patient privacy and autonomy;
4. Accountability to patients, society and the profession; and,
5. Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.
6. Treat patients/family/staff/paraprofessional personnel with respect;
7. Demonstrate sensitivity to patient’s pain, emotional state, and gender/ethnicity issues;
8. Discuss death honestly, sensitively, patiently, and compassionately;
9. Exemplify integrity;
10. Accept responsibility/accountability;
11. Demonstrate reliability;
12. Maintain calm, even temperament;
13. Exhibit self-awareness and knowledge of limits;
14. Respond to the comments of other team members, patients, families, and peers openly and responsibly; and,
15. Graduate training in neurological surgery requires a commitment to continuity of patient care, as practiced by qualified neurological surgeons. This continuity of care must take precedence without regard to the time of day, day of the week, number of hours already worked, or on-call schedules. At the same time, patients have a right to expect a healthy, alert, responsible, and responsive physician dedicated to delivering effective and appropriate care.

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

Residents are expected to:

1. Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
2. Communicate effectively with physicians, other health professionals, and health related agencies;
3. Work effectively as a member or leader of a health care team or other professional group;
4. Act in a consultative role to other physicians and health professionals; and,
5. Maintain comprehensive, timely, and legible medical records.
6. Develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
7. Develop effective written communication skills;
8. Involve patients in medical decisions; and,
9. Strengthen listening and non-verbal communication skills.
ACGME Competencies for Neurosurgery

Patient Care

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

Residents:
1. are expected to gather and understand essential patient information in a timely manner;
2. are expected to generate an appropriate differential diagnosis;
3. are expected to implement an effective plan of management;
4. are expected to prioritize and stabilize multiple patients simultaneously;
5. are expected to competently perform neurosurgical operative procedures;
6. are expected to manage complications;
7. are expected to analyze outcomes;
8. are expected to counsel and educate patients and families;
9. are expected to provide health care services aimed at preventing health problems and maintaining health;
10. are expected to work with health care professionals to provide patient-focused care;
11. must participate in the management (including critical care) and surgical care of adult and pediatric patients and experience should include the full spectrum of neurosurgical disorders; and,
12. must have opportunities to evaluate patients referred for elective surgery in an outpatient environment. Under appropriate supervision, this experience should include obtaining a complete history, conducting an examination, ordering (if necessary) and interpreting diagnostic studies, and arriving independently at a diagnosis and plan of management. Consonant with their skills and level of experience, residents should be actively involved in preoperative decision making and subsequent operative procedures under the supervision of the attending physician who has ultimate responsibility for the patient. Residents should similarly be actively involved in postsurgical care and follow-up evaluation of their patients to develop skills in assessing postoperative recovery, recognizing and treating complications, communicating with referring physicians, and developing the physician-patient relationship. Preoperative interview and examination of patients already scheduled for a surgical procedure will not satisfy these requirements.

12. (a) Resident participation in and responsibility for operative procedures embracing the entire neurosurgical spectrum should increase progressively throughout the training period.

Medical Knowledge

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care.

Residents:
1. are expected to generate a differential diagnosis and properly sequence critical actions for patient care, including management complications, morbidity and mortality;
2. are expected to synthesize and properly utilize acquired patient data;
3. are expected to identify neurosurgical emergencies;
4. are expected to know how to access current medical information;
5. are expected to understand how to treat neurosurgical conditions;
6. are expected to incorporate evidence-based principles;
7. must have educational experience in neuroradiology, including endovascular surgical neuroradiology, and neuropathology designed specifically for neurological surgery residents. Such experience should be under the direction of qualified neuroradiologists and preferably endovascular neurosurgeons, and neuropathologists; and,
8. must have experience and instruction in the basic neurosciences.
Practice-based Learning and Improvement

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

Residents are expected to develop skills and habits to be able to meet the following goals:
1. identify strengths, deficiencies, and limits in one’s knowledge and expertise;
2. set learning and improvement goals;
3. identify and perform appropriate learning activities;
4. systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;
5. incorporate formative evaluation feedback into daily practice;
6. locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems;
7. use information technology to optimize learning; and,
8. participate in the education of patients, families, students, residents and other health professionals.
9. apply knowledge of study design and statistical methods to critically appraise the medical literature;
10. Facilitate the learning of students and other health care professionals
10. (a) Resident participation in undergraduate medical education is desirable.

Interpersonal and Communication Skills

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

Residents are expected to:
1. communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
2. communicate effectively with physicians, other health professionals, and health related agencies;
3. work effectively as a member or leader of a health care team or other professional group;
4. act in a consultative role to other physicians and health professionals; and,
5. maintain comprehensive, timely, and legible medical records.
6. develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
7. develop effective written communication skills;
8. involve patients in medical decisions; and,
9. strengthen listening and non-verbal communication skills.

Professionalism

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to demonstrate:
1. compassion, integrity, and respect for others
2. responsiveness to patient needs that supersedes self interest;
3. respect for patient privacy and autonomy;
4. accountability to patients, society and the profession; and,
5. sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.
6. treat patients/family/staff/paraprofessional personnel with respect;
7. demonstrate sensitivity to patient’s pain, emotional state, and gender/ethnicity issues;
8. discuss death honestly, sensitively, patiently, and compassionately;
9. exemplify integrity;
(10) accept responsibility/accountability;
(11) demonstrate reliability;
(12) maintain calm, even temperament;
(13) exhibit self-awareness and knowledge of limits;
(14) respond to the comments of other team members, patients, families, and peers openly and responsibly; and,

(a) Graduate training in neurological surgery requires a commitment to continuity of patient care, as practiced by qualified neurological surgeons. This continuity of care must take precedence without regard to the time of day, day of the week, number of hours already worked, or on-call schedules. At the same time, patients have a right to expect a healthy, alert, responsible, and responsive physician dedicated to delivering effective and appropriate care.

**Systems-based Practice**

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

**Residents are expected to:**

1. work effectively in various health care delivery settings and systems relevant to their clinical specialty;
2. coordinate patient care within the health care system relevant to their clinical specialty;
3. incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;
4. advocate for quality patient care and optimal patient care systems;
5. work in inter-professional teams to enhance patient safety and improve patient care quality; and,
6. participate in identifying system errors and implementing potential systems solutions.
7. understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal neurosurgical care;
8. understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;
9. practice cost-effective health care and resource allocation that does not compromise quality of care;
10. advocate, coordinate, and facilitate patient care; and,
11. understand principles of and advance practices for patient safety at the institutional and individual level.
Below are the specialty-specific duty hour definitions that will be incorporated into each respective set of program requirements on July 1, 2011 and specialty-specific FAQs. Additional definitions and FAQs will be developed over time.

VI.D.1. - In the clinical learning environment, each patient must have an identifiable, appropriately-credentialed and privileged attending physician (or licensed independent practitioner as approved by each Review Committee) who is ultimately responsible for that patient’s care.

VI.D.5.a).(1) - Supervision of Residents: In particular, PGY-1 residents should be supervised either directly or indirectly with direct supervision immediately available. [Each Review Committee will describe the achieved competencies under which PGY-1 residents progress to be supervised indirectly, with direct supervision available.]

VI.E. - Clinical Responsibilities: The clinical responsibilities for each resident must be based on PGY-level, patient safety, resident education, severity and complexity of patient illness/condition and available support services. [Optimal clinical workload will be further specified by each Review Committee.]

VI.F. - Teamwork: Residents must care for patients in an environment that maximizes effective communication. This must include the opportunity to work as a member of effective interprofessional teams that are appropriate to the delivery of care in the specialty. [Each Review Committee will define the elements that must be present in each specialty.]

VI.G.5.b) - Minimum Time Off between Scheduled Duty Periods: Intermediate-level residents [as defined by the Review Committee] should have 10 hours free of duty, and must have eight hours between scheduled duty periods. They must have at least 14 hours free of duty after 24 hours of in-house duty.

VI.G.5.c) - Minimum Time Off between Scheduled Duty Periods: Residents in the final years of education [as defined by the Review Committee] must be prepared to enter the unsupervised practice of medicine and care for patients over irregular or extended periods.

VI.G.5.c).(1) - Minimum Time Off between Scheduled Duty 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.

VI.G.6.- Maximum Frequency of In-House Night Float: Residents must not be scheduled for more than six consecutive nights of night float. [The maximum number of consecutive weeks of night float, and maximum number of months of night float per year may be further specified by the Review Committee.]
Clinical Supervision. All patients receiving neurosurgical care, outpatients, inpatients, and those seen in the Emergency Department, are under the direct supervision of an attending in neurosurgery. Residents care for these patients and are engaged in the operating room as their abilities warrant. However, during each operation and during the pre and post operative periods, there is constant attending input and supervision. During interactive teaching conferences, morbidity and mortality conferences, and teaching rounds residents are challenged and feedback provided by attendings in neurosurgery, neurology, neuroradiology and neuropathology. In the outpatient settings, attendings are available to see the patients and to supervise the evaluation and treatment plans.

Based upon our pre-existing team structure and computer based patient management systems, the responsible attending physician for any given patient should be clearly identifiable to all team members. Upon transfer of care or coverage between attendings, these systems will be updated and team members will be informed.

Direct supervision may be provided by faculty or by more advanced residents, depending upon the circumstances.

PGY1’s beginning rotation on the service will be provided with direct supervision at all times until the PGY6 and PGY7 staff have had sufficient interactions with the PGY1 to determine whether he or she may safely provide care with direct supervision immediately available. Once deemed appropriate thereafter, PGY1’s will provide care with direct supervision immediately available. The patient responsibilities assigned to PGY1’s will be commensurate with each PGY1’s abilities and experience. If a PGY1 encounters any of the situations listed below requiring attending notification, the expectation is that they communicate with a supervising, more advanced resident and dependent upon that interaction either the supervising resident or the PGY1 will communicate with the responsible attending physician.

Communication. Neurosurgery attendings are and will continue to be notified immediately in the circumstances noted below. These notifications may come from a resident, fellow, or P.A. at any level and occur at anytime, day or night. Note the team including attendings, residents, P.A.s must all regularly communicate patient’s status and plans to one another but these areas require urgent interaction with attendings.

1. When any patient is being considered for admission or transfer to their service unless the attending in question has already arranged for the admission or transfer. This notification may come from a resident, fellow, or PA at any level but occurs before the patient is actually admitted and at anytime, day or night.
2. Similarly, all consults are to be rapidly seen and discussed with the attending including outpatients, inpatients and Emergency Department patients.
3. Neurologic deterioration/change including unexpected seizures (i.e., unmonitored patients). Includes wound problems and CSF leak.
4. Invasive monitoring.
5. Emergence or progression of systemic disorder. Examples include concern for pulmonary embolism, myocardial ischemia, respiratory compromise, sepsis.

6. Unexpected changes in vital signs requiring an intervention or diagnostic procedures not covered in the daily plan.

7. The planning of diagnostic imaging. In particular, urgent imaging needs to be immediately communicated.

8. Need for consultation by another service.

9. Unexpected and significantly abnormal laboratory values.


11. Anticoagulation.

12. Need for chemical or physical restraints

13. Out of the ordinary or persistent patient complaints.


15. Serious concerns raised by nursing staff.

16. Situations requiring decision-making about limiting the degree of care or end-of-life.
From ACGME Common Program Requirements, effective 7/01/2011

VI.D. Supervision of Residents

VI.D.1. In the clinical learning environment, each patient must have an identifiable, appropriately-credentialed and privileged attending physician (or licensed independent practitioner as approved by each Review Committee) who is ultimately responsible for that patient’s care.

VI.D.1.a) This information should be available to residents, faculty members, and patients.

VI.D.1.b) Residents and faculty members should inform patients of their respective roles in each patient’s care.

VI.D.2. The program must demonstrate that the appropriate level of supervision is in place for all residents who care for patients. Supervision may be exercised through a variety of methods. Some activities require the physical presence of the supervising faculty member. 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 or resident physician, either in the institution, or by means of telephonic and/or electronic modalities. In some circumstances, supervision may include post-hoc review of resident delivered care with feedback as to the appropriateness of that care.

VI.D.3. Levels of Supervision

To ensure oversight of resident supervision and graded authority and responsibility, the program must use the following classification of supervision:

VI.D.3.a) Direct Supervision – the supervising physician is physically present with the resident and patient.

VI.D.3.b) Indirect Supervision:

VI.D.3.b.(1) 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.

VI.D.3.b.(2) 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.

VI.D.3.c) Oversight – The supervising physician is available to provide review of procedures/encounters with feedback provided after care is delivered.

VI.D.4. 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.D.4.a) The program director must evaluate each resident’s abilities based on specific criteria. When available, evaluation should be guided by specific national standards-based criteria.

VI.D.4.b) Faculty members functioning as supervising physicians should delegate portions of care to residents, based on the needs of the patient and the skills of the residents.

VI.D.4.c) 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.D.5. Programs must set guidelines for circumstances and events in which residents must communicate with appropriate supervising faculty members, such as the transfer of a patient to an intensive care unit, or end-of-life decisions.

VI.D.5.a) Each resident must know the limits of his/her scope of authority, and the circumstances under which he/she is permitted to act with conditional independence.

VI.D.5.a.(1) In particular, PGY-1 residents should be supervised either directly or indirectly with direct supervision immediately available. [Each Review Committee will describe the
achieved competencies under which PGY-1 residents progress to be supervised indirectly, with direct supervision available.

VI.D.6. Faculty supervision assignments should be of sufficient duration to assess the knowledge and skills of each resident and delegate to him/her the appropriate level of patient care authority and responsibility.

Neurological Surgery ACGME Duty Hour and Supervision Specific Language effective 7/2011

Q: What competencies must a PGY-1 resident demonstrate in order to progress to being supervised indirectly with direct supervision available?

A: Programs must document that residents have had structured education in the procedures listed below equivalent to that available through the boot camps offered by the Society of Neurological Surgeons. Program directors must ensure that a resident has demonstrated competence in each listed procedure and patient management competency to the satisfaction of the supervising faculty member before he or she can be supervised indirectly with direct supervision available for that procedure or patient management competency.

Approved procedures and patient management competencies that PGY-1 residents can perform under indirect supervision with direct supervision immediately available are:

**Patient Management Competencies**
1. evaluation and management of a patient admitted to hospital, including initial history and physical examination, formulation of a plan of therapy, and necessary orders for therapy and tests
2. pre-operative evaluation and management, including history and physical examination, formulation of a plan of therapy, and specification of necessary tests
3. evaluation and management of post-operative patients, including the conduct of monitoring, specifying necessary tests to be carried out, and preparing orders for medications, fluid therapy, and nutrition therapy
4. transfer of patients between hospital units or hospitals
5. discharge of patients from hospital
6. interpretation of laboratory results

**Procedural Competencies**
1. carry-out of basic venous access procedures, including establishing intravenous access
2. placement and removal of nasogastric tubes and Foley catheters
3. arterial puncture for blood gases

During the early months of the PGY-1, residents must be educated in, directly observed, and assessed in the following:

**Patient Management Competencies**
1. initial evaluation and management of patients in the urgent or emergent situation, including urgent consultations, trauma, and emergency department consultations (ATLS required)
2. evaluation and management of post-operative complications, including hypotension, hypertension, oliguria, anuria, cardiac arrhythmias, hypoxemia, change in respiratory rate, change in neurologic status, and compartment syndromes
3. evaluation and management of critically-ill patients, either immediately post-operatively or in the intensive care unit, including monitoring, ventilator management, specification of necessary tests, and orders for medications, fluid therapy, and enteral/parenteral nutrition therapy

4. management of patients in cardiac arrest (ACLS required)

Procedural Competencies

1. carry-out of advanced vascular access procedures, including central venous catheterization, temporary dialysis access, and arterial cannulation

2. repair of surgical incisions of the skin and soft tissues

3. repair of skin and soft tissue lacerations

4. excision of lesions of the skin and subcutaneous tissues

5. tube thoracostomy

6. paracentesis

7. joint aspiration

8. advanced airway management
   a. Endotracheal intubation
   b. Tracheostomy

Q: Why are PGY-2 residents defined as intermediate-level residents?

A: All residents enter the program as interns having participated in the Neurological Surgery Boot Camp offered through the Society of Neurological Surgeons. Boot camp provides intense training and assessment of fundamental professionalism, communication, and procedural skills, which are directly observed and evaluated during the early months of the PGY-1. By the time residents enter the PGY-2, they have had considerable experience as members of operative teams and in other teams providing patient care. Because neurological surgery programs are relatively small (one to three residents per PGY level), residents will assume continuously increasing progressive responsibilities. By the PGY-2, these residents are often the most senior residents on certain rotations (i.e., a pediatric service in a children’s hospital), and in such a role will function as a leader of the team with the attendings. Although neurological surgery programs are long, PGY-2 residents are as prepared to assume the responsibilities of an intermediate resident as are PGY-2 residents in shorter programs in primary care specialties, such as internal medicine or pediatrics. The additional years of neurological surgery education are needed to refine operative skills, not to develop advanced skills in the other competency domains.

Q: What responsibilities should residents at the PGY-3 level or beyond have in order to prepare them to enter unsupervised practice of medicine?

A: It is very important that senior and chief neurological surgical residents have semi-continuous responsibility for groups of patients as part of a team led by an attending surgeon. This type of experience is very similar to the conditions of independent practice which residents at this level will enter soon after graduating, and often occurs in the context of ‘home call’, where the requirement for a 10-hour respite does not apply. Whether during at-home call or during scheduled duty periods, it is important that these residents have this kind of experience.

Q: Why are residents at the PGY-3 level and beyond considered to be in the final years of education?

A: Neurological surgery programs are designed such that excellent educational experiences occur when residents are given the responsibility to lead a team of more junior residents under the PGY-2 residents are considered to be at the intermediate level. Residents at the PGY-3 level
and beyond are considered to be in the final years of education. Supervision of an attending whose practice is focused in a specific clinical area. Because most neurological surgery programs have relatively few residents, it is desirable that a resident at the PGY-3 level or beyond assume such a leadership role. For example, if a PGY-3 resident is the senior-most resident working on a dedicated spine service and the operative case runs until 10:30 p.m., the resident should be able to return to lead the service hospital rounds at 6:00 a.m. the following morning. The educational value of this type of leadership experience is important for a resident’s maturation as a clinician and surgeon. 

NOTE: such experiences must occur in the context of the 80-hour limit and the one-day-off in seven requirements.

Q: What are some specific examples of circumstances when residents at the PGY-3 level or beyond may stay on duty or return to the hospital with fewer than eight hours free of duty? 

A: VI.G.5.c.(1),(b) Residents at the PGY-3 level or beyond may stay on duty or return to the hospital with fewer than eight hours free of duty under specific circumstances. The Review Committee defines such circumstances as: required continuity of care for a severely ill or unstable patient, or a complex patient with whom the resident has been involved; events of exceptional educational value; or, humanistic attention to the needs of a patient or family.

1. to optimize continuity of care for patients, such as a: a) patient on whom the resident operated/intervened that day and needs to return to the Operating Room (OR) b) patient on whom the resident operated/intervened that day and who requires transfer to the Intensive Care Unit (ICU) from a lower level of care; c) patient on whom the resident operated/intervened that day in the ICU and who is critically unstable; d) patient on whom the resident operated/intervened during that hospital admission and who needs to return to the OR due to a matter related to a procedure previously performed by the resident; e) patient and/or patient’s family with whom the resident needs to discuss the limitations of treatment/DNR/DNI orders for a critically ill patient on whom the resident operated participate in a declared emergency or disaster when residents are 

2. to include in the disaster plan

3. to perform important, low-frequency procedures necessary for competence in the field

4. when functioning in a leadership role as the senior-most resident on a team of other residents and attendings where the resident’s presence at rounds or another important surgical procedure is necessary for continuity of team leadership (most often in the context of a “home call” arrangement.)
**Neurosurgery Transitions of Care / Hand-offs**

**Goal:** Structured hand-off processes are designed to minimize the disruption to patient care from changes in covering providers. This is accomplished by dividing the service into teams and maintaining consistent day float / night float residents over long rotations, which helps minimize the number of different covering providers and maximizing patient familiarity. Additionally, during hand-offs, formalization of the process ensures quality communication of pertinent information to ensure patient care.

**Service Structure**

All attendings are sub-divided into 4 teams, each with a chief resident and junior resident. All members know the details of all care for patients on their team.

Day-float / Night-float are the communication pillars for the service and they often receive the first call regarding patient issues. Midlevel providers (MLPs) assist with patient care on primary floor patients or ICU patients, however more significant issues requiring attention are first directed to day-float / night float for triage. They also see all new consults.

Neurosurgery Census: maintained electronically in EPIC with appropriate identifying information, new post-op patients are added to the list by the resident covering the case, new consults/admissions are added by the resident who performs the initial encounter (typically day-float or night float). This is printed in a way that patient identifiers including name, MRN, bed, age and attending are listed, with ample space to make appropriate notes.

**Morning team rounds**

**Goal:** to collect relevant data and exams on all neurosurgery patients / consult patients

**Procedure:** The junior resident for each team rounds on the floor and consult patients for the respective team including collecting vitals/labs/events/reviewing images/performing physical exam. This typically starts at 4:30am. At 6am the junior resident and chief resident meet in the neuro-ICU to round on more critical patients together. Immediately following this, the junior resident presents and reviews all patients with the chief resident in detail, including reviewing relevant radiographic data. If necessary, the junior resident and chief resident then round together on any floor or consult patients if there is any concern or question regarding their condition/exam.

**Morning sign out**

**Goal:** communicate all pertinent patient information on the entire neurosurgery service from the rounding teams and night-float to day-float.

**Procedure:** At 6:50 am the entire resident team meets. At this time, the pager is covered by one of the operative residents that is not currently presenting patients to minimize disruptions/distractions to the sign out process. The primary rounding resident for each neurosurgery patient (primary and consults) then gives verbal sign-out directly to day-float on the patient. This is supervised by the chief residents for each team to ensure important information is not omitted. Additionally, night-float is also present to ensure that no overnight events were missed for any of the patients. The day-float makes notes on the patient census list as needed including “one liner” describing patient and condition, important co-morbidities, most recent events, most recent exam, events, most recent vitals and labs, current significant medications, and current plan including items to be performed/followed up on during the next shift. Significant radiographic findings are also reviewed on the computer for each patient as needed. Day-float is often familiar with most of the patients from prior shifts, new patients added that day or any patient...
day-float is unfamiliar with is covered in more detail with presentation of a complete history and physical. Day-float is encouraged to ask clarifying questions as needed, other members of the team will also ask clarifying questions or make suggestions following the presentation for each patient. For patients who are especially critical or complex, the team will go and perform an evening exam as a group if necessary.

Following sign-out, the day-float resident is informed of any pages and relevant patient information that occurred during sign-out.

**Attending Rounds**

Goal: to review each patient in detail with the responsible attending.

Procedure: each day following AM rounds the chief resident for the service contacts each attending in his team and reviews the appropriate details of each patient including the overnight events, relevant labs and vitals, relevant imaging, and the current plan for the day. The chief resident then relays any changes to the plan to the day-float resident. Additionally, the attending often discusses relevant patients directly with day-float.

**MLP sign out**

Goal: to communicate relevant patient information to the floor MLPs and neuro-ICU MLPs / team.

Procedure: following AM sign out, the day-float resident reviews the floor patients with the floor MLP including a “one liner” describing patient and condition, important comorbidities, overnight events, most recent exam, events, most recent vitals and labs, current significant medications, and current plan including items to be performed/followed up on during the day. The floor MLP is often familiar with most of the patients from prior shifts, with new patients are reviewed in more detail. The neuro-ICU patients are reviewed with the neuro-ICU team in a similar fashion. The MLPs and the day-float resident work closely throughout the day, often reviewing patients and events.

**Evening sign out**

Goal: communicate all pertinent patient information on the entire neurosurgery service from day-float to night-float.

Procedure: At 5:30pm the day-float and night float resident meet with the neuro-ICU fellow and the neuro-ICU MLPs. During this time the pager is held by another resident to triage calls and minimize disruptions/distractions to the sign out process. The primary covering provider for each neurosurgery patient then gives verbal sign-out directly to night float on the patient. This is supervised by the neuro-ICU fellow and the day float resident to ensure important information is not omitted. Additionally, a more senior neuro-surgery resident is often present to supervise as well. The night float makes notes on the patient census list as needed including “one liner” describing patient and condition, important co-morbidities, most recent events, most recent exam, events, most recent vitals and labs, current significant medications, and current plan including items to be performed/followed up on during the next shift. Significant radiographic findings are also reviewed on the computer for each patient as needed. Night-float is often familiar with most of the patients from prior nights, new patients added that day or any patient night-float is unfamiliar with is covered in more detail with presentation of a complete history and physical. Night-float is encouraged to ask clarifying questions as needed, other members of the team will also ask clarifying questions or make suggestions following the presentation for each patient. For patients who are especially critical or complex, the team will go and perform an evening exam as a group if necessary.
Following neuro-ICU sign-out, the day-float, night-float, and more senior neurosurgery residents leave the neuro-ICU to complete sign-out in the resident room. Again, the pager is triaged by a different resident during this time to minimize distractions/interruptions. The remaining patients are covered in the same manner.

Following sign-out the night-float resident retrieves the pager from the triage resident and receives verbal updates regarding any new pages that occurred during sign out, including items to be performed/followed up on during the day. The floor MLP is often familiar with most of the patients from prior shifts, with new patients are reviewed in more detail. The neuro-ICU patients are reviewed with the neuro-ICU team in a similar fashion. The MLPs and the day-float resident work closely throughout the day, often reviewing patients and events.

**Weekend sign out**

Goal: communicate all pertinent patient information on the entire neurosurgery service from week-day team to the week-end team. The weekends are often covered by residents with less day-to-day familiarity with the patients on service so additional sign-out procedures are applicable.

Procedure: The junior resident and chief resident of each team makes a written sign-out which is provided to each of the weekend residents which reviews the patients and their recent course. The chief residents verbally sign-out to the weekend chief resident. Additionally, the day-float / night-float resident perpetuates information throughout the weekend. This ensures multiple parallel sign-outs to ensure no information is dropped.
ACGME Case Logs

Each resident must record, in the ACGME Case Log System, the number and type of each procedure he or she performs as either assistant resident surgeon, senior resident surgeon, or lead resident surgeon.

Resident cases must be entered into the ACGME Case Log System. Residents must indicate their major role in each case: assistant resident surgeon, senior resident surgeon, or lead resident surgeon. The definitions for these roles are:

- **Assistant resident surgeon**: includes positioning, sterile preparation, monitoring devices, microscope preparation, participation in the initial (opening) or final (closing) portions of the case, and/or assisting the resident or staff surgeon(s). *This category does not accrue case numbers for residents.*

- **Senior resident surgeon**: may include aspects of all of the above, and must include participation in the surgical procedure between opening and closing.

- **Lead resident surgeon**: may include aspects of all of the above, and must include participation in the critical portion of the case.

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

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

The Review Committee began reviewing Case Log reports for all programs, beginning with the 2012-2013 graduates. These reports include completed cases for each of the new defined case categories. Initially, feedback will be provided to all programs, but no citations will be given related to non-compliance with minimum numbers. 2013-2014 and 2014-2015 program graduates are expected to demonstrate compliance with all minimum numbers, except for the critical care (DC20-28) and endovascular (DC3b) procedures. Beginning with the 2015-2016 graduates, all program graduates are expected to demonstrate compliance with all minimum numbers without exception.

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

**Defined Case Categories and Minimum Numbers**

- Adult Cranial (205)
- Adult Spinal (95)
- Pediatric (30)
- Adult and Pediatric Epilepsy (10)
- Critical Care (90)
- Total All Defined Case Categories = 430
## EVALUATIONS

### Evaluation of Residents

Residents are continuously and periodically evaluated. There is daily interaction between residents and faculty. Notable events are recorded and discussed. The following tools are utilized to report performance in an ongoing fashion: Case Log, Clinical Performance Biopsy Tool, Surgical Performance Biopsy Tool, Impromptu Performance Commentary, Twice yearly 360 degree evaluations are carried out and twice yearly the residents are asked to upload the following information to their electronic portfolio: updated CV, goals and objectives for the next 6 months, critical evaluation as to how well the previous 6 months goals and objectives have been met, meetings and courses attended, papers published, grant applications and funding status. Additional information obtained includes patient surveys, Neurosurgery Primary Examination and an in-house oral examination. The faculty and chief resident(s) meet and complete a Biannual Summary that is then discussed with the residents individually. The Program will use the web-based MedHub system to distribute and compile evaluations.

Residents are tracked by the Program for ACGME mandated Milestones. Each resident will be asked to carry out a self-study twice yearly of their progress. Subsequently the Clinical Competency Committee composed of members of the Neurosurgery Faculty will make the final determination of specific Milestones. These are reported directly to the ACGME.

Residents take the Neurosurgery Primary examination beginning in the PGY 1 year and continue to take it annually. In years PGY 1 – PGY 3 this examination is taken for self-assessment and for credit PGY 4. Residents must have a passing score prior to PGY 4 to be eligible to take for credit PGY 4. Failure to do so is an indication of inadequate progress. In such an event the resident will be required to take the exam for self-assessment in PGY 4 year. Residents who are unable to pass this examination PGY 5 year are subject to disciplinary action including failure to promote and places the resident at jeopardy for dismissal. Note the Primary Examination is requisite for completing the Program by ACGME Requirements.

### Evaluation of Faculty

Yearly, the residents meet and write faculty evaluations. These evaluations are discussed with the individual faculty members and the Chair of the Department by the Program Director and a written report of this discussion made.

### Evaluation of the Program

Similar to the faculty evaluation, programs and rotations within the residency are reported by the residents and are discussed in the periodic Neurosurgery Education Meetings that occur 1 to 3 times/month. These discussions are documented in those minutes and in the faculty reviews.
# Neurosurgery Conference Schedule

<table>
<thead>
<tr>
<th>Type</th>
<th>Frequency</th>
<th>Year</th>
<th>Names of Individuals Responsible for Oversight</th>
<th>Names of Individuals Presenting the Conference</th>
<th>Required to Attend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epilepsy</td>
<td>Weekly</td>
<td></td>
<td>Dennis Spencer, MD and Jason Gerrard, MD PhD</td>
<td>Varies</td>
<td>Relevant Faculty/Residents</td>
</tr>
<tr>
<td>M&amp;M</td>
<td>Weekly</td>
<td></td>
<td>Chief Residents</td>
<td>Residents</td>
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<td>Tumor Boards, Adult and Pediatric</td>
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<td>Joseph Piepmeier, MD and Michael DiLuna MD</td>
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<td>Journal Club</td>
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<td>Varies</td>
<td>Faculty/Residents</td>
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## RESIDENT OUTPATIENT EXPERIENCES

| PGY 1 | Weekly clinic session first 6 months neurology clinic (NeuroMusc-EMG, Epilepsy, Pediatrics, Stroke, Neuro-Oncology, Neuro-Ophthalmology), second 6 months NS specialty session/week except when day or night float. |
| PGY 2 | Weekly VA except when day or night float. GK when at VA. |
| PGY 3 | Weekly VA except when day or night float. GK when at VA. |
| PGY 4 | Two sessions/month in specialties of particular interest, arrange with faculty. |
| PGY 5 | Two sessions/month in specialties of particular interest, arrange with faculty. |
| PGY 6 | One session weekly by assigned service, i.e., Pediatric or Spine. |
| PGY 7 | One session weekly by assigned service, i.e., Neuro-Oncology, Functional or Vascular. |
COURSES AND MEETINGS

Residents have the opportunity to attend courses and meetings throughout the course of their residency. A partial list of expected courses are as follows:

PGY 1 Boot Camp (2 days) Boston
PGY 2 Junior Resident Course (2 days) New York
PGY 3 Research Update in Neuroscience for Neurosurgeons, RUNN (8 days) Woods Hole
PGY 4 & 5 Residents usually attend several AANS/CNS or institution sponsored specialty courses (2 – 3 days each)
PGY 6 Residents may attend AANS/CNS or institution sponsored specialty courses (2 – 3 days each)
PGY 7 Gamma Knife Certification Course (5 days) Pittsburgh

Funding for these courses is ordinarily by the Department, Hospital or sponsoring institution.

Residents are welcome to attend major neurosurgery and specialty meetings as well as other appropriate meetings and courses. This requires coordination with schedules. Funding is ordinarily by the Hospital Educational Reimbursement Fund which is currently limited to $1,400/year and eligibility begins October 1 after a year in the institution. The Department or individual investigators may supplement if the resident has a major presentation. Note that eligibility for Hospital requires that all training requirements have been completed. Further details regarding this fund is available in the House Staff Office.
FACILITIES/RESOURCES/SUPPORT

Environment

Residents work and live in the rich academic and cultural environment of a major academic medical center, university and medium-sized New England city. Below are detailed a number of aspects of the academic community, but each resident adds to its richness and diversity.

The institution assures that appropriate support services, personnel, and facilities are available for its trainees. For example, neurosurgery has a suite of call rooms within the NICU consisting of 2 bedrooms, each with bunk beds, computers, and a private bathroom connected to both rooms. YNHH has three cafeterias, located throughout the hospital complex. Residents are allocated funds on their ID cards with which they can purchase meals at any of the cafeterias when on-call. In addition, the hospital makes available a free late night meal to all residents on-call in the House Staff Lounge. Finally, 24-hour/day canteens are available in a number of locations throughout the institution, including one in the House Staff Lounge, which provides an assortment of sandwiches, fruits, snacks and beverages and a microwave oven.

Neurosurgery residents share a conference room in the NICU. The conference room is used for rounds, small teaching conferences, and has imaging workstations and audio-visual equipment. The NICU also has an office that is shared by the residents on ICU rotations, neuroICU fellows, and mid-levels. Additionally, each resident is provided with an iPad mini to access electronic resources for education, as well as connect to the EPIC electronic medical record. The residents also have a private workroom on the neurological floor next to the NICU that has several computer terminals, printers, conference space, and the Louis Kaplow Neurosurgery Residents Library. Furthermore, residents are provided with a personal set of lead and surgical loupes. A $1400/year stipend for academic expenses is available each year for books, courses, and additional surgical attire. The department will pay for USMLE step 3 in the PGY-1 year, as an incentive to complete it in a timely fashion. In the PGY-3 year, residents attend the Woods Hole course in basic neuroscience prior to starting their PGY-4 research year. In the PGY-4 year, residents attend the AFIP short course in neuroradiology and neuropathology for board review.

Patient care associates (PCAs) are assigned on all shifts to every patient care unit. This PCA performs almost all phlebotomy, electrocardiograms, patient transport, as well as several other patient support services. Nurses insert and maintain all peripheral intravenous catheters. All specimens, excluding cerebral spinal fluid are transported to the appropriate laboratory by a pneumatic tube system. Requests for laboratory, radiological, and consultation services are entered into the hospital computer system. Results of all laboratory tests are available immediately after completion on the same hospital computer system. Terminals are located throughout the hospital on all patient care units as well as in the Emergency Department, operating rooms, on call rooms, clinics, etc. An attending level neuroradiologist is in house 24 hours a day for easy review of films. Computerized images including CT, MRI and plain films are available on every computer workstation in the hospital via Synapse. In order to assure that the above-described support is adequate to meet the needs of the residents, the GMEC and OGME receive continuous feedback from program directors as well as through specific questions posed to the residents by the Office of GME. All residents are given remote access to be able to access radiology images and the EMR from home.

The mid-level providers (MLPs) that work with the neurosurgical service are an integral part of the neurosurgical team. They provide a wide spectrum of services including high quality direct patient care while enhancing resident education. The role of the physician assistant is complex, comprehensive and flexible. The primary responsibility is the provision of direct patient care, with an emphasis on detail and continuity. Working collaboratively with the attending staff and residents, daily work rounds are conducted (twice daily with residents) with plans for patient management formulated and implemented. Throughout the day, the MLPs are a “readily available” conduit for communication between attending physicians and residents (who may be obligated in the operating room, etc.) and
help provide high quality, efficient, patient care with a focus on continuity of care. The neurology and neurosurgery services are in process of hiring additional MLPs to have in-house coverage of the NICU every night.

The number of MLP positions has been increased over the past 2 years to six full-time positions, including a “Lead Physician Associate”. The areas of coverage include: the neurosurgical intensive care unit, adult step-down, adult floor, pediatric ICU/floor, and occasionally the operating room. In-house MLP coverage is provided Monday-Friday (6am-4pm) in the neurosurgical intensive care unit, and the adult neurosurgical step-down floor. A rotating schedule has been developed which allows for “off-loading” the on-call neurosurgical resident with evening MLP coverage. A MLP is teamed up with the on-call neurosurgical resident with the result of more available manpower to cover the service in the “off hours”. This design allows for more efficient patient care, improved documentation, and a collaborative working environment with opportunity for education of both the physician assistants and residents. Over time, the continuity and familiarity with the unique aspects and attending preferences of the service is conveyed by the physician assistant to the neurosurgery residents. In exchange, the neurosurgical resident is available for assistance, education and “back up” for the physician assistants in many clinical experiences (e.g., central line placement, ventriculostomy, emergency/trauma consults, etc). Communication with ancillary and nursing staff is greatly enhanced as is team morale with the result of a more positive work environment.

With the increasing complement of MLPs, the goal is to have NICU coverage 24/7. Residents now have the opportunity to moonlight in the NICU to aid in patient care and also be compensated financially. All these endeavors have allowed for more expeditious discharges and more efficient patient management in timely fashion. It also allows further opportunity for formal teaching rounds by the attending physicians and/or Chairman without adversely affecting patient care. It has improved patient satisfaction and the working relationship with the nursing staff.

Residents are encouraged to attend meetings and courses. The hospital provides a stipend each year for such purposes to which the department adds substantial funding. If residents are presenting at a course, the department will pay for travel and accommodation costs.

Certain materials are needed for the Program and are provided by the Department. These include surgical loupes and lead. These are both quite expensive and will be provided to each resident once. Mrs. McLaughlin will coordinate fitting and purchase during the PGY 1 year.

Residents are provided with mini iPads for EPIC and Yale Medical Library access. They are provided to the residents during orientation. The purchase of these iPads has been made possible by the Kaplow Yale Neurosurgery Residents Library.

Other materials may be reimbursed by the Hospital Educational Reimbursement Fund with some restrictions. Each resident should inquire about current criteria with the House Staff Office.

All Yale Neurosurgery Residents are reimbursed $50/month for their cell phone in order to offset professional communication. Bills must be submitted within 90 days of being issued in order to qualify for reimbursement by the University. Speak with Mrs. McLaughlin to assure requirement are met for this reimbursement.
FELLOWSHIPS

Fellowships

The epilepsy surgery program offers a flexible experience in the diagnostic and therapeutic approaches to medically intractable seizures. A single position for six months to one year is available either following completion of neurosurgical training or embedded within the residency. A Yale-New Haven Hospital resident may elect to concentrate within this specialty for six months to one year and, if choosing this path, may combine clinical experience with ongoing research related to epilepsy.

For individuals choosing the one-year course, either during or following neurosurgery training, the year begins in July and the first three months are spent in Neurology. Here, the fellow works with the medical epileptologists attending outpatient clinics, evaluating patients for the surgical program, learning about the appropriate selection of anticonvulsants, and studying both scalp and intracranial electroencephalography. The surgical fellow rotates with the neurology fellows supervising the audiovisual monitoring (AVEEG) of Phase-1 patients (24-hour scalp monitoring selection for surgical candidacy) and caring for the patients undergoing chronic intracranial studies (Phase 3). The fellow is supervised in the AVEEG monitoring suite by an epileptology faculty and is then responsible for presenting these patients at the weekly Monday epilepsy surgery conference. The next nine months are then spent in the surgical arm of the program where they take part in both diagnostic and therapeutic surgical procedures. There is a close interaction with the other residents who also take part in the surgical procedures assuming the role of assistant or primary surgeon, depending on year of training and ability. The fellow is expected to carry out at least one clinical research project during this year, attend twice weekly clinics, present at monthly Journal Club, and at the end of the year prepare an abstract for the yearly meeting of the American Epilepsy Society.
Effective January 1, 2013, Yale New Haven Hospital’s Perioperative Services including the York Street Campus, Saint Raphael’s Campus, Temple Surgical Center, and Shoreline will begin following the Yale New Haven Health System Universal Protocol for Surgical / Invasive Procedures.

Please note: Two major changes – marking procedures with laterality before entering the operating room, and participating in the YNHH developed pre operative checklist (time out) - will affect work flow for your patients entering the operating room and may require adjustments to your morning. These changes are mandated by the Department of Public Health and must be followed. The nursing staff has been educated and briefed.

The Universal Protocol must be followed in any location in which invasive procedures occur. The updates of this policy include multiple sections as outlined below:

**Booking:** At the time of the OR booking for an elective case, the operative site and laterality must be verified with the surgeon, surgeon’s office, or booking service.

**Marking the operative/procedure site(s):** Side/site must be marked before the patient enters the procedure room and with the patient involved and aware, if possible. The site must be marked with an indelible marker with the operator’s initials so that it will be visible after draping. If a white band is utilized on the patient for laterality, the actual procedure site must be marked after anesthesia induction. Pre-operative verification includes the availability and review of radiology tests.

**Time-out:** Multiple procedures/surgeries require a time-out, as defined above, prior to the start of each procedure. In the case of an emergency where imminent death to the patient or fetus is a risk or some other extreme unanticipated circumstance, adherence to this policy may be impractical or impossible. In those instances an abbreviated time-out should be conducted while other activities are occurring. The abbreviated time-out includes: correct patient identity, the correct site and the procedure to be done. Such cases require documentation in the medical record by the attending surgeon/physician delineating the circumstances.

These updates to the policy have been made by the System Perioperative Leadership Committee, and have been approved by the Perioperative Executive Leadership Committee (PELC) and Perioperative Patient Safety and Quality Committee (POPSQC) as well as Drs. Udelsman and Sweeney to standardize perioperative safety and quality. The actions are also necessary related to recent Department of Public Health reportable events.

Thank you very much for your anticipated cooperation with the full implementation of this updated policy.

Douglas Vaughn, M.D., D.D.S.                                      Maxwell Laurans, M.D.
Co-Chair, POPSQC                              Co-Chair, POPSQC
Medical Director, Perioperative Svs                      Assistant Professor, Neurosurgery
REVISIONS: Changes to this policy require Yale New Haven Health System-wide Executive Committee approval and cannot be edited or altered at the delivery network level.

PURPOSE: To promote patient safety by providing a standardized approach for verification of correct site, correct procedure and correct patient before the commencement of all surgical/invasive procedures. This includes perioperative/pre-procedure verification and site marking.

POLICY: Prior to initiation of a surgical or invasive procedure, each of the components of the Universal Protocol will be followed and documented as defined below.

SCOPE: Universal Protocol must be followed in any location in which invasive procedures occur. This includes procedures that involve puncture or incision of the skin, insertion of an instrument, or insertion of foreign material into the body (see Attachment A for a listing of procedures that fall within the scope as well as exemptions from site marking). This policy does not apply to “minor” procedures, including but not limited to peripheral IV line placement, NG tube insertion and Foley catheter placement.

PROCEDURE:

Booking (applies to the O.R. only)

1. At the time of O.R. booking for an elective case, the operative site and laterality will be verified with the surgeon, surgeon’s office, or booking service.
2. Elective O.R. booking will not be processed until right or left distinction, multiple structures (such as fingers or toes), or level (such as the spine) are identified. This shall be recorded by the O.R. schedulers in the O.R. booking documents.

Pre-operative/procedure verification

1. Performed by:
a. Perioperative setting: an RN, proceduralist or licensed independent practitioner (LIP) who is a member of the procedural team.

b. All other areas: a designated member of the multidisciplinary team.

2. Confirmation of the correct site, procedure and patient takes place prior to the procedure in the pre-operative, pre-procedure, or procedure area or at the bedside.
   a. Ask the patient to state: (1) full patient name, (2) date of birth or medical record number, and (3) procedure, site and any side/level.
   b. If the patient lacks capacity to verify identity, when possible ask a responsible family member to assist with verification (order of preference would be: patient’s health care representative or other legally appointed decision-maker, spouse/partner to civil union, adult child, parent, sibling or other family members) to state (1) full patient name, (2) date of birth or medical record number, and (3) procedure, site and any side/level. (Refer to Advance Directive or Consent Form).
   c. Correctly identify patient, or confirm patient identification stated per step a., using two patient identifiers.
   d. Verify that all relevant documentation (e.g., H&P, consent(s), pre-anesthesia assessment, nursing assessment, labeled diagnostic and radiology test results) is available, reviewed and accurately matched to the patient and confirms procedure and site.
   e. Blood products, implants, devices and/or special equipment are available, if needed.
   f. Missing information, inconsistencies and discrepancies must be addressed before starting procedure.

Marking the operative/procedural site(s)

1. Side/site must be marked before the patient enters the procedure room and with the patient involved and aware if possible.
   **Unless patient has altered conscious state or the physician declares an emergency**

2. Performed by:
   a. The proceduralist or licensed independent practitioner – including the Attending Surgeon/Physician, Dentist or Podiatrist – who is ultimately accountable for the procedure and will be present and participating when the procedure is performed must mark the site(s).
   OR
   b. The designee of the LIP above who is (1) a participant in a medical residency program, is supervised by the LIP above or a licensed individual who performs duties in a collaborative agreement with or supervised by the LIP above (e.g., Advanced Practice Registered Nurse, Physician Assistant, et al), (2) is familiar with the patient, (3) is permitted by the institution and (4) will be present for and participating in the procedure.

3. Procedure:
   a. The site is topically marked only by the proceduralist or designee as above, with the initials of the person marking, at or near the incision site so that the initials are visible.
   b. Upon completion of positioning, prepping, and draping the initials must be visible prior to the start of the procedure.
   c. The site will be initialed with hospital approved indelible marker.
   d. If the proceduralist initials are “N.O.”, the site will be marked with three initials, first, middle and last initial.

4. Mark all cases that involve distinctions between right/left side, surface (flexor, extensor), multiple structures (fingers and toes), or multiple levels (spinal procedures).

5. For spinal procedures, in addition to preoperative skin marking of the general spinal region, special intraoperative imaging techniques must be used for locating and marking the exact vertebral level and images must be available, visible, correct and properly labeled.
6. All special procedures involving laterality, with an incision or approach from the midline or a natural orifice, require initialing.  
Note: please see Attachment A (page 7) for a list of the exemptions from site marking.

**Alternative marking process:**

If a patient refuses to have the skin marked, a “white” ID band with the patient’s name, medical record number, side/site and proceduralist’s initials, will be placed on the wrist or ankle of the same side of the planned procedure. The ID band will be placed by the proceduralist, LIP or designee as above.

Pediatric and certain other patients rarely may resist or be frightened by accurate surgical site marking. The operating surgeon may elect to use an indelible marker to establish laterality by marking the upper extremity on the same side as the planned procedure. Whenever this method is employed, the actual surgical site must be marked after anesthetic induction is completed as part of the time-out procedure.

For additional information related to alternative marking for interventional radiologists/cardioologists, please see Addendums A and B.

**Time-out immediately before starting the invasive procedure or making the incision**

A final verification must be conducted by all members of the team to ensure that the correct patient, procedure, and site are identified. The final time-out is required for all O.R. cases and for all invasive procedures. The final time-out occurs after the patient is positioned prior to the incision/beginning of invasive procedure.

1. The time-out is conducted in the operative, procedure room or specified area.
2. The time-out involves all members of the operative/procedural team.
3. The circulating RN is the designated member of the team to initiate the time-out (acceptable if surgeon/proceduralist or anesthesiology provider initiate the time out) or when outside of the O.R., a designated member of the team.
4. The time-out involves interactive communication and all participants are expected to express concerns about any component of the process.
5. During the time-out, team members will face the patient and all other activities are suspended, to the extent possible,
   a. without compromising the safety of the patient, and
   b. all participants are focused on the time-out.
6. The following elements are included during the time-out process

   **a. In the O.R.:**
   
<table>
<thead>
<tr>
<th>All members of the team suspend activities during and actively participate in the time-out (exemption: direct monitoring of patient status)</th>
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<tbody>
<tr>
<td>The circulating RN is designated to initiate the time-out (acceptable if surgeon/proceduralist or anesthesiology provider initiate the time out)</td>
</tr>
<tr>
<td>The attending surgeon/proceduralist is present for the time out</td>
</tr>
<tr>
<td>The attending anesthesiologist, CRNA or anesthesia provider is present for the time out</td>
</tr>
<tr>
<td>All members of the surgical team are present</td>
</tr>
<tr>
<td>Name of patient <strong>and</strong> MRN or DOB (if MRN unavailable) is stated and matches ID band (if ID band inaccessible, checked against previously confirmed medical record consent)</td>
</tr>
</tbody>
</table>
The attending surgeon/proceduralist states or confirms the procedure to be performed

The surgical consent is used to verify the procedure to be performed and consent matches patient identifiers

Confirm site marking

(a) Site of procedure(s) (with laterality) is topically marked and with initials and visible prior to incision

And

(b) Radiographic imaging is present (when applicable)

Or

(c) A site/side ID band is present on the patient's wrist or ankle and is accessible

The following items are addressed:

(a) Antibiotic prophylaxis
(b) Blood products
(c) Imaging (if applicable)
(d) Implants
(e) Special equipment

Attending surgeon/proceduralist and anesthesia provider discuss particular challenges or special considerations

Timing: the time out is initiated prior to the incision/beginning of the invasive procedure

b. Outside of the O.R.:

All members of the participating patient care team are present, suspend activities during and actively participate in the time out (exemption: direct monitoring of patient status)

A designated member of the participating care team initiates the time out

The proceduralist is present for the time out

The attending anesthesiologist, CRNA or anesthesia provider is present for the time-out (if applicable)

Name of patient and MRN or DOB (if MRN unavailable) is stated and matches ID band (if ID band inaccessible, checked against previously confirmed medical record consent)

The proceduralist states or confirms the procedure to be performed

The procedural consent is used to verify the procedure to be performed (when applicable) and consent matches patient identifiers

Confirm site marking (except when site marking is excluded)

a) Site of procedure(s) (with laterality) is topically marked with initials and visible prior to procedure

And

b) Radiographic imaging is present (when applicable)

Or

c) A site/side ID band is present on the patient’s wrist or ankle and is accessible

The following items are addressed:

a) Medications (if applicable)
b) Blood products (if applicable)
c) Imaging (if applicable)
d) Implants (if applicable)
e) Special equipment (if applicable)

Proceduralist discusses particular challenges or special considerations with all team members

Timing: the time out is initiated prior to the incision/beginning of the invasive procedure

7. Multiple procedures/surgeries require a time-out, as defined above, prior to the start of each procedure.
8. The completion of the time-out is documented and signed. (Refer to Documentation below).
   a. A designated member of the team will complete, document and sign the time-out form.
9. If the proceduralist leaves the patient area for any reason, a second time-out will occur.
   a. Any time a change is made to the surgical field that requires a change in patient position and/or a change is made to the boundaries of the original areas that were prepared and draped for surgery, new surgical site verification must be accomplished and documented in the operative nursing record. The minimum personnel required to be present and participating in the new surgical site verification and pause are: the circulating RN, the scrub technician, the attending surgeon, and the anesthesia provider.

   b. The minimum required elements of the new surgical site verification and pause are:

      1) Verify correct patient name, date of birth, and medical record number on both the operative consent and the patient identification wrist band.
      2) Verify the correct procedure and operative site per the operative consent.
      3) Verify the correct site marking per the operative consent. The site marking must be visible to all members of the team. If site marking is impossible, then the appropriate extremity band must be used as set forth in section Confirm Site Marking above.

   c. The new site verification/pause is to be performed immediately before the incision is made.

10. If discrepancies occur, the surgery/procedure will not take place until the discrepancies are resolved.
    a. If a resolution cannot be achieved, the procedure is cancelled.
    b. If, at any later time, any doubt is raised as to the validity of the confirmation process, the case will pause until the concern is resolved. Resolution will be documented in the medical record.

11. In the case of an emergency where imminent death to the patient or fetus is a risk or some other extreme unanticipated circumstance, adherence to this policy may be impractical or impossible. In those instances an abbreviated time-out should be conducted while other activities are occurring. The abbreviated time-out includes: correct patient identity, the correct site and the procedure to be done. Such cases require documentation in the medical record by the attending surgeon/physician delineating the circumstances.

12. In the O.R., any deviation from this policy must be documented by the attending surgeon/physician.
a. In other areas, any deviation from this policy must be documented by a member of the multidisciplinary team.

**Documentation:**

The final time out must be documented. Documentation must include the time that the time-out takes place.

BH: The Procedural Verification Form (BPT0211) or the Procedural Verification Electronic Segment is used to document the final time-out

GH: The Patient Safety Verification Checklist (hardcopy or electronic) is used to document the final “time out”.

YNHH: The Universal Protocol For Surgical / Invasive Procedures Checklist (hardcopy or electronic) is used to document the final time out.

**REFERENCES:**

The Joint Commission, *Comprehensive Accreditation Manual for Hospitals*, January 2012

Edition: UP 01.01.01, UP 01.02.01, UP 01.03.01

**RELATED POLICIES:**
Surgical or other invasive procedures that may be done in settings other than the operating room include, but are not limited to:

- Amniocentesis
- Interventional Radiology Procedures
- Angiograms, angiographs, angioplasties
- Line placements (central, Swan Ganz, arterial, PICC, percutaneous, portacath, umbilical)
- Arthrograms
- Kidney biopsy
- Bone marrow aspiration
- Liver biopsy
- Biopsies
- Lumbar puncture
- Bronchscopy
- Myelogram
- Cardiac Catheterizations and Vascular procedures
- Needle localization mammogram
- Chest tube insertions
- Paracentesis
- Circumcision
- Pericardiocentesis
- Discograms
- Percutaneous aspirations
- Endoscopies
- Peripheral nerve block
- Epidurals
- Thoracentesis

EXEMPTIONS: Site marking is excluded in the following circumstances; however, other elements of the Universal Protocol still apply:

a. Physician declared Emergency in which a delay may cause harm to patient.
b. Single organ procedures which do not involve laterality (e.g. cesarean section, circumcision, cardiac surgery).
c. Endoscopic procedures without intended laterality.
d. Teeth - The operative tooth name(s) and number are marked on the digital x-ray. The documentation, images, and/or diagrams are available in the procedure room before the start of the procedure.
e. Stump debridement
f. External fixation removal
g. AV fistula / AV shunt
h. Premature infants, for whom the mark may cause a permanent tattoo.
i. Burns
j. Any skin graft
k. Thyroid
l. Parathyroid
m. Areas that are not anatomically or technically possible
ADDENDUM A

For Interventional Radiology Laboratories
Body Marking Guidelines

The purpose of this document is to identify a body marking standard operating procedure (SOP) to be used in the Heart and Vascular Center (HVC)/Procedures. This is derived from the current practice at Yale and the following document, which can be found on the Society of Interventional Radiology (SIR) website:


Yale HVC/Procedures practice is currently compliant with the Joint Commission guideline of utilizing a time out process with associated documentation. This is to ensure that the correct procedure is performed on the correct patient at the correct time. However, unlike the operating room, HVC/Procedures does not typically employ a body marking system. This can be explained because of the nature of interventional radiology/cardiology procedures. Typically, the percutaneous area entered does not always correlate with the target organ or body part being treated or imaged. An example of this is when the Right Femoral Artery is punctured with the purpose of advancing a catheter into the left renal artery. In addition, interventional radiology/cardiology procedures are image guided and imaging is utilized in every procedure performed. This imaging whether it is ultrasound, CT, or fluoroscopy acts as confirmation of disease or location of interest and can be considered a possibly superior alternative to body marking with a pen.

The following process is proposed for “image marking” of the body part of interest in HVC Procedures.

1. There are situations, in which site marking is required by the Joint Commission, but implementation of this requirement is difficult or impossible in the HVC/Procedures suites. In these cases, the Society of Interventional Radiology recommends that the side of intervention be confirmed in the manner traditionally used by interventional radiologists-cardiologists: appropriate intra-procedural imaging.

2. Interventional radiology/cardiology imaging equipment can lead to left/right errors. The interventional radiologist/cardiologist is responsible for making certain that images are correctly oriented (right or left, cephalad or caudal) before being sent to archive.

3. This policy may not apply in emergent, life-threatening clinical situations at the discretion of the responsible physician.

4. When both left- and right-sided structures are known to be abnormal (eg, bilateral hydronephrosis), the Society of Interventional Radiology recommends that skin marking be performed even if intra-procedural imaging is employed.*

5. The Society of Interventional Radiology recommends that, in procedures in which vascular access is simply a means to provide a route of access to perform a procedure or to provide central venous access, skin marking at the vascular access site is not needed. This is consistent with the Joint Commission guidance regarding cardiac catheterization.
6. Placement of central venous catheters is a special clinical situation in which side marking is not required, but in
which it is good clinical practice to investigate if there is a preferred side.

* see addendum
ADDENDUM B

For Interventional Radiology Laboratories
Body Marking Guidelines Addendum*

*This addendum is created to identify those procedures performed in HVC/Procedures where body marking may be appropriate and to create a body marking procedure.

As previously stated most interventional radiology/cardiology procedures are image guided and documented image guidance acts to confirm disease or condition prior to intervention. When both left- and right-sided structures are known to be abnormal (eg, bilateral hydroureteronephrosis), the Society of Interventional Radiology recommends that skin marking be performed even if intra-procedural imaging is employed. The following conditions/procedures should be considered for body marking:

1. Fistulograms if more than one fistula is present.
2. Unilateral Nephrostomy tube placements. Unilateral Nephrostomy tube check/change when bilateral Nephrostomy tubes exist.
3. Unilateral venogram: when a specific extremity has been requested

Below is a suggested procedure for body marking in HVC/Procedures. Steps include identification of which patients may need body marking, documentation of this need, communication to various team members and the actual body marking process.

1. To identify which patients may need body marking: This will begin with the person taking the initial consult or referral phone call (the intake person). The intake person will ask appropriate questions to determine who these patients are, and where the structure or condition exists.
2. This information will need to be written on the requisition (for outpatients) or on the consult card (for inpatients). The consult card will be faxed to the scheduler so this information can be transcribed into the order.
3. This information will then be visible once the patient is scheduled, either in IDX or Navicare. The scheduler will write left or right as noted on the requisition. If there is a discrepancy between what is noted on the requisition and the clinical documents provided, the scheduler will note this as well.
4. When the patient is being consented, the person obtaining consent (a clinically trained person) will confirm in the documentation where the structure or condition exists. When there is conflicting or incomplete information, the person obtaining consent will call the referring physician or representative for clarification.
5. The consent will reflect the specific location of the condition or structure.
6. Once consent is signed, an operator (attending, fellow, resident, PA or APRN) who will be present during the procedure will mark the site with their initials. A permanent marker will be used.
7. The region will be marked either in the pre-procedure area or when the patient is in the procedure room prior to prepping and draping.
8. Before the start of the procedure, it will be part of the timeout process for all team members to confirm which area is being studied or treated and whether body marking is required and to confirm the presence of the appropriate body marking. The time out document already contains this wording.
Resident Eligibility and Selection to ACGME Accredited Training Programs

Introduction: This policy is adopted consistent with the hospital mission to educate physicians for a leadership role in clinical and academic medicine as well as to protect and improve the health and maintain the safety of our patients, visitors and staff, recognizing the importance of accepting qualified applicants.

Policy:

Resident eligibility:

It shall be the policy of Yale-New Haven Medical Center that programs select candidates from among eligible applicants who possess one of the following criteria:

1. Graduates of medical school in the United States and Canada accredited by the Liaison Committee on Medical Education (LCME).

2. Graduates of colleges of osteopathic medicine in the United States accredited by the American Osteopathic Association (AOA).

3. Graduates of medical schools outside the United States and Canada who meet one of the following qualifications:
   a. Have received a currently valid certificate from the Educational Commission for Foreign Medical Graduates or
   b. Have a full and unrestricted license to practice medicine in a US licensing jurisdiction in which they are in training.

4. Graduates of medical schools outside the United States who have completed a Fifth Pathway program provided by an LCME- accredited medical school.

5. If applying for a fellowship program, the individuals have completed an appropriate accredited residency program

6. If applicant is transferring to a hospital program, the program director must have received and reviewed evaluations/ letters of recommendations from the previous program and have communicated with the candidate’s former program director.

7. This information must be given to the DIO prior to the acceptance of the transferring resident.
Policy:

Resident Selection:

Candidates to the programs must be selected among eligible applicants on the basis of their preparedness, ability, aptitude, academic credentials, communications skills, and personal qualities such as motivation and integrity. Programs must not discriminate with regard to sex, race, age, religion, color, national origin, disability, or veteran status.

Furthermore, accredited training programs must select trainees through an organized matching program, such as the National Residency Matching Program (NRMP), where such is available.
Resident Promotion Policy

Introduction:
This policy is adopted consistent with the hospital mission to educate physicians for a leadership in clinical and academic medicine as well as to protect and improve the health and maintain the safety of our patients, visitors and staff, recognizing the importance of commensurate, increasing levels of responsibility.

Policy:
It shall be the policy of Yale-New Haven Medical Center that residents in accredited training programs will be promoted to higher levels of responsibility based on their accomplishments and achievements during the past year. Each Program will develop policies for promotion for their own individual program. The Program Director is responsible for communicating these specific standards for promotion to their residents. For each trainee the program must document the trainee’s performance on a regular basis and review the performance at least semi-annually with the trainee.
Resident Probation, Suspension or Dismissal Policy

Introduction:

This policy is adopted consistent with the hospital mission to educate physicians for a leadership role in clinical and academic medicine as well as to protect and improve the health and maintain the safety of our patients, visitors and staff.

Definitions:

Probation: A trial period in which a resident is permitted to redeem academic performance or behavioral conduct that does not meet the standard of the program

Suspension: A period of time in which a resident is not allowed to take part in all or some of the activities of the program. Time spent on suspension may not be counted toward the completion of program requirements.

Dismissal: The condition in which the resident is directed to leave the residency program, with no award of credit for the current year, termination of the resident’s appointment and termination of all association with the Medical Center.

Policy:

It shall be the policy of Yale-New Haven Medical Center that the decision for probation, suspension and/or dismissal of residents in accredited training programs is the primary responsibility of the program director. This process should be progressive and objective and the final decision must be reviewed and approved by the chair of the department and reported to the Director/Associate Dean of GME prior to the probation, suspension and/or dismissal. The program director must have records, in writing, of discussions, with the resident, involving faculty and the chair of the department concerning the problems that have led to the probation and/or dismissal. A resident involved in any of the actions of probation, suspension or dismissal has the right to appeal according to GMEC policy.

Procedure:

Classification of Progressive Discipline Steps

There are basic steps of progressive disciplinary action, as follows:

Resident Counseling

1. Resident is counseled by the Program Director in an effort to eliminate possible misunderstandings and to explain what constitutes proper conduct or acceptable job/academic performance.

Verbal Warning (oral reprimand)

1. Following unsuccessful attempts (number of attempts is proportionate to the level of the problem) to correct the problem through repeated counseling, the resident should be verbally warned that further discipline may follow if the resident continues to commit the offense in question, or does not otherwise correct the academic/performance problem.
Written Warning
1. Resident receives written notice of discipline on following intentional or repeated offenses. The purpose of a written warning is to make certain that the resident is fully aware of the misconduct he/she has committed and what is expected, thereby enabling the resident to avoid a recurrence of the incident. A written warning requires prior approval by the department Chair or appropriate residency review committee in the Department.

Probation
1. A resident may be placed on probation by a Program Director for reasons including, but not limited to any of the following:
   a. failure to meet the performance standards of an individual rotation;
   b. failure to meet the performance standards of the program;
   c. failure to comply with the policies and procedures of the GME Committee, the Medical Center, or the participating institutions;
   d. misconduct that infringes on the principles and guidelines set forth by the training program;
   e. when reasonably documented professional misconduct or ethical charges are brought against a resident which bear on his/her fitness to participate in the training program.
2. When a resident is placed on probation, the Program Director shall notify the resident in writing in a timely manner, usually within a week of the notification of probation. The written statement of probation will include a length of time in which the resident must correct the deficiency or problem, the specific remedial steps and the consequences of non-compliance with the remediation.
3. Based upon a resident’s compliance with the remedial steps and other performance during probation, a resident may be:
   a. continued on probation;
   b. removed from probation;
   c. placed on suspension; or
   d. dismissed from the residency program.

Suspension
1. A resident may be suspended from a residency program for reasons including, but not limited to any of the following:
   a. failure to meet the requirements of probation;
   b. failure to meet the performance standards of the program;
   c. failure to comply with the policies and procedures of the GME Committee, the Medical Center, or the participating institutions;
   d. misconduct that infringes on the principles and guidelines set forth by the training program;
   e. when reasonably documented professional misconduct or ethical charges are brought against a resident which bear on his/her fitness to participate in the training program;
   f. when reasonably documented legal charges have been brought against a resident which bear on his/her fitness to participate in the training program;
   g. if a resident is deemed an immediate danger to patients, himself or herself or to others.
2. When a resident is suspended, the Program Director shall notify the resident with a written statement of suspension to include:
   a. reasons for the action;
   b. appropriate measures to assure satisfactory resolution of the problem(s);
   c. activities of the program in which the resident may and may not participate;
   d. the date the suspension becomes effective;
   e. consequences of non-compliance with the terms of the suspension;
   f. whether or not the resident is required to spend additional time in training to compensate for the period of suspension and be eligible for certification for a full training year.
A copy of the statement of suspension shall be forwarded to the Director/Associate Dean for Graduate Medical Education and the Director of Housestaff Office.

3. During the suspension, the resident will be placed on “administrative leave”, with or without pay as appropriate depending on the circumstances.

4. At any time during or after the suspension, resident may be:
   a. reinstated with no qualifications;
   b. reinstated on probation;
   c. continued on suspension; or
   d. dismissed from the program.

**Dismissal**

1. Dismissal from a residency program may occur for reasons including, but not limited to, any of the following:
   a. failure to meet the performance standards of the program;
   b. failure to comply with the policies and procedures of the GME Committee, the Medical Center, or the participating institutions;
   c. illegal conduct;
   d. unethical conduct;
   e. performance and behavior which compromise the welfare and of patients, self, or others;
   f. inability of the resident to pass the requisite examinations for licensure to practice medicine in the United States.

2. The Program Director shall contact the Director/Associate Dean for GME and provide written documentation which led to the proposed action.

3. When performance or conduct is considered sufficiently unsatisfactory that dismissal is being considered, the Program Director shall notify the resident with a written statement to include:
   a. reasons for the proposed action,
   b. the appropriate measures and timeframe for satisfactory resolution of the problem(s).

4. If the situation is not improved within the timeframe, the resident will be dismissed.

5. Immediate dismissal can occur at any time without prior notification in instances of gross misconduct (e.g., theft of money or property; physical violence directed at an employee, visitor or patient; use of alcohol/drugs while on duty).

6. When a resident is dismissed, the Program Director shall provide the resident with a written letter of dismissal stating the reason for the action and the date the dismissal becomes effective. A copy of this letter shall be forwarded to the Director/Associate Dean for GME and the Director of Housestaff Records.

7. If a contract is not to be renewed, and the resident dismissed, the program will provide the resident with written notice of intent not to renew the agreement no later than four (4) months prior to the end of the resident’s current agreement. If the primary reason for non-renewal occurs within the four months prior to the end of the agreement, the program will provide the resident with as much written notice of the intent not to renew as the circumstances will reasonably allow, prior to the end of the agreement.

8. At that time, the resident will also be given a written copy of the grievance process.
Grievance Policy

It is the policy of Yale-New Haven Medical Center to foster sound communications between Specialty and Subspecialty Residents programs (hereafter known as Residents) in ACGME accredited, ABMS accredited and GMEC approved training programs and their respective Chiefs of Service and to ensure that problems arising within the programs are appropriately discussed and resolved. This policy is intended to address those situations in which a trainee may have a disagreement with an action taken or treatment received within the program.

Application and Definitions:

This policy shall apply to all Specialty and Subspecialty Residents in ACGME accredited, ABMS accredited and GMEC approved training programs who are employed under a contract with Yale-New Haven Hospital or Yale University School of Medicine. This policy does not apply to research post-doctoral fellows.

Residents: Specialty and Subspecialty (Clinical Fellows) Residents in ACGME accredited, ABMS accredited and GMEC approved training programs.

Grievance: A grievance is defined as an expression of dissatisfaction regarding any of the following:

   a) the Resident’s written contract
   b) duties assigned to a Resident
   c) application of Hospital or University policies
   d) unfair or inequitable discipline or performance reviews or evaluations
   e) an issue regarding non-renewal of a Resident’s appointment
   f) termination of a Resident’s appointment prior to the end of the contract term
   g) discrimination of any type

Complaints related to sexual harassment must be made pursuant to the Hospital’s Policy or the University policy, depending on the salary source of the Resident.

Complaints of academic fraud/scientific misconduct must be brought under the "Policies and Procedures for Dealing with Allegations of Academic Fraud at Yale University" (see

http://www.yale.edu/grants/acadfraud.html) and will be referred to the Special Advisor to the Dean of the School of Medicine.

Violations of Title VII (acts of discrimination against protected classes under federal law) may be directed to the Hospital or University Compliance Officer.

Grievance Panel: A standing panel will be selected consisting of 4 Chief Residents, three Program Directors, three Chiefs/Associate Chiefs of the Medical Staff, three administrative officials (from both Hospital and Medical School). These individuals will serve for a period of two years. Upon submission of a grievance, the Director/Associate Dean of GME will select with the Resident pursuing the grievance a panel consisting of 2 Chief Residents not from their specialty. The Director/Associate Dean will select one Program Director not from the trainee’s specialty, one member of the Medical Staff not from their specialty and an administrative officer. The Chair of each panel will be selected by the panel members.

Working Days: Monday through Friday, excluding Hospital holidays.
Policy and Procedure:

A. When an incident forming the basis for a grievance arises, the grievant must follow the procedure outlined below. Each grievance shall be handled promptly and impartially, without fear of coercion, discrimination or reprisal. Each participant in a grievance shall do his or her part to protect this right.

B. All time limits specified in this policy refer to working days. To achieve a prompt resolution of Resident’s grievances, the action at each step of the Grievance Procedure should be taken as rapidly as possible, but not later than the prescribed time limits. In the event of extenuating circumstances, a time limit may be extended by mutual agreement of the parties at that step.

C. Grievance meetings shall be scheduled at times which are mutually satisfactory to all parties concerned. No resident, faculty member, member of the Grievance panel, administrator, or witness shall suffer loss of compensation or leave time for the time spent in any step of this procedure.

D. A Resident may obtain the assistance of another Hospital or University employee of his/her choice in preparing and presenting a grievance at any step, including a member of the Human Resources Department. In the latter case of a Hospital employee, notification should be made to the Manager, Employee Relations. Other outside individuals, including attorneys, are not permitted to participate directly in the grievance process, though consultation with an attorney is permitted.

E. All issues to be raised in a grievance must be raised from the first step and may not be introduced for the first time in Step 2 without having been previously raised.

F. At each step of the grievance, the Resident must prepare a written summary of the complaint, facts, information accumulated, and the remedy or outcome being sought. This must be forwarded to the Chairperson of the Graduate Medical Education Committee (GMEC), as well as to the individual/panel hearing the next level of the grievance.

G. The Chairperson of the GMEC will serve to ensure that the procedure for the grievance is adhered to at each step.

H. At the conclusion of each step of the Grievance Procedure, the involved Resident and the Chief of Service and/or Section Chief, as appropriate, shall both receive a copy of the written decision which includes an explanation of the reasoning behind the decision.

I. All information, whether provided in writing or through interviews, obtained in connection with a grievance shall be treated in a confidential manner by all parties involved. Only the final outcome and disposition will be recorded and maintained in the Resident’s file, while the detailed information referred to in paragraph F above shall be discarded by the Chief of Service or Section Chief and others hearing the grievance. However, the complete record will be maintained in the Program Director’s file.
J. Data regarding numbers of grievances, their general subject matter and their departments, as well as their final outcomes will be an agenda item at each scheduled meeting of the GMEC, when applicable. Annually the GMEC shall summarize the number of grievances, the Department and type of grievances for the committee. Trends in this data may be used by the GMEC to provide specific feedback to the Departments.

Administrative Procedures

A. General Conflict Resolution

Every effort should be made to resolve all questions, problems and misunderstandings as soon as they arise. Accordingly, Residents are encouraged to initiate discussions with their Chief of Service, and when appropriate, Section Chief, at the time the dissatisfaction or questions arise. In addition, the Director/Associate Dean GME may be asked to facilitate this discussion.

B. Step 1 – Grievance Panel

If a Resident is unable to resolve his/her problem, a grievance may be initiated through the Director/Associate Dean of GME. A written statement setting forth the basis for the grievance and the outcome or remedy sought shall be submitted to the GME Coordinator, who will give it to the Chairperson of the GMEC. To be accepted for consideration, a grievance must be initiated by the Resident within ten (10) working days of the time he/she first had knowledge of the incident that gave rise to the grievance. The Chair of the GMEC shall then arrange a meeting with the House Officer to select the grievance panel. The panel will be immediately notified and shall meet with the resident within fourteen (14) working days after receiving the Step 1 appeal. The panel shall conduct a review of the grievance, shall develop the facts and information which are relevant to the grievance, shall meet with all other relevant parties and shall issue a written decision. The panel’s decision shall be issued within fourteen (14) working days of the meeting. A copy of the decision shall be given to the Resident and to the GME Coordinator, who shall give it to the GMEC Chairperson.

C. Step 2 - Chief of Staff or Dean’s Representative

If the Resident is not satisfied with resolution of the Grievance at Step 1, the Resident may appeal to Step 2 of the Grievance Procedure. This appeal must be in writing and comply with the requirements of paragraph F under Policy above, 2 copies must be submitted to the GME Coordinator, within seven (7) working days after receiving the Step 1 decision. He/she will deliver the appeal to individuals who will hear the Step 2 grievance. In the event a grievance is not appealed to Step 2 within the seven (7) working day time frame, the Step 1 decision shall be considered final.

A second step grievance will be reviewed by one of the following, depending on the salary source of the Resident: 1) Chief of Staff/Senior Vice-President for Medical Affairs of Yale-New Haven Hospital, 2) Representative of the Dean, Yale University School of Medicine.

Either the panel or the Chief of Staff, as applicable, shall meet with the resident within fourteen (14) working days after receiving the Step 2 appeal. The Chief of Staff/Representative of the Dean shall conduct a review of the grievance and reach a written decision promptly. The Chief of Staff’s /Representative of the Dean’s decision shall be issued within ten (10) working days of his/her meeting with the Resident. Either decision shall be deemed final and binding on all concerned parties.
Moonlighting

Introduction:

YNHMC and its clinical training programs recognize that because residency/fellowship education is a full-time endeavor, the institution and the program director must ensure that moonlighting does not interfere with the ability of the resident/fellow to achieve the goals and objectives of the educational program. Professional and patient care activities that are external to the educational program are called moonlighting. Moonlighting activities, whether internal or external, may be inconsistent with sufficient time for rest and restoration to promote the residents' educational experience and safe patient care. In addition, YNHMC abides by the ACGME institutional requirements which set policies for moonlighting. The following policy will define the parameters that are to be used in monitoring and approving moonlighting activities.

Policy:

1. Neurosurgery Residents are permitted to moonlight ONLY in the Neuro-ICU, after obtaining written permission from the Program Director on the required form.
2. Only Neurosurgery PGY 4-7 residents, after obtaining passing Primary Exam Score, are permitted to moonlight in the Neuro-ICU.
3. Residents are not required to engage in moonlighting.
4. A statement that this policy is understood must be signed by the trainee and the Program Director and maintained in the resident's file. Non-compliance with the signed policy may result in disciplinary action including probation and possible dismissal.
5. A prospective, written statement of permission to moonlight must be obtained by the resident from the program director, and maintained in the resident file.
6. The statement states that the resident's performance will be monitored for the effect of these activities upon performance and that adverse effects may lead to withdrawal of permission to moonlight. Moonlighting cannot interfere with the educational activities of the program.
7. All moonlighting must be considered within the 80-hour work week.
8. Residents/fellows are not permitted to bill for professional services provided within the scope of their training program and during working hours.
9. Yale-New Haven Hospital will not provide liability coverage to residents/fellows while on professional activities (moonlighting) outside of the training program.
10. Residents/fellows on J-1 Visas are NOT permitted to moonlight, as established by Federal Regulations 22CFR 514.16.
11. Residents/fellows on H-1B Visas are only permitted to moonlight within the Institution that supports the Visa.
USMLE Step 3
(effective April 2014)

Introduction:

This policy applies to all Department of Neurosurgery residents Yale-New Haven Medical Center.

Policy:

1. All PGY-1s are expected to take and pass USMLE Step 3.
2. The Department will pay for the exam for each PGY-1.
3. All Neurosurgery residents must pass Step 3 by the end of their PGY-3, as a Yale Neurosurgery Program Requirement for promotion to PGY-4.
4. The Department will pay for the current PGY-2 residents to take their exams within one year of the effective date noted above.
5. All current residents should make plans to take and pass Step 3 within 12 months of the effective date noted above.
ABNS Primary Exam Policy

The Neurological Surgery Primary examination is a critical step toward American Board of Neurological Surgery Certification and is a requirement for the completion of residency at Yale and all other neurosurgery programs in the U.S.

The Department expects all residents to take the ABNS Primary Exam, beginning in PGY-1, for assessment until they pass for credit. It is expected that PGY-4 level residents take and pass the Primary Exam for credit. Residents are not allowed to take the Exam for Credit until after they pass it during the time they take it for assessment. If a resident does not meet these goals, promotion and continuation in the program are in jeopardy.
Professionalism/Standards of Appearance Policy

Introduction:
The Graduate Medical Education Training Programs of the Yale-New Haven Medical Center are committed to the highest standards of professionalism and professional image to all persons, agencies and associations. This foremost includes our patients, their families and other visitors. We believe that professionalism and the image we present inspires confidence in the care and services we provide as professionals and as an institution.

We expect that trainees must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles, including:

1. compassion, integrity, and respect for others;
2. responsiveness to patient needs that supersedes self-interest;
3. respect for patient privacy and autonomy;
4. accountability to patients, society and the profession; and,
5. sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation;
6. a safe, comfortable and healthy work environment;
7. presenting a professional and identifiable appearance to patients, their families and visitors, YNHH staff, and the medical and business communities;
8. supporting a culture of confidence and service excellence while at the same time, accommodating sincerely held religious and cultural beliefs when operationally feasible.

In order to promote the professional image, the following standards of appearance are put into place.

Scope:
This policy applies to all residents/fellows at Yale-New Haven Medical Center.

Individual program directors have the discretion to define appropriate attire for the work environment and the nature of the work performed within the scope of this policy.

Policy:
1. General Appearance
   In all circumstances, professionalism and appropriateness are the guiding standards. Extremes of fashion in clothing, hair styles and accessories must be avoided, as well as any clothing or adornment that detracts from the trainees’ roles and responsibilities.

2. Identification
   a. All residents/fellows must wear their identification badges with the photo plainly visible above the waist when in patient care areas.
   b. A lab coat with name will not replace the use of a name badge
c. Name badges should be clipped on and lanyards should not be used in areas and roles that necessitate patient contact.
d. Personal statements expressed by symbols, messages or insignia must be appropriate and consistent with our mission and patient satisfaction goals. This includes personal statements reflected on clothing, accessories, pins, buttons, stickers, fabric patterns and non-YNHH/YSM logo wear.

3. Grooming and Hygiene
a. All residents/fellows will maintain reasonable personal hygiene and grooming standards essential to a professional image.
b. Scents of any kind (perfumes, lotions, hair products, etc.) must be used sparingly and are not permitted where there is sensitivity to fragrances.
c. Cosmetics should be used in moderation.
d. Hair must be clean and neat and worn off the face when working with patients or as required for safety and sanitation.
e. Facial hair and fingernails must be clean and trimmed according to applicable health standards and Hospital policies. For additional information, please refer to the Fingernails, Natural and Artificial C: F-1 in the Administrative Policies and Procedures Manual.

4. Jewelry and Accessories
a. Jewelry must be discreet and appropriate, and not cause a safety or infection control hazard. Earrings must be small and unobtrusive, and not detract from the professional image or represent a safety risk.
b. Visible body piercings (other than earrings) are prohibited.
c. Tongue piercings can impact communications and are therefore prohibited.
d. Tattoos and body art that are considered offensive, sexually explicit, racist or threatening must be covered.
e. Authorized head coverings, i.e. surgical caps, may be worn correctly and as appropriate to the task and work environment.

5. Professional Dress:
a. When residents are not required to wear scrubs, their dress must be professional.
   i. For men this includes: collared shirts (dress shirts, button downs), turtlenecks or sweaters (including cardigans), tailored trousers (dress slacks, khakis, corduroys) and loafers or laceup shoes with socks. Blazers and sports jackets are optional.
   ii. For women this includes: shirts (collared) or blouses with sleeves, turtlenecks, sweaters and sweater sets, skirts or tailored pants, and flats, pumps or boots.
   iii. It is understood that when residents/fellows are asked to return to the hospital at night, in an emergency, the above requirements may be relaxed as arriving for patient care is the first priority.
b. Inappropriate attire includes: denim, shorts, tee shirts (sleeveless shirts, tank tops, halter tops, crop tops), sandals (beach sandals, Birkenstocks, flip flops), athletic wear of any kind (sweatshirts, rugby shirts, sweatpants, leggings, stirrup pants, jogging suits, spandex, lycra, caps), torn clothing (clothing with holes or frayed ends), and provocative or revealing clothing.
c. Clothing when on night call may include heavier upper garments, including fleece jackets/vest/sweatshirts, if clean, neat and in good repair without hoods.
d. Clothing must be clean, neat and in a good state of repair.
e. Clothing must cover the shoulders and midriff.
f. Undergarments:
   i. Undergarments must be worn under clothes and must not be distinguishable through attire.
g. Ties:
   i. Neck ties may be worn. In roles that require direct patient contact neck ties must be clipped or worn with a buttoned white lab coat or suit coat, so as to prevent transmission of infection.
h. Lab Coats:
i. A clean, neatly pressed, white lab coat should be worn.

6. Footwear/Shoes:
   i. Shoes worn by direct patient care residents must be clean, well-kept and should have an enclosed toe.
   ii. Athletic or walking shoes (sneakers) may be worn, but must be plain and clean.

6. Scrubs:
   a. Direct patient care employees will wear scrubs as designated by their role and their department.
   b. Scrubs must be neat, wrinkle free and clean.
   c. Soiled scrubs need to be changed immediately.
   d. Scrubs should not be worn outside of the workplace, with the exception of transport to and from the hospital.
   e. Midriff must be covered.
   f. Clean, neat T-shirts without logos or turtle necks can be worn under scrub tops but not in the place of scrub tops.

Accountability:

Every resident/fellow has the responsibility of being fit for duty within the core competency of professionalism. As such, it is expected that each resident/fellow will hold one another accountable. Residents/fellows who report for duty in unacceptable attire, improper grooming or uniform, may be sent home by a supervising resident/fellow, a Chief Resident or an attending. If sent home, they must return to duty in a timely manner. After counseling, continued violations of this policy will result in progressive discipline including written notice of failure to achieve competency in professionalism and possible probation, suspension or dismissal from the training program.

Reasonable accommodations based on religion and/or cultural observances or practices such as, but not limited to, style of dress, head coverings, grooming requirements will be considered on a case by case basis.
Vacations/Holidays/Meeting Time

Policy for Time Away From Service

Goal: To clearly establish the expectations for the amount of time spent away from service for neurosurgery residents and provide additional oversight of the time away.

Commensurate with the YNHH house staff manual, the following is meant to apply to all residents at all levels, including residents on lab rotations, away rotations or those electing to enroll in other educational programs (i.e. other advanced degree programs), either formally or informally.

Vacation time: residents may take up to three weeks of vacation time during each academic year (July 1 – June 30). Unused vacation time will not accumulate from year to year. Vacation time is defined as any time when the resident is unavailable to participate in patient care, research or other academic pursuits and does not fall under the other away times as defined below. Also excluded is holiday time when the resident is not involved in patient care or otherwise engaged with the YNHH or WHVAH service.

Sick leave: residents may take up to an additional ten days of sick leave per academic year as needed. Any absence due to illness greater than or equal to 3 days requires a note from a licensed physician to return to duty. Unused sick leave does not accumulate from year to year.

Extended leave: the department supports the policies defined in the Family and Medical Leave Act of 1993. It is at the discretion of the department to decide how to reconcile the time spent away with the amount of time needed to complete the residency as defined by the ACGME and ABNS. Furthermore, it is at the discretion of the department to grant other professional leave outside that which falls under the purview of FMLA.

Meeting time: Residents may take up to two weeks away per academic year to attend meetings and courses. This time may be extended at the written request of the resident. This time does not accumulate from year to year.

Chief residents may request additional time away for job interviews, etc. It is at the discretion of the program director to grant such requests. The last day of service for the chief residents shall be June 15 unless otherwise arranged with the program director.

The above rules are meant to ensure fairness and equality among the residents with respect to time devoted to educational activities and clinical service. As mentioned above, if any resident needs additional time away, this can and should be discussed with the faculty.
Family Medical Leave Policy

Introduction: It is the policy of Yale-New Haven Hospital and Yale University School of Medicine to grant a leave of absence to employees who are absent from work due to physical or mental disability, parental needs for newborn or child adoption, or the serious illness of a family member. The Hospital and the Medical School are interested in ensuring that parental and family leaves of absence are granted in order to allow an employee personal time to meet family and parental needs. Under this policy, a family/medical leave of absence (FM LA) may be granted for a period up to sixteen (16) weeks during a 24-month period for all eligible employees. Under some circumstances, additional time may be available if more than twelve (12) months have elapsed since the beginning of the last FMLA leave. The leave may be paid, unpaid, or a combination. The leave is reserved for purposes of either child adoption, care of a newborn infant, the serious illness of a child, spouse, or parent, parent-in-law, or medical leave of absence for an employee who is absent from work due to a physical or mental illness or disability. For resident staff, this leave is paid for.

It is the intention of the Hospital and the Medical School to comply with the Federal Family and Medical Leave Act of 1993, as well as applicable Federal or State Statutes.

Policy:

I. Eligibility
A. All residents are entitled to family/medical leave of absence for a period generally not to exceed sixteen (16) weeks for the purposes of parental and family needs and not to exceed 26 weeks for the purposes of their own disability.

B. Parental and family leaves of absence are limited to sixteen (16) weeks per employee within a 24-month period of eligibility. Approved FMLA time granted by this policy will be reduced by the amount of time granted prior to the request during that 24-month rolling period.

C. If at least twelve (12) months have elapsed since the commencement of a FMLA and the employee requests a second FMLA, an additional twelve (12) weeks is available.

D. For birth mothers, the date of delivery is considered the commencement of the FMLA period.

E. The FMLA may be used consecutively or intermittently, or under certain circumstances may be used to reduce the workweek or workday. In no case will the total leave exceed 16 weeks. For birth, adoption or foster care of a child, the Hospital and/or Medical School must agree to the schedule. For a serious health condition of the employee or family member, there must be mutual agreement to intermittent leave unless the employee can prove it medically necessary.

F. If both husband and wife work for the Hospital/Medical School and each wishes to take leave for the birth of a child, adoption or placement of a child in foster care, or to care for a parent, or parent-in-law with a serious health condition, the husband and wife combined may only take a total of sixteen (16) weeks of leave.

II. Type of Leave Covered

A. In order to qualify as FMLA leave under this policy, the employee must be taking the leave as defined by one of the following circumstances:
• within one year of birth of a child and in order to care for that child
• within one year of placement of a child for adoption or foster care
• to care for a spouse, child, parent, or parent-in-law with a serious health condition
• the serious health condition of the employee, whether considered work-related or not

B. DEFINITIONS

• "Parent" means a natural parent, foster parent, adopted parent, stepparent, or legal guardian of an eligible employee; "parent-in-law" means the parent (see above) of current spouse.
• "Child" means a natural, adopted, or foster child, stepchild, or legal ward, provided such child is under the age of 18 or, if over 18 years, unable to care for themselves because of a serious disability
• "Rolling period" commences with the first day of FMLA leave.
• "Spouse" means an individual legally married to an eligible employee
• "Serious health condition" for employees means that the employee is unable to perform the functions of the employee's position. The origin of this condition may or may not be a work-related incident. As it applies to both employees and family member, a serious health condition is defined as a condition, which requires inpatient care at a hospital, hospice, or residential medical care facility or a condition that requires continuing care by a licensed, health care provider. The serious health condition also includes illnesses of a long-term nature, resulting in recurring or lengthy absences. Generally, a chronic or long-term health condition which, if left untreated, would result in a period of incapacity of more than three days, would be considered a serious health condition.
Digital Content on the Internet, Electronic Networking and Other Media

Introduction:
This policy applies to all residents and fellows at Yale-New Haven Medical Center. Use of the Internet includes posting on blogs, instant messaging [IM], social networking sites such as Facebook and Twitter, e-mail, posting to public media sites, mailing lists and posting of audio/video material.

The ease with which we can now record, store and transmit information in electronic format brings new responsibilities to those working in healthcare with respect to privacy of patient information and ensuring public trust in our hospitals, physicians and staff. New advances in technology bring significant educational benefits to trainees, as well as improve communication between health care providers.

Policy:
There are notable risks associated with use of electronic networking, the internet and other media. This includes but is not limited to:

1. **Patient privacy**: Privacy and confidentiality between the physician and patient are of utmost importance. All health care providers have an obligation to maintain the privacy of patient health information as outlined by the Health Insurance Portability and Accountability Act (HIPAA). Material that identifies patients, (without their consent) and is intentionally or unintentionally placed in the public domain constitutes a breach of standards of professionalism and confidentiality.

2. **Professional image/persona**: Physicians’ professional images are important and should be protected. Portrayal of unprofessional behavior may impair a physician’s ability to effectively practice medicine, become licensed and participate in positions of trust and responsibility in the community. All material published on the web should be considered public and permanent. There should be a “think before you post” attitude. It is also appropriate to be proactive and routinely perform searches for your individual names online and identify material posted without your consent.

3. **Appropriate internet use**: Trainees should be guided and staff should be mindful of appropriate use of the Internet and electronic publication. Patient care and safety should never be compromised due to distraction during use of electronic material. Never leave printed patient information on printers unattended. Providers should always log off from applications containing patient information after using computer terminals in the hospital.

4. **E-mail communication**: The tone and content of all electronic conversations should remain professional. The use of a privacy disclaimer on all professional emails is advised. Privacy disclaimers should include a notice of confidentiality, and advise recipients of appropriate handling of misdirected email. As an example, “This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error, please notify the system manager. This message contains confidential information and is intended only for the individual named. If you are not the named addressee, you should not disseminate, distribute or copy this email. Please notify the sender immediately by email if you have received this email by mistake and delete this email from your system. If you are not the intended recipient, you are notified that disclosing, copying, distributing or taking any action in reliance on the contents of this information is strictly prohibited”.

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5. **Internet posts**: Never post private information about any patient on the internet. This applies even if no one other than a patient is able to identify him/herself from the posted information. If a resident or fellow directly or indirectly identifies themselves as an employee and discusses their work, the Hospital expects them to express themselves professionally and consistent with the values of excellence, compassion and integrity. The content of postings when referring to colleagues and co-workers should be professional respecting the privacy rights of those individuals. When in doubt regarding postings consult with your Program Director, Department Chair or your GME Office.

6. **Social Networking Sites (SNS)**: The use of blogging and microblogging on SNS such as MySpace®, Facebook®, Twitter® and Orkut® are on the rise. Material posted on these sites is visible to many individuals. Posting of inappropriate content on these sites not only affects the professional image of the individual but can harm the public image of the institution. Students, residents and staff are encouraged to refrain from discussing patient issues or posting pictures/videos taken at work. Capture or posting of digital content involving patients is strictly prohibited. It is rarely appropriate to ‘friend’ patients or look at their private profile on a SNS. Users of SNS should consider setting privacy to the highest level, and periodically review them to ensure they are maintained.

7. **Academic Integrity**: Breach of academic trust by sharing examination questions by mobile devices is an ethical violation in addition to a breach of copyright law. Engaging in such violations constitute misconduct and can result in disciplinary action.

**Penalties for inappropriate use of the Internet and other electronic media**

The penalties for inappropriate use of the Internet and other electronic media include:

- Discipline for breach of hospital or institutional policy
- Remediation, dismissal or failure to promote

**Enforcement**

- All professionals have a collective professional duty to assure appropriate, behavior, particularly in matters of patient privacy and confidentiality.

A person who has reason to believe that another person has contravened these guidelines should approach his/her immediate supervisor/program director for advice, contact the GME Hotline (203.688.2277) or the Ombudsperson (203.688.1449).

**References:**

YNHH Policy handbook Policy #B:16A

Yale University Policy 1607- Information Technology Appropriate Use Policy
CRITICAL RESOURCES

Department of Neurosurgery,  http://medicine.yale.edu/neurosurgery/


Yale Medical Library,  http://library.medicine.yale.edu/

Thieme publications for Yale NS Residents,  https://eneurosurgery.thieme.com/

Medhub evaluations and house staff policies,  https://yale.medhub.com/index.mh

AANS,  http://www.aans.org/


ACGME,  https://www.acgme.org/acgmeweb/