

# MGH Neurosurgery Curriculum

## Overall Educational Goals of the Neurosurgical Rotations

The general objectives of the program are education in the basic and clinical sciences related to neurosurgical knowledge and practice, training in cognitive and technical skills, the development of clinical knowledge and maturity and the acquisition of surgical judgment. Rotation objectives and evaluation specific to the six ACGME competencies are noted below. Specific technical and medical objectives to be gained within each rotation are described individually below.

The educational experiences for reaching these objectives are:

- Supervised responsibility for patient management and operations;
- Lectures and conferences;
- Teaching rounds;
- Review of deaths, complications and errors;
- Web-based modules; and
- Development of individualized program of reading and self education.

Evaluation of attainment of these goals is measured by faculty evaluation on clinical services, as well as evaluation by other professional staff (e.g. nursing).

The program performs self-evaluation through residents' evaluations of the program, rotations, and by faculty and nursing evaluation of residents' performance. Evaluation includes biannual self-assessment and review with the Program Director of performance as well as electronic case log monitoring and biannual review with the Program Director of case volume, breadth, and complexity.

### **The Six Core Competencies**

**Patient Care:** Residents must demonstrate manual dexterity appropriate for their level of training, and be able to develop and execute patient care plans. This is taught to residents during each clinical rotation by direct preceptorship with senior residents and faculty, and evaluated as part of the final formative resident evaluation at the conclusion of each rotation.

**Medical Knowledge:** Residents are expected to learn basic medical knowledge about established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care. They must be able to critically evaluate scientific information and apply this knowledge to patient care. These skills are taught through departmental lectures, conferences, morbidity and mortality conferences, and assigned resident presentations.

**Practice-based Learning and Improvement:** Residents are expected to demonstrate practice based learning and improvement in their own patient care. They 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. They must be able to identify strengths, deficiencies, and limits in one's knowledge and expertise; set learning and improvement goals; identify and perform appropriate learning activities, and systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement. They must locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems, use information technology to optimize learning, and participate in the education of patients, families, students, residents, and other health professionals. This is taught by critique of personal practice outcomes in morbidity and mortality conferences, daily discussion of patient care plans and outcomes with faculty, and assignment of literature review for discussion at Morbidity and Mortality Conference and Journal Club.

**Interpersonal and Communication Skills:** Residents are expected to learn to communicate effectively with other healthcare professionals, to counsel and educate patients and families, and to effectively document practice activities. These skills will be taught through daily interaction with faculty in the inpatient and outpatient areas, through the Partners Core Curriculum, and by presentations at conferences as appropriate. Attainment of these skills will be measured through performance on clinical rotations and by evaluation by nursing staff. Adequate documentation will be assured by monitoring of patients' records by faculty.

**Professionalism:** Neurosurgical residents will maintain high standards of ethical behavior and sensitivity to age, gender, and cultural differences of patients and other health care professionals. These objectives are taught through daily interaction with faculty on clinical rotations, appropriate conferences and discussions, and the Partners Core Curriculum. Attainment of these goals is assessed via faculty evaluations on clinical rotations as well as evaluation by nursing staff. Residents are expected to demonstrate a commitment to continuity of patient care, which is assessed by their participation in outpatient clinics.

**Systems-based Practice:** Residents must demonstrate an awareness of and responsiveness to health care systems, an ability to work effectively in various health care delivery systems, coordinate patient care with the health care system, an ability to work in interprofessional teams to enhance patient safety and patient care quality, and an ability to participate in identifying system errors and implementing potential systems solutions. Residents must develop and demonstrate knowledge of risk-benefit analysis and high quality, cost effective patient care. This knowledge base is developed via daily clinical care, interdisciplinary rounds, lectures, discussion in conferences, and resident topic presentations. Residents may, on occasion, be required to participate in patient safety and quality improvement initiatives. Attainment of these goals is measured by faculty assessment on clinical rotations. Similarly, residents' understanding of the role of different specialists and health care professionals in patient management and the ability to work with these others most effectively is assessed by faculty and nursing staff evaluation on clinical rotations.

## **PGY 1**

### **Rotation Descriptions, Goals and Objectives**

Beginning with July 2009, the ACGME restructured the training programs to integrate the PGY 1 year into neurosurgery programs. Residents match directly into neurosurgery to become acclimated with the requisite and fundamental skills associated with neurosurgery education. The PGY-1 program includes six months in General Surgery of structured rotations in surgery, critical care, trauma, and other related rotations. Residents also spend three months of training in neurology, six weeks in Neurosurgery, and six weeks in neuro-critical care. Trainees will be evaluated with regard to all six core competencies as described above. The specific educational goals for each rotation are detailed below.

#### **General Surgery PGY 1**

##### **Rotation Description, Goals and Objectives**

The trainee will have six months of rotations in general surgery. These will include time spent on the trauma service, the general surgery service and other rotations that help build the essentials of diagnosing, treating and managing general surgical and trauma patients.

In July, the trainees participate in the annual Society of Neurological Surgeons PGY1 Bootcamp. A certificate is distributed to successful participants following completion of the two day course which features professionalism, safety and fundamental skills exercises, including faculty-mentored hands on training.

Training Objectives:

- Development of basic skills in the diagnosis, preoperative and nonoperative management, and postoperative care of general surgical patients in the hospital and outpatient setting.
- Development of fundamental technical operative skills through assistance at operations and closely supervised performance of minimally complex operations.
- Experience in the initial evaluation of trauma and emergency cases and outpatient management of minor surgical cases.
- Experience in the fundamental components of the care of patients in specialty areas of, critical-care, trauma, pediatric, orthopedic, burn, thoracic, and in anesthesia.

Competencies Addressed:

### **Patient care**

#### A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

- Suture and repair of traumatic skin lacerations
- Closure of simple surgical wounds
- Placement of venous access catheters

#### B. History and Physical Examination.

#### C. Clinical judgment and decision-making.

#### D. Non-operative clinical skills.

#### E. Data gathering and organization of case logs.

#### F. Development and execution of patient care plans.

#### G. Management of time and tasks.

### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

#### A. Fundamental medical knowledge

#### B. General Surgical knowledge base

- a) understanding of safe performance of procedures
- b) knowledge of relevant anatomy
- c) knowledge of operative procedures
- d) understanding of perioperative care and complications

#### C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

#### A. Understanding of evidence based case management and using this information for patient-care decisions

#### B. Appreciation of risk-benefit analysis in clinical decisions.

#### C. Participation in teaching conferences and other educational activities

#### D. Preparation of original clinical studies for formal presentation

#### E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

### **Neurology PGY 1**

#### **Rotation Description, Goals and Objectives**

The training objective for neurology are to develop familiarity with neurological conditions, their differential diagnoses, and their treatment relevant. Specifically, the trainee is expected to gain familiarity with common neurological conditions such as stroke, multiple sclerosis, and epilepsy.

The trainee will develop familiarity with the neurological examination and localization of findings to specific areas of the nervous system.

The trainee will also develop familiarity with a variety of pertinent studies including neurodiagnostic techniques such as EEG and EMG imaging such as CT and MRI.

Training Objectives:

- Fundamentals of the emergency management of neurosurgical patients, including diagnosis treatment, and triage. Emphasis on head and spinal trauma as well as the combined trauma patient. Learn relevant basic procedures such as CSF drainage, ICP monitoring, and burr holes.
- Basic operative exposures and techniques of wound closure, as well as the fundamentals of inpatient neurosurgical care and outpatient evaluation of elective conditions.

Competencies Addressed:

#### **Patient care**

- A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

- Perform a structured neurological examination
- Develop an appropriate neurological differential
- Develop a basic understanding of diagnosis and management of status epilepticus
- Develop a basic understanding of diagnosis and management of ischemic stroke
- Develop a basic understanding of diagnosis and management of intracranial hemorrhage
- Safely perform a lumbar puncture

- B. History and Physical Examination.
- C. Clinical judgment and decision-making.
- D. Non-operative clinical skills.
- E. Data gathering and organization of case logs.
- F. Development and execution of patient care plans.
- G. Management of time and tasks.

### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

- A. Fundamental medical knowledge
- B. Neurological/neurosurgical knowledge base
  - a) Understanding of safe performance of procedures
  - b) Knowledge of relevant anatomy
  - c) Knowledge of operative procedures
  - d) Understanding of perioperative care and complications
- C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

- A. Understanding of evidence based case management and using this information for patient-care decisions
- B. Appreciation of risk-benefit analysis in clinical decisions.
- C. Participation in teaching conferences and other educational activities
- D. Preparation of original clinical studies for formal presentation
- E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues

- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

### **Neurosurgery PGY 1**

#### **Rotation Description, Goals and Objectives**

This is the trainees' first exposure to neurosurgery. They will be expected to start developing basic skill in the assessment and pre-operative, post-operative, and outpatient management of neurosurgical patients. The trainee will gain increased familiarity with a focused neurological examination in the context of acute trauma, stroke or hemorrhage. The trainee will also gain increasing familiarity with the various diagnostic modalities such as CT, MRI, and Ultrasound.

Training Objectives:

- Fundamentals of the emergency management of neurosurgical patients, including diagnosis treatment, and triage. Emphasis on head and spinal trauma as well as the combined trauma patient. Learn relevant basic procedures such as CSF drainage, ICP monitoring, and burr holes.
- Basic operative exposures and techniques of wound closure, as well as the fundamentals of inpatient neurosurgical care and outpatient evaluation of elective conditions.

Competencies Addressed:

#### **Patient care**

A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

- a. Development of focused, rapid, but competent neurological examination
- b. Performance of Shunt Taps
- c. Placement of intracranial pressure monitoring bolts

B. History and Physical Examination.

C. Clinical judgment and decision-making.

D. Non-operative clinical skills.

E. Data gathering and organization of case logs.

F. Development and execution of patient care plans.

G. Management of time and tasks.

#### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

A. Fundamental medical knowledge

B. Neurological/neurosurgical knowledge base

- a) understanding of safe performance of procedures
- b) knowledge of relevant anatomy
- c) knowledge of operative procedures
- d) understanding of perioperative care and complications

C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

- A. Understanding of evidence based case management and using this information for patient-care decisions
- B. Appreciation of risk-benefit analysis in clinical decisions.
- C. Participation in teaching conferences and other educational activities
- D. Preparation of original clinical studies for formal presentation
- E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

### **Critical Care PGY 1**

#### **Rotation Description, Goals and Objectives**

The trainee will learn fundamental aspects related to the management of neurological and neurosurgical patients in the neuroscience ICU. Specific areas of focus will include the management of intracranial pressure, management of IV fluids, and basic management of acute neurological, cardiac, and

pulmonary issues common to these patients. Trainees will learn by rounding with the ICU fellows and Attendings, by conferences, and by supervised management of patients.

Training Objectives:

- Fundamentals of the emergency management of neurosurgical patients, including diagnosis treatment, and triage. Emphasis on head and spinal trauma as well as the combined trauma patient. Learn relevant basic procedures such as CSF drainage, ICP monitoring, and burr holes.
- Basic operative exposures and techniques of wound closure, as well as the fundamentals of inpatient neurosurgical care and outpatient evaluation of elective conditions.

Competencies Addressed:

**Patient care**

A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

- a. Arterial line placement
- b. Central venous catheter placement

B. History and Physical Examination.

C. Clinical judgment and decision-making.

D. Non-operative clinical skills.

E. Data gathering and organization of case logs.

F. Development and execution of patient care plans.

G. Management of time and tasks.

**Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

A. Fundamental medical knowledge

B. Neurological/neurosurgical knowledge base

- a) understanding of safe performance of procedures
- b) knowledge of relevant anatomy
- c) knowledge of operative procedures
- d) understanding of perioperative care and complications

C. Knowledge of recent literature: innovations and controversies.

**Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

A. Understanding of evidence based case management and using this information for patient-care decisions

B. Appreciation of risk-benefit analysis in clinical decisions.

C. Participation in teaching conferences and other educational activities

D. Preparation of original clinical studies for formal presentation

E. Preparation of oral presentations for formal presentation

**Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

## **Radiosurgery/West Rotation PGY 2/3**

### **Rotation Description, Goals and Objectives**

The trainee is introduced to the management of nonoperative brain lesions requiring radiosurgery. The resident also attends the proton-beam conference on Thursdays and attends clinic with Dr. Chapman. The trainee will become familiar with the indications for treatment and planning of single fraction radiosurgery, primarily STAR and LINAC. The trainee will become familiar with some radiobiology and radiation physics, the avoidance of critical neuroanatomic structure, and will assist in all aspects of treatment including dosimetry and conformal planning.

The resident also has clinical responsibilities as junior resident on the West service. However, priority is given to understanding the basics of radiation biology, dosimetry, and relevant critical brain anatomy that might be affected by radiosurgery.

The trainee's primary role will be with Dr. Chapman but will work closely with the Department of Radiation Oncology as well. He/she will review new and follow-up cases, attend proton clinic on Thursday from 10:00-11:00 followed by adult oncology tumor conference from 11:00-12:00. The trainee will attend the Friday morning Vascular Conference at 7:30 a.m. and should also attend the pediatric oncology tumor conference from 11:45-12:15 on Wednesdays. The trainee will participate with LINAC cases including placement and removal of stereotactic headframe.

Radiosurgery may be performed as an alternative to conventional neurosurgery for certain types of medical conditions. In other circumstances it may be used in conjunction with fractionated radiotherapy and/or surgery. Some of the determining factors are the nature of the disease, its location, and extent. At the end of the rotation the trainee should demonstrate satisfactory performance in the determination and evaluation for treatment.

Brain tumors commonly treated by radiosurgery include benign lesions such as meningiomas, acoustic neuromas, pituitary adenomas, as well as a variety of malignant tumors including gliomas and metastases. Vascular abnormalities of the brain, especially arteriovenous malformations, are also frequently treated. Recent advancements allow for select lesions located throughout the body to be treated using radiosurgical techniques.

Radiosurgery can be performed with any type of beam of ionizing radiation. This includes photon beams such as gamma rays and x-rays, as well as particle beams, which include protons.

Training Objectives:

- The trainee will become familiar with some radiobiology and radiation physics, the avoidance of critical neuroanatomic structure, and will assist in all aspects of treatment including dosimetry and conformal planning.
- Familiarity with the indications and elements of treatment planning, in particular in relation to critical neuroanatomic structures.
- Satisfactory performance in the determination and evaluation for treatment

Competencies Addressed:

As with all rotations, all six core-competencies will be assessed. However, the specific goals for this rotation are listed below.

**Patient care**

A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

- a. Placement of stereotactic frame
- b. Planning for simple dosimetry as in cortical cerebral metastasis

B. History and Physical Examination.

C. Clinical judgment and decision-making.

D. Non-operative clinical skills.

E. Data gathering and organization of case logs.

F. Development and execution of patient care plans.

G. Management of time and tasks.

**Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

A. Fundamental medical knowledge

B. Neurological/neurosurgical knowledge base

- a) Understanding of safe planning of radiosurgical procedures
- b) Knowledge of relevant anatomy and dosimetry
- c) Knowledge of relevant papers, indications, and contraindications.
- d) Understanding of perioperative care and complications

C. Knowledge of recent literature: innovations and controversies.

**Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

- A. Understanding of evidence based case management and using this information for patient-care decisions
- B. Appreciation of risk-benefit analysis in clinical decisions.
- C. Participation in teaching conferences and other educational activities
- D. Preparation of original clinical studies for formal presentation
- E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.

## **North Junior PGY 2/3**

### **Rotation Description, Goals and Objectives**

The trainee assists the recently graduated Junior Staff neurosurgeon (during the latter's period of extended training), learning fundamental diagnostic and operative skills and taking part in the daily care of patients assigned to this team. There is emphasis on the fundamentals of emergency management of the neurosurgical patient, including head and spine trauma, and acute presentations of brain and spine tumors and other diagnoses. Simple invasive procedures and basic operative techniques are learned. Clinical responsibilities, including Emergency Ward coverage, are carried out under the supervision of Senior Residents, the North Attending neurosurgeon and other MGH Neurosurgical Faculty.

Training Objectives:

- Fundamentals of the emergency management of neurosurgical patients, including diagnosis treatment, and triage. Emphasis on head and spinal trauma as well as the combined trauma

patient. Learn relevant basic procedures such as CSF drainage, ICP monitoring, and burr holes.

- Basic operative exposures and techniques of wound closure, as well as the fundamentals of inpatient neurosurgical care and outpatient evaluation of elective conditions.

Competencies Addressed:

### **Patient care**

A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

- Ventricular catheter insertion
- Burr hole placement for chronic subdural hematoma
- Create bone flap/craniectomy

B. History and Physical Examination:

C. Clinical judgment and decision-making.

D. Non-operative clinical skills.

E. Data gathering and organization of case logs.

F. Development and execution of patient care plans.

G. Management of time and tasks.

### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

A. Fundamental medical knowledge

B. Neurological/neurosurgical knowledge base

- a) understanding of safe performance of procedures
- b) knowledge of relevant anatomy
- c) knowledge of operative procedures
- d) understanding of perioperative care and complications

C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

A. Understanding of evidence based case management and using this information for patient-care decisions

B. Appreciation of risk-benefit analysis in clinical decisions.

C. Participation in teaching conferences and other educational activities

D. Preparation of original clinical studies for formal presentation

E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

A. Understanding of team organization and goals

B. Team performance - Participate and carry out tasks according to level of expected responsibility

C. Ability to communicate appropriately with patients and families.

D. Ability to communicate appropriately with medical personnel.

**Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

**Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

**East Junior PGY 2/3****Rotation Description, Goals and Objectives**

The trainee shares clinical responsibilities with the East Chief Resident caring for patients under the direct supervision of the responsible Staff neurosurgeon. There is particular emphasis on vascular, functional, and peripheral neurosurgery during this rotation. In this context he/she is expected to acquire additional expertise in the non-operative management of such cases. Operative competence by the end of this rotation should include satisfactory performance of supratentorial and infratentorial brain exposures by craniotomy and uncomplicated spinal exposures.

The primary faculty members are Dr. Ogilvy, Eskandar and Williams.

Training Objectives:

- Care of the patient with subarachnoid hemorrhage including initial assessment, interpretation of radiographic studies, and management of related complications such as vasospasm.
- ICU management.
- Surgical care of functional abnormalities such as epilepsy and movement disorders.
- Introduction to operative techniques and post-operative management in spinal surgery and tumor surgery.

Competencies Addressed:

**Patient care**

A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

- spinal exposure
- discectomy, shunt placement
- craniotomy for aneurysm or epilepsy

- B. History and Physical Examination:
- C. Clinical judgment and decision-making.
- D. Non-operative clinical skills.
- E. Data gathering and organization of case logs.
- F. Development and execution of patient care plans.
- G. Management of time and tasks.

### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

- A. Fundamental medical knowledge
- B. Neurological/neurosurgical knowledge base
  - a) understanding of safe performance of procedures
  - b) knowledge of relevant anatomy
  - c) knowledge of operative procedures
  - d) understanding of perioperative care and complications
- C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

- A. Understanding of evidence based case management and using this information for patient-care decisions
- B. Appreciation of risk-benefit analysis in clinical decisions.
- C. Participation in teaching conferences and other educational activities
- D. Preparation of original clinical studies for formal presentation
- E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

### **Endovascular/East Rotation PGY2/3**

#### **Rotation Description, Goals and Objectives**

The objective of this rotation is to give the trainee a comprehensive educational experience in endovascular surgical neuroradiology. This expertise includes the management of patients with neurological disease, the performance of endovascular surgical neuroradiology procedures, and the integration of endovascular surgical neuroradiology therapy into the clinical management of patients.

The trainee will round with the East Service in the morning, and is otherwise primarily responsible for attending endovascular cases and neurovascular conference Friday mornings (7:30 – 9:00 a.m.) He/she will assist with other East cases as time allows.

At the completion of the rotation, then trainee will have a working knowledge of the basic vascular lesions and the endovascular treatment methods used. Importantly, the endovascular neurosurgery rotator will gain the knowledge needed to evaluate microsurgical versus endovascular treatment options. Over a three month interval, the trainee can conservatively expect to perform greater than 60 diagnostic cerebral angiograms and 25 endovascular coil obliterations of intracranial aneurysms. The trainee will also set up and perform intraoperative cerebral angiograms to assess aneurysm clip placement near the conclusion of the craniotomy. This rotation enables one to gain dexterous skill by performing arterial groin access and diagnostic catheter manipulation. At the completion of the rotation, the endovascular surgery rotator will have mastery to perform a diagnostic cerebral angiogram and be proficient in the radiological interpretation of lesions of the cerebrovasculature.

Training Objectives:

- Working knowledge of the basic vascular lesions and the endovascular treatment methods used.
- Knowledge needed to evaluate microsurgical versus endovascular treatment options.
- Gain dexterous skill by performing arterial groin access and diagnostic catheter manipulation.
- At the completion of the rotation, the endovascular surgery rotator will have mastery to perform a diagnostic cerebral angiogram and be proficient in the radiological interpretation of lesions of the cerebrovasculature.

Competencies Addressed:

#### **Patient care**

A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

Diagnostic cerebral angiograms

Endovascular coil obliterations of intracranial aneurysms.

Setup and perform intraoperative cerebral angiograms to assess aneurysm clip placement near the conclusion of the craniotomy.

- B. History and Physical Examination:
- C. Clinical judgment and decision-making.
- D. Non-operative clinical skills.
- E. Data gathering and organization of case logs.
- F. Development and execution of patient care plans.
- G. Management of time and tasks.

### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

- A. Fundamental medical knowledge
- B. Neurological/neurosurgical knowledge base
  - a) Understanding of safe performance of procedures
  - b) Knowledge of relevant anatomy
  - c) Knowledge of interventional procedures
  - d) Understanding of peri-procedural care and complications
- C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

- A. Understanding of evidence based case management and using this information for patient-care decisions
- B. Appreciation of risk-benefit analysis in clinical decisions.
- C. Participation in teaching conferences and other educational activities
- D. Preparation of original clinical studies for formal presentation
- E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

### **Pediatric Rotation PGY 2/3**

#### **Rotation Description, Goals and Objectives**

During this rotation, the resident gets exposure to a wide variety of pediatric cases including trauma, tumors, vascular abnormalities, dysraphism and hydrocephalus. Professor Ann-Christine Duhaime has recently joined the faculty. She in conjunction with Dr. William Butler provides teaching, guidance, and supervision. The resident learns special aspects of the management of pediatric neurosurgical disorders including hydrocephalus, spinal dysraphism, epilepsy, pediatric brain tumors and the specialized medical management of these patients.

Training objectives:

- To gain familiarity with the neurological examination in pediatric patients
- To gain familiarity with pre-operative, post-operative, and outpatient management of pediatric neurosurgical patients
- Management of conditions including hydrocephalus, CSF shunts, pediatric head and spine trauma, and pediatric tumors

#### **Patient care**

A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent in pediatric patients by end of rotation.

- Lumbar Puncture
- Shunt Tap
- Ventricular catheter insertion
- Burr hole placement
- Create bone flap/craniectomy in children

B. Pediatric History and Physical Examination.

C. Clinical judgment and decision-making.

D. Non-operative clinical skills.

E. Data gathering and organization of case logs.

F. Development and execution of patient care plans.

G. Management of time and tasks.

#### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

A. Fundamental medical knowledge

B. Neurological/neurosurgical knowledge base

- a) understanding of safe performance of procedures
- b) knowledge of relevant anatomy

- c) knowledge of operative procedures
- d) understanding of perioperative care and complications

C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

- A. Understanding of evidence based case management and using this information for patient-care decisions
- B. Appreciation of risk-benefit analysis in clinical decisions.
- C. Participation in teaching conferences and other educational activities
- D. Preparation of original clinical studies for formal presentation
- E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

## **Spine Rotation PGY 2/3**

### **Rotation Description, Goals and Objectives**

This rotation provides a concentrated, systematic exposure to the management of spinal disorders. The resident is principally under the supervision of our senior spine specialists, Drs. Borges and Coumans, assisting in the operative and outpatient care of their patients. The resident is expected to attain competence in the performance of more complex spinal procedures at all levels of the spine including

anterior exposures, fusions, and simple instrumentation. In addition, he/she is expected to demonstrate proficiency in the pre- and post-operative care of such patients and in the outpatient evaluation of more difficult spinal problems, including the complications of surgery.

The resident will round with the West team in the morning.

Training Objectives:

- Increased operative responsibility for uncomplicated spinal procedures.
- Introduction to more complex spinal conditions with evaluation, interpretation of radiographs, and operative techniques including complex exposures, stabilization, bone grafting, instrumentation, tumor surgery.
- Increased responsibility for management of neurosurgical trauma.

**Patient care**

A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

Simple spinal exposure

Familiarity with complex spinal exposure with instrumentation

Peripheral nerve exposure, anastomosis

B. History and Physical Examination.

C. Clinical judgment and decision-making.

D. Non-operative clinical skills.

E. Data gathering and organization of case logs.

F. Development and execution of patient care plans.

G. Management of time and tasks.

**Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

A. Fundamental medical knowledge

B. Neurological/neurosurgical knowledge base

a) understanding of safe performance of procedures

b) knowledge of relevant anatomy

c) knowledge of operative procedures

d) understanding of perioperative care and complications

C. Knowledge of recent literature: innovations and controversies.

**Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

A. Understanding of evidence based case management and using this information for patient-care decisions

B. Appreciation of risk-benefit analysis in clinical decisions.

C. Participation in teaching conferences and other educational activities

D. Preparation of original clinical studies for formal presentation

E. Preparation of oral presentations for formal presentation

**Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

## **Pediatric/Spine Senior Resident PGY 5/6**

### **Rotation Description, Goals and Objectives**

During this rotation, the resident gets a much more extensive experience to a wide variety of pediatric cases including epilepsy, trauma, tumors, vascular abnormalities, and spinal dysraphism and congenital disease. Professor Ann-Christine Duhaime has recently joined the faculty. She in conjunction with Dr. William Butler provides teaching, guidance, and supervision. In the past, residents rotated through Children's Hospital as very junior residents. Under the current system, the residents will have a much more intensive experience as senior residents working directly with highly experienced faculty members. The resident also has a mandate to participate in complex spine cases, particularly those that include subcervical spine instrumentation. This is a new rotation that we hope will allow senior residents to obtain more experience in pediatric neurosurgery and complex spine surgery.

Training Objectives:

- Advanced Craniotomy for Pediatric Tumor
- Advanced Craniotomy for Pediatric Epilepsy
- Advanced Exposure and Instrumentation of degenerative and traumatic spine disorders
- Advanced Exposure and resection of spinal tumors

Competencies Addressed:

### **Patient care**

- A. Technical Proficiency

Index procedures in which resident must be competent by end of rotation.

- a. Sub-occipital craniotomy for posterior fossa tumors
- b. Supra-tentorial craniotomy for tumor and epilepsy
- c. Complex Shunts
- d. Sub-occipital craniotomy for Chiari Malformations
- e. Spinal surgery for tethered spinal cord.

- B. History and Physical Examination:
- C. Clinical judgment and decision-making.
- D. Non-operative clinical skills.
- E. Data gathering and organization of case logs.
- F. Development and execution of patient care plans.
- G. Management of time and tasks.

### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

- A. Fundamental medical knowledge
- B. Neurological/neurosurgical knowledge base
  - a) Understanding of safe performance of procedures
  - b) Knowledge of relevant anatomy
  - c) Knowledge of operative procedures
  - d) Understanding of perioperative care and complications
- C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

- A. Understanding of evidence based case management and using this information for patient-care decisions
- B. Appreciation of risk-benefit analysis in clinical decisions.
- C. Participation in teaching conferences and other educational activities
- D. Preparation of original clinical studies for formal presentation
- E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others

- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

### **North Senior Resident PGY 5/6**

During this rotation, the resident gets a much more extensive experience to a wide variety of general neurosurgical cases working with the North Attending. These cases include brain tumors, traumatic brain injury, degenerative and traumatic spine disease, hydrocephalus and a host of others. Professor Ann-Christine Duhaime provides guidance on trauma cases, while the other attendings provide guidance in each of their respective fields. This is a transitional rotation lasting only one year. Once we have two overlapping North Attendings, this rotation will no longer be present.

Competencies Addressed:

### **Patient care**

#### **A. Technical Proficiency**

Index procedures in which resident must be competent by end of rotation.

- a. Emergent Craniotomy for Trauma
- b. Exposure and instrumentation of spinal trauma cases
- c. Craniotomy for supra-tentorial tumor

- B. History and Physical Examination:
- C. Clinical judgment and decision-making.
- D. Non-operative clinical skills.
- E. Data gathering and organization of case logs.
- F. Development and execution of patient care plans.
- G. Management of time and tasks.

### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

- A. Fundamental medical knowledge
- B. Neurological/neurosurgical knowledge base
  - a) understanding of safe performance of procedures
  - b) knowledge of relevant anatomy
  - c) knowledge of operative procedures
  - d) understanding of perioperative care and complications
- C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

- A. Understanding of evidence based case management and using this information for patient-care decisions
- B. Appreciation of risk-benefit analysis in clinical decisions.
- C. Participation in teaching conferences and other educational activities
- D. Preparation of original clinical studies for formal presentation
- E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

### **Rotation Description, Goals and Objectives**

#### **East Chief [Chief Resident] PGY 5/6**

### **Rotation Description, Goals and Objectives**

The trainee at this level is now able to assume a larger role in operative and non-operative management of more complex clinical problems under the supervision of Visiting Staff neurosurgeons on the East Team. The trainee works closely with his/her East Jr. counterpart, overseeing their clinical activities, thereby playing an important teaching role. As the East senior, the trainee works most closely with Dr. Ogilvy (vascular), but also works closely with Dr. Eskandar (Epilepsy, Movement Disorders) and Dr. Williams (spine and peripheral nerve). Operative experience is extensive with a special emphasis on vascular problems including aneurysms, arteriovenous malformations, and occlusive cerebrovascular disease. In addition, there is considerable exposure to functional neurosurgery including deep brain

stimulation for movement disorders, epilepsy surgery, and the surgical management of trigeminal neuralgia. The East Chief Resident is also responsible for making the call and vacation schedule.

Training Objectives:

- Microsurgical techniques and complex exposures for aneurysms/AVMs
- Introduction to surgical management of cerebral ischemia, esp. carotid endarterectomy
- Functional NS procedures including temporal lobectomy, stereotaxis, deep brain stimulation
- Tumor surgery techniques including frameless stereotaxy
- Advanced operative and non-operative complex trauma management with supervisory/teaching responsibilities

Competencies Addressed:

**Patient care**

A. Technical Proficiency

Index procedures in which resident must be competent by end of rotation.

- a. Craniotomy for aneurysm clipping
- b. Carotid endarterectomy
- c. Craniotomy for temporal lobectomy and other epilepsy cases
- d. Planning and performance of deep brain stimulation
- e. Craniotomy for Microvascular decompression

B. History and Physical Examination:

C. Clinical judgment and decision-making.

D. Non-operative clinical skills.

E. Data gathering and organization of case logs.

F. Development and execution of patient care plans.

G. Management of time and tasks.

**Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

A. Fundamental medical knowledge

B. Neurological/neurosurgical knowledge base

- a) Understanding of safe performance of procedures
- b) Knowledge of relevant anatomy
- c) Knowledge of operative procedures
- d) Understanding of perioperative care and complications

C. Knowledge of recent literature: innovations and controversies.

**Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

A. Understanding of evidence based case management and using this information for patient-care decisions

B. Appreciation of risk-benefit analysis in clinical decisions.

C. Participation in teaching conferences and other educational activities

D. Preparation of original clinical studies for formal presentation

E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

- A. Understanding of team organization and goals
- B. Team performance - Participate and carry out tasks according to level of expected responsibility
- C. Ability to communicate appropriately with patients and families.
- D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

- A. Initiative and sense of responsibility
- B. Emotional Appropriateness
- C. Empathy and responsiveness to the needs of patients and others
- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

### **West Chief [Chief Resident] PGY 6/7**

#### **Rotation Description, Goals and Objectives**

The responsibilities of this rotation include increasing experience in the management of complex tumors and spinal disorders. At this point in the Chief Residency the trainee works with other members of the Attending Staff including Drs. Barker and Curry (tumor), and Drs. Coumans, Borges, and Shin (spine and peripheral nerve). There is a special emphasis on technically difficult tumors of the skull base, including vestibular schwannomas, for which the trainee works especially with Dr. Barker. There is also a significant experience in intra-axial brain tumor surgery (Gliomas, metastases) and craniofacial tumors with Dr. Curry. In addition, there is an increasing opportunity to perform complex spinal instrumentation, spinal tumor surgery, and peripheral nerve surgery. The operative cases are typically of a complex and sophisticated nature, commensurate with the resident's level of progress. At this level and beyond, there is considerable responsibility for teaching of other residents and supervision of their clinical activities. The West Chief Resident is responsible for assigning case to the various residents to ensure a balanced educational distribution. In addition, the West Chief Resident is an important resource for the other residents.

Training Objectives:

- Advanced tumor management (operative, non-operative) including skull base exposures, deep brain lesions.
- Independent trauma management with major responsibility for resident supervision.

Competencies Addressed:

**Patient care**

A. Technical Proficiency Index Procedures.

Index procedures in which resident must be competent by end of rotation.

- a. complex spinal exposure with instrumentation
- b. craniotomy for complex skull-base and posterior fossa tumors
- c. peripheral nerve exposures

B. History and Physical Examination:

C. Clinical judgment and decision-making.

D. Non-operative clinical skills.

E. Data gathering and organization of case logs.

F. Development and execution of patient care plans.

G. Management of time and tasks.

**Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

A. Fundamental medical knowledge

B. Neurological/neurosurgical knowledge base

- a) Understanding of safe performance of procedures
- b) Knowledge of relevant anatomy
- c) Knowledge of operative procedures
- d) Understanding of perioperative care and complications

C. Knowledge of recent literature: innovations and controversies.

**Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

A. Understanding of evidence based case management and using this information for patient-care decisions

B. Appreciation of risk-benefit analysis in clinical decisions.

C. Participation in teaching conferences and other educational activities

D. Preparation of original clinical studies for formal presentation

E. Preparation of oral presentations for formal presentation

**Interpersonal and Communication Skills**

The relevant assessment criteria are:

A. Understanding of team organization and goals

B. Team performance - Participate and carry out tasks according to level of expected responsibility

C. Ability to communicate appropriately with patients and families.

D. Ability to communicate appropriately with medical personnel.

**Professionalism**

The relevant assessment criteria are:

A. Initiative and sense of responsibility

B. Emotional Appropriateness

C. Empathy and responsiveness to the needs of patients and others

- D. Demonstrates responsibility for quality of care, especially in the OR
- E. Exhibits ethical behavior vis-à-vis patients and professional colleagues
- F. Appreciates cultural issues in the context of patient care
- G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

- A. Understands organization and management of clinical databases and registries
- B. Able to critically assess effective treatments and technologies.
- C. Completes medical records in a timely fashion
- D. Orders appropriate tests/studies (diagnostic or therapeutic)
- E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.
- F. Initiates discharge planning in a timely manner.

### **South Chief [Chief Resident] PGY 6/7**

#### **Rotation Description, Goals and Objectives**

The trainee now works directly under the Chief of Service, Dr. Robert Martuza, assisting in the care of his patients. During this period, the residents manage Dr. Martuza's clinic for one day of the week, thereby gaining considerable experience in the outpatient clinical setting. The cases represent a range of complex skull base tumors, including vestibular schwannomas, meningiomas, and intraspinal tumors. In addition, the residents work with Dr. Swearingen in the management of pituitary tumors and master the details of the transsphenoidal approach. During this period, the South Chief Resident gains considerable experience in managing outpatients in a busy academic clinical practice, and in making decisions regarding complex neurosurgical cases. This is also an opportunity for the Chief Resident to spend time with the Chief of Service and to obtain guidance regarding career planning following the completion of training. The South Chief Resident is responsible for assisting with the management and scheduling of Grand Rounds, Journal Club, and didactic teaching sessions for the other residents.

Training Objectives:

- Surgical management of endocrine disorders including transsphenoidal techniques and advanced microsurgical techniques for other conditions.
- Office-based clinical practice.
- Complex case analysis in consultation setting, including telemedicine.

Competencies Addressed:

#### **Patient care**

A. Technical Proficiency

Case logs submitted by resident. Index procedures in which resident must be competent by end of rotation.

- a. Intradural spinal tumor removal
- b. craniotomy for complex supratentorial or posterior fossa tumors
- c. Transsphenoidal approach for pituitary region tumors

B. History and Physical Examination:

C. Clinical judgment and decision-making.

D. Non-operative clinical skills.

E. Data gathering and organization of case logs.

F. Development and execution of patient care plans.

G. Management of time and tasks.

### **Medical Knowledge**

Quantitative evaluation of medical knowledge will be done based on the following areas of competence:

A. Fundamental medical knowledge

B. Neurological/neurosurgical knowledge base

- a) understanding of safe performance of procedures
- b) knowledge of relevant anatomy
- c) knowledge of operative procedures
- d) understanding of perioperative care and complications

C. Knowledge of recent literature: innovations and controversies.

### **Practice-based Learning and Improvement**

The trainee will be expected to demonstrate the capacity to learn and understand the evidence concerning management alternatives, both operative and non-operative. This should be based on systematic study. Evidence of satisfactory performance will be assessed on the basis of:

A. Understanding of evidence based case management and using this information for patient-care decisions

B. Appreciation of risk-benefit analysis in clinical decisions.

C. Participation in teaching conferences and other educational activities

D. Preparation of original clinical studies for formal presentation

E. Preparation of oral presentations for formal presentation

### **Interpersonal and Communication Skills**

The relevant assessment criteria are:

A. Understanding of team organization and goals

B. Team performance - Participate and carry out tasks according to level of expected responsibility

C. Ability to communicate appropriately with patients and families.

D. Ability to communicate appropriately with medical personnel.

### **Professionalism**

The relevant assessment criteria are:

A. Initiative and sense of responsibility

B. Emotional Appropriateness

C. Empathy and responsiveness to the needs of patients and others

D. Demonstrates responsibility for quality of care, especially in the OR

E. Exhibits ethical behavior vis-à-vis patients and professional colleagues

F. Appreciates cultural issues in the context of patient care

G. Observes patient confidentiality

### **Systems-based Practice**

The relevant assessment criteria are:

A. Understands organization and management of clinical databases and registries

B. Able to critically assess effective treatments and technologies.

C. Completes medical records in a timely fashion

D. Orders appropriate tests/studies (diagnostic or therapeutic)

E. Collaborates with other health care individuals outside of neurosurgery regarding patient care/outcome.

F. Initiates discharge planning in a timely manner.