

## **UICOMP Neurosurgery Residency Program Goals and Objectives 2016-2017**

The faculty and staff of the Department of Neurological Surgery at the University of Illinois College of Medicine at Peoria (UICOM-P) are dedicated to providing excellent training to our residents via a competency based educational focus that ensures strict attention to learner performance in reaching specific curricular goals and objectives.

### **Competency Based Goals and Objectives**

The program is dedicated to prepare and train physicians who are driven and motivated by excellence in the process of becoming competent and safe neurosurgeons. The program hopes to instill the principles of honesty, integrity, decency, objectivity, responsibility, and accountability in achieving his or her goals.

#### General Surgery Rotation, 3 Months (PGY1):

##### Patient Care:

- Become proficient in interviewing patients and their families.
- Develop and carry out patient management plans for the treatment of fluid and electrolyte disturbances, poor nutrition, and sepsis.
- Counsel and evaluate patients about the multiple traumatized patient.
- Perform a physical examination on general surgery patients and trauma patients.
- Become proficient in performing arterial line placement, central venous line placement, Swan Ganz catheter placement.
- Learn to become a team member, especially related to trauma team

##### Interpersonal Skills:

- Develop the skills to understand the patients and their family's concerns about various operative procedures.
- Develop the listening skills to become an empathetic physician

##### Professionalism:

- Learn to be respectful of the patients and their family, and auxiliary healthcare personnel.
- Begin to develop the ethics of which patients should be operated on and which should not.
- Be sensitive to cultural, age and gender issues and relate to trauma patients and general surgery patients.

##### Practice-Based Learning and Improvement:

- Learn to do a medical search via the Internet.
- Learn the common statistical methods used for medical studies.
- Develop skills in searching the medical literature and using the information to better treat patients.

- Analyze a series of patients that you have cared for with a common problem, e.g., chest contusion, fractured ribs, etc., to see how you could have improved their care.
- Facilitate the learning of the medical students and nursing staff.

#### Systems-Based Practice:

- Learn the cost of commonly performed procedures, lab tests, and diagnostic tests.
- Compare the cost of care for a certain group of patients with a common disorder, e.g., postop fever.
- Learn how the general surgery department interacts with other departments and the administrative structure in the hospital
- Become advocates for the patients in their journey through the healthcare system.

#### Medical Knowledge:

- Pulmonary
  - Understand the physiology of ventilation and gas exchange
  - Know the indications for and types of mechanical ventilation
  - Learn how to manage ARDS, ventilator assisted pneumonia
  - Learn the criteria for weaning a patient from the ventilator
- Cardiovascular
  - Understand the physiology of the cardiac circuit including cardiac output and stroke volume, cardiac index and vascular resistance.
  - Learn the physiology and hemodynamic monitoring including the concepts of preload, after load, and cardiac output, and how they are measured in a clinical setting.
  - Learn how to manage and what drugs to use for preload and after load and contractility.
- Fluid, Electrolyte and Acid-Based Balance
  - Understand the concepts of body compartments, H<sub>2</sub>O and electrolyte distributions.
  - Understand the difference between osmolality and tonicity.
  - Learn how to accurately assess the fluid and electrolyte requirements in the postop and critically ill patient.
  - Understand the correct amount of volume resuscitation.
  - Know the different types of resuscitative fluids, colloid vs. crystalloid hypertonic fluid resuscitation and when RBL transfer is indicated.
  - Know how to diagnose and treat hyponatremia, SIADH, cerebral salt wasting syndrome, hypokalemia, hypocalcemia, hypernatremia, hypophosphatemia, hypomagnesemia.
  - Learn how to diagnose and treat respiratory alkalosis, respiratory acidosis, metabolic alkalosis, and metabolic acidosis.
- Metabolic and Nutritional
  - Learn how to evaluate patient nutritional requirements and status.
  - Know the Harris-Benedict equation for estimating basal energy expenditure.
  - Become proficient in ordering the different methods of feeding – enteral and paraenteral.
- Infectious Disease
  - Understand the pathogenesis and prevention of systemic infection in the critically ill patient.

- Know the diagnosis and treatment for sepsis, pneumonia, sinusitis, UTI, and CNS infections.
- Learn about antibiotic prophylaxis.
- Multisystem Injury Management
  - Know how to resuscitate the multiple injury patient.
    - airway and breathing
    - treating shock
    - transfusion
    - hypothermia, coagulopathy, and metabolic acidosis
  - Learn how to insert and manage Swan Ganz catheter
  - Know about abdominal compartment syndrome.
  - Know about stress ulcer prophylaxis.
  - Colonic ileus.
  - Acute cholecystitis.
  - DVT and pulmonary embolism
  - Renal failure and renal replacement treatment.
  - Learn how to sedate, chemo paralyze, and control pain.
- Withholding and Withdrawing Life Support in the ICU
  - Understand the complexity of withholding and withdrawing life support.
  - Know the legal aspects.
  - Know why and how life support is withheld and withdrawn.
  - Learn how to resolve potential conflicts between patients and healthcare professionals.
- Declaration of Brain Damage
  - Understand the concept of brain death.
  - Know the clinical criteria for establishing brain death.
  - Learn how to interpret the confirmatory tests.
  - Know the specific problems of diagnosing brain death in children.

### Neurology Rotation, 3 Months (PGY-1):

#### Patient Care:

- Develop a caring and respectful behavior when dealing with patients with common neurological problems such as multiple sclerosis or Alzheimer's disease.
- Develop skills in interviewing families when the patient is incompetent, stuporous, or comatose.
- Develop the knowledge base to make informal decisions about the treatment of common neurological problems, especially when they overlap with neurosurgery.
- Develop and carry out patient management plans, especially in stroke.
- Counsel and educate patients and families about the long-term problem associated with multiple sclerosis, Alzheimer's, stroke, etc.
- Refine and master the neurological examination.
- Develop the skills in performing lumbar puncture, and interpreting EMG, NCV, EEG, Goldman visual fields and funduscopy.
- Learn about stroke prevention.
- Learn how to work within a team of neuroscientists, e.g. neurosurgeon, neurologist, neuropathologists, nurses, etc.

#### Medical Knowledge:

- Understand the different types of dementia and how to differentiate them.
- Classify the seizure disorders and know the pharmacology of commonly used anticonvulsants.
- Learn the different types of aphasia and where the typical lesion occurs in the CNS.
- Learn the workup and evaluation for a patient with ALS and how cervical spondylosis might mimic this disease.
- Learn about Parkinson's disease and the current treatment options, both medical and surgical.
- Learn the common stroke syndromes.

#### Interpersonal Skills:

- Develop the skills to understand the patient's and their family's concerns about the effects of having a stroke.
- Develop the skills to understand the patient's and family's concerns when diagnosed with Alzheimer's disease.

#### Professionalism:

- Become familiar with the various organizations that have been developed to help patients with chronic disabilities, e.g., MS Society, etc.
- Interpersonal and Communication Skills.
- Learn how to communicate with families of patients with common neurological problems such as multiple sclerosis, Alzheimer's, etc.

#### Practice-Based Learning and Improvement:

- Learn about various multicenter prospective randomized trials for stroke, both medical and surgical.

#### Systems-Based Practice:

- Learn about the efforts being made to limit the costs of caring for patients with stroke.

#### Junior Neurosurgery Resident (PGY1-3):

##### Patient care:

- Perform and document a comprehensive neurosurgery history and physical examination
- Understand the indications for and interpret the meaning of laboratory studies and imaging
- Develop patient care plans appropriate to a patient's presenting problems or postoperative course in consultation with the chief resident or attending surgeon
- Establish and implement effective patient care plans
- Counsel patients on the risks, goals, limits, and alternatives to simple neurosurgical procedures and more complex procedures under supervision of the chief resident or attending surgeon
- Perform selected surgical procedures under direct supervision
- Assist in major surgical procedures and perform those portions of such procedures, under supervision, that are appropriate for his or her level of training

- Work with health care professionals composing of the neurosurgery team and other members of the health care team from other disciplines
- Be able to insert an ICP monitor
- Be able to insert a ventriculostomy
- Know the common landmarks, Keen's point, Kocher's point, etc.
- Understand the anatomical landmarks, the surgical incision and components of carpal tunnel syndrome
- Know the anatomy of the cubital tunnel and be able to perform
- Know the skin incision and burr hole positions for a trauma craniotomy
- Know how to perform burr holes or twist drill for chronic subdural hematoma
- Know the anatomy and be able to perform a lumbar laminectomy for disc
- Be able to perform a muscle and nerve biopsy
- Be able to position a patient for a lumbar laminectomy and understand the postop complications from poor positioning
- Know the common causes for intraoperative shock and the appropriate treatment
- Know how to insert the Mayfield head holder, shave the head, and problems of each
- Perform a lumbar puncture
- Insert tongs and place in jacket

#### Medical Knowledge:

- Recognize all of the common cervical and lumbar radicular syndromes, understand the pathophysiology of herniated discs, lateral recess stenosis and spinal stenosis, describe how these syndromes are similar and different from each other, and know the common medical problems that may mimic them. Know the different ways each can be treated, what is considered conservative therapy, and when surgery is indicated. Be able to recognize the cauda equina syndrome
- Know the common presentation and physical findings of the compressive neuropathies, e.g. carpal and cubital tunnel. Know when conservative therapy is indicated and what conservative therapy entails. Understand the similarities and differences between carpal and cubital tunnel syndrome. Know which syndrome has a higher surgical success rate. Know the common mimickers of these syndromes
- Understand the pathophysiology of closed head injury. Know the typical history and physical findings of a patient with a concussion. Understand in detail the anatomical basis for the herniation syndromes. Understand and be able to manage patients with increased intracranial pressure (to include ventilator management)
- Understand the pathophysiology of spinal cord injury. Know the types of cord injuries, complete, incomplete, central cervical cord, Brown-Sequard, anterior spinal artery and explain the anatomical basis of each. Know the dermatomal and myotomal levels of important cord levels. Know how to evaluate and treat the acute spinal cord injury. Recognize when emergency surgery is indicated
- Be able to recognize the history and physical findings of a patient with subarachnoid hemorrhage. Be able to recognize the common sequelae of subarachnoid hemorrhage and the treatment including vasospasm. Be able to recognize the common stroke syndromes and types of aphasia
- Know the common types of brain tumors, their presentation, and natural history
- Be able to treat common neurological emergencies - status epilepticus, hyponatremia, and diabetes insipidus.

- Demonstrate a solid foundation of knowledge of anatomy, physiology, and pharmacology related to inpatient neurosurgery patients
- Correctly interpret basic laboratory and radiological studies
- Demonstrate a growing familiarity with classic and current aspects of the neurosurgical literature
- Demonstrate a foundation for clinical neurosurgery problem solving and decision making

Practice-based learning and improvement:

- Demonstrate an ongoing and improving ability to learn from errors
- Locate, appraise, and assimilate evidence from studies related to common neurosurgical problems

Interpersonal and communication skills:

- Provide compassionate care as determined by patients, families, colleagues, and ancillary staff
- Work effectively as a member of a health care team
- Communicate effectively with other health care professionals on consulting services

Professionalism:

- Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities
- Demonstrate integrity and a commitment to patients that supersedes self interest

System-based practice:

- Understand the practice of neurosurgery, including its interactions with other health care organizations
- Advocate for quality patient care and assist patients in dealing with system complexities
- Practice cost-effective health care and resource allocation through evidence-based medical practice that does not compromise quality of care

Pediatric Rotation (PGY2-3):

Patient care:

- Perform and document a neurosurgery history and physical examination, with emphasis on spinal, pediatric and radiosurgery
- Understand the indications for and interpret the meaning of laboratory studies and imaging as relates to neurosurgery in general, with a specific emphasis on spinal, pediatric and radiosurgery
- Develop complex diagnostic and patient-management skills, including participation in outpatient neurosurgical clinics (pediatric and radiosurgery)
- Establish and implement effective patient care plans
- Counsel patients on the risks, goals, limits, and alternatives to neurosurgical procedures, with an emphasis on spinal, pediatric, and radiosurgery
- Perform selected surgical procedures under direct supervision including but not limited to:
  - Evaluate patient's suitability for surgery, with potential medical and neurological co-morbidities.

- Understand the principles of operating, i.e., patient positioning, prepping and draping.
- Carry out burr holes and drainage of a chronic subdural hematoma under supervision.
- Carry out the soft tissue exposure for a laminectomy in the lumbar, thoracic and cervical region and perform a standard hemilaminectomy and laminectomy with directed guidance. The resident should be able to remove the herniated portion of a lumbar disk with assistance.
- Place a ventriculostomy unsupervised.
- Place either the cranial or abdominal end of a ventriculoperitoneal shunt under supervision with the supervising surgeon performing the other end of the procedure.
- Carry out a carpal tunnel release with directed guidance.
- Turn a simple standard craniotomy up to the level of, but not including opening the dura unassisted. The resident should be able to perform a craniotomy for a traumatic subdural or epidural hematoma. This does not include more complicated craniotomies such as posterior fossa or a pterional craniotomy. The resident should understand the factors to be considered in placing a craniotomy incision and bone flap.
- Remove a cervical disk from an anterior approach under supervision.
- Accurately evaluate the CT scan of the head of a multiple trauma patient and evaluate the spine films of a patient who has sustained severe trauma.
- Perform a cranioplasty.
- Learn how to repair a myelomeningocele
- Learn how to repair the common craniosynostosis

#### Medical Knowledge:

- Understand the normal and abnormal development of the central nervous system
- Recognize different types of spinal dysraphism
- Know the workup and treatment of all of the common types of spinal dysraphism and know the common brain anomalies that occur with them
- Be able to recognize by physical exam the common types of craniosynostosis
- Know the different types of surgical approaches to synostosis
- Know the physiology and pathophysiology of CSF production and absorption
- Recognize the physical findings and symptoms of hydrocephalus and various treatment options
- Know the common postop shunt problems, their recognition, and treatment, e.g. infection, malfunction
- Know how to manage pediatric head and spinal cord injury and SCIWORA syndrome
- Learn about all the common pediatric brain and spinal cord tumors, the appropriate operative approaches and postop therapies
- Know the workup and treatment for suspected child abuse
- Learn the different causes of stroke in children
- Know how to recognize and treat chronic subdural hematoma in children
- Learn the different treatment options for epilepsies
- Know the treatment options for spasticity

- Demonstrate a solid foundation of knowledge of anatomy, physiology, and pharmacology related to inpatient neurosurgery patients, with an emphasis on spinal, pediatric, and radiosurgery
- Demonstrate an expanded familiarity with the neurosurgical literature, with special emphasis on spinal, pediatric neurosurgery, radiosurgery and critical care issues
- Demonstrate accuracy in clinical evaluation skills, including the correct interpretation of basic and advanced laboratory and radiological studies
- Neuropathology
  - Be able to recognize the normal histology of the nervous system
  - Appreciate the various changes in histology in differential situations
  - Recognize basic anatomical areas of the brain
  - Learn to distinguish between a reactive process and tumorous transformation
  - Learn to recognize various non-tumorous conditions
  - Learn to recognize/distinguish various primary and metastatic tumors to the brain and spinal cord, e.g. glial tumors, PNET, meningiomas, primary CNS lymphomas, neurilemmomas, neurofibromas, pituitary adenomas, suprasellar, etc.
  - Basic concepts in recognizing neurogenic versus myopathic process in muscle biopsies
  - Learn to distinguish axonal and demyelinating neuropathies in sural nerve biopsies
  - Understand the smear technique used on fresh surgical material. Learn to recognize the various cells, especially distinguishing metastatic tumor from primary tumor based on the H&E stain
  - Learn to interpret various special stains especially applied to the nervous system, e.g. axonal, myelin, etc.
  - Learn to interpret immunoperoxidase stains (IPS), the usefulness of various IPS in distinguishing different primary and metastatic tumors.
  - Learn different immunoperoxidase staining used in distinguishing pituitary adenomas with different endocrine function
  - Learn to use the electron microscope as a tool to distinguish various metastatic and primary tumors of brain and pituitary adenomas with different endocrine function.
  - Learn to appreciate and distinguish various disease processes by the naked eye, using autopsy brain sections

Practice-based learning and improvement:

- Demonstrate an ongoing and improving ability to learn from errors
- Construct and implement educational goals for instruction in different elective fields (e.g., neuroradiology, neuropathology, radiosurgery, neuro-oncology)
- Finalize the design of a research project to be carried out during the research year
- Locate, appraise, and assimilate evidence from scientific studies related to common neurosurgical problems, with emphasis on spinal, pediatric, and radiosurgery
- Identify areas of neurosurgical practice where current knowledge is inaccurate or inadequate and participate in clinical studies to improve the general fund of knowledge in neurosurgery

Interpersonal and communication skills:



- Provide compassionate ward and outpatient care as determined by patients, families, colleagues, and ancillary staff, with special emphasis on multidisciplinary pediatric and radiosurgery clinics
- Work effectively as a member of a health care team, especially in an outpatient specialty clinic setting
- Participate meaningfully in multidisciplinary conferences focused on specific neurosurgical fields

Professionalism:

- Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities
- Demonstrate integrity and a commitment to patients that supersedes self interest
- Participate meaningfully in ongoing professional development by submitting research for peer review to journals and national professional meetings

System-based practice:

- Understand the practice of neurosurgery, including its interactions with other organizations
- Advocate for quality patient care and assist patients in dealing with system complexities, especially in an outpatient setting
- Practice cost-effective health care and resource allocation through evidence-based medical practice that does not compromise quality of care
- Demonstrate an understanding of practice opportunities, practice types, health care delivery systems, and medical economics

Research or Elective (PGY4 and 5):

Patient care:

- Remains on call schedule and back up the Unity Point Health Methodist resident
- Participate in radiosurgery cases and conferences
- Elective year resident will follow objectives established by advisor

Medical Knowledge:

- Pass ABNS primary exam for credit
- Demonstrate an advanced familiarity with the neurosurgical literature
- Demonstrate the ability to evaluate and synthesize hypotheses regarding basic scientific investigations
- Radiosurgery
  - Learn how to place the radiosurgery base ring on patients
  - Learn the advantages and disadvantages of radiosurgery
  - Learn the typical doses given for meningiomas, acoustic neuromas, and metastases
  - Learn about functional uses for radiosurgery: Parkinson's, trigeminal neuralgia
  - Participate in the planning phase of the radiosurgery treatment to include learning about merge (MRI & CT) technology with the radiation oncologist
  - Present any morbidity associated with treatment at M&M conference

Practice-based learning and improvement:

- Demonstrate an ongoing and improving ability to learn from errors
- Demonstrate a high capacity for work and intensity in a basic science research environment
- Develop problem-solving skills that can be used to design, implement, analyze, and report basic science research that is relevant to the clinical arena
- Establish sound research and research-related problem-solving habits, including the establishment of familiarity with relevant research literature
- Become an integral component of a research team

Interpersonal and communication skills:

- Communicate effectively with all members of the research team
- Utilize communication and interpersonal skills to effectively participate in and lead research projects
- Communicate research results effectively and persuasively through written and oral presentations

Professionalism:

- Demonstrate a commitment to academic and scientific integrity through participation in department-sponsored educational forums on basic and clinical research
- Participate meaningfully in ongoing professional development by submitting research for peer review to journals and national meeting

System-based practice:

- Demonstrate an understanding of practice opportunities, practice types, health care delivery systems, and medical economics

Unity Point Health Methodist (PGY 4 and 5):

Patient care:

- Perform and document a senior level neurosurgery history and physical
- Understand indications for and interpret the meaning of routine and more complicated laboratory studies and imaging
- Devise patient care plans at a senior level
- Establish and implement effective patient care plans, assuming the role of leader on a health care team, under appropriate supervision of an attending surgeon
- Counsel patients on the risks, goals, limits, and alternatives to most neurosurgical procedures
- Perform complex neurosurgery procedures (cranial and spinal) and begin to assist at the chief resident level with a higher degree of independence including but not limited to:
  - Perform a craniotomy, open the dura, and actively participate in the resection of a glioma, meningioma, and metastatic tumor.
  - Perform a pterional craniotomy with minimal supervision.
  - Remove a posterior fossa hematoma.
  - Perform a posterior fossa craniectomy and expose the appropriate cranial nerves for microvascular decompression under supervision.
  - Debride a compound depressed skull fracture with directed guidance.

- Expose the anterior cervical spine, carry out removal of the disc and decompress the nerve root.
- Carry out a carpal tunnel release and ulnar nerve transposition under limited direction.
- Expose the pituitary via a transsphenoidal approach with directed assistance.
- Carry out a stereotactic biopsy with limited supervision.
- Understand the indications and drawbacks of a cervical, upper thoracic or lumbar sympathectomy.
- Perform a carotid endarterectomy with assistance and know its proven indications.
- Debulk a metastatic tumor of the spine and plan for necessary stabilization.
- Understand the indications and arguments for spinal stabilization.
- Know the classifications of spinal fractures and the implications of those fractures.
- Understand the advantages and limitations of spinal instrumentation systems.
- Perform ventriculoscopic IIIrd ventriculostomy.
- Close myelomeningocele under guidance.
- Release simple tethered cord.

#### Medical Knowledge:

- Perform above the passing level on the ABNS primary examination
- Demonstrate an advanced knowledge of anatomy, physiology, and pharmacology related to inpatient and outpatient neurosurgery care
- Demonstrate an advanced familiarity with the neurosurgical literature

#### Practice-based learning and improvement:

- Demonstrate an advanced ability to learn from errors
- Establish a solid evidence-based approach to patient care at a more senior level
- Demonstrate senior level critical appraisal of evidence from scientific studies in the literature
- Identify areas of neurosurgical practice where current knowledge is inaccurate or inadequate and participate in clinical studies to improve the general fund of knowledge in neurosurgery

#### Interpersonal and communication skills:

- Provide compassionate ward and outpatient care at a senior level as determined by patients, families, colleagues, and auxiliary health professionals, serving as the primary provider of care at UPHM
- Work effectively as the leader of a health care team in both inpatient and outpatient settings

#### Professionalism:

- Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities, especially in the setting of providing care to the indigent and underserved
- Demonstrate integrity and a commitment to patients that supersedes self interest, serving as primary neurosurgeon at UPHM
- Participate meaningfully in ongoing professional development by submitting research for peer review to journals and national professional meetings

#### System-based practice:

- Demonstrate an understanding of practice opportunities, practice types, health care delivery systems, and medical economics through participation at a chief level in a variety of delivery settings
- Advocate for high-quality patient care and assist patients in dealing with system complexities, especially in the setting of providing care for the indigent or underserved
- Practice cost-effective health care and resource allocation through evidence-based medical practice that does not compromise quality of care
- Understand practice management issues such as patient processing, evaluation, and management coding, procedural terminology, documentation of services rendered, and other reimbursement process related issues in both inpatient and outpatient settings

#### Chief Resident (PGY 6 and 7):

##### Patient care:

- Gather essential and accurate information about all presurgical patients, either directly or through the management of more junior residents
- Understand indications for and interpret the meaning of all laboratory studies and imaging used
- Devise patient care plans at the level of an independent neurosurgeon, under appropriate supervision from attending surgeons; and also guide more junior residents
- Establish and implement effective patient-care plans, assuming the role of primary leader on the neurosurgery service, under appropriate supervision of an attending surgeon
- Counsel patients on the risks, goals, limits, and alternatives to all neurosurgical procedures
- Demonstrate the ability to perform all major neurosurgical procedures at an independent level, under appropriate supervision of an attending surgeon including but not limited to:
  - Plan and perform a craniotomy and removal of tumor abutting the motor or speech fibers using intraoperative physiology to identify eloquent brain.
  - Plan and perform a craniotomy and clip simple intracranial aneurysms, understand approaches to complex aneurysms, and actively participate in the treatment of complex aneurysms.
  - Formulate a treatment plan for an intracranial arteriovenous malformation and actively participate in the surgical resection of such a lesion.
  - Understand treatment options for the resection of a pituitary tumor and actively participate in the transsphenoidal resection of such a tumor.
  - Understand therapeutic options for the treatment of skull base tumors and actively participate in their surgical excision.
  - Assess cervical, thoracic, and lumbar spinal fractures incorporating appropriate diagnostic studies. Plan and carry out anterolateral and posterolateral decompressions of the spinal canal. Participate in procedures to stabilize the unstable spine.
  - Demonstrate the ability to diagnose and plan treatment of common peripheral nerve entrapment syndromes.
  - Perform a peripheral nerve anastomosis under limited supervision.
  - Diagnose, expose and actively participate in the resection of an intraspinal tumor.

- Diagnose and expose and actively participate in the resection of a posterior fossa pediatric tumor.
- Diagnose and actively participate in the surgical treatment of spinal dysplastic abnormalities.

#### Medical Knowledge:

- Demonstrate an advanced knowledge of anatomy, physiology, and pharmacology related to all aspects of neurosurgery
- Demonstrate a familiarity with the neurosurgical literature appropriate for an independent surgeon capable of life-long learning
- Manage and lead academic conferences at OSF
- Participate actively and lead conferences in a manner that demonstrates a high level of global awareness regarding clinical neurosurgery and understanding of the literature

#### Practice-based learning and improvement:

- Manage and administrate the clinical service at OSF
- Demonstrate a solid evidence-based approach to patient care at the level of a practicing surgeon
- Demonstrate sound habits of personal scholarship and inquiry

#### Interpersonal and communication skills:

- Assist the attending faculty in overseeing the personal, academic, and clinical growth and development of junior residents
- Instruct and nurture junior residents in all aspects of neurosurgical patient care (outpatient, inpatient, and ICU settings)
- Demonstrate the ability to interact with many different health care personnel with efficiency and efficacy in the pursuit of patient care and service management
- Demonstrate leadership skills in the management of more junior residents

#### Professionalism:

- Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities
- Demonstrate integrity and a commitment to patients that supersedes self interest, serving as primary neurosurgeon
- Participate meaningfully in ongoing professional development by submitting research for peer review to journals and national professional meetings

#### System-based practice:

- Demonstrate an understanding of practice opportunities, practice types, health care delivery systems, and medical economics at a level that is expected of an independent neurosurgeon
- Advocate high-quality patient care and assist patients and the responsible junior residents in dealing with system complexities
- Guide junior residents in the practice of cost-effective health care and resource allocation through evidence-based medical practice that does not compromise quality of care
- Understand practice management issues such as patient processing, evaluation and management coding, procedural terminology, documentation of services rendered, and other reimbursement process related issues in both inpatient and outpatient settings

## **Didactic components**

The Department of Neurosurgery at the University of Illinois at Peoria conducts daily conferences and teaching rounds that promote scholarly interaction among residents, visiting professors, and attending faculty.

Clinical Rounds: Conducted twice daily, early morning and again in the evening when all cases are completed in the operating suites. This is the primary duty of the chief and junior residents. Rounding with attendings is conducted at their request, and may be done independently of morning rounds depending on the operating room schedule for the day. Updates on attendings' patients are often given at the conclusion of conference every morning.

Grand Rounds: This is a shared conference, alternating every other week between neurology and neurosurgery at 8 a.m. on Friday. This is attended by all INI faculty, residents, and nurse practitioners, physical and occupational therapists, and operating room staff.

Neuroradiology: This again is a shared conference between neuroradiology, neuropathology, neurology and neurosurgery conducted at 7 a.m. every Friday. Four to five cases are analyzed in great detail with input from various faculty and residents.

Journal Club: This is conducted monthly at 7 a.m. Key articles are distributed in advance for critical analysis by the residents for further discussion with faculty.

Neuro-Oncology: Neuro-Oncology conferences are held weekly on Monday evenings at 5 p.m. Interesting and controversial cases are presented in the Gamma Knife Center. Those in attendance include neurosurgeons, medical and radiation oncologists, neuroradiology and neuropathology. This conference is attended by residents if the operative schedule allows.

Basic Science: A resident presents a topic, usually of board relevance in a lecture format on a bi-weekly or monthly basis. This is attended by residents and neurosurgery faculty. Topics in the past have included neuroanatomy, neurophysiology and pathology, and neurology.

Pre-operative Conference: Operative cases are discussed and presented by the chief resident every Monday morning at 7 a.m. This is attended by faculty and residents. Residents are expected to have some knowledge regarding operative indications and related surgical anatomy of the cases for the coming week.

Cerebral vascular conference: Weekly conference held on Wednesdays 7:00 AM at the INI Seminar room. Prepared by either PGY5 or PGY4 resident, this conference encourages multidisciplinary participation by the Stroke team, endovascular radiologists, and neurosurgery. The conference is supervised and moderated by the vascular section chief.

Brain Cutting: This combined conference with Neurology is held on a monthly basis given by neuropathology. Interesting cases are drawn from neurology and neurosurgery. This exceptional learning experience, held in a Socratic method format, has proved quite valuable to the residents.

Resident Meeting: Monthly meeting to discuss issues, concerns and resources with the residents.

Peer Review: Held monthly on the second Thursday at 7 a.m., neurosurgery faculty and residents discuss all cases in a non-confrontational, learning environment. This is a valuable conference where alternative approaches are suggested and the relevant literature is reviewed regarding complications.

## **Research**

It is essential that the department, both faculty and residents are actively involved in research and scholarly activities. We as a department are required to report these activities to ACGME on an annual basis in terms of publications including peer review journal articles, book chapters and presentations. Therefore, residents are required to be involved in research projects during the entirety of their residency. These activities can include and not limited to case reports, retrospective case series, prospective studies, bench research, etc. The INI Research Council must be notified of these activities and its guidelines and policies followed. The pathway to the INI Research Council is through Joanna Fleckenstein. The residents are expected to present at the monthly Research meeting at least annually their progress on their projects or prior to presentations or manuscripts submissions. All residents in their second year and beyond are expected to submit at least one research paper per year.

Dr. Patrick Elwood Excellence in Research Award: The INI Research Council will recognize an individual resident at the end of the academic year who has submitted the best paper to be considered for publication. The resident who excelled in research will also be rewarded with monetary scholarship and recognition during residency graduation or gathering.

## **Independent Study: *Recommended books***

Neuroanatomy

Parent, *Carpenter's Human Neuroanatomy* 9<sup>th</sup> ed, 1996

Neurophysiology

Kandel and Schwartz, *Principles of Neural Science* 4<sup>th</sup> ed, 2000

Neuropathology

Nelson, *Principles and Practice of Neuropathology*, 2<sup>nd</sup> ed, 2003

#### Neuroradiology

Osborn, *Diagnostic Neuroradiology: A Text/Atlas*, 1994

#### Neurology

*Adams and Victor's Principles of Neurology*, 8<sup>th</sup> ed, 2005

#### Neurosurgery

Greenberg, *Handbook of Neurosurgery*, 6<sup>th</sup> ed, 2006

Schmidek and Sweet, *Operative Neurosurgical Techniques*, 5<sup>th</sup> ed, 2006

*Kempe's Operative Neurosurgery*, 2<sup>nd</sup> ed, 2004

Mclone, *Surgery of the Developing Brain*, 4<sup>th</sup> ed, 2001

Berger, *Textbook of Neuro-oncology*, 2004

Benzel, *Spine Surgery: Techniques, Complication Avoidance...*, 2<sup>nd</sup> ed, 2005

#### Critical Care

Andrews, *Intensive Care in Neurosurgery*, 2003

#### Board Review

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