

# NS-2 Year

## Educational Program Goals and Objectives

The NS-2 year is divided into three rotations. Two months will be spent on the Pain Service, five months on neurosurgery at the Nebraska Medical Center, and five months on the pediatric neurosurgery service at Children's Hospital. The purpose of the NS-2 year is to build on knowledge and skills obtained during the NS-1 year in particular by assuming greater responsibility for patient care (NMC service) and by gaining more in-depth knowledge and skills of the subspecialty area of pediatric neurosurgery and pain. During this year, residents will demonstrate greater independence and responsibility for inpatient and outpatient care, including evaluation and decision-making. Residents at this level are expected to evaluate patients in the inpatient and outpatient settings, establish a differential diagnosis, identify appropriate diagnostic tests, and develop a treatment plan. They may implement non-critical aspects of the evaluation but are expected to report in a timely fashion to Senior and/or Chief Residents and faculty. Residents will refine their abilities to perform the neurosurgical history and physical examinations. Additionally, residents will improve knowledge of indications and interpretation of laboratory and imaging studies, apply complex diagnostic and patient-management skills, including participation in inpatient and outpatient settings, establish and implement effective patient care plans, counsel patients on the risks, goals, limits and alternatives to neurosurgical procedures, perform selected surgical procedures under direct supervision, focusing on spinal neurosurgery (e.g., lumbar and cervical laminectomies, lumbar discectomy, anterior cervical discectomy with and without fusion), assist in major surgical procedures, and perform portions of the procedure that are appropriate to the resident's level of training under guidance, and practice critical care skills as required for inpatient neurosurgery. Global evaluation of resident performance will be performed by the neurosurgery faculty and support staff ("360 degree evaluation") at the conclusion of the neurosurgery rotations. Evaluation of resident performance in non-neurosurgery rotations will be provided by faculty supervising the resident in those rotations. The NSY-2 resident will take the written examination of the American Board of Neurological Surgery (ABNS) for self-assessment. Residents will provide evaluations of faculty in non-neurosurgery rotations following conclusion of those rotations and will complete a "self-assessment" and formal evaluation of the neurosurgery program and faculty (see Appendix for sample forms) annually.

## Educational Goals and Objectives of Training Year NS-2

### PAIN SERVICE

The Pain Service rotation will provide neurosurgery residents with medical cognitive and psychomotor skills relevant to the diagnosis and management of acute and chronic pain disorders, especially those relevant to the neurosurgical population (e.g., back pain). Residents should develop an understanding of the epidemiology, pathophysiology, evaluation, and management of such disorders as spinal pain problems and neuropathic pain disorders (e.g., complex regional pain syndrome). Management strategies including various classes of pharmacologic agents (opioid and non-opioid), interventional, non-interventional, and alternative/complementary treatments will be introduced. Residents will be given a global assessment by the Pain Service faculty at the conclusion of the rotation.

### Patient Care

*Goal: provide appropriate and compassionate care to patients with common pain disorders related to neurosurgery.*

*Specific Objectives:*

- 1. Take and document a comprehensive pain history and do a physical examination*
- 2. Order appropriate laboratory studies and imaging, interpret and apply the results to patient care*
- 3. Develop and implement appropriate care plans in consultation with the faculty*
- 4. Perform basic pain procedures, including epidural steroid injection and trigger point injections, under direct supervision of the Senior or Chief resident or faculty*
- 5. Use multi-modal therapy, including pharmacologic, interventional, and cognitive-behavior strategies for the treatment of pain disorders*

*Assessment: observation by faculty*

## **Medical Knowledge**

*Goal: to acquire and apply knowledge of basic pain disorders and treatments for the management of pain*

*Specific objectives:*

- 1. Demonstrate knowledge of anatomy, physiology and pharmacology related to pain transmission and perception*
- 2. Correctly interpret basic laboratory and radiological studies*
- 3. Describe the indications for common pain medications and procedures*
- 4. Perform above the 20th percentile on the ABNS primary examination*

*Assessment: Written examination of American Board of Neurological Surgery and observation by faculty*

## **Practice-Based Learning and Improvement**

*Goal: to learn to investigate and evaluate the care of patients, acquire and assimilate scientific evidence, and analyze practices in order to improve patient care*

*Specific objectives:*

- 1. Critically evaluate patient care and apply results to improve safety and outcomes*
- 2. Use information technology to locate evidence from scientific studies related to management of common problems and apply this evidence to improve patient care*

*Assessment: observation by faculty*

## **Interpersonal and Communication Skills**

*Goal: to develop skills that result in the effective exchange of information with patients, families, and other healthcare providers*

*Specific objectives:*

- 1. Demonstrate an ability to work effectively with patients with acute and chronic pain*
- 2. Communicate effectively with other health care professionals by requesting consultations from other services and respond to requests for pain service consultations*

*Assessment: observation by faculty*

## **Professionalism**

*Goal: to demonstrate a commitment to carrying out professional responsibilities and adhere to ethical principles.*

*Specific objectives:*

- 1. Demonstrate sensitivity and responsiveness to patients' culture, age, gender and disabilities*
- 2. demonstrate respect for patient privacy and autonomy*

*Assessment: observation by faculty*

## **System-Based Practice**

*Goal: to demonstrate awareness of the larger context of healthcare and call effectively on other resources in the system to provide optimal healthcare*

*Specific objectives:*

- 1. Coordinate care between inpatient and outpatient units by arranging appropriate outpatient follow-up of patients seen during inpatient stays*

2. *Coordinate inpatient care provided by Pain Service with care provided by primary team*

*Assessment: observation by faculty*

## **PEDIATRIC NEUROSURGERY**

The NS-2 pediatric neurosurgery rotation will provide the resident with the basic cognitive and psychomotor skills of fundamental importance to this subspecialty area. Special attention will be directed toward promoting understanding of the common pediatric neurosurgical disorders including pathogenesis, evaluation, and management. During this rotation, residents will assume greater responsibility for patient evaluation, formulating a diagnostic and treatment plan, and implementing the plan (under the supervision of the attending physician). Global evaluation of resident performance will be conducted at the conclusion of the rotation by faculty and support staff. Performance will be gauged also by the written ABNS examination.

### **Patient Care**

*Goal: provide appropriate, timely, cost-effective and compassionate care to pediatric patients*

*Specific objectives:*

*Perform and document a thorough, accurate, concise, and organized comprehensive neurosurgery history and physical examination for the pediatric patient*

1. *Understand the indications for and interpret the meaning of presurgical laboratory studies and imaging including*
2. *Interpret typical radiographic features of common pediatric conditions on MRI and CT*
3. *Educates patients/families about current medical condition and the risks, goals, limits, and alternatives to common pediatric neurosurgical procedures (e.g., ventriculoperitoneal shunt)*
4. *Work with health care professionals composing the neurosurgery team and members of the health care team from other disciplines*
5. *Safely and effectively perform a shunt tap*
6. *Place and revise a ventriculoperitoneal shunt under faculty supervision*

*Assessment: observation by faculty, Senior, and Chief Resident*

### **Medical Knowledge**

*Goal: to acquire and demonstrate knowledge of basic pediatric neurosurgery disorders and apply this knowledge to patient care*

*Specific objectives:*

1. *Describe common types of spinal dysraphism (e.g, myelomeningocele, encephalocele, Chiari malformation, split cord syndromes)*
2. *Describe common craniofacial syndromes*
3. *Delineate the different etiologies of hydrocephalus and their relative incidence.*
4. *Describe the presentation and diagnostic approach to a patient with suspected shunt malfunction.*
5. *List the common tumor types occurring in children and their typical location.*
6. *Describe the typical presentations of tumors, evaluation for patients suspected of having a tumor, and basic tumor treatment strategies.*
7. *Describe the anatomy of the child's spine which causes the epidemiology of spinal cord injury to differ from adults.*

*Assessment: observation by faculty and Senior and Chief Residents; ABNS written examination*

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

*Goal: to learn to evaluate and improve the quality of patient care using self-reflection, self-directed learning, critical analysis of practice patterns and outcomes*

*Specific objectives:*

- 1. Participate in neurosurgery program quality improvement conferences (e.g., morbidity and mortality), evaluate and recommend changes in practice to reduce risk of treatment complication*
- 2. Use information technology to obtain current "best practices" data (e.g., evidence-based guidelines and recommendations) and apply the data to patient care*
- 3. Demonstrate responsibility and leadership in engaging other learners (i.e. medical students, nurses) in the educational process*

*Assessment: observation by faculty and Senior and Chief Residents*

### **Interpersonal and Communication Skills**

*Goal: demonstrate an ability to communicate effectively with pediatric patients and their families, work in a consultative fashion with other healthcare providers, and work as a member of the healthcare team*

*Specific objectives:*

- 1. Demonstrate good listening skills during encounters with pediatric patients and their families*
- 2. Address patient and family concerns, educate them regarding their medical issues*
- 3. Communicate effectively and respectfully with members of the health care team*
- 4. Initiate consultations to other medical services and respond to requests for neurosurgical consultations*

*Assessment: observation by faculty and Senior and Chief Resident; 360 degree evaluation by support staff*

### **Professionalism**

*Goal: to demonstrate respect, compassion, and integrity*

*Specific objectives:*

- 1. Exhibit sensitivity and responsiveness to patients' culture, age, gender, and disabilities*
- 2. Respond well to constructive criticism*
- 3. Maintain timely documentation (no delinquent charts/ dictations)*
- 4. Demonstrate accountability (ownership) to patients*

*Assessment: observation by faculty, Senior, and Chief Resident; 360 degree evaluation by support staff*

### **Systems Based Practice**

*Goal: to learn and demonstrate awareness of and responsiveness to the larger context and system of healthcare and call effectively upon other resources in the system to provide optimal healthcare*

*Specific objectives:*

- 1. Describe resource limitations within the health care system*
- 2. Identify and use appropriate other health care professionals and organizations that may assist in a patient's care.*
- 3. Advocate for quality patient care and assist patients in dealing with system complexities*

*Assessment: observation by faculty, Senior, and Chief Resident; 360 degree evaluation*

## **NEUROSURGERY UNMC**

This rotation will allow the resident to increase knowledge and build on skills learned during the NS-1 year. Residents will be given a greater degree of responsibility in managing patients in the inpatient and outpatient settings. The outpatient experience will include the evaluation of new and return patients. Particular emphasis will be given in the outpatient experience to participating in the preoperative evaluation of patients as well as postoperative follow-up. During midlevel years, when the residents have built a reasonable fund of neurosurgical knowledge and skills, they are expected to conduct a thorough evaluation of the patient, develop a

differential diagnosis, formulate a care plan to include ordering of diagnostic tests, interpret test results, and guide the execution of the treatment plan. The midlevel resident may initiate non-critical aspects of the treatment plan. At this level of training, the midlevel resident may also assume some limited responsibility for oversight of the junior level residents (for common, non-critical disorders). In the operating room, the midlevel resident will work collaboratively with the faculty surgeon on minor and major cases such that as the year progresses the midlevel resident will increasingly be the primary surgeon for non-complex surgical procedures (e.g., spinal surgeries, shunts, pain procedures). At this level, residents will be expected to report to their supervising residents and faculty, particularly prior to implementing treatment, but as they become more versant with patient management may be granted greater autonomy to initiate treatment of non-critical problems. Global evaluation of resident cognitive and technical performance will be conducted by faculty and support staff (as part of the 360 degree assessment) at the conclusion of the rotation and by the ABNS written examination.

## **Patient Care**

*Goal: to develop residents' ability to combine medical knowledge and clinical judgment to promote decision-making skills while providing high quality, compassionate, and cost-effective patient care.*

*Specific objectives:*

- 1. Evaluate patients with cranial and spinal trauma in the Emergency Department, order and interpret tests, and formulate a treatment plan; manage inpatients with supervision*
- 2. Evaluate new patients (inpatients, consults, outpatients), including interpretation of diagnostic tests, establish a diagnosis, and formulate a treatment plan for common spinal disorders (e.g., radiculopathy, stenosis)*
- 3. Evaluate new patients with intracranial hemorrhage (e.g., intraparenchymal, subarachnoid), order and interpret diagnostic tests, establish a diagnosis, and formulate a treatment plan; manage inpatients with supervision*
- 4. Work with members of the healthcare team to provide multidisciplinary care (e.g., arrange social services, physical and occupational therapy evaluations and integrate their recommendations and therapies into overall patient care)*

*Assessment: observation by faculty, Senior and Chief Residents*

## **Medical Knowledge**

*Goal: demonstrate understanding of basic anatomy and physiology pertaining to normal and abnormal function of the nervous system as it relates to neurosurgical disorders*

*Specific objectives:*

- 1. Describe the basic anatomy of cranium, spinal column, and cerebral vasculature*
- 2. Compare and contrast the pathophysiology of common types of intracranial hemorrhage, describe appropriate diagnostic tests, and describe treatment options*
- 3. Describe the neuroanatomical, pathophysiological, and radiographic characteristics of epidural hematoma, subdural hematoma, and diffuse axonal injury; describe appropriate diagnostic tests and treatment options*
- 4. Describe the neuroanatomical, pathophysiological, and radiographic characteristics of common spinal disorders (e.g., herniated disc, stenosis) including traumatic spine injury*
- 5. Perform above the 10th percentile on the ABNS primary examination*

## **Practice-Based Learning and Improvement**

*Goal: demonstrate an ability to learn and improve skills from self-evaluation and critical self-analysis*

*Specific objectives:*

- 1. As part of annual evaluation, identify strengths and weakness, note areas for improvement, and determine how to improve those weaknesses*
- 2. Participate in grand rounds and morbidity and mortality conferences to identify areas of insufficient knowledge or skills; determine how to improve those areas*
- 3. Locate, appraise and assimilate evidence from scientific studies related to common neurosurgical problems and apply this*

information to patient care, with emphasis on spinal and pediatric neurosurgery

*Assessment: observation by faculty, Senior and Chief Residents; annual self-assessment*

### **Interpersonal and Communication Skills**

*Goal: to develop the resident's ability to work as a member of the healthcare team; to educate patients and families regarding medical disorders, and to communicate effectively with medical colleagues*

*Specific objectives:*

- 1. Communicate effectively with patients and families from varying socioeconomic and cultural backgrounds regarding their medical diagnoses, treatment options, and outcomes*
- 2. Provide prompt and accurate communication with referring and collaborating physicians*
- 3. Participate meaningfully in multidisciplinary conferences focused on specific neurosurgical fields*

*Assessment: observation by faculty, Senior, and Chief Residents; review of medical records deficiency reports (e.g., delinquency reports); 360 degree evaluation by faculty and support staff*

### **Professionalism**

*Goal: demonstrate a commitment to carrying our professional responsibilities and adhere to ethical principles.*

*Specific objectives:*

- 1. Demonstrate sensitivity and responsiveness to patients' culture, age, gender and disabilities*
- 2. Demonstrate integrity and a commitment to patients that supersedes self-interest*
- 3. Demonstrate respect for patients' autonomy*

*Assessment: observation by faculty, Senior, and Chief Residents; 360 degree assessment by faculty and support staff*

### **Systems-Based Practice**

*Goal: to understand systems of healthcare and serve as an advocate for quality patient care and assist patients in dealing with system complexities, especially in an outpatient setting*

*Specific objectives:*

- 1. Demonstrate an understanding of practice types and opportunities, health care delivery systems and medical economics*
- 2. Use evidence-based medical practice to provide cost-effective health care and resource allocation that does not compromise quality of care*
- 3. 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 outpatient clinic setting*

*Assessment: observation by faculty, Senior and Chief Residents*