COMBINED GOALS AND OBJECTIVES: UNC Child Neurology

CURRICULAR COMPONENT: CHILD NEUROLOGY ROTATION

I. OVERALL EDUCATION GOAL:

The purpose of the child neurology training program is to teach child neurology residents to evaluate and manage the neurological problems of infancy, childhood, and adolescents. The child neurology resident should also have broad knowledge of the common neurological problems of adults. The child neurology residents also must learn the principles of neurophysiology, neuropathology, neuroradiology, neuro-opthalmology, psychiatry, rehabilitation, neurological surgery, neurodevelopment and the basic neurosciences, of nervous system localization, brain metabolism, growth and development, neuropharmacology, and neurotoxicology.

The goals of the training of the child Neurology resident are to make the resident proficient in the diagnosis and management of most inpatients and outpatients seen by the Child Neurology service. This includes a comprehensive understanding of the uses of neurodiagnostic tests, including but not limited to electrophysiological and neuroradiological techniques, metabolic tests, muscle biopsy, and Tension testing. The Child Neurology Resident must be able to interact with pediatric services in both role of specialty physician and consultant. Child Neurology Resident must have an understanding of the uses of consultation from and interaction with other associated services, including, but not limited to Neuro-opthalmology, neurosurgery, neurooncology, pediatric rehabilitation, medical genetics, pediatric orthopedics, and child psychiatry. Child Neurology Resident will develop a basic understanding of the uses of psychometric and neuropsychological testing in child neurology. The Child Neurology Resident will be expected to provide supervision and teaching of fourth year medical students and informal teaching of pediatric housestaff. Child Neurology Resident will prepare case presentations and other material for the weekly Child Neurology Clinical Case Conference.

Child neurology resident will begin to understand health care financing system well enough to help direct patients and families in handling the increasingly complex system of authorizations, TARS, etc. The Child neurology resident will have a basic understanding of the costs of various care options.

Child Neurology Resident will be expected to learn the following areas of basic and clinical sciences and to develop expertise in the evaluation and management of the following groups of diagnoses, including the appropriate use of diagnostic tests and interpretation of results, use of medications, referral to consultants, and use of appropriate non-medical community resources:

Specific learning objectives follow.

I. OBJECTIVES: The Resident must:

A. BASIC SCIENCES- Develop a sound understanding of physiology, biochemistry, embryology and molecular biology as it relates to the developing nervous system by:
   1. Learning nervous system embryology.
   2. Learning metabolic pathways that affect neural function.
   3. Learning nerve cell physiology including ion channels, receptors, second message, neurotransmitter and neuromodulators, glial function.
   4. Learning biochemical pathways or importance for neural function.
   5. Learning the principles of the blood brain barrier, cerebral perfusion and nervous system homeostasis.
   6. Learning the major principles of molecular biology and genetics.
   7. Learning the principles of immunology.

B. CLINICAL SCIENCES GENERAL SKILLS-
   1. Demonstrate competence in obtaining a neurological history and in performing an neurological examination of infants and children.
      a) Learn how to perform a neurologic examination at different ages.
b) Learn the normal developmental milestones.
c) Learn how to adapt special neurologic examinations to the young child or infant.
d) Learn special physical examination measurements.
e) Learn how to assess visual acuity and perform and interpret funduscopic examination.

2. Develop knowledge and skill in topographic localization
   a) Disorders of motor system.
      (1) To become proficient in differentiating types of movement disorders: tics, incoordination, involuntary movement disorders, and weakness
      (2) Differentiate upper motor neuron and lower motor neuron dysfunction and be familiar with all of their elements.
      (3) Be able to identify types and etiologies of lower motor neuron disorders: motor neuron disorders, neuropathies, neuromuscular junction disorders, and myopathies.
      (4) Be able to recognize the features of ataxia at different ages and be able to identify the different types of ataxia.
      (5) Be able to distinguish the types of involuntary movement disorders: tics, chorea, athetosis, hemiballismus, dystonia, and myoclonus.
      (6) Be able to distinguish and localize the types of abnormalities of tone: dystonia, spasticity, rigidity.
      (7) Be able to localize lesions along the longitudinal and lateral axis of the central nervous system- left vs. right hemisphere; hemisphere, brain stem or spinal cord.
   b) Somatosensory system disorders
      (1) Be able to distinguish sensory deficits in the cerebral hemisphere, thalamus, brainstem, spinal cord, nerve roots, or peripheral nerves.
      (2) Be able to identify types of sensory deficits and localize sensory deficits in the spinal cord.
      (3) Recognize the types of peripheral sensory deficits: radiculopathy, plexopathy, peripheral nerve, mononeuropathy, mononeuropathy multiplex, peripheral polyneuropathy.
   c) Disorders of special senses
      (1) Be able to localize visual losses to the retina, optic nerve, optic chiasm, optic radiations or visual cortex.
      (2) Be able to localize auditory deficits: conductive vs. nerve deafness, brainstem vs. auditory cortex.

C. DEMONSTRATE A KNOWLEDGE OF THE PATHOPHYSIOLOGY, ETIOLOGY, METHODS OF DIAGNOSIS, TREATMENT AND MANAGEMENT OF NEUROLOGIC DISORDERS OF INFANTS AND CHILDREN BY DISEASE TYPE OR CARDINAL MANIFESTATION
1. Disorders of weakness
   a) Myopathies
   b) Neuromuscular junction disorders
   c) Guillain Barre
2. Spinal cord disorders
   a) Transverse myelitis
   b) Trauma
   c) Degenerative diseases
3. Paroxysmal disorders
   a) Syncope
   b) Seizures
      (1) Know the classification of seizures and epilepsy
      (2) Know the causes of seizures at different ages and the features of each etiology.
      (3) Know the laboratory methods for evaluating seizures at different ages.
(4) Know the antiepileptic drugs- choices by seizure type, doses, pharmacokinetics, adverse effects.
(5) Know what surgical techniques can be used to treat epilepsy and the criteria for the use of epilepsy surgery.
(6) Know the types and details of the diagnosis and management of status epilepticus.

c) Periodic paralysis
d) Sleep disorders
   (1) Know how to diagnose and treat common sleep disorders, paroxysms, narcolepsy, cataplexy and sleep apnea.

4. Movement disorders
a) Ataxia
   (1) Know the features of ataxia in the eyes, speech, upper extremities, lower extremities, and body.
   (2) Be able to give a complete differential for different types of ataxia- paroxysmal, subacute, chronic, and chronic progressive.
   (3) Know the etiologies of ataxia at different ages.

b) Extrapyramidal disorders
   (1) Know the causes of chorea, methods for diagnosis, and treatment options.
   (2) Know the causes of dystonia, methods for diagnosis, and treatment options.

5. Disorders of behavior, cognition and higher cortical function
a) Know the types of developmental delay- mental retardation, cerebral palsy, autism.

b) Mental retardation- know etiology, manifestations, methods of evaluation, and treatment options.

b) Autism- know etiology, manifestations, methods of evaluation, and treatment options.

b) Disorders of language- speech delay, Landau-Kleffner syndrome, dysarthria, stuttering.

e) Know the approach and management of children with delayed speech, impaired attention, behavioral problems, and school failure.

6. Strokes and other vascular disorders
a) Know the pathophysiology of strokes in infants and their manifestations, methods of diagnosis and management.

b) Know the types, etiologies, manifestations, methods of diagnosis, and management of strokes in children.

7. Pain
a) Headaches in infants and children
   (1) Know the International Classification of Headaches and the criteria for each headache type.
   (2) Know the medications used to treat headaches- choices, dosing, pharmacokinetics, and adverse effects.
   (3) Know the principles of biofeedback.
   (4) Be familiar with the psychosocial issues important in the management of headaches.

8. Metabolic disorders
a) Disorders of carbohydrate metabolism and mitochondrial disorders
b) Glycogen storage diseases
c) Amino acidopathies
d) Organic acidurias
e) Peroxisomal disorders
f) Lysosomal storage diseases
g) Disorders of porphyrin metabolism

9. Genetic defects and developmental defects
a) Neurocutaneous disorders
   (1) Neurofibromatosis
   (2) Tuberous sclerosis
   (3) Sturge Weber
Ataxia telangiectasia
Know the features of other neurocutaneous disorders
hypomelanosis of Ito, linear sebaceous nevus syndrome

Chromosomal disorders
(1) Down syndrome
(2) Other trisomies

Abnormalities of increased intracranial pressure
a) Hydrocephalus
   (1) Know the manifestations of hydrocephalus
   (2) Know the types and causes of hydrocephalus
   (3) Know treatment options for managing hydrocephalus and the complications of each.

b) Cerebral edema
   (1) Know the pathophysiologic mechanisms of cerebral edema.
   (2) Know the cardinal manifestations of cerebral edema.
   (3) Know the types of cerebral edema and the treatment of them.

c) Pseudotumor cerebri

Coma and Brain Death
a) Know the types of coma and the features of each type.
b) Know the pathophysiology of coma types.
c) Know the Glasgow Coma scale for children.
d) Know the types of herniation syndromes and the pathophysiological mechanisms for each.
e) Know the treatment of coma
f) Know the management of coma
g) Know the criteria for brain death and be able to assess infants and children for brain death.

Nervous system infections in infants and children
a) Encephalitis
b) Slow virus infections
c) Meningitis
d) Abscess
e) Biology of organisms infecting the nervous system- bacteria, fungi, viral, parasitic.

Vasculitis and collagen vascular disease
a) Know the types of vasculitis that affect infants and children at different ages and their etiologies.
b) Know the laboratory testing used to diagnose vasculitis
c) Know the treatment of autoimmune diseases

Toxins
a) Know the manifestations of common intoxication- alcohol, cocaine, barbiturates, opiates, heavy metals

Nervous system trauma
a) Closed head injury
b) Spinal cord injury
c) Vascular injury

Visual system disorders
a) Be able to recognize and evaluate types of ocular motility disorders- strabismus, ophthalmplegia, nystagmus, spasmus nutans.
b) Be able to recognize and evaluate optic atrophy.
c) Be able to recognize evaluate papilledema

Auditory and vestibular disorders
a) Know the types of deafness, etiologies, evaluation of and treatment.
b) Know the causes of vertigo and the evaluation and treatment.

Cranial nerve disorders
a) Know the manifestations, etiologies for, evaluation of and treatment of facial sensation changes.
b) Know the manifestations, etiologies, evaluation and treatment of facial paresis.
c) Know the manifestations, etiologies, evaluation and treatment of CN IX and X defects.
D. Be well-versed in the psychological, social, and ethical considerations associated with neurological diseases in infants and children.
   1. The resident must learn methods for the prevention of neurological disease.
   2. The resident must learn long-term disease management skills.
   3. The resident should become familiar with the psychological, social, family and patient counseling and need for referral.
E. Be proficient in the use and interpretation of standard laboratory investigations used in evaluating neurological disorders in children (LP; EEG; CT; MRI; EMG/NCV; evoked potential studies; angiography; and nerve and muscle biopsy). The resident should know when to use each of these tests and what abnormalities will be found in the disorders and diseases listed above

II. EVALUATION:

Faculty preceptors during the various clinical and didactic activities of the rotation evaluate residents. Faculty members observe residents while they perform clinical assessment on child neurology patients. Faculty members review the clinical findings, interpretations, and plans presented by residents as they see neurology patients. Residents are also evaluated on the quality of their assigned topic reviews at weekly child neurology conference. Faculty members complete the standard neurology evaluation form, which is keyed to the above learning objectives. Residents will also be evaluated on the basis of their presentations at Neurology Grand Rounds, at Journal Club, and at the Child Neurology Clinical Case Conferences. Residents will take the annual Inservice Examination, the RITE exam and their performance will be used to assess who well the goals and objectives have been met.

III. LEARNING ACTIVITIES:

Child Neurology residents during their rotation on child neurology see neurology patients in both the inpatient and outpatient setting. Inpatient opportunities include consultations from the ward teams and direct evaluation of patients admitted to the pediatric neurology service. There are inpatient ward rounds and teaching rounds daily. The outpatient activities include pediatric neurology clinics five days a week. Residents on the neurology rotation participate in the clinics on most afternoons.

Didactic

The rotation has a number of didactic sessions for residents which include:

1. Thursday morning Pediatric Neurology Clinic review rounds. During this sessions interesting and challenging cases seen in the clinics are reviewed. Child Neurology residents are asked to discuss cases and provide a differential diagnosis, evaluation and management. Residents may be asked to present previously assigned topics.

2. Neurology Grand Rounds. This is a weekly one hour presentation of a clinical problem in neurology/neurosurgery.

3. Neuropathology rounds and brain cutting are held weekly.

4. A weekly clinical neurophysiology conference where faculty members present topics related to EEG's, evoked potentials, EMG's and nerve conduction studies.

5. There is a weekly neurology resident conference, which reviews major topics in neurology and child neurology. Residents as assigned topics for research and presentation at one of the weekly conferences.

6. Basic science lectures will be given in a three year cycle and will be part of the resident weekly resident lecture schedule.
Adult Neurology Rotations

The Neurology residency program at the University of North Carolina seeks to provide excellent clinical training of child and adult neurology residents. During the three years of neurology residency training, the neurology resident is expected to learn how to effectively evaluate and manage a variety of neurological problems. Training is conducted in an environment conducive to learning. The faculty and staff are committed to facilitating resident education and training.

This is accomplished through a strong faculty presence in all aspects of resident training. Residents follow a structured curriculum during their three years of residency. Formal didactic conferences are given each day as part of the residents' education. Attendance at these conferences is expected of all residents, unless a direct patient care conflict exists, or the resident is away. Teaching in both the basic and clinical neurosciences is covered over the course of the residency. Daily rounds on the inpatient service provide for both bedside and didactic teaching. All outpatients seen by the resident are presented and discussed with to an attending. Progressive responsibility in the care of patients is emphasized. Program goals and objectives are provided for each resident rotation. Competence will be expected in a variety of areas, as outlined on the following page. At the completion their training, neurology residents will be eligible for certification by the American Board of Psychiatry and Neurology.

Over the course of training the resident will be expected to become competent in the following clinical areas:

A. The ability to take an accurate and complete neurologic history.
B. The performance of the neurologic exam.
C. The ability to summarize and present neurologic cases.
D. Residents will learn how to localize neurologic symptoms and findings in the nervous system.
E. The generation of a differential diagnosis for common neurologic symptoms and findings.
F. The ability to appropriately order and interpret diagnostic tests.
G. The management of a variety of neurologic disorders.
H. The ability to identify and manage neurologic emergencies.
I. The identification of patients requiring neurosurgical referral.
J. The identification and general management of patients with psychiatric disorders.
K. An understanding of the relationship between psychiatric and neurologic disorders.
L. The psychological aspects of the physician-patient relationship.
M. The basic principles of rehabilitation of neurological disorders.
N. The cost effective evaluation and treatment of patients with neurologic disorders.
O. The professional and respectful care of patients.
P. The compassionate care of patients.
Q. An understanding of ethical issues related to patients with neurologic disease.
R. An understanding of end-of-life issues in patient care.
S. The management of chronic pain.
T. Ability to perform and interpret the results from lumbar puncture.
U. Ability to perform a Tensilon test.
V. The interpretation of EEG studies.
W. The use of evoked potentials in neurology.
X. The use of ambulatory and video EEG monitoring.
Y. The performance and interpretation of NCV and EMG studies.
General Competencies Required of Neurology Residents

The residency program requires its residents to develop the competencies in the 6 areas below, to the level expected of a new practitioner. Attainment of these competencies will be developed and evaluated through a variety of different means. Residents work closely with the Neurology Department faculty in both the outpatient and inpatient setting. This gives the residents an opportunity to observe directly how to provide compassionate, appropriate, and effective patient care; to discuss and demonstrate knowledge about related and relevant health care sciences; to learn appropriate communication skills; to develop professionalism; and to develop an awareness of their relationship with the health care system. The faculty will incorporate these issues in to the case discussion. Morning Report conference is held by Residency Director approximately three times each month. During many of these conferences, the residents will present cases for discussion. The general competencies will be incorporates in to these case discussions as well. Issues related to practice-based learning and improvement are discussed at each monthly Journal Club. Specific lectures directly related to the general competencies will be given during the course of the year. An example is the review of the Position Statements of the North Carolina Medical Board given by Dr. Hinn and the monthly bioethics lectures given by Dr. Jacobson.

The evaluation of the residents in these general competencies is included in the monthly and semi-annual resident evaluation forms. These areas will also be incorporated in to the Residency In-Service Training Exam and Mock Oral Boards. A portfolio is maintained for each resident, and any problem areas in performance related to the general competencies that are brought to the attention of the residency director, will be reviewed with the resident.

PATIENT CARE

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

- communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
- gather essential and accurate information about their patients
- make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
- develop and carry out patient management plans
- counsel and educate patients and their families
- use information technology to support patient care decisions and patient education
- perform competently all medical and invasive procedures considered essential for the area of practice
- provide health care services aimed at preventing health problems or maintaining health
- work with health care professionals, including those from other disciplines, to provide patient-focused care

MEDICAL KNOWLEDGE

Residents must demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care. Residents are expected to:

- demonstrate an investigatory and analytic thinking approach to clinical situations
- know and apply the basic and clinically supportive sciences which are appropriate to their discipline

PRACTICE-BASED LEARNING AND IMPROVEMENT
Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. Residents are expected to:

- analyze practice experience and perform practice-based improvement activities using a systematic methodology
- locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems
- obtain and use information about their own population of patients and the larger population from which their patients are drawn
- apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness
- use information technology to manage information, access on-line medical information; and support their own education
- facilitate the learning of students and other health care professionals

INTERPERSONAL AND COMMUNICATION SKILLS

Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients families, and professional associates. Residents are expected to:

- create and sustain a therapeutic and ethically sound relationship with patients
- use effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
- work effectively with others as a member or leader of a health care team or other professional group

PROFESSIONALISM

Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. Residents are expected to:

- demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supercedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
- demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
- demonstrate sensitivity and responsiveness to patients’ culture, age, gender, and disabilities

SYSTEMS-BASED PRACTICE

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value. Residents are expected to:

- understand how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
- know how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
- practice cost-effective health care and resource allocation that does not compromise quality of care
- advocate for quality patient care and assist patients in dealing with system complexities
- know how to partner with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance
CURRICULAR COMPONENT: CLINIC ROTATION

I. OVERALL EDUCATION GOAL:

The purpose of the clinic rotation is for residents to learn to evaluate and manage common neurological problems seen in the outpatient clinic setting. Residents will achieve this through experience in both the adult and child general diagnostic clinics. In addition, the resident will rotate through the specialties clinics including the Neuromuscular Clinic, Pain Clinic, various Epilepsy Clinics, Sleep Clinic, Parkinson’s Clinic, and Botox Clinic. The resident will gain experience in the diagnosis and management of various neurological disorders under the direct supervision of the attending assigned to these various clinics.

II. OBJECTIVES:

1. The resident will learn to take an accurate neurological history and perform an appropriate neurological exam for patients with both general and specialty neurological problems.

2. The resident will learn to present neurological cases to the attending.

3. The resident will gain skill in the localization of neurological symptoms and findings in the nervous system.

4. The resident will learn to generate a differential diagnosis for various neurological symptoms and findings seen in the outpatient setting.

5. The resident will become competent in the management of the various neurological disorders seen in the outpatient settings. Examples will include head and facial pain, neck and low back pain, other pain disorders, epilepsy, neuromuscular junction disorders, muscle disease, motor neuron disease, sleep disorders, multiple sclerosis, Parkinson’s disease, dystonias, other movement disorders, dementia, gait disturbances, focal and polyneuropathies, as well as various other neurological disorders.

6. The resident will learn the appropriate and cost-effective evaluation of various outpatient neurological disorders. The resident will gain skills in the long-term management of patients with various neurological disorders.

III. EVALUATION:

The residents will be evaluated directly by the faculty assigned to the clinic. Faculty members will critique the residents’ presentations of various neurological cases as well as their assessment and plan for the care of outpatients with neurologic disorders. Faculty members will complete a standard neurology evaluation form which is keyed to the learning objectives.

IV. LEARNING ACTIVITIES OF THE ROTATION:

Residents on the clinic neurology rotation will gain experience through their exposure to outpatients with various neurological disorders. The attending assigned to the clinic will provide feedback to the resident directly critiquing their presentation and evaluation of patients. After the residents’ presentation, the attending will ask the resident for both their assessment and plan for management of the patient. The attending will then critique this and make their own recommendations. Throughout the year, the management of common outpatient neurological problems will be discussed in various formats in the residents daily 7:40 am to 8:30 am lectures. This will include the Clinical Lecture Series, Morning Report, and other formats.
I. OVERALL EDUCATION GOAL:

The goal of the triage and ER rotation is for residents to learn the evaluation and management of common acute neurological problems seen in the outpatient neurology setting. The resident will achieve this through the evaluation of patients presenting to the emergency room, general medical clinics, and neurology clinic with acute or urgent neurologic problems. The resident will gain experience in the diagnosis of various acute neurological disorders under the direct supervision of the attending assigned to the triage service.

II. OBJECTIVES:

1. The resident will become competent in obtaining a neurological history and performing a neurological exam on patients presenting with various acute or urgent outpatient neurologic problems.

2. The resident will learn to effectively present such neurological cases.

3. The resident will gain skill in the localization of various neurological symptoms and findings seen in patients with acute neurologic problems.

4. The resident will learn to generate a differential diagnosis for common acute neurological symptomatology and findings seen on the triage service.

5. The resident will become an integral part of the Neurology team with the ability to both synthesize cases for presentation to the neurology attending, as well as participate in the education and teaching of medical students on the Neurology triage service.

6. The resident will learn to effectively work with referring physicians in the evaluation and management of these patients.

7. The resident will gain competence and skill in the assessment of common neurological problems seen on the triage service including TIA, stroke, delirium, coma, seizures and epilepsy, syncope, acute visual disturbances, increased intracranial pressure, CNS infections, dizziness, ataxia and gait disorders, movement disorders, focal neuropathies and radiculopathy, acute and subacute polynuropathy, neuromuscular weakness, acute low back pain, acute and intractable headache, various pain syndromes, multiple sclerosis, and myelopathic disorders.

8. The resident will learn the appropriate and cost effective evaluation of patients presenting with various problems to the triage service.

9. The resident will gain ability in the use of laboratory tests, lumbar puncture, EMG/nerve conduction studies, EEG, evoked potentials, CT, MRI, and other studies in the evaluation and management of patients seen on the triage service.

III. EVALUATION:

The residents will be evaluated directly by the faculty members assigned to the triage and ER service. The faculty members will directly observe the residents’ presentation of cases, and their assessment and plan for the management of patients with acute neurological disorders. The attending will provide feedback to the resident during the rotation regarding their skills in the assessment and management of neurological patients. In addition, the faculty member will assess the resident’s ability to be an integral member of the team, including their ability to interact with other physicians and ancillary personnel. At the end of the rotation, the faculty members will complete a standard neurology evaluation form, which will be keyed to the learning objectives of the rotation.

IV. LEARNING ACTIVITIES OF THE ROTATION:

Residents on the triage and ER service will have an opportunity to present cases and be critiqued on
both their evaluation and management ability. Residents will have the opportunity to observe the attendings history taking and neurological examination on neurology outpatient consults. The residents will also be present when the attending discusses their assessment of neurology outpatient cases, as well as didactic presentations by the attending on various neurological issues. The resident will have the opportunity to review neuroimaging studies with the Neuroradiology staff and the neurology triage attending. The neurology resident will also have the opportunity to review clinical neurophysiology studies done with the clinical neurophysiology attending staff. Throughout the year, the resident will attend the daily 7:40 am to 8:30 am resident lectures which will cover various neurological topics, including the evaluation and management of a variety of disorders seen on the neurology outpatient service. This will include Morning Report, the Clinical Lecture Series, and other conferences.
CURRICULAR COMPONENT: INPATIENT CONSULT ROTATION

I. OVERALL EDUCATION GOAL:

The goal of the inpatient consult rotation is for residents to learn the evaluation and management of common neurological problems seen in the inpatient neurology consult setting. The resident will achieve this through the evaluation and management of patients on the inpatient neurology consult service. This includes patients in the intensive care unit, medical and surgical wards, psychiatry, and the rehabilitation medicine service. The resident will gain experience in the diagnosis and management of various neurological disorders under the direct supervision of the attending assigned to the triage service.

II. OBJECTIVES:

1. The resident will become competent in obtaining a neurological history and performing a neurological exam on inpatients with a variety of neurologic problems.

2. The resident will learn to effectively present such neurological cases.

3. The resident will gain skill in the localization of various neurological symptoms and findings seen in patients on the neurology inpatient consult service.

4. The resident will learn to generate a differential diagnosis for common neurological symptomatology and findings seen on the neurology inpatient service.

5. The resident will become an integral part of the Neurology consult team with the ability to both synthesize cases for presentation to the neurology attending, as well as participate in the education and teaching of medical students on the Neurology inpatient consult service.

6. The resident will learn to effectively work with referring physicians in the evaluation and management of these patients.

7. The resident will gain competence and skill in the assessment of common neurological problems seen on the neurology inpatient consult service including TIA, stroke, delirium, coma, brain death, seizures, syncope, acute visual disturbances, increased intracranial pressure, CNS infections, dizziness, ataxia and gait disorders, movement disorders, nerve and plexus disorders, polyneuropathy, neuromuscular weakness, low back pain, intractable headache, various pain syndromes, AIDS and the nervous system, malignancy and the nervous system, multiple sclerosis, and myelopathic disorders.

8. The resident will learn the appropriate and cost effective evaluation of patients of patients on the neurology inpatient consult service.

9. The resident will gain ability in the use of laboratory tests, lumbar puncture, EMG/nerve conduction studies, EEG, evoked potentials, CT, MRI, and other studies in the evaluation and management of patients seen on the triage service.

III. EVALUATION:

The residents will be evaluated directly by the faculty member assigned to the inpatient consult service. The faculty members will directly observe the residents’ presentation of cases, and their assessment and plan for the management of patients. The attending will provide feedback to the resident during the rotation regarding their skills in the assessment and management of neurological patients. In addition, the faculty member will assess the resident’s ability to be an integral member of the team, including their ability to interact with other physicians and ancillary personnel. At the end of the rotation, the faculty member will complete a standard neurology evaluation form which will be keyed to the learning objectives of the rotation.

IV. LEARNING ACTIVITIES OF THE ROTATION:

Residents on the Neurology rotation will round with the neurology inpatient consult team each weekday
and on one weekend day. They will have an opportunity to present cases and be critiqued on both their evaluation and management ability. Residents will have the opportunity to observe the attendings history taking and neurological examination on neurology consult patients. The residents will also be present when the attending discusses their assessment of neurology inpatient cases with the neurology consult team, as well as didactic presentations by the attending on various neurological issues. The resident will have the opportunity to review neuroimaging studies with the Neuroradiology staff and the neurology outpatient consult attending. The neurology resident will also have the opportunity to review clinical neurophysiology studies done with the clinical neurophysiology attending staff. Throughout the year, the resident will attend the daily 7:40 am to 8:30 am resident lectures which will cover various neurological topics, including the evaluation and management of a variety of disorders seen on the neurology inpatient consult service. This will include Morning Report, the Clinical Lecture Series, and other conferences.
CURRICULAR COMPONENT: JUNIOR RESIDENT WARD ROTATION

I. OVERALL EDUCATION GOAL:

The goal of the ward rotation for junior residents is to learn the evaluation and management of common neurological problems seen in the inpatient neurology setting. The resident will be part of the Neurology ward team consisting of the neurology attending, neurology senior resident, medicine and psychiatry interns, and medical students who are involved in the care of inpatients on the Neurology ward service.

II. OBJECTIVES:

1. The resident will become competent in obtaining a neurological history and performing a neurological exam on patients presenting to the Neurology inpatient service.
2. The resident will learn to effectively present neurological cases.
3. The resident will gain skill in the localization of various neurological symptoms and findings seen on the Neurology inpatient service.
4. The resident will learn to generate a differential diagnosis for common neurological symptomatology and findings seen on the inpatient service.
5. The resident will become an integral part of the Neurology team with the ability to both synthesize cases for presentation to the neurology senior resident and attending.
6. The resident will gain competence and skill in the assessment of common neurological problems seen on the Neurology inpatient service including TIA, stroke, delirium, intractable epilepsy, Parkinson’s disease, myasthenia gravis, acute and chronic inflammatory demyelinating polyneuropathy, polymyositis, acute low back pain, intractable headache, multiple sclerosis, and myelopathic disorders.
7. The resident will learn the appropriate and cost effective evaluation of patients presenting with various problems to the Neurology inpatient service.
8. The resident will gain ability in the use of laboratory tests, lumbar puncture, EMG/nerve conduction studies, EEG, evoked potentials, CT, MRI, and other studies in the evaluation and management of neurology inpatients.

III. EVALUATION:

The residents will be evaluated directly by the faculty member assigned to the Neurology ward service. The faculty members will directly observe the residents’ presentation of cases, and their assessment and plan for the management of patients with neurological disorders. The attending will provide feedback to the resident during the rotation regarding their skills in the assessment and management of neurological patients. In addition, the faculty member will assess the resident’s ability to be an integral member of the Neurology ward team, including their ability to interact with other members of the ward team and ancillary personnel. At the end of the rotation, the faculty member will complete a standard neurology evaluation form, which will be keyed to the learning objectives of the rotation.

IV. LEARNING ACTIVITIES OF THE ROTATION:

Residents on the Neurology rotation will round with the neurology ward team each weekday and on one weekend day. They will have an opportunity to present cases and be critiqued on both their evaluation and management ability. Residents will have the opportunity to observe the attendings history taking and neurological examination on neurology inpatients. The residents will also be present when the attending discusses their assessment of neurology inpatient cases with the neurology inpatient ward team, as well as didactic presentations by the attending on various neurological issues. The resident will have the opportunity to review neuroimaging studies with the Neuroradiology staff and the neurology inpatient attending. The neurology resident will also have the opportunity to review clinical neurophysiology studies done with the clinical neurophysiology attending staff. Throughout the year,
the resident will attend the daily 7:40 am to 8:30 am resident lectures which will cover various neurological topics, including the evaluation and management of a variety of disorders seen on the neurology inpatient service. This will include Morning Report, the Clinical Lecture Series, and other conferences.
IV. **OVERALL EDUCATION GOAL:**
The purpose of the rotation is for residents to learn to evaluate and manage the common neuromuscular problems of children and adults. In doing so, residents should understand principal aspects of peripheral nervous system anatomy, neurophysiology, neuropathology, neuropharmacology and neuromuscular genetics as well as current strategies for the diagnosis and treatment of these disorders.

V. **OBJECTIVES:**
1. Demonstrate competence in obtaining a neuromuscular history and in performing a neuromuscular examination in children and adults.
2. Demonstrate competence in using clinical information to localize lesions within the peripheral nervous system.
3. Demonstrate competence in performing clinical assessments of commonly encountered neurological problems in neuromuscular practice. Such assessment includes differential diagnosis, diagnostic test selection, and clinical management. Examples of problems include: myasthenia gravis, muscular dystrophy, peripheral neuropathies (entrapment, hereditary and inflammatory), motor neuron disease, myopathy, plexopathy and radiculopathy.
4. Demonstrate competence in performing standard nerve conduction studies with attention to electrode placement, identification of artifacts, waveform recognition.
5. Demonstrate an understanding of needle EMG recordings and the ability to recognize more common waveforms (i.e. fibrillation potentials, positive sharp waves, abnormal motor unit potentials).
6. Describe the standard laboratory investigations used in evaluating neuromuscular disorders in patients (i.e., indications, technique, contraindications, and risk of: Somatosensory evoked potentials, CT; MRI; EMG/NCV; and nerve and muscle biopsy).

VI. **EVALUATION:**
Residents are evaluated by faculty preceptors during the various clinical and didactic activities of the rotation. Faculty members observe residents while they perform electrodiagnostic and neuromuscular consultations. Faculty members review resident presentations regarding the electrodiagnostic findings and interpretations of the study of patients seen in the Clinical Neurophysiology Laboratory and the clinical findings, interpretations and plans for patients seen in the neuromuscular disorders clinic. Faculty members complete the standard EMG-Neuromuscular evaluation form that is keyed to the above learning objectives.

VII. **LEARNING ACTIVITIES OF THE ROTATION:**
Residents on the Neuromuscular-EMG/NCV rotation see neuromuscular patients in both inpatient and outpatient settings. Their time is apportioned between inpatient and outpatient clinical opportunities and the EMG Section of the Clinical Neurophysiology Laboratory.

Inpatient opportunities include consultations from hospital wide ward teams and direct evaluation of patients admitted to the adult and child neurology services. There are inpatient ward and consultation rounds and teaching rounds daily.

The outpatient clinical activities include MDA (Muscular Dystrophy Association), peripheral neuropathy, Myasthenia Gravis and autonomic disorder clinics that meet at least seven half-days per week. Residents on the Neuromuscular-EMG/NCV rotation participate in the clinics on 2 to 3 half-day sessions per week.
In addition, residents on the Neuromuscular-EMG/NCV rotation spend 3 consecutive months in the EMG Section of the Clinical Neurophysiology Laboratory under the mentorship of a faculty attending. This laboratory section meets 5 days per week and sees about 2,000 patients per year. The resident spends up to 6-half days per week in the laboratory.

The rotation has a number of didactic sessions for residents that include:

7. **Neurology Grand Rounds.** This is a weekly one hour presentation of a clinical problem in neurology or a pertinent topic in neuroscience. One week per month is devoted to a M&M conference.

8. **Clinical Neurophysiology Conference.** This is a weekly one-hour presentation where faculty members present topics related to clinical neuromuscular disease, EMGs and nerve conduction studies, EEG’s, evoked potentials and sleep studies. The EMG and Neuromuscular portions of this conference meet on the odd Wednesdays of each month.

9. **EMG Clinical Case Correlation Conference.** This is a monthly one-hour presentation in which an unknown clinical case is given to a resident who has completed his/her rotation in the EMG Laboratory. This discussant develops the differential diagnosis and discusses the necessary laboratory evaluation to arrive at a diagnosis. This individual leads the participant discussion.

10. **Muscle Pathology Conference.** This is a weekly one-hour presentation where members of the Department of Pathology present and discuss muscle and nerve pathology using cases obtained from the prior week. Multi-headed microscopes are used to view pathological specimens.

11. **Neuropathology Rounds.** This is a weekly one-hour presentation where members of the Department of Pathology present neuropathological cases. Some of the sessions have topics pertinent to neuromuscular disease.

12. **Neurology Resident Conference.** This is a weekly one-hour conference which reviews major topics in neurology and child neurology. Residents as assigned topics for research and presentation at one of the weekly conferences. Some of these sessions deal with topics pertinent to neuromuscular disorders.

13. **Child Neurology Clinic Review Rounds.** This is a weekly one-hour conference. During these sessions interesting and challenging cases seen in the clinics are reviewed. Residents may be asked to present previously assigned topics. Some of these sessions deal with neuromuscular topics.

Self-learning is an integral part of the residents experience during their Neuromuscular-EMG/NCV rotation. This is accomplished through the use of CD-ROMs, video tapes and access to a large Neuromuscular-EMG/NCV literature library. Faculty mentors are always available to assist and teach the resident user. By the middle of 2006 residents will have access to a newly constructed Teaching-Conferencing Center located in the EMG Section of the Clinical Neurophysiology Laboratory. This state-of-the-art facility will allow didactic sessions, self-learning modules, internet access and video-conferencing. EMG/Neuromuscular lectures are uploaded to the departmental web site as PDF files for use by the neurological house officer at anytime for their personal use and review.

All participants in the Neuromuscular-EMG/NCV rotation receive an EMG Training Manual, a more than 200 page syllabus detailing aspects of electrodiagnostic medicine. It is supplemented with an extensive reading list and literature reference guide.

All residents who have rotated on the Neuromuscular-EMG/NCV rotation participate in the American Association of Neuromuscular and Electrodiagnostic Medicine Training Program Self-Assessment examination (TPSAE) given in the spring of each year. This 4 hour examination is composed of two parts. Part 1 of the AANEM TPSAE is a 1 hours video-tape portion in which the resident is examined on surface anatomy, electrodiagnostic waveform recognition of normal and pathological signals. Part 2 of the AANEM TPSAE is a multiple-choice examination, approximately 2 hours in length, which tests background knowledge and the application of neuropsychiatric techniques to the diagnosis, evaluation, and treatment of patients with impairments and/or disabilities of musculoskeletal, neurologic, or other body systems. The examination will cover anatomy, autonomic nervous system, clinical problems, electromyography, ethics, nerve conduction studies, physiology, pathophysiology, somatosensory evoked potentials, and technical considerations. Residents are scored against their peers with similar
training experience. The faculty uses the results of this examination to identify areas of weakness in the teaching curriculum.
CURRICULAR COMPONENT: EEG-Epilepsy Rotation

I. OVERALL EDUCATION GOAL:

1. The purpose of this rotation is to learn the evaluation and management of patients with disorders of consciousness and the indications for clinical neurophysiological studies including EEG, long term monitoring and evoked potentials. Residents will work within the epilepsy team consisting of neurology attendings, fellows, physician assistants and medical students. Residents will attend the adult and pediatric epilepsy clinic and participate in the evaluation and management of patients with paroxysmal events. Residents should gain an understanding of basic management of these patients and integrated the diagnostic evaluation and care of these patients. The resident should gain a basic knowledge of interpretation of clinical neurophysiological studies and develop an understanding of the information these studies can provide as well as their limitations. The resident should also develop an appreciation for integration of clinical neurophysiology into their practice of neurology.

II. OBJECTIVES:

1. Demonstrate competence in selecting clinical neurophysiological studies with an understanding of their strengths, weaknesses and limitations.
2. Demonstrate competence in understanding the physiological basis of clinical neurophysiological parameters and their relationship to clinical situation.
3. Demonstrate competence in basic electronics, basic computer skills and in the operation of the instruments and the reading stations.
4. Demonstrate competence in identifying normal EEG patterns across the developmental spectrum.
5. Demonstrate competence in identifying artifacts in electroencephalography.
6. Demonstrate competence in recognizing common pathological patterns in electroencephalography and show an understanding of their clinical correlations.
7. Demonstrate competence in understanding the principles of EEG and evoked potentials and their clinical indications. It is not expected that the resident will develop extensive skill in interpretation of such studies.

III. EVALUATION:

1. Residents are evaluated during their rotations on clinical neurophysiology faculty preceptors. Residents will see patients in the epilepsy clinic with faculty and the faculty will give opinion of the differential diagnosis and potential evaluation and treatment.

IV. Expectations:

1. The residents will be expected to participate in this two consecutive month rotation as part of the epilepsy team. The Resident and fellow will review all of the patients undergoing video EEG recording and formulate a tentative clinical action plan. The resident is also expected to participate in the child and adult epilepsy clinic and review all of the EEG and Evoked potential recordings prior to the attending review. The resident will be required to formulate an opinion and keep a record of the number of EEGs and evoked potential reviewed, and type of abnormality found. Residents will also be required to review the EEG-Epilepsy manual and complete reading of the EEG textbook.

V. LEARNING ACTIVITIES OF THE ROTATION:

1. All EEG-Evoked Potential studies are available for the resident to review and interpret before attending rounds. Resident interpretations are reviewed daily as noted above.
2. Residents participate in seeing patients in the Epilepsy Clinic while rotating on the EEG service. This affords an opportunity for making clinical correlations.
3. Residents are encouraged to supplement lectures and discussions on rounds with reading from standard texts, which are available in the laboratory or for check-out in the medical library.
4. A computer is available with selected EEG related learning modules in the laboratory for literature searches to supplement text-based learning.
5. A paper teaching set is available for the residents to review. This teaching set has examples of all of the common normal and abnormal pediatric and adult findings for EEG with a written description of the findings.
6. A syllabus of selected articles, didactic handouts, and reference ranges is readily available in the laboratory.
7. The rotation provides the following didactic sessions for residents:
8. Weekly Clinical Neurophysiology conference, which covers the objectives listed above.

VI. Alternative resident exposure to EEG and Epilepsy

1. Residents are given lectures throughout the year regarding issues on clinical neurophysiology and epilepsy. These lectures review and are not limited to basic clinical neurophysiology, pharmacology, epileptic disorders diagnosis and treatment and status epilepticus.
2. Residents have opportunity to rotate through the epilepsy clinics, and have exposure to patients with paroxysmal complaints in the neurology outpatient clinics, inpatient service consult service, and child neurology services. Epilepsy physicians participate in general neurology rotations and demonstrate the key ties between EEG, Epilepsy, and general neurology.
3. Residents have opportunity to participate in the multidisciplinary epilepsy case conference, epilepsy research review, pediatric research review, and journal review.
4. Residents include EEG and Epilepsy topics within the general journal club.
5. EEG and epilepsy related topics are included in the Neurology Grand Rounds, Clinical Neurophysiology, and basic neurophysiology lecture series.
CURRICULAR COMPONENT: UNC Sleep Medicine

I. OVERALL EDUCATION GOAL:

1. The purpose of the Sleep Medicine rotation is to learn the evaluation and management of patients with common sleep related complaints and the indications for sleep studies including overnight polysomnography, multiple sleep latency test, maintenance of wakefulness test, forced immobilization and actigraphy. Residents will work within a sleep medicine team consisting of neurology attendings, fellows, physician assistants and medical students. Residents will attend the sleep clinic and participate in the evaluation and management of patients with sleep complaints. Residents should gain an understanding of basic management of patients with sleep disorders and how sleep studies are integrated into the diagnostic evaluation and care of these patients. The resident should gain a basic knowledge of interpretation of sleep studies and develop an understanding of the information these studies can provide as well as their limitations. The resident should also develop an appreciation for integration of sleep medicine into their practice of neurology.

II. OBJECTIVES:

1. Demonstrate competence in selecting sleep studies with an understanding of their strengths, weaknesses and limitations.
2. Demonstrate competence in understanding the physiological basis of sleep parameters and their relationship to sleep stages.
3. Demonstrate competence in basic electronics, basic computer skills and in the operation of the instruments and the reading stations.
4. Demonstrate competence in identifying normal stages of sleep across the developmental spectrum.
5. Demonstrate competence in identifying artifacts in polysomnography.
6. Demonstrate competence in recognizing common pathological patterns in polysomnography and show an understanding of their clinical correlations.
7. Demonstrate competence in understanding the principles of multiple sleep latency and maintenance of wakefulness testing and their clinical indications. It is not expected that the resident will develop extensive skill in interpretation of such studies.

III. EVALUATION:

1. Residents are evaluated during their rotations on Sleep Medicine by the Sleep Medicine faculty preceptors who are all board certified in Sleep Medicine. Residents will see patients in the sleep clinic with faculty and the faculty will give opinion of the differential diagnosis and potential evaluation and treatment. Faculty members will also meet with the Residents and review and interpret all sleep studies daily. Residents are asked to read the studies before the attending and commit their interpretations to a written report. Resident interpretations are reviewed and feedback given on errors. Faculty members complete the standard neurology evaluation form which is keyed to the above learning objectives.

IV. LEARNING ACTIVITIES OF THE ROTATION:

1. All sleep studies are available for the resident to review and interpret before attending rounds. Resident interpretations are reviewed daily as noted above.
2. Residents participate in seeing patients in the Sleep Clinic while rotating on the Sleep service. This affords an opportunity for making clinical correlations.
3. Residents are encouraged to supplement lectures and discussions on rounds with reading from standard texts, which are available in the laboratory or for check-out in the medical library.
4. A computer is available with selected sleep related learning modules and presentations and is in the laboratory for literature searches to supplement text based learning.
5. A syllabus of selected articles, didactic handouts and reference ranges is readily available in the laboratory.

6. The rotation provides the following didactic sessions for residents:

7. Weekly Sleep Medicine Case conference, which covers the objectives listed above. These conferences are performed on a rotation of sleep related respiratory disorders, insomnia, hypersomnia, pediatric sleep issues to assure balance of topics. The resident will be assigned a case presentation to include a handout and literature review to be discussed by the end of the month.

8. Weekly literature and research review which covers new topics in sleep medicine.

V. Alternative resident exposure to Sleep Medicine

1. Residents are given six lectures on sleep medicine and polysomnography each year. These lectures review and are not limited to basic sleep physiology, pharmacology, sleep disorders, neurological disease and sleep, polysomnography and pediatric sleep issues.

2. Residents have opportunity to rotate through the general sleep clinics, and have exposure to patients with sleep complaints in the neurology outpatient clinics, inpatient service and consult service. Sleep physicians participate in general neurology rotations and demonstrate the key ties between sleep and neurology.

3. Residents have opportunity to participate in the multidisciplinary sleep case conference, sleep research review and journal review.

4. Residents include sleep topic within the general journal club

5. Sleep related topics are included in the Neurology Grand Rounds, Clinical Neurophysiology and basic neurophysiology lecture series.
CURRICULAR COMPONENT: NEUROSURGERY

I. OVERALL EDUCATION GOAL:

The goal of the neurosurgery rotation is for the resident to learn the evaluation management of common problems seen on the neurosurgery service. The resident will be part of the neurosurgery team consisting of the neurosurgery attendings, neurosurgery residents, and surgery interns. They will be expected to be involved in the care of both inpatients and outpatients on the neurosurgery service.

II. OBJECTIVES:

1. The resident will become competent in obtaining a neurological history and performing an neurologic exam on patients seen in the neurosurgery outpatient clinics, as well as inpatient consults.

2. The resident will gain skill in the localization of various neurological symptoms and findings in neurosurgical patients.

3. The resident will learn to generate a differential diagnosis of common problems seen on the neurosurgical service.

4. The resident will be an integral part of the neurosurgery team with the ability to synthesis cases for presentation to the neurosurgery senior residents and attendings.

5. The resident will gain competence and skill in the assessment of common neurosurgical problems including head trauma, intracranial mass lesions, intracerebral hemorrhage, subarachnoid hemorrhage, brain tumors, acute and chronic spinal cord injuries, radiculopathies, and peripheral nerve lesions.

6. The resident will learn the appropriate use and interpretation of neuroradiologic studies in neurosurgical patients.

7. The resident will gain experience in the management of patients in the neurosurgical ICU.

8. The resident will get exposure in the operating room of the surgical treatments of the various disorders mentioned above.

III. EVALUATION:

The residents will be evaluated directly by the neurosurgery faculty for whom they work with during the rotation. The faculty member will directly observe the residents presentation of cases, and their assessment and plan for the management of patients with neurosurgical disorders. The attending will provide feedback to the resident during the rotation regarding their skill in the assessment and management of neurosurgical patients. At the end of the rotation the faculty member will complete a standard neurology evaluation form, which will be keyed to the learning objectives of the rotation.

IV. LEARNING ACTIVITIES OF THE ROTATION:

Residents on the neurosurgery service will round with the neurosurgery team each weekday and at least one weekend day. They will have opportunities to present cases and be critiqued about the evaluation and management ability. Residents will have the opportunity to observe the attending and senior neurosurgery resident history taking and neurologic examination on neurosurgery patients. Residents will have the opportunity to review neuroimaging studies with neuroradiology staff and neurosurgery attendings and senior residents. The resident will attend the neurosurgery conferences during the month. Residents will have the opportunity to directly observe neurosurgical operative procedures in the operating room.
CURRICULAR COMPONENT: NEURORADIOLOGY

I. OVERALL EDUCATION GOAL:

The goal of the neuroradiology resident is for the resident to learn the appropriate use and the interpretation of neuroradiologic studies. The resident will be a part of the neuroradiology team consisting of the neuroradiology attendings, neuroradiology fellow, and radiology residents.

II. OBJECTIVES:

1. The resident will become competent in the appropriate use of neuroimaging studies for the evaluation of a variety of neurologic problems.

2. The resident will become skilled in the interpretation of CT scans of the head.

3. The resident will become skilled in the interpretation of MRI studies of the brain and spinal cord.

4. The resident will become skilled in the interpretation of MRA studies of the head and neck.

5. The resident will become skilled in interpretation of plain films of the head and spine.

6. The resident will get exposure to and develop a basic understanding of the interpretation of CT myelography.

7. The resident will get exposure to and develop a basic understanding of the interpretation of cerebral angiography studies.

III. EVALUATION:

The resident will be evaluated directly by the neuroradiology faculty. The faculty members will observe the residents understanding of the use of neuroimaging, and their skill in the interpretation of these studies. The attendings will provide feedback to the resident during the rotation regarding their skills in this area. At the end of the rotation the faculty member will complete a standard neurology evaluation form, which will be keyed to the learning objectives to the rotation.

IV. LEARNING ACTIVITIES OF THE ROTATION:

Residents on the neuroradiology rotation will review studies each weekday with the neuroradiology staff. They will have the opportunity to present studies and be critiqued on their interpretive ability. Residents will also be present when the attendings make their formal interpretation of the studies. Resident will have the opportunity to attend neuroradiology conferences.
I. OVERALL EDUCATION GOAL:

The goal of the neuropathology rotation is for the resident to gain an understanding of both macroscopic and microscopic neuropathology. Residents will achieve this through the review of neuropathology cases seen both as part of the autopsy service and the surgical pathology service. Resident will work closely with the neuropathology faculty, fellows, and residents.

II. OBJECTIVES:

1. The resident will become familiar with the macroscopic appearance of a variety of neuropathology cases seen as part of the autopsy service.

2. The resident will gain skill in competence in macroscopic anatomy as part of brain cutting.

3. The resident will gain an understanding of neuropathology techniques in brain cutting and specimen preparation.

4. The resident will gain skill in the microscopic interpretation of neurosurgical specimens seen on the autopsy service as well as the surgical pathology service. This will include brain, spinal cord, and nerve specimens.

III. EVALUATION:

The resident will be evaluated directly by the neuropathology faculty. Faculty members will assess the residents learning of both macroscopic and microscopic neuropathology. Attending will provide feedback to the resident during the rotation regarding their skills in these areas. At the end of the rotation the faculty member will complete a standard neurology evaluation form which will be keyed to the learning objectives of the rotation.

IV. LEARNING ACTIVITIES OF THE ROTATION:

Residents on the neuropathology service will work directly with the neuropathology team during weekdays. They will be present during brain cutting and will review specimens directly with the neuropathology team. The resident will go to the operating room with the neuropathology faculty for review of surgical specimens. The resident will attend the weekly neuropathology conference. The resident will have the opportunity to review the museum specimens on the neuropathology service.
Curricular Component: Child Psychiatry

I. OVERALL EDUCATIONAL GOALS:

The child neurology resident is expected to learn the evaluation and management of common neuropsychiatric problems in childhood and adolescence. The resident will learn to do a basic neuropsychiatric assessment. There will be opportunities to participate in the care of psychiatry patients in both the inpatient and outpatient setting. At the completion of the pediatric neurology residency, the individual should feel comfortable evaluating children and adolescents with a variety of neuropsychiatric illnesses including ADHD, Autism, learning disabilities, Tourette’s syndrome, anxiety disorders and obsessive-compulsive disorders. They should understand the underlying pathophysiology and principles and practice of pharmacotherapy for these disorders. They should be familiar with the major classes of pediatric psychiatric diseases and be able to distinguish those patients that should be referred to a child psychiatrist for outpatient therapy or acute inpatient evaluation and treatment.

II. OBJECTIVES:
The child neurology resident is expected to:


2. Demonstrate competence in appropriate referral for psychoeducational and neuropsychological testing and interpretation of standard neuropsychological test batteries (e.g. Bayley Scales of infant development, Vineland Adaptive Behavior Scales, K-ABC, WPPSI-R, WISC-III, etc).

3. Demonstrate competence in identifying major psychiatric illnesses in children and adolescents (e.g. major mood disorder, psychotic disorder, oppositional defiant disorder), and making appropriate psychiatric referrals.

4. Demonstrate competence in understanding the utility of ancillary testing in evaluating neuropsychiatric disorders – e.g. appropriate use of EEG, MRI, functional imaging studies, etc.

5. The resident should be familiar with the DSM-IV criteria for the diagnosis of autism, and the spectrum of pervasive developmental disorders, and be able to perform a history and physical exam/neurological assessment in patients suspected of this diagnosis. They should be familiar with the differential diagnosis of underlying causes of PDD, and be able to order and interpret any laboratory, electrophysiological, and imaging studies that would be appropriate.

6. Demonstrate competence in identifying children with attention deficit hyperactivity disorder; be familiar with the DSM-IV criteria for this entity, be able to use appropriate parent and teacher rating scales to assist in making the diagnosis. They should be able to formulate a differential diagnosis and use appropriate ancillary studies to rule out other diagnostic considerations. They should be familiar with the appropriate pharmacological and behavioral management and how to counsel families to help manage behavior.

7. The resident should be familiar with the diagnostic criteria for Tourette’s syndrome, appropriate entities to consider in the differential diagnosis, and both patient education, parental counseling and pharmacological therapy when indicated.

8. Demonstrate competence in assessing children with learning disabilities; be able to make a brief cognitive assessment and be familiar with the interpretation of in-depth psychoeducational evaluations. The resident should be able to identify any co-existing metabolic or genetic syndromes contributing to the learning disabilities, and be able to order additional laboratory, genetic and imaging studies when appropriate.

9. The resident should be familiar with the neuropsychiatric sequelae of traumatic brain injury, understand the relevant pathophysiology, and be able to assess deficits and help manage behavior. They should be aware of relevant pharmacological intervention, which would be beneficial.
10. Demonstrate competence in identifying anxiety disorders and appropriate evaluation and treatment
11. Demonstrate Competence in identifying symptoms of obsessive-compulsive disorder and appropriate assessment and treatment
12. The resident should be familiar with the symptoms of childhood onset schizophrenia and be able to make appropriate referral for further evaluation and treatment
13. The resident should be able to recognize the symptoms of mood disorders, and make appropriate referral for evaluation and treatment.
14. Demonstrate competence in recognizing conduct disorder and sociopathy, whether as a primary entity or as a comorbid diagnosis, and refer for appropriate evaluation and treatment.

III. EVALUATION

Observation of the residents during their evaluation and management of Child Psychiatry patients serves as the means by which faculty evaluate resident performance. Faculty members review the neurology resident’s findings, interpretations and plans for further evaluation and treatment of each patient they see. The faculty will complete a written evaluation of each resident at the end of the rotation. The residents are also asked to evaluate the faculty and provide suggestions for improvement in the rotation.

IV. LEARNING ACTIVITIES OF THE ROTATION

1. Inpatient experiences
   The child neurology resident will have the opportunity to rotate through the child psychiatry inpatient ward and participate as part of the treatment team. In this capacity, he will perform preliminary evaluation of inpatients, help generate a treatment plan, and follow the patient during his/her stay. He will participate in daily ward rounds. There will be no required night call, however the pediatric neurology resident will be encouraged to participate in night call with the child psychiatry residents.
   The child neurology resident will also have the opportunity to participate in child psychiatry consultations to the general pediatric inpatient service.

2. Outpatient experiences
   The child neurology resident will have the opportunity to attend sessions of child psychiatry clinic, both general child psychiatry as well as the developmental neuropharmacology clinic. They will be able to evaluate new patients and contribute to follow up care of established patients under the guidance of the child psychiatry faculty.

3. Didactic sessions include:
   a. Child Psychiatry lecture series
   b. Child Psychiatry grand rounds
CURRICULAR COMPONENT: PEDIATRIC REHABILITATION

I. OVERALL EDUCATION GOAL:

The goal of the pediatric rehabilitation rotation is to provide a comprehensive experience caring for children with special needs, and children and adolescents recovering from traumatic brain injury, integrating the medical and psychosocial aspects of their care. Interact with multidisciplinary teams, the educational system, and community resources.

II. OBJECTIVES:
The resident should become knowledgeable in:

1. Some aspects of biomechanics, the effects of musculoskeletal development on function and aging issues for adults with congenital or childhood onset disabilities.

2. Identification and management of common pediatric rehabilitation medical conditions and complications, including nutrition, bowel management, bladder management, skin protection, sensory impairments, and spasticity.

3. Principles and techniques for general pediatric rehabilitative therapeutic management, including play (avocation), therapeutic exercise, electrical stimulation and other modalities, oral motor interventions, vocational planning, transitional planning, adjustment to disability support, and prevention strategies.

4. Evaluation and prescription for assistive devices technology, including orthotics, prosthetics, wheelchairs and positioning, ADL aids, interfaces and environmental controls, augmentative/alternative communication, environmental accessibility, electrical stimulation, and dynamic splinting.

5. Rehabilitation management of musculoskeletal disorders, trauma, cerebral palsy, spinal dysraphism, peripheral nerve injuries and other congenital anomalies, limb deficiency/ amputation.

6. Develop a knowledge of cost efficiency, outpatient services, home care and community resources, and support as they apply to pediatric rehabilitation.

III. EVALUATION:

Based on clinical observations by faculty as they assess the residents ability to meet goals and objectives with enthusiasm, and demonstrate excellence in skills and comprehension of materials.

IV. LEARNING ACTIVITIES OF THE ROTATION:

Perform histories and physicals in the Pediatric Rehabilitation clinics and to participate in team rehab conference; inpatient treatment sessions in P.T., O.T., S.L.P., recreation, special education, and family conferences. The resident will also participate in the evaluation of inpatient consults. The resident will be required to attend the rehab conference.