

## **Pediatric Residency Child Neurology Elective**

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**Goals:** Over the past several years, it has become apparent that many graduating pediatric and med-peds residents are not comfortable in their knowledge of many common childhood neurologic conditions, their diagnostic work up, or their treatments. In an attempt to rectify this situation, Dr Desselle, as director of the pediatric residency program, and Dr Deputy have worked to create a predominantly outpatient child neurology required elective (or “selective”). The goal of this rotation is to familiarize pediatric residents with frequently encountered outpatient pediatric neurology disorders, their evaluation, and their treatment. Another goal is to teach the rotating pediatrics residents about the neurological examination. The rotation is geared toward outpatient, office-based neurological referrals. Therefore, the most frequently encountered neurological conditions will be emphasized. Also, it is important to look at these conditions from the “eyes” of a practicing pediatrician, and not necessarily from the perspective of a child neurologist. Given the relative shortage of child neurologists nationwide, it is important that today’s graduating pediatricians be comfortable in diagnosing and managing many pediatric neurology conditions on their own without the assistance of child neurologists. It is equally important for pediatricians to recognize severe neurological illness and to make appropriate referrals to child neurologists when necessary.

**LEARNING OBJECTIVES:** Based on the above goals, the following learning objectives will be emphasized:

### **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.

- The pediatric resident will demonstrate competency in performing a complete neurologic examination on one or more outpatients. Child neurology faculty will evaluate the different components of the examination (ie Mental Status, Cranial Nerves, Motor, Sensory, Coordination, and Gait) and fill out an evaluation form on each resident by the end of the month. Residents will also receive handouts concerning the neurologic examination and be given feedback continually during the rotation regarding their performance of the exam. Residents will need to learn which components of the neurologic examination need to be done in detail and

which should be done as a screen for each patient depending on the particular chief complaint and other historical data.

- Residents will learn about the evaluation of patients with hypotonia. They will understand the concept of central hypotonia and be able to differentiate it from hypotonia due to neuromuscular disorders. Residents will also be able to identify and understand the significance of neurological soft signs.
- Residents will learn to identify and diagnose childhood autism and the other pervasive developmental disorders through developing a screening list of questions that covers many of the behaviors commonly seen in young autistic children. They will learn about various diagnostic evaluations and interventions.
- Residents will learn to identify the characteristic features of childhood migraine and chronic daily headache. They will be able to identify features of headaches in children that suggest raised intracranial pressure or mass lesions. They will also be able to develop a comprehensive treatment plan for both migraine and chronic daily headaches.
- The pediatric resident will be able to recognize signs of concussion and to provide family members with appropriate information regarding duration of symptoms and restrictions of physical activities.
- Residents will learn about the use of EEG and neuroimaging in the evaluation and diagnosis of epilepsy. Initiation and discontinuation of anticonvulsant medications will be discussed. Dosing, therapeutic levels, and side effects of various anticonvulsants will be discussed.

## **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.

- The pediatric resident will be able to distinguish global developmental delay from autism spectrum disorders. They will learn the difference between conditions resulting in a static encephalopathy and those resulting in a neurodegenerative disorder. The residents will be able to define and describe the various subtypes of cerebral palsy.
- Residents will become familiar with issues such as alternative “therapies” for autism and be able to discuss some of the literature concerning perceived associations between childhood vaccinations and autism.
- Residents will learn about mild head trauma. They will learn indications for neuroimaging as well as about concussion management.

- Residents will learn more about the evaluation and significance of febrile seizures. Simple versus complex features will be discussed as will various diagnostic work up options. Risk factors concerning the future development of epilepsy as well as the risk factors for the development of recurrent febrile seizures will be identified.
- Residents will learn to initiate the appropriate diagnostic evaluation for a child following a first unprovoked seizure. Risk factors for the development of epilepsy will be identified and the reasoning behind the decision as to whether or not to start anticonvulsant medications will be explored..
- Residents will learn about diagnostic criteria for ADHD. Various co-morbid conditions such as learning disabilities, tic disorders, fine motor dyspraxia, depression, anxiety disorders, and bipolar affective disorder will be discussed. The mechanisms of action for stimulant medications will be discussed and residents will learn about various potential side effects of stimulant medications.

## **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.

- Child neurology faculty will evaluate residents in the different components of the neurologic examination (ie Mental Status, Cranial Nerves, Motor, Sensory, Coordination, and Gait) and fill out an evaluation form on each resident by the end of the month. Residents will also receive handouts concerning the neurologic examination and be given feedback continually during the rotation regarding their performance of the exam. Residents will need to learn which components of the neurologic examination need to be done in detail and which should be done as a screen for each patient depending on the particular chief complaint and other historical data.
- Residents will become familiar with issues such as alternative “therapies” for autism and be able to discuss some of the literature concerning perceived associations between childhood vaccinations and autism.
- Residents will learn about both symptomatic and preventative migraine therapy as continuing treatments for patients with migraine.
- Residents will learn about epidemiological risk factors for recurrent febrile seizures and for the development of epilepsy with respect to patient counseling and treatment.
- Treatment of ADHD with environmental manipulation, behavioral modification, stimulant medications and other psychotropic medications will be discussed.

## **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 will learn about the usefulness and extent of diagnostic workup for patients with developmental disorders and about referrals to early intervention support agencies.
- Residents will become familiar with issues such as alternative “therapies” for autism and be able to discuss some of the literature concerning perceived associations between childhood vaccinations and autism with families.
- The pediatric resident will be able to recognize signs of concussion and to provide family members with appropriate information regarding duration of symptoms and restrictions of physical activities.
- In patients with febrile seizures, treatment options and family counseling will be discussed.
- Initiation and discontinuation of anticonvulsant medications will be discussed.

## **PROFESSIONALISM**

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

- Residents will be evaluated during their patient encounters and given feedback concerning their skills in obtaining medical histories, patient interactions and counseling of parents of children with various neurological disorders.
- Residents will learn about the usefulness and extent of diagnostic workup for patients with developmental disorders and about referrals to early intervention support agencies.
- The pediatric resident will be able to recognize signs of concussion and to provide family members with appropriate information regarding duration of symptoms and restrictions of physical activities.

## **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 will learn about the usefulness and extent of diagnostic workup for patients with developmental disorders and about referrals to early intervention support agencies.
- Residents will learn about the management of patient with cerebral palsy with regards to not only their neurological symptoms (spasticity, epilepsy, etc.) but also with regards to diagnosing and treating constipation, nutritional support, GERD, scoliosis, osteoarthritis, joint contractures, aspiration risk, drooling management, adaptive equipment, and outpatient interventional therapies. Appropriate co-management with gastroenterologists, orthopaedic surgeons, nutritionists, and neurosurgeons will be explored for each patient.

## **MEANS OF ACHIEVING GOALS AND LEARNING OBJECTIVES**

During the child neurology elective, residents will attend neurology clinics with the faculty mentioned above. Residents are encouraged to attend clinic with as many different faculty as possible to achieve a wide range of teaching perspectives. Specialty clinics (ie Muscular Dystrophy clinic, Movement Disorders clinic, Botox clinic, Spasticity clinic, etc) are offered only a few times per month and residents are encouraged to attend these clinics in addition to the “regular” outpatient neurology clinics of the faculty. A list of each faculty’s weekly clinic schedule will be provided to the residents at the onset of the child neurology elective.

Residents will be provided a handout about the various components of the neurologic examination at the start of the elective. During the faculty and teaching clinics, they will observe various faculty performing parts of the examination. The residents will also demonstrate competency in performing all or parts of the neurologic exam and will be evaluated by faculty several times during the month. Faculty will fill out a formal examination evaluation form for each resident during their elective. This form will become part of each resident’s overall performance documentation at the end of the rotation.

Residents will be provided with a list of 10 questions pertaining to common outpatient child neurology conditions at the beginning of the rotation. Through clinical experience and reading, the residents will be able to competently answer all of the questions by the end of the rotation. Written responses to the questions will also become part of each resident’s overall performance evaluation at the end of the rotation.

Various review articles and faculty-generated handouts will also be provided to the residents at the beginning of each rotation. Topics covered will pertain to those neurological disorders mentioned in the goals and learning objectives portions of this document.

The residents will be encouraged to attend any of several teaching conferences given during the elective including, but not limited to Child Neurology Grand Rounds, Adult

Neurology Grand Rounds, Pediatric Neuropathology Conference, Pediatric Morning Report, Pediatric Grand Rounds.

Dr. Deputy will also meet with the residents individually throughout the rotation to give feedback on each resident's performance and learning. Residents are encouraged to provide feedback to Dr. Deputy or any of the child neurology faculty during the elective as to any problems they are experiencing with the rotation or its goals or objectives.

Residents will be evaluated with a written report that will judge their skills in performing the neurological examination, their clinical skills (based on their performance in clinic) and their medical knowledge based on the written answers submitted for the 10 questions. The written answers to the assigned questions are expected to be completed and turned in to Dr Deputy **no later than two weeks after starting the rotation**. This will provide Dr Deputy or other Child Neurology faculty with enough time to read your answers and go over them with you to remediate any deficiencies in clinical knowledge.

Grading will be based on a Likert scale will be assigned to each resident with the following grading schemata: 1 significant deficit, 2 below expected level, 3 expected level, 4 above expected level, 5 exceed expected level. Each resident will receive a numerical grade for each of the following components of the rotation:

- 1) **Clinical Skills** (Their performance in the clinic setting). This grade will be determined based on the resident's ability to take a pertinent medical history, demonstrate pertinent neurological findings on exam, develop a reasonable differential diagnosis and diagnostic evaluation plan, suggest appropriate treatment/interventions for the disorder and counsel the patient's family with this plan and long-term expectations for the particular neurological disorder.
- 2) **Neurological Examination Skills** (Based on ratings on the Neurological Examination Form).
- 3) **Medical Knowledge** (Based on overall quality and accuracy of written responses to the assigned questions)

A **Final Grade** for the rotation will be based on the numerical average of the above 3 grading components.

Those receiving a grade of 3 or greater will pass the course. Those who score below 3 will be offered a chance at remediation that may include revision of their written questions, further demonstration of one or more sub-components of the neurological examination, and/or further time spent in neurological clinic. Remediation decisions will be based on the discretion of the course director, Dr Deputy, along with input from the Pediatrics Residency Program Director, Dr Desselle. Residents who have not completed remediation assignments will be given an "Incomplete" grade until assignments are completed.