

# The University of Arizona Pediatric Residency Program

## Primary Goals for Rotation

### Neurology

1. **GOAL:** Understand the role of the pediatrician in preventing neurological diseases, and in counseling and screening individuals at risk for these diseases.
2. **GOAL:** Identify whether a child is normal or suffers from a neuropathological condition.
3. **GOAL:** Evaluate, treat and/or refer patients with presenting signs and symptoms that may indicate a neurologic or neuromuscular disease process.
4. **GOAL:** Recognize and manage neurological disease conditions that generally do not require referral.
5. **GOAL:** Recognize and initiate management of neurological conditions that generally require referral.
6. **GOAL:** Seizures. Evaluate, manage, and refer patients with seizures.
7. **GOAL:** Headaches. Evaluate and manage headaches.
8. **GOAL:** Understand the indications for the use, side effects, and mode of action of commonly used neurological drugs.
9. **GOAL:** Demonstrate high standards of professional competence while working with patients under the care of a subspecialist.

**1. GOAL: Understand the role of the pediatrician in preventing neurological diseases, and in counseling and screening individuals at risk for these diseases.**

A. Provide routine neurological prevention counseling to parents and patients about:

1. Prevention of head and spinal cord trauma through use of seat belts, car seats, helmets, firearm safety, playground safety and diving injuries
2. Avoidance of environmental toxins including lead, insecticides and other household poisons
3. Public health and legislative strategies to reduce head and spinal cord injury

B. Provide specific counseling to parents and patients with neurological disorders, addressing:

1. Reducing long-term sequela from neurologic injury or congenital CNS disorders through rehabilitation and early intervention
2. Providing appropriate home stimulation for preterm infants at risk for developmental delay
3. The etiology and natural course of epilepsy, and treatment options and precautions for children with this condition
4. The expected course, resolution, risk of seizure disorder, and potential treatment of simple febrile seizures

**2. GOAL: Identify whether a child is normal or suffers from a neuropathological condition.**

A. Describe normal neurological development, including language acquisition, cognition, motor development, loss of primitive reflexes, and socialization.

B. Explain the findings on clinical history and examination that suggest neurologic dysfunction that requires further evaluation and treatment.

C. Differentiate a peripheral from a central nervous system lesion, diffuse from focal, and static from progressive neurologic dysfunction. Using this knowledge, correctly localize the site of any lesion.

D. Distinguish between a temporary neurological dysfunction (e.g., ataxia or lethargy due to anticonvulsant loading dose) from a pathological dysfunction (e.g., trauma, poisoning, severe infection, hypoglycemia, electrolyte imbalance).

E. Discuss the diagnostic value of tests to aid in the diagnosis of neurologic diseases, including indications, limitations, and costs. Discuss the following tests: electroencephalogram (EEG), head computerized tomography scan (CT), head magnetic resonance scan (MR), lumbar puncture, psychometric testing, electromyography (EMG) and nerve conduction velocity (NCV).

**3. GOAL: Evaluate, treat and/or refer patients with presenting signs and symptoms that may indicate a neurologic or neuromuscular disease process.**

A. Create a strategy to determine if the following signs and symptoms are caused by a neurologic or neuromuscular disease process:

1. Vomiting
2. Weakness
3. Seizures

4. Failure to thrive
5. Feeding difficulties
6. Developmental delay
7. Spasticity
8. Hypotonia
9. Abnormal movement or tics
10. Headache
11. School problems
12. Behavior problems
13. Sleep problems

**4. GOAL: Recognize and manage neurological disease conditions that generally do not require referral.**

A. Diagnose, explain, and manage the patient with the following neurologic conditions:

1. Absence seizures
2. Simple febrile seizures
3. Static encephalopathy and cerebral palsy follow-up and co-management
4. Headaches, including migraine and tension headaches
5. Closed head trauma and simple linear skull fractures without evidence of concussion
6. Transient neurological disturbances due to drug ingestions (e.g., antihistamines, benzodiazepams)
7. Simple generalized tonic-clonic seizures
8. Viral meningitis
9. Attention problems including ADHD
10. Simple tics

**5. GOAL: Recognize and initiate management of neurological conditions that generally require referral.**

A. Identify, explain, initially manage and refer the following neurological or neuromuscular conditions:

1. Acute encephalopathy such as that caused by metabolic disturbances, lead ingestion, hypertension, anoxia, or drug/toxin overdose or ingestion
2. Bacterial meningitis
3. Brain tumor
4. Initial evaluation for cerebral palsy
5. Coma
6. Increased intracranial pressure
7. Encephalitis
8. Headaches that are severe, progressive, refractory to simple therapy, or suggestive of malignancy
9. Hydrocephalus
10. Abnormal movements (chorea, ataxia, complex tics)
11. Initial evaluation for mental retardation, loss of neurologic skills, autism
12. Muscle weakness, flaccidity, or paralysis suggestive of Guillain-Barre, muscular dystrophy or hypotonia
13. Neurocutaneous syndromes

14. Complex seizures that are difficult to diagnose or manage, or those that present with status epilepticus or are associated with progressive neurologic impairment

15. Stroke

B. Identify the role and scope of practice of neurology; recognize situations where children benefit from the skills of specialists trained in the care of children; and work effectively with these professionals to care for children with neurologic disorders.

C. Identify the role of other specialists (e.g., neurosurgery, rehabilitative medicine, psychology, psychiatry and neuropsychology) in the treatment of children with common neurological disorders.

**6. GOAL: Seizures. Evaluate, manage, and refer patients with seizures.**

A. Explain the findings on clinical history, examination and investigation that suggest a seizure disorder and classify the seizure as generalized (including absence), focal or complex partial.

B. Manage uncomplicated seizures using a step-wise approach that begins with the most appropriate anticonvulsant for the type of seizure.

C. Develop a step-wise plan for evaluation and treatment for a patient in status epilepticus.

D. Identify the indicators that would lead to a neurology referral for a child with seizures, including infantile onset seizures, seizures that are complicated, intractable, or difficult to diagnose or manage, and status epilepticus.

E. Explain the characteristics of simple febrile seizures, including epidemiology, genetic predisposition, natural history, risk factors for a seizure disorder and treatment options.

F. Discuss common episodic events that may mimic seizures and the findings on history and examination that suggest that the event is not epileptic in origin (e.g., breath-holding spells, benign movement disorders, pseudoseizures, common sleep disorders).

**7. GOAL: Headaches. Evaluate and manage headaches.**

A. Take a thorough headache history including family history of headaches, location, duration, frequency, character, triggers and associated symptoms.

B. Compare and contrast the symptoms associated with tension headaches, migraine headaches, chronic daily headaches and headaches associated with increased intracranial pressure and sinus disease.

C. Compare the therapeutic options, both pharmacologic and non-pharmacologic, for treatment of migraine and tension headaches in children. Include mechanism of action, effectiveness, side effects, and costs.

D. Identify the indicators for radiologic imaging (CT or MRI) in a patient with headaches.

E. Identify the indicators for a neurology consult or referral in a child with headaches.

F. Counsel families about strategies for helping children with headaches of possible psychosomatic or psychosocial origin.

**8. GOAL: Understand the indications for the use, side effects, and mode of action of commonly used neurological drugs.**

- A. Compare and contrast the indications, contraindications, side effects and common drug interactions of the most commonly used neurological drugs.
- B. For each neurological drug, describe the laboratory tests needed to follow drug therapy, side effects and drug interactions.
- C. Describe the effect on the CNS of other commonly used drugs with known CNS action, including: antihistamines, antidepressants, stimulants for attention deficit disorder, over-the-counter cold preparations, and tranquilizers.

**9. GOAL: Demonstrate high standards of professional competence while working with patients under the care of a subspecialist.**

- A. **Competency 1: Patient Care.** Provide family-centered patient care that is development- and age-appropriate, compassionate, and effective for the treatment of health problems and the promotion of health.
  - 1. Use a logical and appropriate clinical approach to the care of patients presenting for specialty care, applying principles of evidence-based decision-making and problem-solving.
  - 2. Describe general indications for subspecialty procedures and interpret results for families.
- B. **Competency 2: Medical Knowledge.** Understand the scope of established and evolving biomedical, clinical, epidemiological and social-behavioral knowledge needed by a pediatrician; demonstrate the ability to acquire, critically interpret and apply this knowledge in patient care.
  - 1. Acquire, interpret and apply the knowledge appropriate for the generalist regarding the core content of this subspecialty area.
  - 2. Critically evaluate current medical information and scientific evidence related to this subspecialty area and modify your knowledge base accordingly.
- C. **Competency 3: Interpersonal Skills and Communication.** Demonstrate interpersonal and communication skills that result in information exchange and partnering with patients, their families and professional associates.
  - 1. Provide effective patient education, including reassurance, for a condition(s) common to this subspecialty area.
  - 2. Communicate effectively with primary care and other physicians, other health professionals, and health-related agencies to create and sustain information exchange and teamwork for patient care.
  - 3. Maintain accurate, legible, timely and legally appropriate medical records, including referral forms and letters, for subspecialty patients in the outpatient and inpatient setting.
- D. **Competency 4: Practice-based Learning and Improvement.** Demonstrate knowledge, skills and attitudes needed for continuous self-assessment, using scientific methods and evidence to investigate, evaluate, and improve one's patient care practice.
  - 1. Identify standardized guidelines for diagnosis and treatment of conditions common to this subspecialty area and adapt them to the individual needs of specific patients.

2. Identify personal learning needs related to this subspecialty; systematically organize relevant information resources for future reference; and plan for continuing acquisition of knowledge and skills.

**E. Competency 5: Professionalism.** Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diversity.

1. Demonstrate personal accountability to the well-being of patients (e.g., following up on lab results, writing comprehensive notes, and seeking answers to patient care questions).

2. Demonstrate a commitment to carrying out professional responsibilities.

3. Adhere to ethical and legal principles, and be sensitive to diversity.

**F. Competency 6: Systems-based Practice.** Understand how to practice high-quality health care and advocate for patients within the context of the health care system.

1. Identify key aspects of health care systems as they apply to specialty care, including the referral process, and differentiate between consultation and referral.

2. Demonstrate sensitivity to the costs of clinical care in this subspecialty setting, and take steps to minimize costs without compromising quality

3. Recognize and advocate for families who need assistance to deal with systems complexities, such as the referral process, lack of insurance, multiple medication refills, multiple appointments with long transport times, or inconvenient hours of service.

4. Recognize one's limits and those of the system; take steps to avoid medical errors.

## **Procedures**

**A. GOAL: Technical and therapeutic procedures.** Describe the following procedures, including how they work and when they should be used; competently perform those commonly used by the pediatrician in practice.

1. Lumbar puncture

**B. GOAL: Diagnostic and screening procedures.** Describe the following tests or procedures, including how they work and when they should be used; competently perform those commonly used by the pediatrician in practice.

1. Developmental screening test

2. Electroencephalogram (EEG)

3. Electromyography (EMG)

4. Nerve conduction velocity

5. Radiologic interpretation: CT of head

6. Radiologic interpretation: MRI of head

**Source**

Kittredge, D., Baldwin, C. D., Bar-on, M. E., Beach, P. S., Trimm, R. F. (Eds.). (2004). APA Educational Guidelines for Pediatric Residency. Ambulatory Pediatric Association Website. Available online: [www.ambpeds.org/egweb](http://www.ambpeds.org/egweb). [Accessed 03/26/2008]. Project to develop this website was funded by the Josiah Macy, Jr. Foundation 2002-2005.