1.22 SEIZURES

Introduction

Seizures are the most common neurologic disorder of childhood. Febrile seizures occur in up to 5% of children under age 5, and many children experience one afebrile seizure by adolescence. A subset of these children will develop epilepsy. In 2015, the CDC estimated that close to a half a million children were afflicted with this disorder. Seizures may range from self-limited to life-threatening events. Status epilepticus is defined as seizure activity of greater than five minutes duration without return to baseline. Optimal management of seizures not only includes identification of the underlying cause and initiation of appropriate anticonvulsant therapy or other treatments, but also the maintenance and management of an adequate airway and circulation. Pediatric hospitalists frequently encounter patients with active seizures and underlying epilepsy and should render both acute care and coordination of multidisciplinary care to the ambulatory setting.

Knowledge

Pediatric hospitalists should be able to:

- Discuss the pathophysiology of seizure activity.
- List the most common etiologies of seizures in various age groups such as the neonate, infant, preschool aged, school aged, and adolescent.
- List the various etiologies of seizures attending to both acute (such as electrolyte imbalance, infection, toxins, trauma, and others) and chronic (such as central nervous system malformations, metabolic diseases, and others) causes.
- Describe and distinguish between the various manifestations of seizure activity, such as involuntary motor activity, alterations of consciousness, behavior changes, disturbances of sensation, autonomic dysfunction, and others.
- Classify seizures based on where seizures begin in the brain, level of awareness during the seizures, and other distinguishing features.
- Review alternate diagnoses which may mimic the presentation of seizures including behavioral abnormalities, movement disorders, conversion disorders, and others.
- Compare and contrast distinguishing features of seizures versus other paroxysmal events.
- Define simple and complex febrile seizures and discuss evaluation, treatment, prognosis, and indications for admission.
- State the common complications associated with seizures and status epilepticus.
- Compare and contrast commonly used seizure medications and therapies, attending to treatments for specific seizure types, adverse drug events, and ease of use.
- Review the management of status epilepticus, including stabilization, testing, monitoring, and patient placement.
- Compare and contrast the risk and benefits of commonly used imaging modalities.
- Review the goals of inpatient diagnostic evaluation and therapy.
- Discuss indications for hospitalization or transfer to a higher level of care and/or comprehensive epilepsy care unit.
- List the indications for EEG monitoring and/or subspecialty consultation with neurology, psychiatry, and others as indicated.
- Summarize the risks for readmission, attending to medication management (such as dosing, availability, pharmacokinetics, and side effect profiles), compliance, and changes in disease state.

Skills

Pediatric hospitalists should be able to:

- Diagnose seizures by efficiently performing an accurate history and physical examination, with focus on the neurologic exam.
- Order appropriate laboratory and radiographic studies to identify the etiology of the seizure and potential underlying disorders.
- Interpret laboratory studies including drug levels and make therapy adjustments based on results.
- Order appropriate studies for patients with epilepsy, avoiding unnecessary duplication of testing and radiation exposure.
- Identify and efficiently treat the cause of the seizure where appropriate.
- Identify status epilepticus and initiate appropriate evidence-based treatment.
- Diagnose complications due to seizures and institute an appropriate medication plan and cardiorespiratory support as needed.
- Identify patients at increased risk for seizure recurrence or morbidity and ensure appropriate monitoring and treatment, including prescription of seizure rescue medications.
- Engage consultants when appropriate, including neurologists, epileptologists, and others.
- Create a comprehensive evaluation and management plan, addressing the needs of patients and the family/caregivers.
- Anticipate, monitor for, identify, and treat potential side effects of treatment.
- Recognize and efficiently transfer patients requiring higher level of care.

Attitudes

Pediatric hospitalists should be able to:

- Realize the importance of effective communication with patients, the family/caregivers, hospital staff, subspecialists, and primary care providers regarding the reasons for diagnostic testing and therapy choices.
- Recognize the role of education of patients and the family/caregivers in improving compliance with treatment and follow-up.
- Realize the impact that anxiety related to seizures in their child has on the family/caregivers.
- Prioritize anticipatory guidance and education of the family/caregivers regarding outcomes of febrile seizures, including the risk of the child developing epilepsy.
- Acknowledge the value of collaboration with subspecialists

and the primary care provider to ensure coordinated longitudinal care for children with epilepsy.

Systems Organization and Improvement

In order to improve efficiency and quality within their organizations, pediatric hospitalists should:

- Lead, coordinate, or participate in the development and implementation of cost-effective safe, evidence-based care pathways to standardize the evaluation and management of hospitalized children with seizures and status epilepticus.
- Collaborate with hospital administration and community partners to develop and sustain referral networks for both transport and subspecialty services for children with seizures and chronic epilepsy.
- Collaborate with primary care providers, subspecialists, and other healthcare providers to create effective discharge plans that reduce the likelihood of readmission.

References

1. Berg AT, Berkovic SF, Brodie MJ, et al. Revised terminology and concepts for organization of seizures and epilepsies: report of the ILAE Commission on Classification and Terminology, 2005-2009. *Epilepsia*. 2010; 51:676-685. https://doi.org/10.1111/j.1528-1167.2010.02522.x.
2. Fisher RS, Cross JH, French JA, et al. Operational classification of seizure types by the International League Against Epilepsy: Position Paper of the ILAE Commission for Classification and Terminology. *Epilepsia*. 2017;58(4):522-530. https://doi.org/10.1111/epi.13670.