Epilepsy: Management in School and Sports
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Stephen J. Thompson, MD
Associate Professor and Medical Director
Division of Pediatric Neurology
Departments of Pediatrics and Neurology
University of Maryland School of Medicine

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Objectives
• Understand
  – Basic seizure types
  – Signs of seizures in children
  – Seizure emergency measures
  – Seizure issues for the classroom and in sports
What is a Seizure?

- Clinical expression of abnormal electrical activity in the brain
- Seizures may:
  - be a symptom of Epilepsy
  - cause abnormal muscle movements
  - be subtle and barely noticed
  - affect one part of the brain
  - effect the entire brain
  - be brief or prolonged

What is Epilepsy?

- “Epilepsy is a neurological condition that from time to time produces brief disturbances in the normal electrical functions of the brain.”
- Multiple recurrent seizures

Who has seizures?

- Approximately 3 million people in USA have epilepsy
- Nearly 1 in 10 people will have one seizure in their lifetime
- 3% of population will develop epilepsy by age 75
- Most <2 or > 65 years old
  - 50% before age 25
Seizures? In my school?

- Incidence
  - Most common neurologic condition in children
- Likelihood of student or athlete in your school
  - CDC estimates 6/1000 students
- Impact
  - Students 6-17 years of age miss 11 + days/year

Special Populations

- Autism
- Other neurologic conditions
  - Genetic disorders
  - Traumatic Brain Injury (TBI)
  - Static Encephalopathy (Cerebral Palsy)

Clinical Presentation

- Staring
  - Change in attention
  - Change in academic performance
- Falling
- Stiff, then shaking
- Rapid muscle jerks
Febrile Seizures

• A preschool and kindergarten/1st grade issue
  – 6 months to 6 years of age
  – Generalized (usually)
  – Brief (usually)
  – Resolve quickly (usually)

Tonic-Clonic Seizures

• Whole body
  – Incontinence, altered consciousness
• Rarely do we see the tonic phase
• Can be brief, but...
  – Status epilepticus
    • 30 minutes vs 5 minutes
      – When to act?
    • Multiple seizures without return to baseline

Absence Seizures

• Staring spells
  – Brief
  – Eyelid flutter
  – Many times per day
  – Child may appear inattentive, day dreaming
    • Change in academic performance
    • Injury due to lapse in awareness while playing
### Other Seizures Types

- **Atonic**
  - Sudden loss of muscle tone
  - Sudden fall, then rapidly returns to prior activity

- **Myoclonic**
  - Rapid muscle jerks
  - May drop things or appear clumsy

- **Partial Complex**
  - Altered awareness, automatisms

### Other Seizure Syndromes

- **Dravet Syndrome**
  - SCN1A
  - Genetic disorder
  - Refractory epilepsy
  - Developmental delays

- **Lennox-Gastaut Syndrome**
  - Mixed seizure types
  - Developmental delays

### Medication Treatment

<table>
<thead>
<tr>
<th>Medication</th>
<th>Treatment</th>
<th>Adverse Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbamazepine</td>
<td>Focal seizures</td>
<td>Nausea, ataxia, decreased ANC (infection)</td>
</tr>
<tr>
<td>clonazepam</td>
<td>Adjunctive therapy for LGS</td>
<td>Somnolence, sedation, drooling</td>
</tr>
<tr>
<td>ethosuximide</td>
<td>Absence seizures</td>
<td>Nausea, drowsiness</td>
</tr>
<tr>
<td>levetiracetam</td>
<td>Broad spectrum</td>
<td>Rash, dizziness, somnolence</td>
</tr>
<tr>
<td>oscarbazepine</td>
<td>Focal seizures</td>
<td>Irritability</td>
</tr>
<tr>
<td>phenobarbital</td>
<td>Broad spectrum</td>
<td>Sedation, headache, dizziness, rash</td>
</tr>
<tr>
<td>phenytoin</td>
<td>Broad spectrum</td>
<td>Loss of balance if toxic levels</td>
</tr>
<tr>
<td>topiramate</td>
<td>Broad spectrum</td>
<td>Word finding difficulty, numbness, tingling</td>
</tr>
<tr>
<td>valproate</td>
<td>Broad spectrum</td>
<td>Hair loss, weight gain, thrombocytopenia, encephalopathy, sedation</td>
</tr>
<tr>
<td>vigabatrin</td>
<td>Infantile spasms, intractable focal seizures</td>
<td>Peripheral vision loss, drowsiness</td>
</tr>
<tr>
<td>zonisamide</td>
<td>Broad spectrum</td>
<td>Somnolence, ataxia, confusion</td>
</tr>
</tbody>
</table>
Side Effects

- Somnolence
- Nausea and vomiting
- Irritability and mood changes
- Impaired academic performance
- Loss of balance and coordination

“Medical Marijuana”

- THC vs. Cannabidiol
  - DEA and FDA
  - Epidiolex
    - Approved for only 2 specific epilepsy syndromes
      - Dravet Syndrome and Lennox-Gastaut Syndrome

Seizures and Sports

- Exercise is a good thing, but...
  - Could athletic participation cause a seizure?
  - Triggers for seizures
    - Head injury
    - Hyperventilation
    - Dehydration and electrolyte imbalance
Emergency Measures

• #Stay, Safe, Side
• Call
  – 911 and Nurse
• Administer Rescue
  – VNS
  – Diastat

Vagus Nerve Stimulator

• What it is
  – Implanted electrical stimulator
• What it does
  – Sends signals to the brain
  – Monitors heart rate (auto-stimulation)
  – Can be used as a rescue in case of seizures
• Who might have one
  – Anyone with refractory epilepsy
Role of the Teacher

• Know if you have students in your class who have epilepsy
  – If possible, know the student’s seizure triggers
  – If you suspect the student may be having seizures notify the school nurse and the child’s family
  – Be familiar with basic seizure safety
  – Remain calm, and know when to call for help
Role of the Coach/Trainer

• Know if you have athletes on your team who have epilepsy
  – If possible, know the student’s seizure triggers
  – If you suspect the student may be having seizures notify the school nurse and the child’s family
  – Be familiar with basic seizure safety
  – Remain calm, and know when to call for help

Role of the School Nurse

• Know if you have students or athletes in your school who have epilepsy
  – Be familiar with their Seizure Action Plan
  – Know basic seizure emergency measures
  – Know how to swipe a VNS magnet and how to administer Diastat

• You may have teachers and staff in your school who have epilepsy

Summary

• Epilepsy is common in children
• You may have children with epilepsy in your class or on your sports team
• Know your students and athletes
• Know basic seizure emergency measures
• Collaborate with their pediatrician and neurologist
Resources

• American Academy of Pediatrics
  – www.aap.org
  • National Coordinating Center for Epilepsy
• Epilepsy Foundation
  – www.epilepsy.com
• Child Neurology Society
  – www.childneurologysociety.org