

## EM Basic- Febrile Seizures

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### Background

#### Febrile seizure criteria

- Convulsion with T > 38° C (100.4° F)
- Child < 6 y.o.
- No CNS infection/inflammation
- No history of afebrile seizures
- No acute systemic metabolic abnormalities that could produce Convulsions

**Simple febrile seizures** – most common, last < 15 min for single episode no focal features

**Complex febrile seizures** – rare, episodes last > 15 min, focal features often present

**Febrile status epilepticus** – single episode >30 min

### History

#### Determine whether patient had a seizure:

- Uncontrolled, rhythmic motor movements?
- Responsive during episode?
- How long did it last? (Seizures rarely > 90 – 120 seconds)
- Any head trauma from episode or prior to episode?
- Facial/respiratory muscle involvement?
- Tongue biting/incontinence/vomiting?
- Abnormal behavior before/after episode?

#### Signs/symptoms of meningitis/encephalitis:

- Nausea, vomiting, anorexia, HA, photophobia, neck stiffness?

#### Determine whether patient had a recent viral illness:

- Cough, runny nose, rashes, swollen lymph nodes, FEVER?

#### Past Medical Hx

- Happened in past?
- Has patient been to a neurologist?
- If child has epilepsy, are they compliant with meds?
- Changes to dosing regimens?
- Weight changes since last visit with neurologist?

**Immunizations** – any recently? (higher risk of febrile seizures increase after old school DTP (now using DTaP), also MMRV (but not MMR and Varicella separately)

**Family Hx** – parent or sibling with febrile seizures? (genetics play a role)

**Pearl** – in children with epilepsy who present with seizures, be sure to ask about weight changes since last visit with neurologist (increase in weight could mean dose of anticonvulsant med is no longer adequate)

### Physical Exam

**Vital signs** – fever; possible HTN, tachycardia, tachypnea shortly after seizures have stopped; resolve quickly

**General** – if not seizing, usually a neurologically and developmentally healthy child

**Rule out meningitis/encephalitis** – fever, nausea, vomiting, irritability, nuchal rigidity, papilledema, CN palsies?

**Test for nuchal rigidity** – look for limited range of motion in active flexion or passive extension of neck; test Kernig's and Brudzinski's signs generally only reliable in children older than 2 years old

**Look for adverse sequelae of seizure** – head trauma, oral/tongue injury, other traumatic injuries

### Workup

**Not seizing** – if stable and has a history or exam unremarkable for something other than febrile seizures, nothing further needed

**Seizing in ED** – fingerstick glucose, consider additional blood work

#### AAP recommends Lumbar puncture in patients in following scenario

- Meningeal signs/symptoms, looks toxic, febrile status epilepticus
- Child 6-12 mo. with deficient immunization status for H. influenzae type B or S. pneumoniae.

**Consider LP** (can base on exam and clinical situation)

Seizure happens after 2<sup>nd</sup> day of illness

Patient on antibiotics treatment (can mask signs of meningitis)

**Imaging** – Rarely needed except in setting of trauma or when neuro exam is persistently abnormal (non-contrast head CT). Emergent MRI possible if your inpatient peds team can make it happen quickly and you don't suspect acute trauma

**PEARL** – standard tests such as CBC, BMP, and calcium level are low yield in patients with likely febrile seizures

### **Which patients to do workup**

**<28 days with fever-** Full-court press- labs, cath urine, CXR, LP, antibiotics and admit

**29-60 days-** Some say LP all, some use Rochester/Philadelphia criteria to determine need for LP- use institutional guidelines

**60 days and already has 2 month shots-** can start using clinical exam to determine if any workup needed

**3 months and vaccinated-** occult bacteremia risk is low, can use history and exam to guide workup

### **Children at high risk for UTIs- in general, obtain cath urine**

Circumcised males < 6 months old (lowest risk)

Uncircumcised males <12 months old (medium risk)

Females <24 months old (highest risk)

### **Differential Diagnosis**

**Meningitis/encephalitis** – if suspicious, order CBC + diff, BMP, blood cultures, LP if no contraindications

**Syncope** – H/P + EKG

**Shaking chills** – rarely involve facial or respiratory muscles, not associated with LOC

**Metabolic disorder** – hx of vomiting/diarrhea, altered fluid intake, or electrolyte abnormality such as hyponatremia

### **Management**

#### **If seizing:**

#### **ABCs**

Place patient on side if seizing

O2 as necessary

**IV access** – if not established within 5-10 min of seizure activity, start IO line

**PEARL:** Keep in mind that most seizures are self limited and resolve within 2 minutes- don't have to be super aggressive with IV/IO access you witness onset of seizure. Can set up equipment and start the process of getting IV access at the 2 minute mark

**Glucose** – If actively seizing- get fingerstick glucose

**PEARL:** All patients with altered mental status are hypoglycemic until proven otherwise, if you can't get D-stick, give dextrose empirically

### **Glucose concentrations:**

Infants: D10 at 5 -10 cc/kg

Children: D25 at 2-4 cc/kg

Adults: D50 at 1-2 cc/kg

**PEARL:** To remember this, Take 50 and 100 and divide by dextrose concentration (50/D10 = 5 cc/kg, 100/D10 = 10 cc/kg)

**Anticonvulsants** – administer if seizure persists > 5 min

Lorazepam 0.05-0.1 mg/kg IV or IM to max dose of 4 mg → if continues → give additional dose → Seizure still

persists → fosphenytoin 15-20 mg/kg IV to max dose of 1000 mg

No IV access → .5 mg/kg rectal diazepam gel to max dose of 20 mg

**Supportive measures** – cooling blanket, antipyretics

**PEARL** – Remember that if the patient is not seizing, stable, and has a and PE unremarkable for something other than febrile seizures, then treatment necessary

**Hyponatremia treatment-** rare cause of seizures in kids, usually from overdilution of formula with water

**Treatment-** 3% hypertonic saline- 3 cc/kg IV bolus until seizures stop

### **Disposition**

Normal neuro exam and no antiepileptic used → d/c home with PCP followup

Persistent seizures requiring antiepileptics/hx of seizures → admit Febrile Status epilepticus- admit ICU

## Parental Education

Important to reassure parents that simple febrile seizures are not harmful to children in of themselves and that it is about how quickly the child's temperature rises. Re-assure parents that their child's brain is not "boiling inside of their head." Make sure they know that there is nothing they could have done to prevent the seizure.

Febrile seizures do not increase the risk of a future diagnosis of epilepsy unless the child has already diagnosed developmental delays

Antipyretics like acetaminophen and ibuprofen **DO NOT** prevent febrile seizures- even when given prophylactically (very important to tell parents to avoid unnecessary antipyretics and parental worry)

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