New Mexico Early Childhood Education & Care Department | Family Support and Early Intervention Division
FAMILY INFANT TODDLER (FIT) PROGRAM

CENTER FOR DEVELOPMENT & DISABILITY

Early Childhood Evaluation Program – Technical Assistance & Consultation
Continuing Education series for NM FIT Providers

ECEP Office Hours

April 16, 2025

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New Mexico Early Childhood Education & Care Department | Family Support and Early Intervention Division
FAMILY INFANT TODDLER (FIT) PROGRAM

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Seizure Considerations in Toddlers



April 16, 2025

University of New Mexico Health Sciences Center

Department of Pediatrics - Center for Development & Disability



Introductions and Housekeeping

- Today's ECEP Team
- We want to see you- cameras on!
- We want to hear you
  - Please use the chat or jump in with comments, ideas, and questions.
  - Goal is to share experiences and knowledge.



Remember: New and Improved Format!

- Topical Information and Background
- De-identified Case Example and Discussion
- Volunteer case consultation and questions!

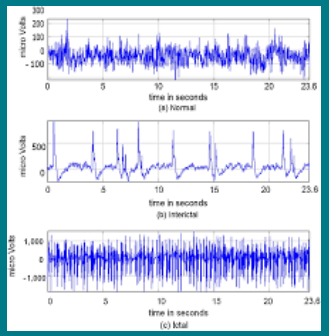
***Please note this zoom platform is not HIPAA-compliant - please de-identify any confidential/case-related information.**



Objectives for today

- Understand what causes seizures
- Become familiar with some seizure types
- Become familiar with movement patterns that mimic seizures
- Help support families when there is a seizure concern

Seizure definition



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A seizure is a sudden, abnormal wave of electrical activity in the brain. Seizures begin suddenly. Most often stop on their own within a few minutes.

1. **Focal,** meaning the seizure activity begins in one part of the brain and may spread from there.
2. **Generalized**, meaning the seizure affects all parts of the brain at once.
3. **Infantile spasms**, a type of seizure that begins during the first year of life.
4. **Status epilepticus,** which involve convulsions of more than five minutes.
5. **Febrile seizures,** which occur within 24 hours of a fever for children between six months and five years of age.

Cincinattichildrens.org/health/s/seizures

What causes seizures and epilepsy?



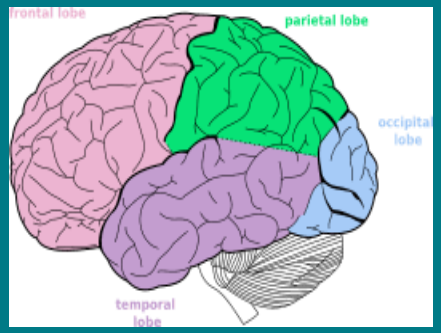
- Genetic
- Structural
- Metabolic
- Immune
- Infectious
- Unknown

Genetic



- Most of the recognized genetic epilepsies begin in childhood.
- Head ultrasound, CT scan and MRI are typically normal
- The cause is a known or presumed genetic ion channel or receptor defect.
- Seen in Rett syndrome, Angelman syndrome, tuberous sclerosis, among others.
- Includes:
  - childhood and juvenile absence epilepsy
  - juvenile myoclonic epilepsy
  - syndromes often associated with neurodevelopmental disability and refractory seizures, such as Dravet syndrome.

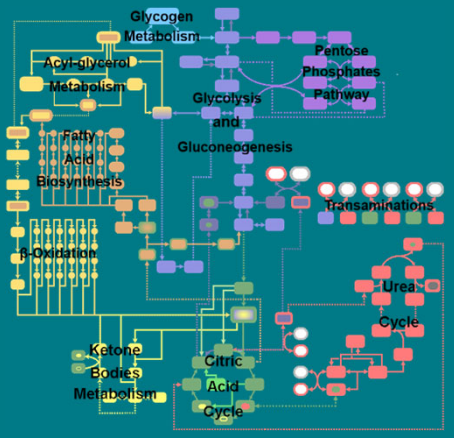
Structural



Virtually any event that causes damage or harm to the cerebral cortex can cause a seizure:

- Hypoxic events (decreased oxygen)
- Toxic/metabolic events (disorders of the metabolism of amino acids, folic acid, GABA, fatty acid oxidation; mitochondrial disease)
- Head trauma
- Vascular lesions: ischemia, bleeding

Metabolic



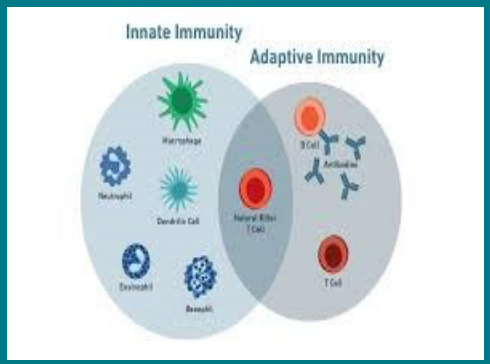
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Many metabolic conditions are associated with an increased risk of developing epilepsy.

Includes:

- Chronic metabolic conditions.
- Acute metabolic issue: eg, high fever, hypocalcemia (low calcium), hyponatremia (low sodium) dehydration.

Immune



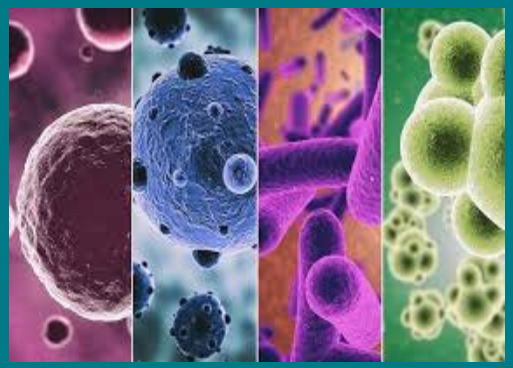
To fight off a threat or heal damaged tissue, the body releases chemicals that trigger an immune response and causes inflammation (heat, swelling), which can cause seizures

Inflammation of the brain is called encephalitis

Inflammation of the membranes around the brain (meninges) is called meningitis.

Examples include Rasmussen encephalitis and anti-N-methyl-D-aspartate (NMDA) receptor encephalitis

Infections



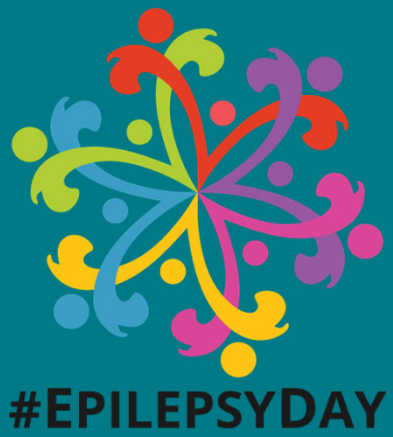
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Infections are the most common cause of epilepsy worldwide.

- HIV
- HSV (Herpes simplex virus)
- Neurocysticercosis: parasitic, pork tapeworm Taenia solium – cysts in the brain and spinal cord.
- Tuberculosis
- Acute meningitis or encephalitis
- Sequela of meningitis, encephalitis, sepsis
- Subacute sclerosing panencephalitis (SSPE) from a persistent measles infection

Diagnosis of Epilepsy

Second Monday in February – International Epilepsy Day



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Not all seizures are due to epilepsy!

Criteria for epilepsy:

- Two or more unprovoked seizures occurring more than 24 hours apart
- One unprovoked or reflex seizure with a high probability (≥60 percent) of recurrence within 10 years
- An epilepsy syndrome

Umprovoked vs Provoked seizures



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Unprovoked seizures occur without an identifiable proximate cause, spontaneously.

Provoked seizures (also known as acute symptomatic seizures) have an identifiable proximate cause, as illness, CNS infection, stroke, traumatic brain injury; anoxic encephalopathy, or intracranial surgery, severe metabolic derangement.

Provoked seizures are generally associated with a low risk for future epilepsy compared with unprovoked seizures. However, provoked seizures caused by an acute brain injury (eg, ischemic stroke, hemorrhage, or trauma) may result in an increased risk of subsequent seizures and epilepsy.



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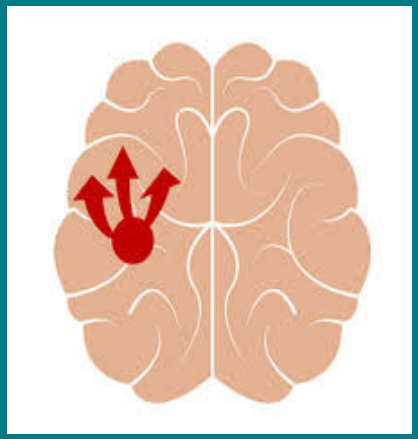
https://youtu.be/2FAG67JrmTY (link for video in slide15)

https://www.youtube.com/shorts/G__MDhmJE1U

(Focal seizures)

Have you seen it before?

Focal seizures



- Begin in one part of the brain
- Symptoms will vary depending on the area of the brain involved. For example, uncontrolled movement of parts of the body or sensory changes such as things smelling or tasting strange to the child.
- During these seizures, the child is aware and alert but unable to respond to others or have control of their body movements.
- Usually last between a few seconds to 2 minutes.

Gelastic seizures video



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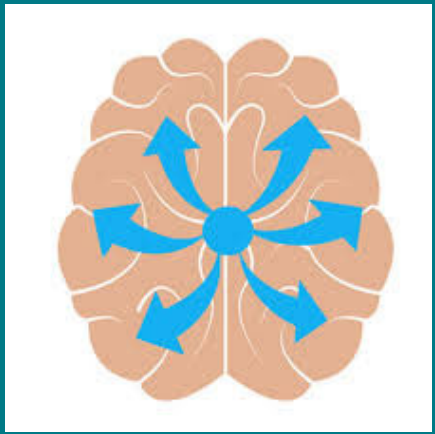
Gelastic Seizure



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- Gelastic seizures are focal seizures that start in an area at the base of the brain called the hypothalamus. The most common cause is a small tumor localized in this area (hypothalamic hamartoma).
- Begin in infancy in 1 out of 3 children. The average to start is around 10 months.
- Present as bouts of uncontrolled laughing or giggling. Also called laughing seizures.
- Children may look like they are smiling or smirking but the emotions are often forced; can't stop them from happening and they may feel scared or a loss of control.
- Usually a child is aware of what's going on around them during these seizures.
- https://youtu.be/kDIKCfsMqkg (link for video)

Generalized seizures



Characteristics:

- They originate at some point within, and rapidly engaging, bilaterally distributed networks.
- Awareness may be impaired, which may be the initial manifestation.
- Motor manifestations (if present) are bilateral.

Classification:

- Motor
- Non motor



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Absence seizures



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Can be mistaken for daydreaming.

Can cause the child or adolescent to be unconscious and/or less responsive.

Usually last only a few seconds (no longer than 30 seconds).

The child might stare blankly ahead, blink rapidly or their mouth/face may twitch.

When the seizures are over, the child will often seem normal and may not recall what just happened.

May occur several times a day.

Note: These seizures were previously called “petit mal” seizures, but that term is no longer used.

https://youtu.be/C7NfsGbGRj8 (link for video)



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Tonic Clonic Seizure



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- This type of seizure (also called a convulsion) is what most people think of when they hear the word "seizure."
- An older term for this type of seizure is "grand mal."
- As implied by the name, they combine the characteristics of tonic and clonic seizures.

Tonic = stiffening

Clonic = rhythmical jerking.

https://youtu.be/OcJOQQvieR8 (link for video)





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Tonic Seizure



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- The tone is greatly increased: the body, arms, or legs become suddenly stiff or tense.
- A child may be aware or have only a small change in awareness during a tonic seizure.
- Usually happen during sleep and usually involve all or most of the brain, affecting both sides of the body.
- Short, usually less than 20 seconds.
- A child may fall if standing when a tonic seizure starts.
- https://youtu.be/pjmDY3tR6ak (link for video)





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Atonic Seizure



"Atonic" (a-TON-ik) means "without tone."

Part or all of the body may become limp. The eyelids may droop, the head may nod or drop forward, and the child may drop things or falls to the ground.

Typically last less than 15 seconds.

Children may get injured when they fall. Head protection, such as a helmet or other protective gear, may be needed.

These seizures are also called "drop attacks" or "drop seizures.“

https://youtu.be/EEusUYl5uQ4 (atonic seizure)

Myoclonic seizures



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Juvenile Myoclonic Epilepsy (JME): This is a common epilepsy syndrome that often begins in adolescence and is characterized by myoclonic seizures, often involving the neck, shoulders, and upper arms.

Lennox-Gastaut Syndrome: This is a rare and severe form of epilepsy that often begins in childhood and is characterized by multiple seizure types, including myoclonic seizures, and cognitive impairment.

Infantile spasms: This is a type of myoclonic epilepsy that typically begins in infancy.

https://youtu.be/YgDbLtokJbo (myoclonic seizures)

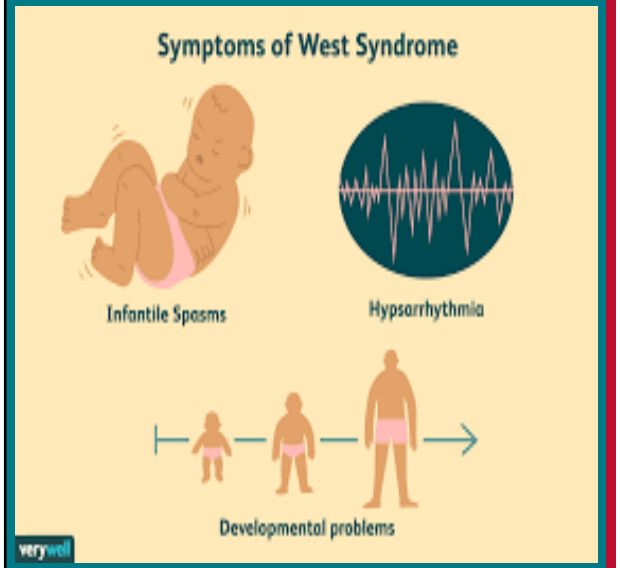
Myoclonic seizures



Infantile Spasms



Infantile Spasms



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They usually begin between 2-12 months of age and peak between 4-8 months of age.

Impact more than 1,200 infants per year in the United States. While rare, these seizures can cause long-term injury to an infant's developing brain and if left untreated can cause problems with learning and development as well as seizures that are hard to control.

Can be caused by structural changes in the brain due to a prior brain injury or a change in the way the brain has developed and genetic conditions.

https://youtu.be/VU6qNLOlU_A (link to video)

Infantile Spasms Characteristics



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- Occur in clusters right after a baby wakes up or falls asleep.

- Some signs of infantile spasms are:
  - Body stiffening
  - Back arching
  - Jerking at the abdomen
  - Arm raising*
  - Wide-eyed blinks or eye rolling*

- *These movements are repetitive, subtle, and occur every 3-5 seconds lasting approximately 5-30 minutes in clusters.

Abusive Head Trauma (AHT)



Clinical manifestations:

- Seizures
- Retinal hemorrhages
- Vomiting and fussiness
- Bruising. “TEN-4-FACESp”
- Oral injuries in infants, such as frenulum tears

What to do? Emergency!

A comprehensive medical evaluation, including a thorough skin examination, skeletal survey, head imaging, and a timely ophthalmology consultation.

Children with suspected intracranial injury should have a cranial computed tomography and/or MRI scan

Status epilepticus



Generalized convulsive status epilepticus (SE) is a serious and potentially life-threatening medical emergency that requires prompt intervention.

Defined as sustained and rhythmic generalized tonic and clonic motor activity lasting for longer than five minutes or repetitive convulsive seizures without a return to baseline consciousness between seizures.

What about epilepsy in autism?



More individuals with autism have epilepsy than in the general population

- About 8 percent of children with autism will have a seizure ** if there is not intellectual disability
- About 20 percent if ID is present
- Genetic overlap – Fragile X for example
- Shared neurodevelopmental pathways

Take home message: have a higher index of suspicion for seizures in a child with autism especially if they have significant delays in cognitive, motor and adaptive skills

**studies vary in ranges

How can we understand seizures

A framework for observation, gathering key information, and ruling out concerns:

1. What is observed
2. How long does it last
3. Time it!
4. Video tape it!
5. What interrupts (or doesn't)
6. What preceded, how long, behavior afterwards

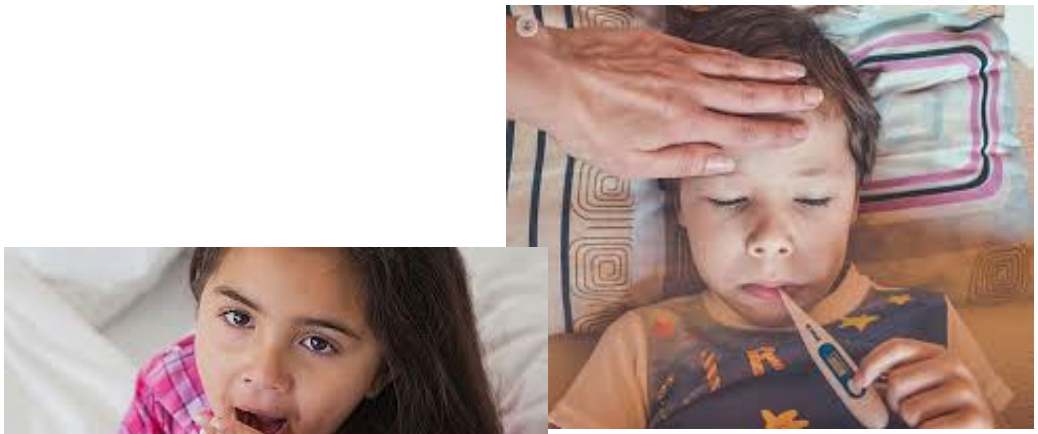
What can be seizure triggers?



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Chat blast

What can be seizure triggers?







Preventing seizures and seizure triggers



Fatigue – it is important to keep a good sleep schedule.

Excessive stress – mental health professionals can help children and families learn to manage stress in healthy ways.

Fever or other symptoms of illness – it is important to have good hand washing. Stay up to date on immunizations.

Visual stimuli, such as flashing bright lights or computer games (please note that this type of seizure trigger is rare.)

Using certain medications or not taking anti-seizure medication as prescribed.

Stay well **hydrated.**

Febrile Seizures



- These seizures occur in children ages six months to five years old.
- They happen within 24 hours before or after the child has a fever.
- These motor seizures involve convulsions. Children typically outgrow these seizures.
- Febrile seizures can be simple or complex.
- Complex febrile seizures = must last longer than 15 minutes or occur more than once in 24 hours or affect one part of the body. The shaking may affect one or both sides of the body. A small percentage of children who have complex febrile seizures develop epilepsy.

Medical Considerations



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- Children with a first nonfebrile seizure or suspected seizure should be evaluated by a pediatrician or neurologist
- The initial evaluation is directed toward uncovering a potential medical etiology.
- If unprovoked seizure or epilepsy of unknown etiology, will need testing with magnetic resonance imaging (MRI), and electroencephalography (EEG) or video EEG
- If the history, physical examination, MRI, and EEG do not reveal a cause for recurrent seizures, the child should be evaluated for potential underlying metabolic, genetic, immune-mediated, or neurodegenerative disorders

Seizure mimics in neonates



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Neonates

- Apnea
- Jitteriness
- Benign neonatal sleep myoclonus
- Hyperekplexia : Rare. Persistent startle reflex followed by stiffness.

- https://youtu.be/zt8L5MS4ROE link for video for Jitteriness in infant)

Jitteriness in infant



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Hyperekplexia

Hyperekplexia is a rare, inherited neurological disorder characterized by an exaggerated startle reflex in response to sudden, unexpected stimuli like noise, movement, or touch. It can affect individuals of any age, but is often diagnosed in infants, sometimes before birth.

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https://www.instagram.com/nicu_musings/reel/CzoQ_ZDLY-H/

Seizure mimics in infants



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Infants:

- Breath-holding spells
- Benign myoclonus of infancy
- Shuddering attacks
- GERD (Sandifer syndrome)
- Benign torticollis in infancy
- Abnormal eye movements (eg, spasmus nutans, opsoclonus-myoclonus-ataxia syndrome)
- Rhythmic movement disorder (head banging)

https://youtu.be/j52KDOQDgnI (link to video for breath-holding spells)

Breathholding spell (video)



Myoclonic Jerks: Not seizures



- Occur only when asleep, disappear with arousal
- Primarily during non-rapid eye movement (NREM) sleep or in the transition from sleep to wakefulness.
- Onset is in the first few days to weeks of life
- The jerks are typically bilateral, symmetric movements of the arms and/or legs.
- Absence of autonomic disturbances
- Normal EEG
- Normal neurologic and developmental examination
- https://www.tiktok.com/@go.fns/video/7393162030183746821?is_from_webapp=1&sender_device=pc

Benign sleep myoclonus

https://youtube.com/shorts/SXLxnMIV3xk?si=A_kGFwskPfaYt_z7

Seizures mimics in children



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- Breath-holding spells
- Vasovagal syncope
- Migraine
- Benign paroxysmal vertigo
- Zoning out (staring- like spells)
- Tic disorders and stereotypies
- Rhythmic movement disorder
- Parasomnias
- https://www.tiktok.com/@aqotas/video/7197896056829562118?is_from_webapp=1&sender_device=pc (link for video for zoning out)

Management



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What Should I Do if My Child Has a Seizure?

If you think your child is having a seizure, try to stay calm and:

Gently place your child on the floor or the ground.

Remove any nearby objects.

Place your child on their side to prevent choking.

Loosen any clothing around the head and neck.

Watch for signs of breathing problems, including bluish color in the face.

Try to keep track of how long the seizure lasts.

When the seizure is over, call your doctor. They probably will want to see your child.

When to call 911



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it's their first seizure

the seizure lasts longer than 5 minutes or your child is having repeated seizures

has trouble breathing

has a bluish color on the lips, tongue, or face

won’t respond to you or wake up after the seizure

fell, got hurt, or hit their head before or during the seizure

seems to be sick (has a fever, headache, or stiff neck)

had the seizure while in water

has any other symptoms that concern you

Case Example #1

Josiah is a 32 month old boy who was born full term following a healthy pregnancy and delivery. There were no prenatal exposures and he was the appropriate size at birth. At 18 months, Josiah stopped using the words that he previously had gained and began to be “in his own world.” It was hard to gain his attention and he had episodes where he would “zone out” and seem entirely unaware of his surroundings. His EI team is concerned for seizures. He was recently diagnosed with autism through a community ABA provider.

What more would you like to know?

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References and resources



- https://www.hopkinsmedicine.org/health/conditions-and-diseases/epilepsy/seizures-and-epilepsy-in-children
- https://www.cincinnatichildrens.org/health/s/seizures\
- Understanding Pediatric Epilepsy: Infantile Spasms. American Academy of Pediatrics. Last Updated. 12/08/2023
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- Epilepsy Foundation. Understanding Epilepsy. https://www.epilepsy.com/what-is-epilepsy/seizure-types/
- Capal JK, Jeste SS. Autism and Epilepsy. Pediatr Clin North Am. 2024 Apr;71(2):241-252. doi: 10.1016/j.pcl.2024.01.004. Epub 2024 Feb 2. PMID: 38423718.
- National Organization of Rare Diseases NORD
- https://kidshealth.org/en/parents/seizures-sheet.html
- https://www.uptodate.com/contents/seizures-and-epilepsy-in-children-classification-etiology-and-clinical-features

Discussion



Case examples?

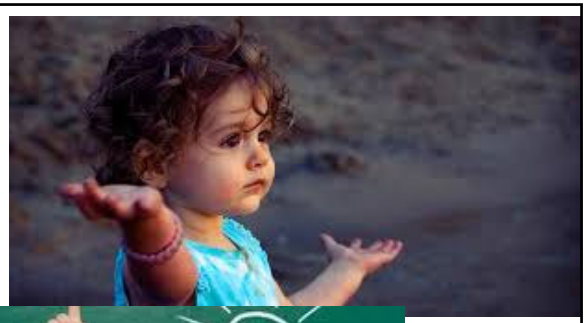
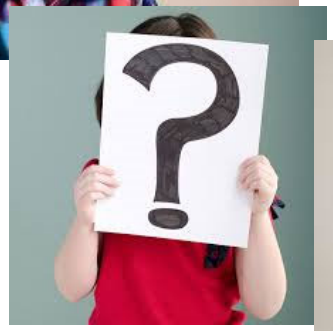
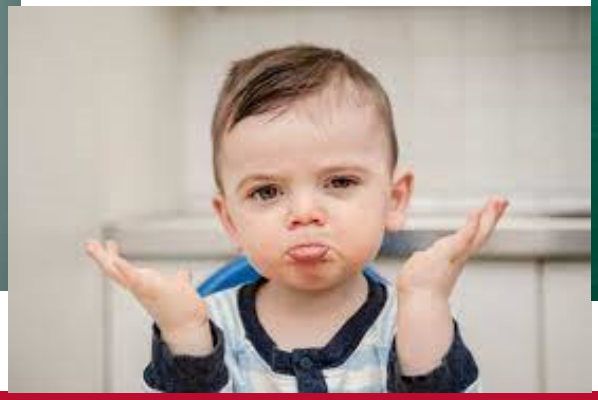
Successes?

Challenges?

Team considerations?

Next Steps?




Questions

Join us for more ECEP Office Hours in 2025!

Session 5:



Contact information



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Resources



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Zero to Three

https://www.zerotothree.org/

Pathways

https://pathways.org/

CDC

https://www.cdc.gov/ncbddd/actearly/milestones/index.html

AAP Bright Futures

https://www.aap.org/en/practice-management/bright-futures

What to Expect

https://www.whattoexpect.com/