

# Seizures Unmasked: Distinguishing Real Events from Mimics

---

Katherine Muir, MD FRCPC



THE COLLEGE OF  
FAMILY PHYSICIANS  
OF CANADA



LE COLLÈGE DES  
MÉDECINS DE FAMILLE  
DU CANADA

# Presenter Disclosure

Presenter: Katherine Muir

---

## Relationships with financial sponsors:

- Any direct financial relationships, including receipt of honoraria: Argus (site PI), Jazz Pharmaceuticals (honoraria)
- Membership on advisory boards or speakers' bureaus: none
- Patents for drugs or devices: none
- Other: none

# LAND ACKNOWLEDGEMENT

We are gathered on the traditional, ancestral and unceded territories of the Musqueam, Squamish and Tsleil-Waututh Nations. We honor their rich history, culture, and ongoing contributions to this land. I would like to recognize and honor their enduring connection to the land, waters and community and am committed to learning, sharing and fostering meaningful relationships.

# LEARNING OBJECTIVES

1. Differentiate epileptic seizures and the most common seizure-mimics.
2. Recognize patients that have epilepsy.
3. Identify when to start anti-seizure medication.



# RECOGNIZING SEIZURES



# SEIZURE

Definition: An epileptic seizure is a transient occurrence of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain.

## **Diagnosis of seizures is made based on history**

- Episodes that are stereotyped, recurrent, cannot interrupt or distract
- Semiology consistent with a seizure
- Supported by EEG

# NEONATAL MIMICS: SLEEP MYOCLONUS

- Only in sleep in otherwise healthy baby
- Affects all limbs, occurs in brief flurries
- Rousing aborts the movements
- EEG normal

# NEONATAL SEIZURE

- Stereotyped episode
- Repeats with same semiology
- Cannot be interrupted
- Neonatal seizures are focal seizures



# INFANTILE MIMICS: SHUDDERING SPELLS

- Resemble shivering/straining
- Can be triggered by feeding, head movements
- Usually last a few seconds
- No post-ictal fatigue or confusion
- Usually otherwise neurologically normal
- EEG normal

# INFANTILE MIMICS: STEREOTYPY

- Repetitive purposeless movements that can be stopped with distraction (hand flapping, rocking)
- Onset less than 3 years of age
- Do not wax and wane
- Triggered by excitement/boredom
- Often in children with developmental delay
- Diagnose based on history, no investigations required

# INFANTILE SEIZURE: INFANTILE SPASMS

- Triad of Infantile Epileptic Spasm Syndrome (West Syndrome):
  - Infantile spasms
  - Developmental regression
  - EEG showing hypsarrhythmia
- Requires urgent referral as early treatment improves outcomes

# CHILDHOOD MIMICS: PARASOMNIAS

- Night terrors, sleep walking, confusional arousals
- Usually occur in the first third of the night, usually once/night
- Not stereotyped
- No memory of the event

# CHILDHOOD SEIZURE: FOCAL MOTOR

- Symptoms will depend on in which part of the brain the seizure begins
- Stereotyped: same on set and same spread
- EEG may show focal epileptiform discharges or slowing over area of onset
- Greater than 50% of first EEGs are normal in focal epilepsy

# CHILDHOOD MIMICS: INATTENTION

- Not sudden onset
- Child sometimes aware
- Can interrupt with touch
- More frequent when tired or relaxed
- Common in children with ADHD and autism

# CHILDHOOD SEIZURES: TYPICAL ABSENCE

- Sudden onset and offset
- May have eye blinking
- Interrupt activities like talking or eating
- Occur many times each day (20-30)
- No memory of the event

# ADOLESCENT/ADULT MIMICS: VASOVAGAL SYNCOPE

- Triggered by prolonged standing, change in posture, dehydration, emotional upset
- Prodrome of blurred vision, dizziness, nausea, flushing
- Stiffening and tonic-clonic movements in 50%
- Can have tongue biting and incontinence
- Minimal confusion, return to normal fairly quickly



# ADOLESCENT/ADULT MIMICS: FUNCTIONAL NEUROLOGIC DISORDER

- Seizure-like episode involving abnormal movements and/or altered awareness
- Movements more proximal involving trunk, horizontal movements of the head, eyes often closed
- Not stereotyped, wax and wane
- Minimal confusion, return to normal fairly quickly

# ADOLESCENT/ADULT: BILATERALLY CONVULSIVE SEIZURE

- Tonic phase: stiffening of the body
- Clonic phase: bilateral sustained rhythmic jerking
- Somnolence and confusion afterward
- Can be generalized or focal progressing to bilaterally convulsive



# RECOGNIZING EPILEPSY



## DEFINITION OF EPILEPSY

- At least two unprovoked seizures occurring >24 hours apart
- Diagnosis of an epilepsy syndrome
- One unprovoked seizure and a probability of further seizures similar to the general recurrence risk after two unprovoked seizures (based on testing)

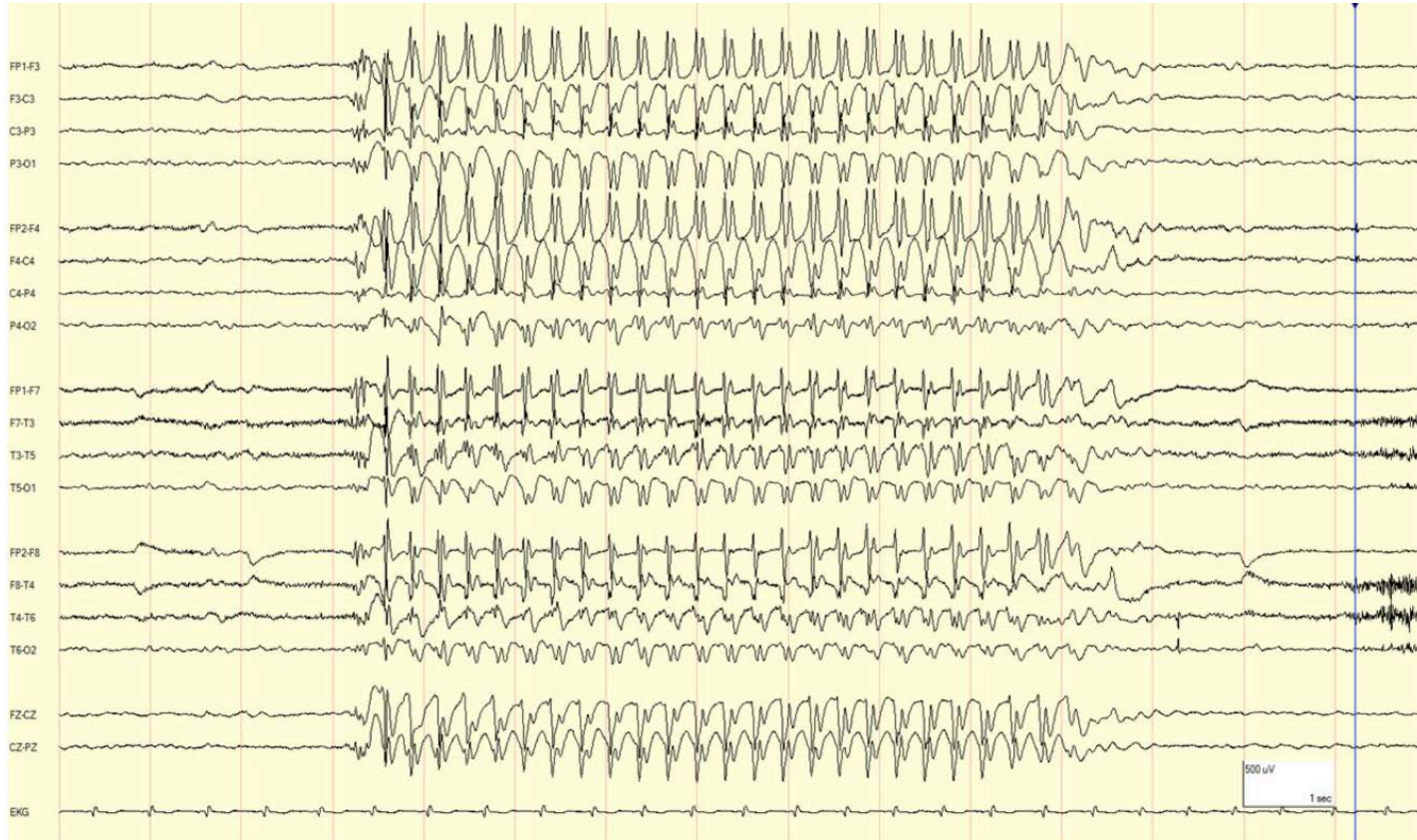
## DEFINITION OF EPILEPSY

- At least two unprovoked seizures occurring >24 hours apart
- Diagnosis of an epilepsy syndrome
- One unprovoked seizure AND either
  - Epileptiform discharges on EEG
  - Epileptiform lesion on MRI

## CASE 1

- 8 year old is being seen for difficulties in school
- Teachers feel she is inattentive and often forgets simple instructions
- Parents have noted staring spells at home where she suddenly stops what she is doing and stares off into space. They are too brief to video
  
- Would you do further tests?

# EEG



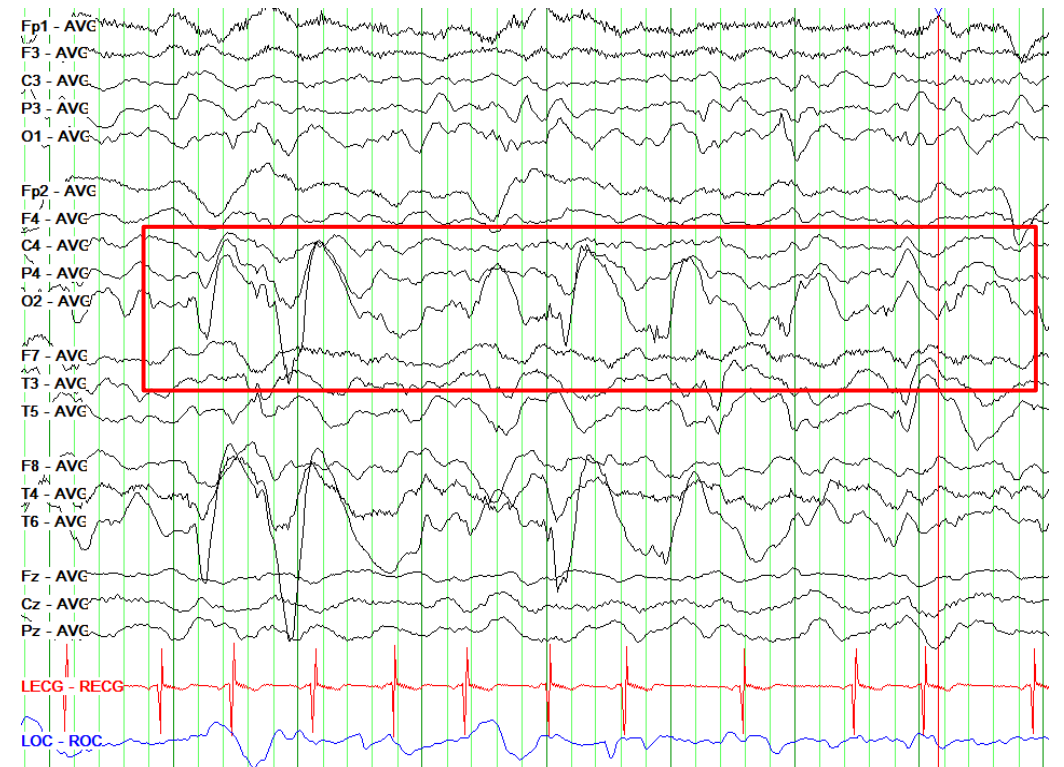
Typical Absence Seizure

**Diagnosis:** Childhood  
Absence Epilepsy

# DIAGNOSTIC TESTING : EEG

- Can show slowing or epileptiform discharges
- Can be focal or generalized
- Can be normal in patients who have epilepsy
- Can be abnormal in patients who do not have epilepsy

**“clinical correlation is recommended”**

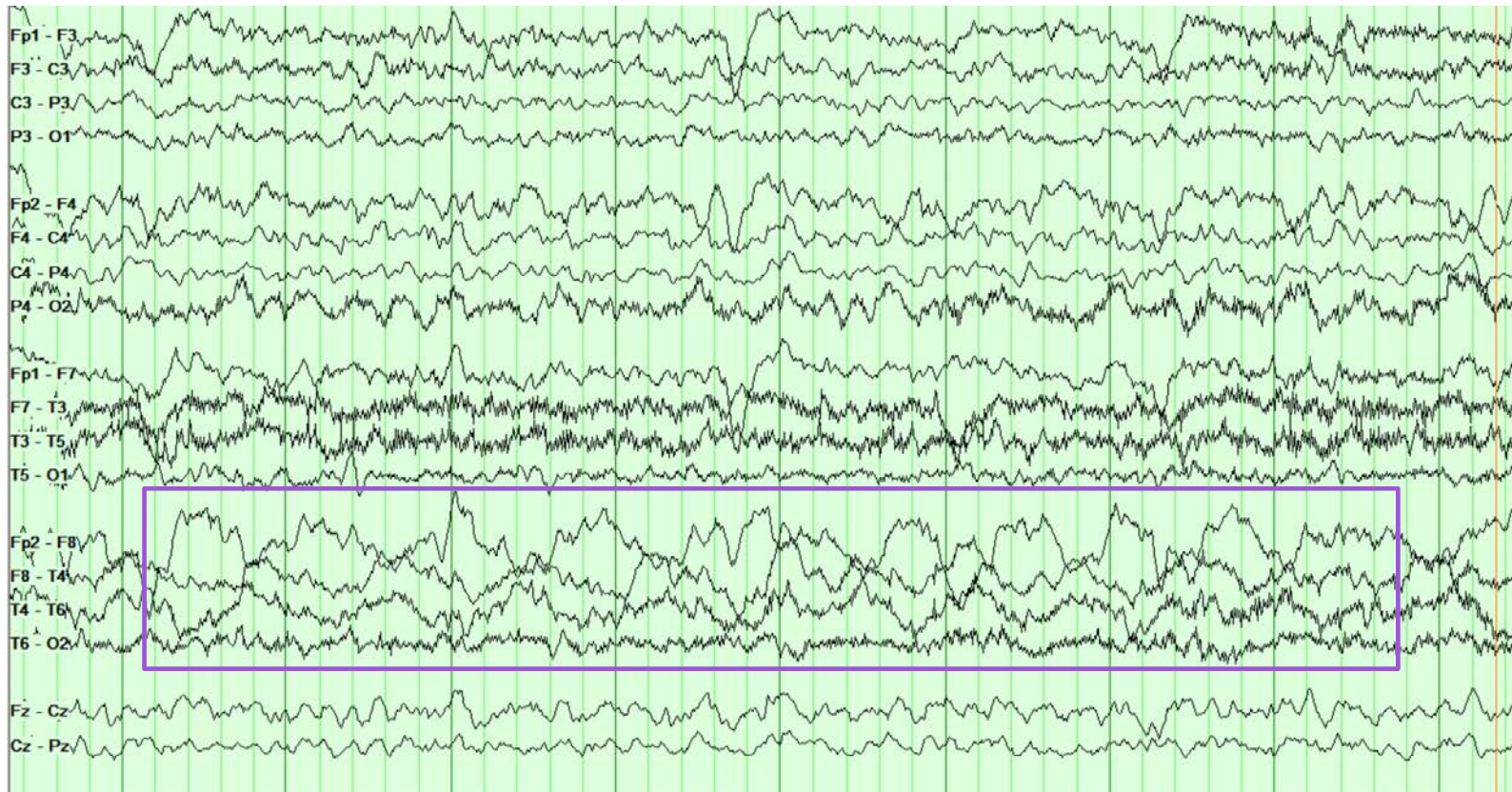




## CASE 2

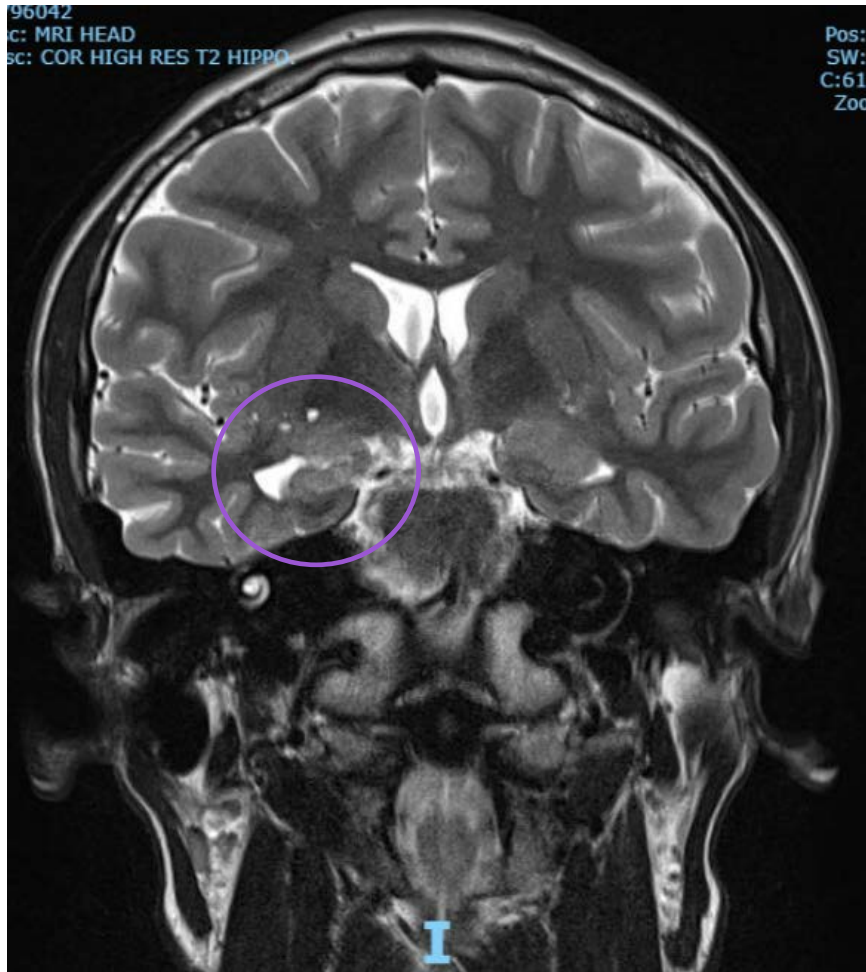
- 13 year old is being seen for recurrent episodes of staring
- Occur 1-2 times/week
- He will stop what he is doing, make unusual movements of his mouth and fiddle with his hands, then his left hand will stiffen
- Lasts 1 minute
- He is tired and needs to nap afterward
- Would you do further tests?

# EEG



Right temporal  
slowing

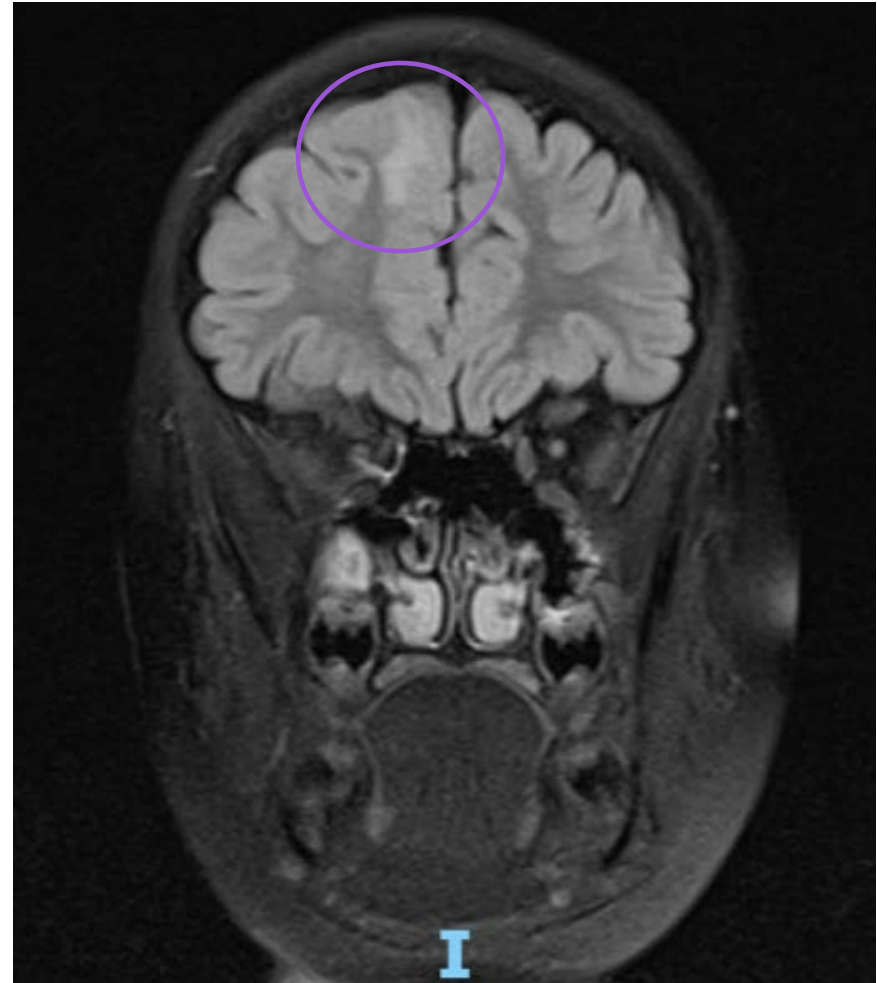
# MRI



- Right mesial temporal sclerosis
- Diagnosis: focal epilepsy arising from the right temporal lobe

## DIAGNOSTIC TESTING: MRI

- MRI is not needed in:
  - Febrile seizures
  - idiopathic generalized epilepsy
  - Self-limited childhood epilepsy with centro-temporal spikes
- All other patients with new onset seizures should have an MRI



# DIAGNOSING EPILEPSY

- **Epilepsy is a clinical diagnosis, supported by testing**
- Every patient with a first unprovoked seizure should have an EEG
- Every patient with a focal seizure OR focal features on EEG should have head imaging



# WHEN TO START ANTI-SEIZURE MEDICATION



# WHEN TO START ANTI-SEIZURE MEDICATION

- Why do we treat seizures?
  - Safety
  - Cognition
  - Kindling
  - SUDEP
- Consider starting anti-seizure medication in any patient with a diagnosis of epilepsy

# CONSIDER PATIENT SPECIFIC FACTORS

- Age of patient
- Frequency of seizures
- Timing of seizures
- Type of seizures
- Patient or parent preference



# ANTI-SEIZURE MEDICATION: LEVETIRACETAM

- Works for almost all types of seizures
- No blood-work required for monitoring

Dosing:

250 mg twice daily for 1 week

500 mg twice daily

Can increase to 1500 mg twice daily

Side effects: fatigue, **irritability, anxiety, depression, SUICIDE**

# ANTI-SEIZURE MEDICATION: ETHOSUXIMIDE

- Treats typical absence seizures in Childhood Absence Epilepsy
- Does not treat generalized tonic clonic seizures

Dosing (children >6 years of age):

250 mg twice daily for 1 week

500 mg twice daily

Side effects: fatigue, **nausea**, psychiatric symptoms, decreased WBC, Steven Johnson Syndrome

# ANTI-SEIZURE MEDICATION: LAMOTRIGINE

- Works for almost all types of seizures
- No blood-work required for monitoring
- Activating, mood stabilizer

Dosing: very slow escalation

Side effects: insomnia, headache, **Steven Johnson Syndrome**

- **Must warn patients about rash**

# LAMOTRIGINE TITRATION

Week 1 & 2: 25 mg daily

Week 3 & 4: 25 mg twice daily

Week 5: 25 mg in the morning & 50 mg in the evening

Week 6: 50 mg twice daily

Week 7: 50 mg in the morning & 75 mg in the evening

Week 8: 75 mg twice daily

Week 9: 75 mg in the morning & 100 mg in the evening

Week 10: 100 mg twice daily

Week 11: 100 mg in the morning & 125 mg in the evening

## TAKE HOME MESSAGES

- Seizures are a clinical diagnosis
- Epilepsy is diagnosed after having clinical seizures, may require supportive tests
- Anti-seizure medication should be considered in any patient with epilepsy

# RESOURCES

- [Epilepsydiagnosis.org](http://Epilepsydiagnosis.org)
- ECHO Epilepsy Across the Lifespan

---

# Thank you!

Please fill out your session evaluation now!

**#myfmf**



FamilyMedicineForum



FamilyMedForum



FamilyMedForum