

# Topical Issues in Epilepsy

Parbeen K. Pathak BSc, MD, FRCPC  
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# Disclosures

NONE

# Learning Objectives

## Management of a First Seizure

*Investigations, Treatment, driving*

## New Antiepileptic drugs

*A few pearls (re: levetiracetam & lacosamide)*

## Women and Epilepsy

*Use of antiseizure medication in pregnancy*

## Marijuana & Epilepsy

*What do we know in 2014?*

# First Seizure: Investigations

- ▶ Metabolic workup
  - ▶ CT head with and without contrast
  - ▶ MRI head with “seizure protocol”
  - ▶ EEG
- 

# CT Head

- ▶ A “good” screening test in the ER setting.
- ▶ CT head without contrast : helps rule out intracranial bleeding.
- ▶ CT with contrast allows a more accurate assessment (space-occupying lesions).
- ▶ However, CT scan may miss brain lesions that would otherwise be detected by MRI.
- ▶ CT scanning detected only 12 of 28 brain lesions that were detected by MRI; 7 of the missed lesions were brain tumors.

King et al. Lancet. Sep 26 1998;352(9133):1007-11.

# MRI head and EEG

Using history, EEG, and MRI data:

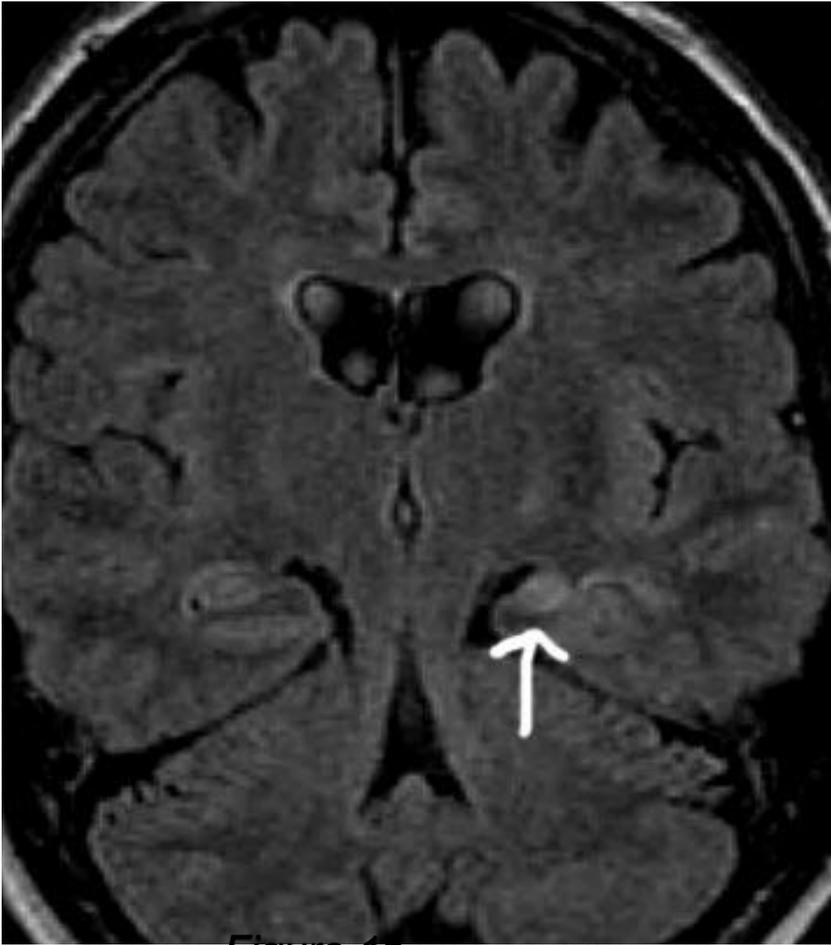
23% of patients had primary generalized epilepsy,

58% had partial epilepsy /focal onset seizures

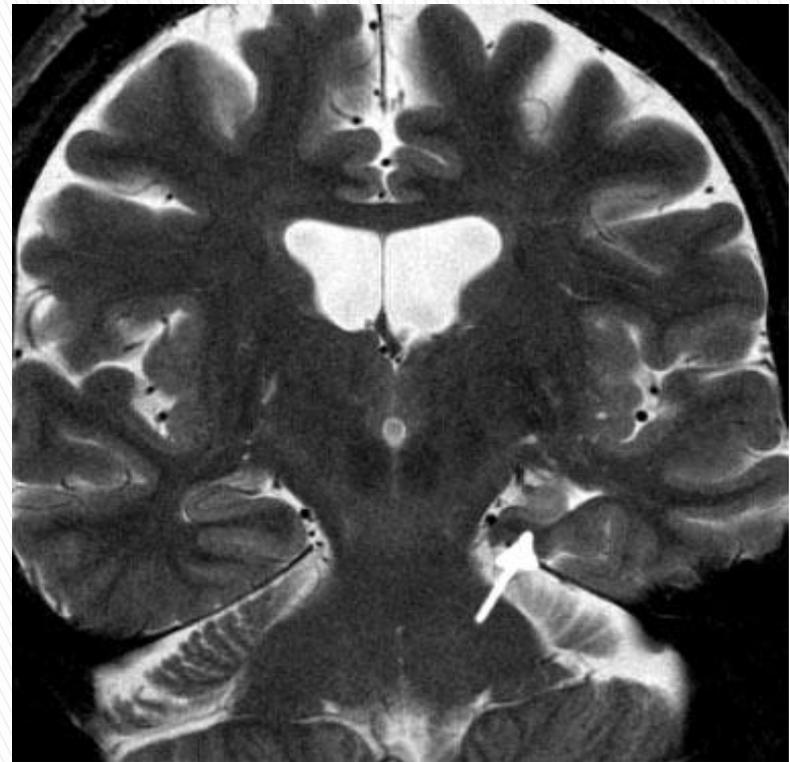
19% had unclassified seizures

King et al. Lancet. Sep 26 1998;352(9133):1007-11.

# Left mesial temporal sclerosis

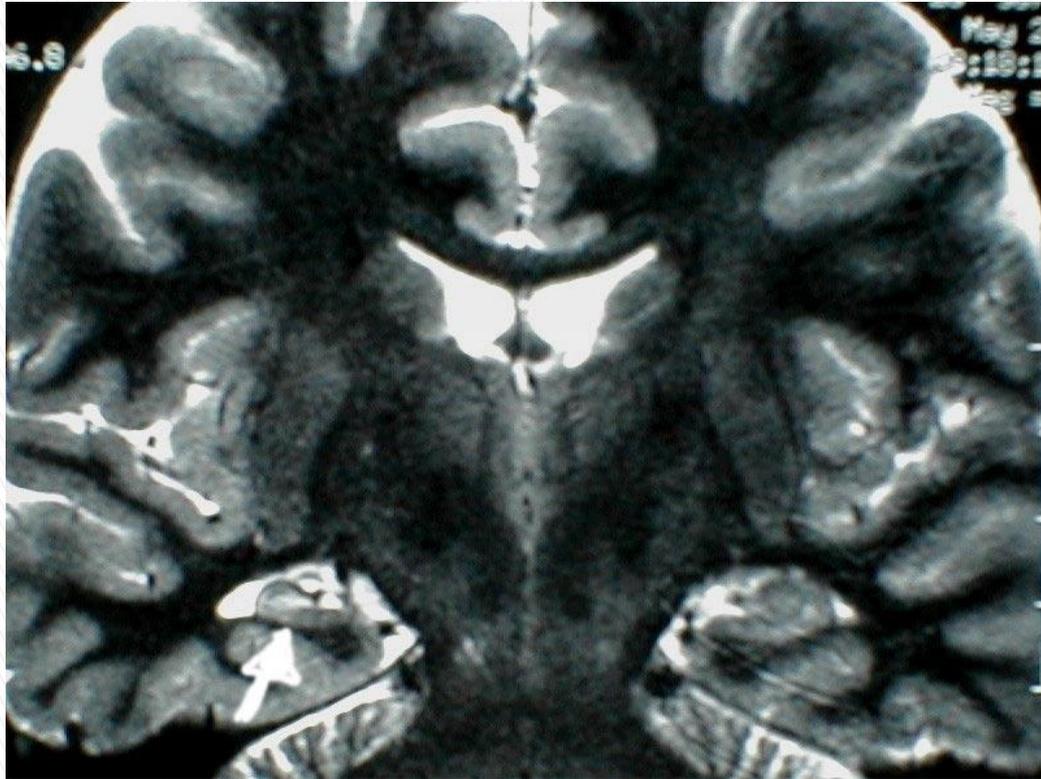


*Figure 1b*



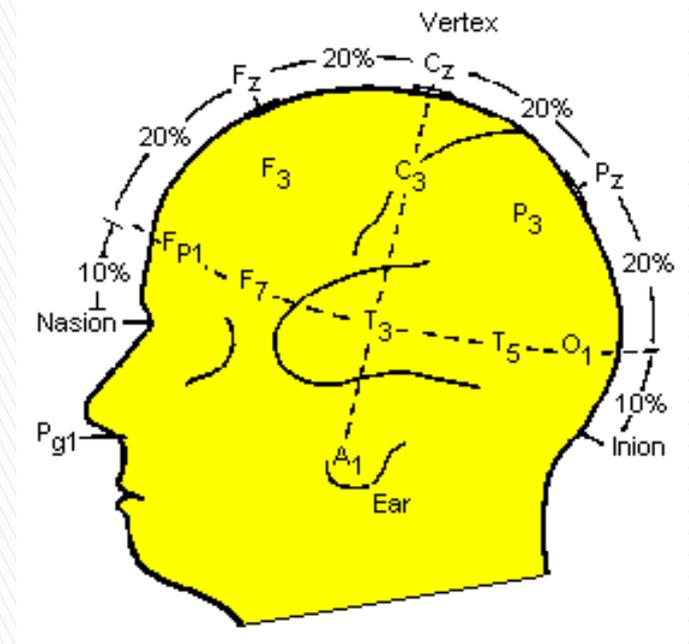
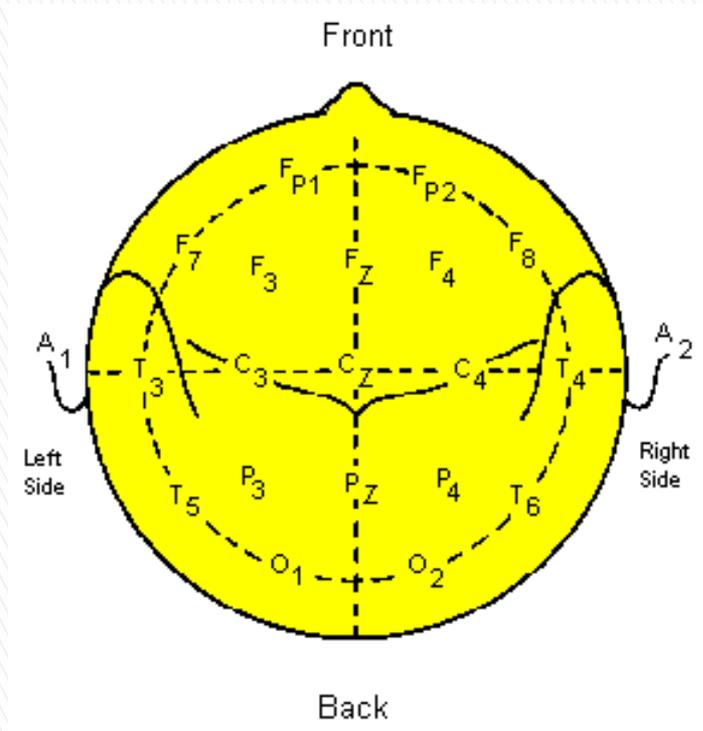
*Figure 1c*

# Right hippocampal sclerosis

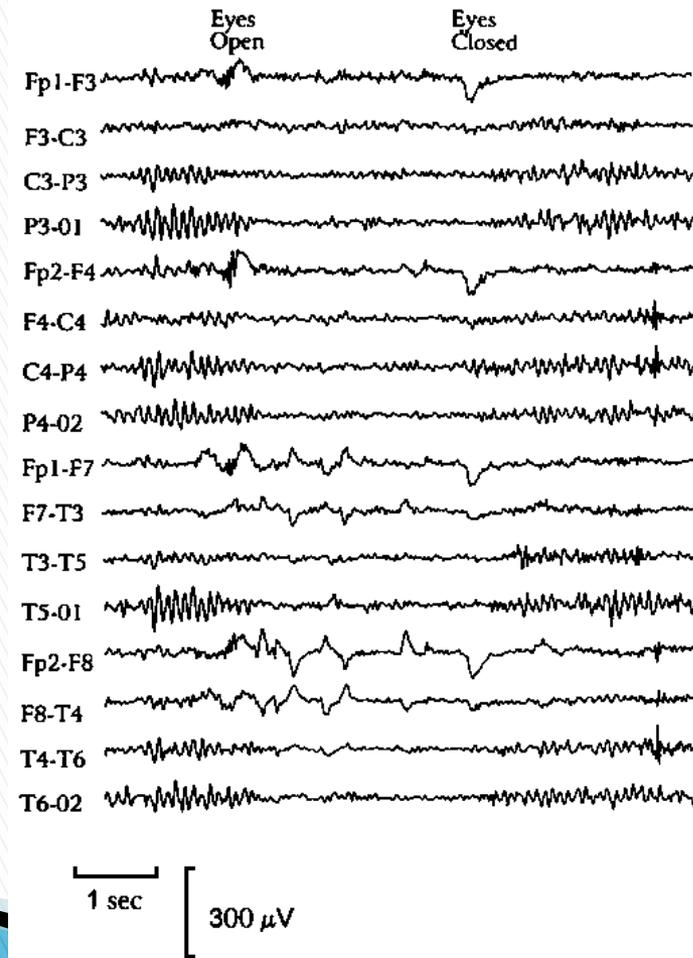


*Figure 1a*

# 10/20 System of EEG Electrode Placement



# Normal Adult EEG



- ◆ Normal alpha rhythm



# EEG: Absence Seizure



# Treatment after a First Seizure?

- ▶ One year probability of seizure recurrence –
- ▶ Low Risk: 0.19 (single seizure, normal exam and tests)
- ▶ Medium Risk: 0.35 (neurological disorder +/- abnormal EEG +/- multiple seizures)
- ▶ High Risk: 0.59 (neurological disorder & abnormal EEG +/- multiple seizures)

# Treatment after a First Seizure?

“Little benefit to immediate treatment in patients at low risk of seizure recurrence, but potentially worthwhile benefits are seen in those at medium and high risk.”

MRC Multicentre trial for Early Epilepsy and Single Seizures (MESS)

*The Lancet Neurology*, [Volume 5, Issue 4](#), Pages 317 – 322, April 2006

# Driving?

Single seizure : No driving for at least 3 months AND neuro consult/EEG/imaging.

**(For commercial drivers, restriction is 12 months).**

After diagnosis of epilepsy: Drive if seizure free for 6 months on medication, patient is compliant, caution against excessive fatigue and alcohol.

**(For commercial drivers, restriction is 5 years seizure free) .**

# Resources

- ▶ <http://www.cma.ca/determining-fitness-to-drive>
- ▶ <https://www.bcma.org/publications-media/handbooks-guides#4>
- ▶ [http://www.ccmta/english/pdf/medical\\_standards\\_march2009.pdf](http://www.ccmta/english/pdf/medical_standards_march2009.pdf)

# “New” Antiepileptic Drugs

1999 – Levetiracetam (Keppra)

2010 – Lacosamide (Vimpat)

2012 – Perampanel (Fycompa)

# Levetiracetim (Keppra)



- ▶ Used as monotherapy or as an add-on drug:
- ▶ Partial seizures
- ▶ Secondary generalized seizures
- ▶ Primary generalized seizures

# Levetiracetim (Keppra)

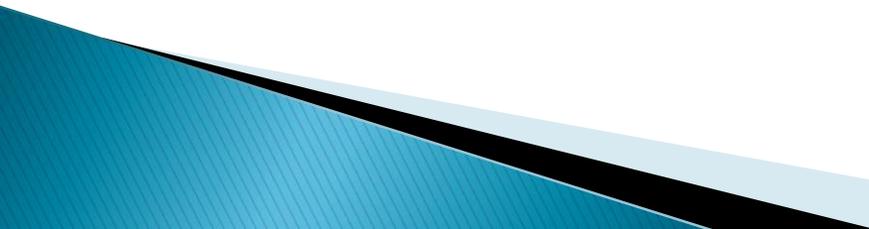


- ▶ Potential behaviour changes in some people who take this drug:
- ▶ Anxiety
- ▶ Agitation
- ▶ Mood swings
- ▶ Depression
- ▶ Suicidal ideation

# Lacosamide (Vimpat)

- ▶ New antiepileptic drug approved by Health Canada in November 2010
- ▶ Useful as *adjunctive therapy* in the management of *partial onset seizures* in patients *18 years of age and older* who are not controlled with conventional therapy.

# Lacosamide side effects

- ▶ Suicidal behaviour and/or ideation.
  - ▶ Anxiety, aggravation of depressed mood
  - ▶ Nausea, dizziness, syncope, headache, diplopia
  - ▶ Caution in patients with cardiac conduction blocks
- 

# Women and Epilepsy



*Can specific  
medications for epilepsy  
affect my baby?*

# Risk of teratogenicity

- ▶ Risk of congenital anomalies in offspring of Women with Epilepsy (WWE):

- ▶ Overall risk 4.2%

- ▶ Monotherapy 3.7%

**Polytherapy 6.0%**

**Valproic acid 6.2%**

- ▶ WWE (no Rx) 3.5%

UK Epilepsy and Pregnancy Register  
J Neurol Neurosurg Psychiatry. Feb 2006;  
77(2): 193-198.

# Valproic Acid used in Pregnancy may cause Birth Defects



**Practice Parameter Update:  
Management issues for women with  
Epilepsy. Neurology 2009;73;142-149**

Avoid use of valproic acid in women of child bearing age

Avoid polytherapy

Use Folic Acid 5 mg daily

# Seizures and Medical Marijuana



- ▶ Charlotte Figi, 6, has **Dravet Syndrome**, a rare, severe form of epilepsy
- ▶ Doctors tried everything they could think of to get her daily seizures to stop
- ▶ The family decided to try a special type of medical marijuana low in THC
- ▶ Her parents say Charlotte is now thriving and seizures have been reduced to one a day
  - CNN, 2013

# Seizures and Medical Marijuana

## Is medical marijuana safe for kids?

**ADRIANA BARTON**

The Globe and Mail

Published Sunday, Nov. 10 2013, 4:00 PM EST

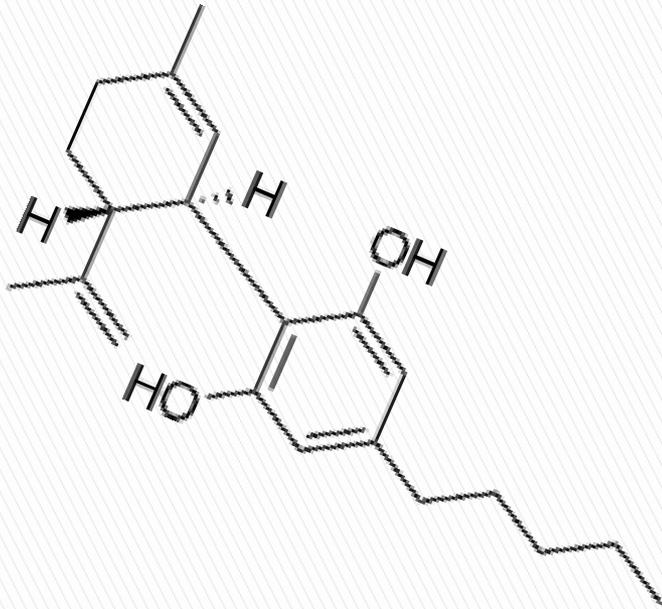
Last updated Monday, Nov. 11 2013, 5:06 PM EST



Alexander Repetski cuddles with his 16-month-old daughter Gwenevere in their Toronto home on November 6, 2013.

(Jennifer Roberts for The Globe and Mail)

# Cannabidiol (CBD).



- ▶ A major constituent of the plant, second to tetrahydrocannabinol (THC), and
- ▶ CBD represents up to 40% in its extracts.

Compared with THC, cannabidiol is not psychoactive in healthy individuals,

# AES Position on Medical Marijuana

- ▶ The recent anecdotal reports of positive effects of the marijuana-derivative cannabidiol for some individuals with treatment-resistant epilepsy give reason for hope. However, we must remember that these are only anecdotal reports.
- ▶ Healthcare professionals, patients, and caregivers are reminded that use of marijuana for epilepsy may not be advisable due to the lack of information on safety and efficacy.
- ▶ We need scientifically rigorous research into the development of cannabinoid-based treatments.

February 28, 2014

# Seizures and Medical Marijuana

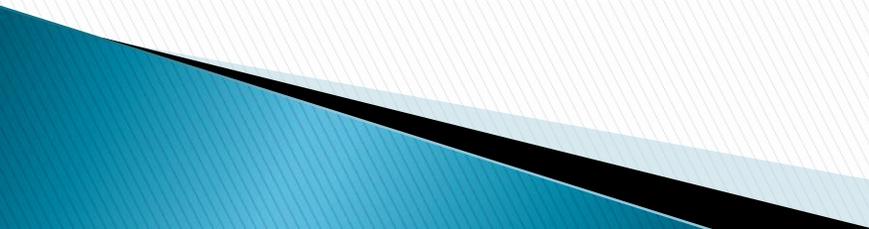
- ▶ Cannabidiol (CBD).
  - ▶ **We need randomized controlled trials.**
  - ▶ A clinical trial of CBD in children with epilepsy is under way at New York University.
  - ▶ In Calgary, a pediatric neurologist has proposed a study of CBD.
  - ▶ Neurologists at Hospital for Sick Children in Toronto are looking into the feasibility of conducting a clinical trial.
- 

# Seizures and Medical Marijuana?



- ▶ We need randomized controlled trials in children and adults.
- ▶ At this point, CBD or medical marijuana is **not** recommended for management of seizures

# History of Antiepileptic Drug Therapy

- ◆ 1857 – Bromides
  - ◆ 1912 – Phenobarbital
  - ◆ 1937 – Phenytoin
  - ◆ 1954 – Primidone
  - ◆ 1960 – Ethosuximide
- 

# Antiepileptic Drug Therapy

- ◆ 1974 – Carbamazepine
- ◆ 1978 – Valproate
- ◆ 1991 – Clobazam
- ◆ 1993 – Gabapentin
- ◆ 1995 – Lamotrigine
- ◆ 1997 – Topiramate
- ◆ 1999 – Levetiracetam
- ◆ 2000 – Oxcarbazepine
- ◆ 2010 – **Lacosamide**
- ◆ 2011 – **Rufinamide** (*only for Lennox Gastaut syndrome*)
- ◆ 2012 – **Perampanel**

# Antiepileptic Drugs for which we measure serum concentrations

**Carbamazepine**

**Phenytoin**

**Phenobarbital**

**Primidone**

**Valproic acid**

A landscape photograph of a beach at sunset or sunrise. The sky is a warm, hazy orange. In the background, a range of mountains is visible, with several prominent peaks. The middle ground shows a calm sea meeting a sandy beach. The foreground is dominated by dark, wet sand with intricate patterns of water and sand. The text "The End" is overlaid in the center in a white, sans-serif font.

The  
End