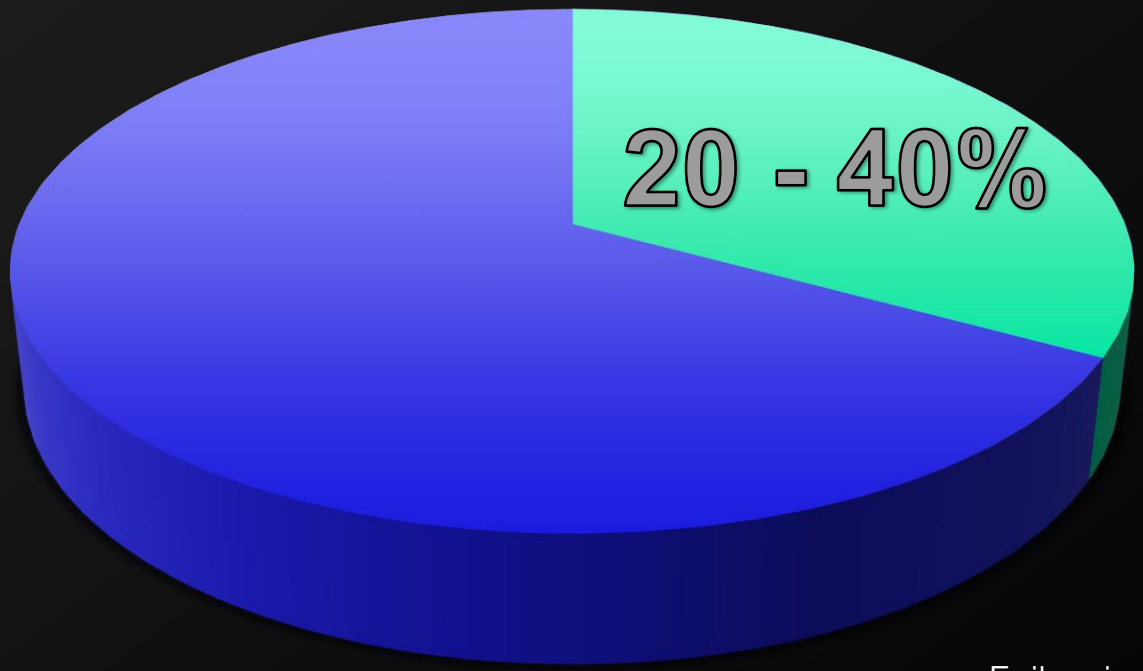
SEIZURES:

WHAT'S SHAKE'N?

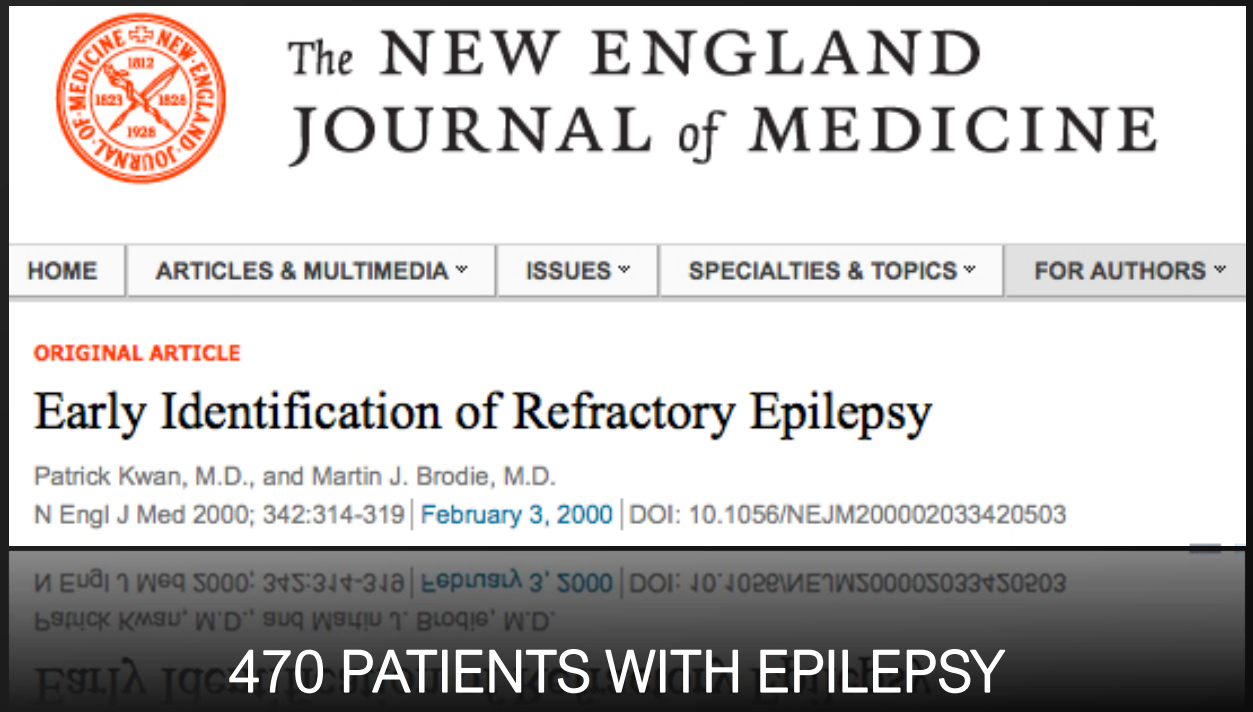
Dr Thomas F Minahan
Riverside County Regional Medical Center

- Epilepsy Prevalence:
  - 1:100

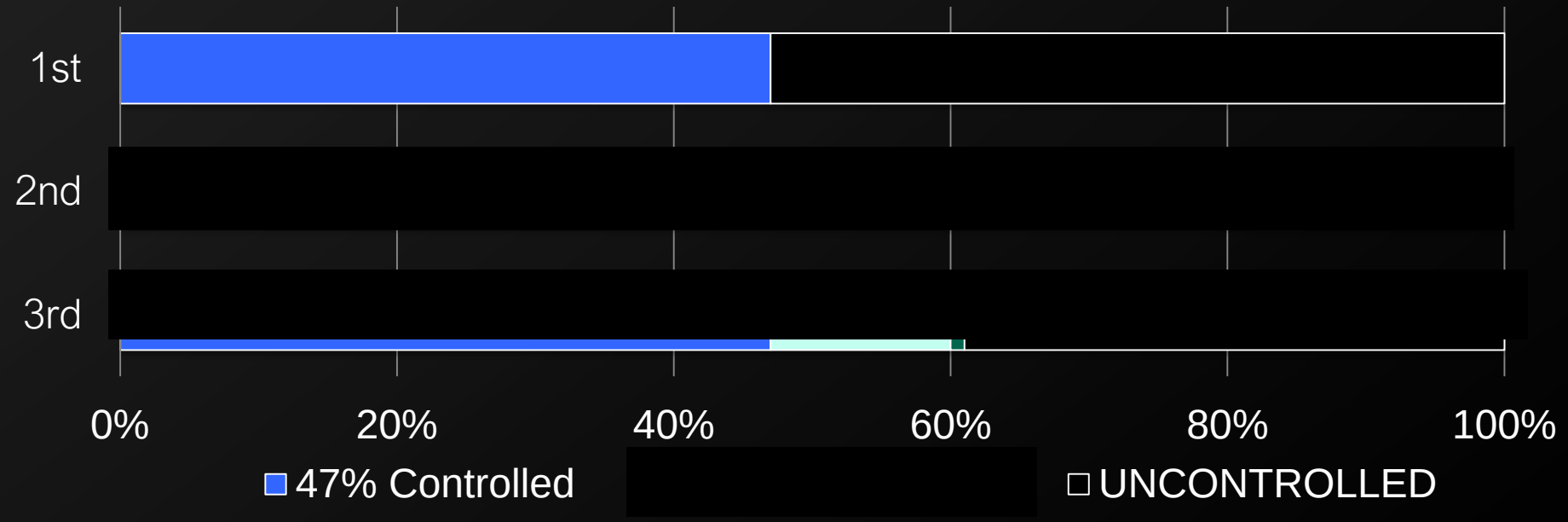
- Prevalence of **Refractory** Epilepsy



Epilepsy.com
Epilepsia. 2007;48 Suppl 1:3-7



470 PATIENTS WITH EPILEPSY



Objectives

- Not all shaking is a seizure
- Not all seizures shake
- Consider the cardiac differential
- How to detect a Pseudo-Seizure

SEIZURES:

WHAT'S SHAKE'N?

Thomas F Minahan, DO, FACOEP

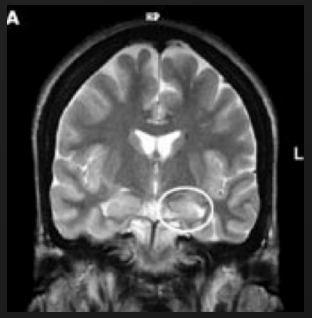
SEIZURE: follow up from ER

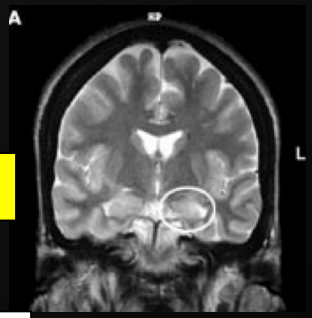
- New Onset Seizure
  - MRI
  - EEG
  - Who do we medicate?

MRI

COMMUNITY HOSP MRI

EPILEPSY PROTOCOL MRI





39%

50%

91%

NORMAL RADIOLOGIST

‘EXPERT’ RADIOLOGIST

2002, Journal Neurology Neurosurgery Psychiatry

EEG

- Routine EEG
  - Sensitivity 25-56%
  - Specificity 78-98%
- Healthy, no history of Sz
  - Adults: + 0.5%
  - Kids: + 2-4%

Journal of Neurology, Neurosurgery and Psychiatry, 2005
EEG in the diagnosis, classification, and management of patients with epilepsy

“First Seizure is FREE”

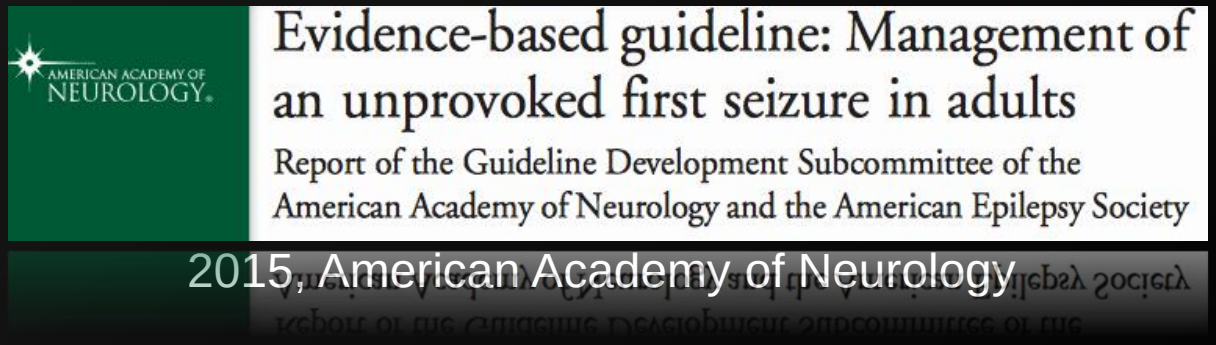
Medicate the first seizure?

Treat after the second?

70%

First Seizure: start medications?

Who to treat?	Odds Ratio
EEG abnormality	2.16 (95% CI 1.07–4.38)
MRI/CT abnormality	2.44 (95% CI 1.09–5.44)
Nocturnal	2.1 (95% CI 1.0–4.3)



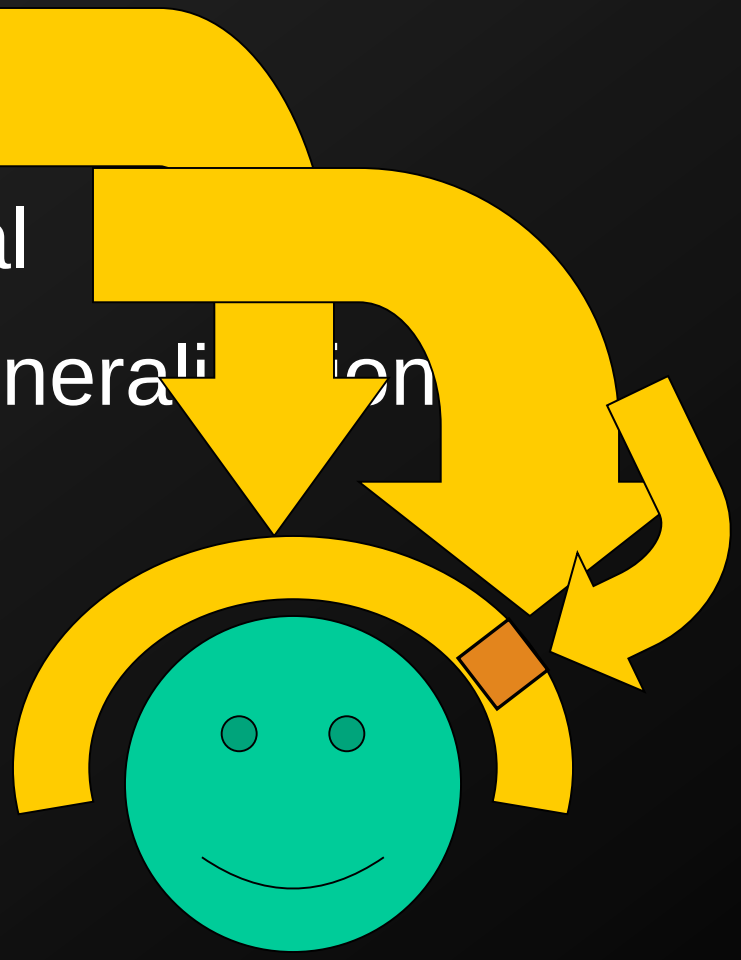
2015, American Academy of Neurology

Seizure Nomenclature

Generalized

Partial or Focal

Secondary Generalization



Convulsive Syncope

- Annals of Neurology

  Aug 1994

  - 59 healthy med students
  - Induced

  <u>90%</u> with motor activity
  (0.7 – 15.9 sec)

- Transfusion

  Dec 2001

  - 1921 blood donors
  - 12 with syncope

  <u>46%:</u> with motor activity

Convulsive Syncope

- Journal of the American College of Cardiology
  July 2002

  <u>15%</u> limb jerking

- Annals of Emergency Medicine
  July 2009

  Delay to diagnosis…… 2 ½ yrs (one 20)

Consider EKG in Sz workup

- Not all seizures shake
- Not all shaking is a seizure

Objectives

- Not all seizures shake
- Not all shaking is a seizure

EKG!

SEIZURE:

- Pseudo-Seizure
- Hysterical Seizure
- Non-Epileptic Seizure
- Psychogenic Non-Epileptic Seizure
- PNES

- NOT FAKING

Psychogenic Non-Epileptic Seizure

- Rule IN Seizure
- Heart Rate
  - 84%
  - >130 bpm

Seizure (35) 2016 (11-22)

Psychogenic Non-Epileptic Seizure

- Who?
  - Female
  - Onset 20-30's
  - 'No drugs work'
- Clinically?
  - Eyes closed
  - Not typical pattern
    - Opisthotonus
    - Bicycle
  - Someone around
  - > 5 minutes
- Afterward?
  - +urinate
  - +tongue bite
  - +trauma

Epilepsy and Behavior, 2017 (127-131)

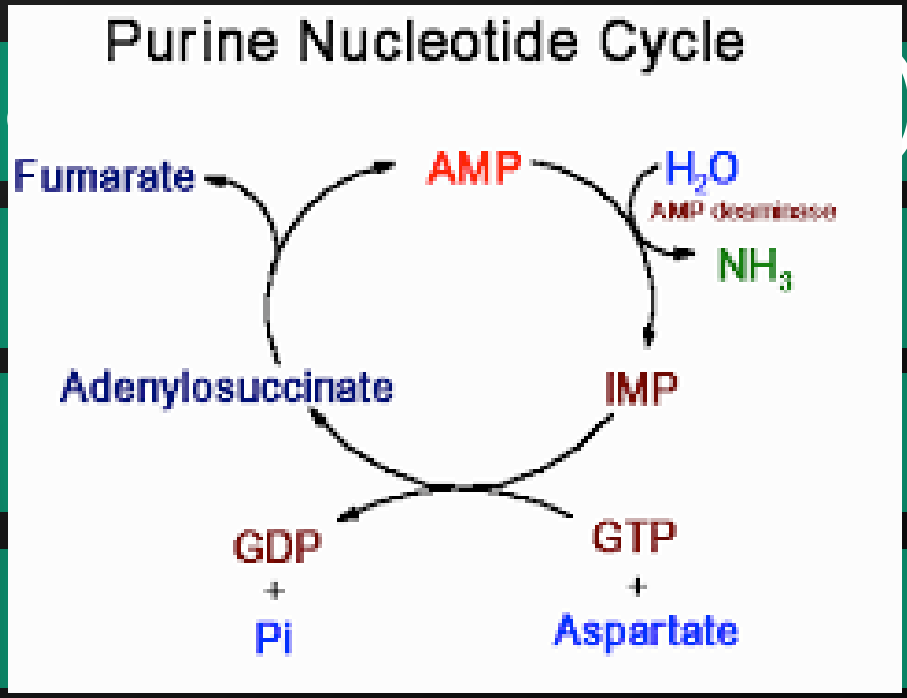
Psychogenic Non-Epileptic Seizure

- Rule **IN** Seizure
  - Biomarkers

Seizure (35) 2016 (11-22)

SEIZURE: Biomarkers

SENSITIVITY		SPECIFICITY
85%	L	88%
81%		98%
75%		86%
69%		93%
53%	Ammonia >65	90%



Seizure (35) 2016 (11-22); Epilepsia (57) 2016 (1221-1227); J of Neurology (262) 2015 (251-7)
Epilepsia (58) 2017 (132-5); Epilepy Behav (15:3) 2009 330-332; Epilepsy Behav (75) 2017 (13-17

Pseudo-Seizure / PNES

Average time to Dx?

7.2 years

Diagnostic delay in psychogenic nonepileptic seizures

Abstract—Delay to diagnosis was studied in 313 consecutive patients with psychogenic nonepileptic seizures (PNES). On average, patients with PNES were diagnosed 7.2 years after manifestation (SD 9.3 years). Younger age, interictal epileptiform potentials in the EEG, and anticonvulsant treatment were associated with longer delays. Other patient factors did not explain the great variability of the time to diagnosis, suggesting that physician factors contributed to delays.

NEUROLOGY 2002;58:493–495

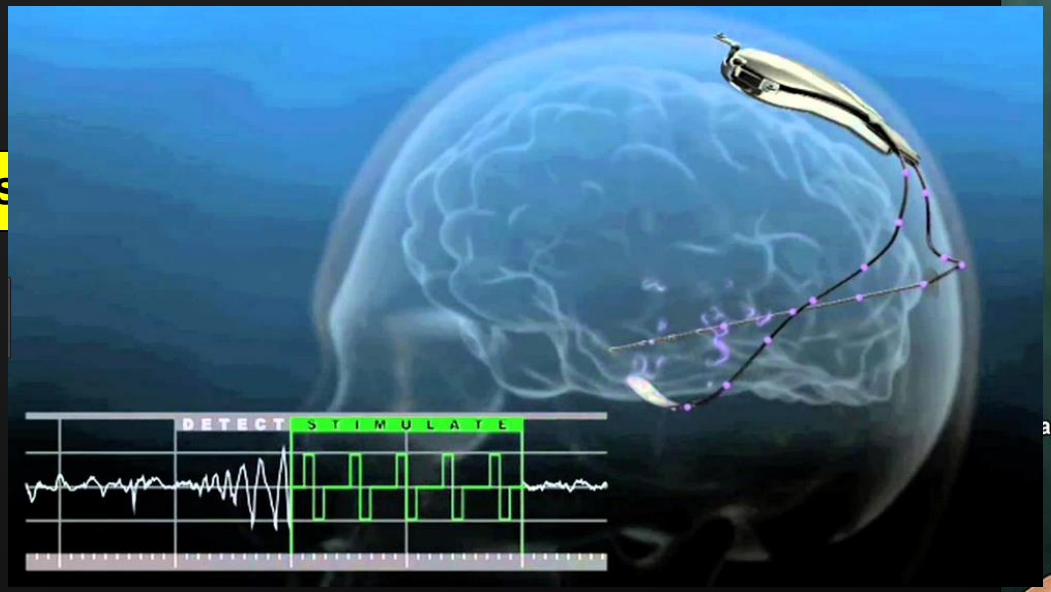
Pseudo-Seizure / PNES

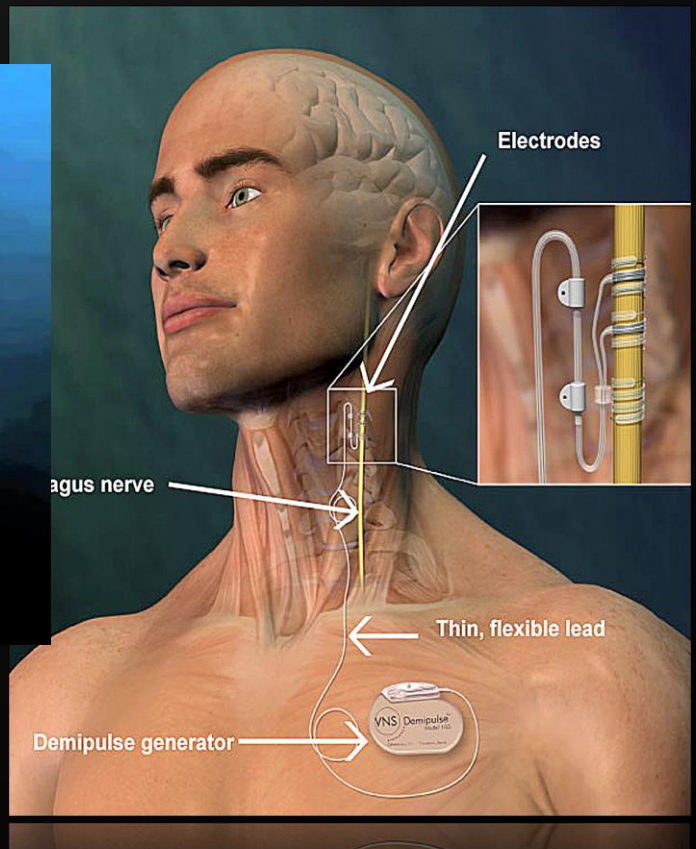
- Don’t start medications
- Psychologist/psychiatrist
- Family video seizure?
- Video EEG

Epilepsy: 1/3 are refractory to meds

- Non-Medicinal Treatments
  - Neuropace
  - Vagal Nerve Stimulator

30 s





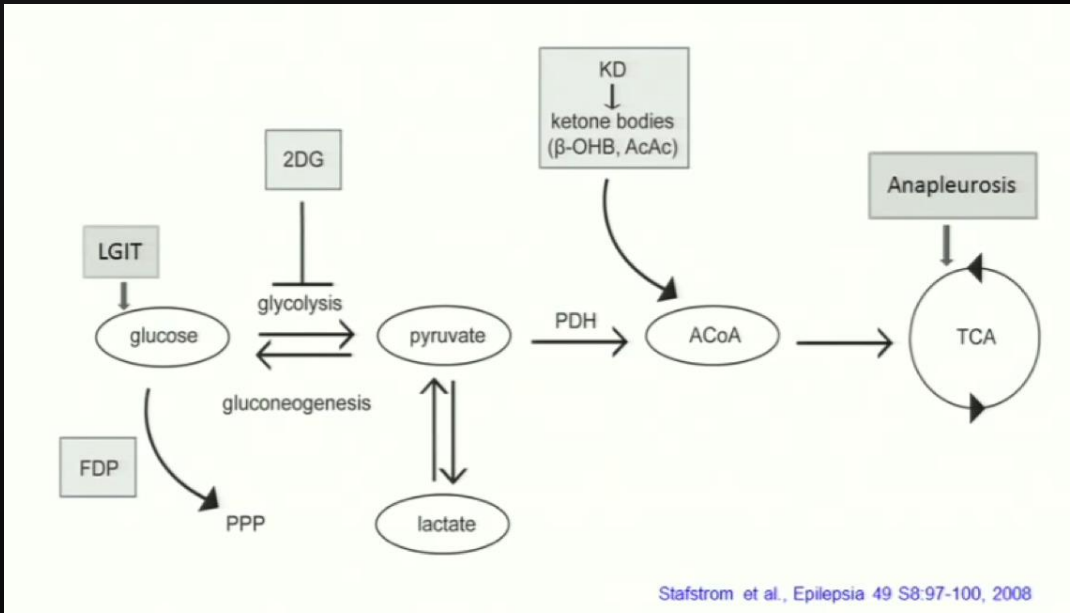
Epilepsy: 1/3 are refractory to meds

- Non-Medicinal Treatments
  - Neuropace
  - Vagal Nerve Stimulator
  - Surgery
    - *After 2-3 failed medications*
    - *CURE!*
  - Diet?
    - *After 2-3 failed medications*
    - *CURE!*

Ketogenic Diet

- 4 gm fat : 1 gm protein/carb
- “Adkins diet on steroids”
- Wean off diet after 2 years
- CURE 15-25%...50% with 50% improvement

- Charlie Foundation
- Diets:
  - K.D.
  - MAD
  - MCT
  - LGI



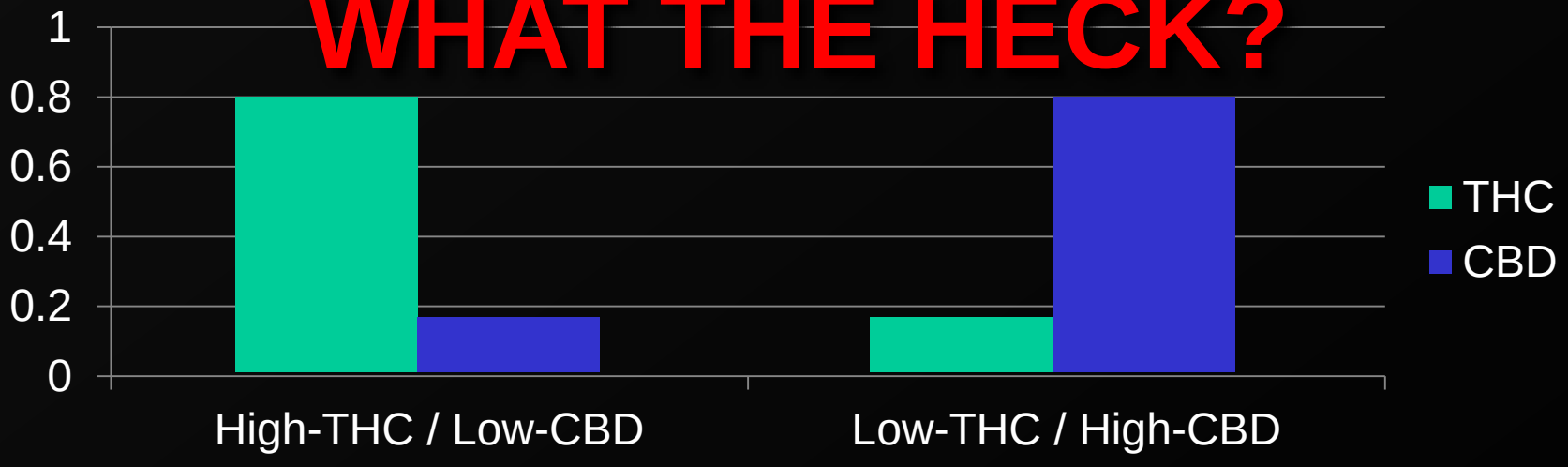
Medications…but 1/3 of patients

- Non-Medicinal Treatments
  - Neuropace
  - Vagal Nerve Stimulator
  - Surgery
    - *CURE!*
  - Diet
    - *CURE!*
  - CBD oil (Marijuana)

SEIZURE TREATMENT

Marijuana 5 y/o Charlotte Figi, 300 sz/wk

WHAT THE HECK?



Schedule I: THC, Heroin, Ecstasy
Epidiolex

……Felbatol (Felbamate)

Not all seizures shake

Not all shaking is a seizure

Consider starting meds after 1st seizure

- EEG
- CT/MRI
- Nocturnal

How to detect a Pseudo-Seizure

- Heart Rate
- Clinically
- Biomarkers

Surgery – CURE

DIET - CURE

Questions?

Dr Thomas F Minahan
Riverside County Regional Medical Center

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