

# Management of Patients with Epilepsy

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# Topics for Discussion

- How to evaluate new onset seizures
  - Electrophysiology
  - Neuroimaging
- When to begin antiepileptic drugs (AEDs)
- Which AEDs to use
  - Established AEDs
  - Newer AEDs
- When to taper and withdrawal AEDs
- When to consider epilepsy surgery
- When to consider vagus nerve stimulation (VNS)

# Evaluation and Treatment of Epilepsy

- **Goal:** Maintenance of normal lifestyle by complete seizure control with no side effects (65% of patients with newly diagnosed epilepsy)
- Accurate classification of seizure type(s) and epilepsy syndrome
- Initiate AED therapy with first line monotherapy (47% become Sz-free)
- Switch to 2nd first line AED (13% become Sz-free)
- Consider (“synergistic”) dual AED therapy (only 3% become Sz-free)
- Consider resective epilepsy surgery (especially if HS or lesion present)
- Consider VNS if not a surgical candidate

Kwan & Brodie. NEJM 342:314-319, 2000

Brodie & Kwan. Neurology 58 (suppl 5):S2-S8, 2002

Kwan & Brodie. Seizure 11:77-84, 2002

# New Onset Episodic Events

- Is it epilepsy or not?
- Yes (recurrent, unprovoked seizures)
  - Classify seizure type (and epilepsy syndrome)
- No (Nonepileptic seizures [NES] or other episodic events)
  - Provoked seizures (alcohol withdrawal, hypotension, fever, etc.)
  - Psychogenic NES
  - Migraine equivalents
  - Vasovagal syncope and related conditions (arrhythmia, etc.)
  - Sleep disorders
  - Cerebrovascular events (TIA, etc.)

# Classify Seizure Type and Epileptic Syndrome

- History and physical examination
  - Accurate seizure description (often lacking)
  - Seizure “risk factors” (possible etiology of seizures)
  - Family history of epilepsy
  - Physical and neurological exam findings
- EEG
  - Helps differentiate partial vs primary generalized seizures
  - Routine EEG may be nondiagnostic
  - Video EEG monitoring may be necessary to establish diagnosis
- Neuroimaging
  - To rule out a structural process
  - MRI is the modality of choice
  - Routine MRI cannot detect HS or some cortical dysplasia

# When to Begin AEDs

- In USA, after the second seizure
  - Some patients (~ 15-30%) have only a single seizure
- Factors to consider
  - EEG shows epileptiform activity
  - MRI shows a structural lesion
  - Family history of epilepsy
  - Psychosocial factors

# Which AEDs to Use: Primary Generalized Epilepsy

## Drugs of choice

- Simple absence (CAE)
  - VPA
  - ESM
- GTCS
  - VPA
  - CBZ
  - PHT
- Mixed PGE
  - VPA

## Newer AEDs

- LTG
- TPM
- LEV
- ZNS

# Which AEDs to Use: Partial Seizures w/wo GTCS

## Drugs of choice

- CBZ
- PHT

## Second line AEDs

- VPA
- PB
- PRM

## Newer AEDs

- LTG
- TPM
- OXC
- LEV
- ZNS
- PGB
- LCM

## Second line AEDs

- GBP
- TGB



# When to Taper AEDs

- When patient is seizure-free for 1-2 years
  - Most studies are in children/adolescents
- Factors to consider
  - EEG shows epileptiform activity
  - MRI shows a structural lesion
  - Family history of epilepsy
  - Certain epileptic syndromes (JME, MTLE due to HS)
  - Psychosocial factors

# When to Consider Epilepsy Surgery

- Patient is considered **medically refractory** after he has failed 2 first line AEDs and 1 or 2 trials of dual AED therapy appropriate for his seizure type
- Patient has a surgically remediable (curable) cause of his epilepsy
  - Potentially malignant structural lesion (tumor, AVM)
  - Hippocampal sclerosis (HS)
  - Lesional epilepsy (especially, developmental anomaly, cortical dysplasia, cavernous angioma, DNT, ganglioglioma, gangliocytoma)

# When to Consider VNS

- Patient is **medically refractory** (by above definition) and is found **not** to be a surgical candidate after a thorough presurgical evaluation
- Patient is found to be a surgical candidate, but refuses epilepsy surgery
- Patient should be evaluated in a Comprehensive Epilepsy Program before placement of VNS

# Identification and Treatment of Refractory Epilepsy

- **Goal:** Maintenance of normal lifestyle by complete seizure control with no side effects (65% of patients with newly diagnosed epilepsy)
- Accurate classification of seizure type(s) and epilepsy syndrome
- Failure to respond to 1st AED (only 11% become Sz-free)
- Failure to respond to 2 first line AEDs (only 4% become Sz-free)
- Consider (“synergistic”) dual AED therapy (only 3% become Sz-free)
- Consider resective epilepsy surgery (especially if HS or lesion present)
- Consider VNS if not a surgical candidate

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# AED Acronyms

## Established AEDs

- Phenytoin (PHT)
- Carbamazepine (CBZ)
- Valproic acid (VPA)
- Phenobarbital (PB)
- Primidone (PRM)
- Ethosuximide (ESM)

## Newer AEDs

- Gabapentin (GBP)
- Lamotrigine (LTG)
- Topiramate (TPM)
- Tiagabine (TGB)
- Oxcarbazepine (OXC)
- Levetiracetam (LEV)
- Zonisamide (ZNS)
- Pregabalin (PGB)
- Lacosamide (LCM)