The stated goal of advocacy groups for patients with seizures, is to have the patient seizure free.

Management of Seizures
- When to pharmacologically manage seizures
- When to use other means
- When to passively manage seizures

Introductory remarks:
- Management of seizures is an elusive goal and humbling pursuit
  - Early experience
  - 15 yo presented in Oct 2008

The Plural of anecdote is not evidence

Management Options to prevent recurrence of Seizures
- 1) Anticonvulsant therapy – usually oral – must be taken several times per day for many years
  - Must take medications consistently
  - All drugs have adverse effects
  - Drugs acting on the CNS, may dull intellect
Management Options to prevent recurrence of Seizures

2) Surgical Options
- Irreversible
- Rarely cause complete cessation
- What to do if multiple foci

3) Vagal Nerve Stimulator
- Reversible
- Rarely cause complete cessation
- Side Effects are tolerable

4) Ketogenic Diet
- Reversible
- Hard to follow
- A single slip up can produce status

5) Intermittent oral or rectal Benzodiazepine
- Either: a reactive response to Seizure that has already occurred
- Or: prophylactic action to prevent possible seizure
- Serious issues with sedation

6) Counseling and education of family and caretakers
- Always necessary
- Sometimes it is the only management
- Useful helping parents in refractory epilepsy

Management of Seizures

- How important is it to manage seizures
  - Epileptic Encephalopathy - (anecdote)
  - School performance - (VNS patient)

- Do seizures cause damage to the brain, resulting in more seizures
  - Kindling theory of epilepsy
Management of Seizures

- Can seizures result in harm to patient
  - Driving, or any activity where sudden loss of consciousness may prove problematic
- SUDEP – hair samples show variable drug administration in some patients

Nomenclature

Epilepsy vs. Seizure Disorder

Epilepsy

- Definition of Epilepsy:
  - Recurrent unprovoked seizures
  - 2 or more seizures
  - What period of time
  - Convulsive seizures vs ?

- International League Against Epilepsy
  - Partial Seizures
  - Generalized Seizures
  - Unclassified

Partial Epilepsy

Simple Partial Seizure

Complex Partial Seizure

Partial with Secondary Generalization

Simple Partial Epilepsy
Simple Partial Epilepsy

Emotional and Other –
Simple partial seizures which arise in or near the temporal lobes often take the form of an odd experience.

One may see or hear things that are not there. One feels emotions, often fear, but sometimes sadness, anger, or joy.

There may be a bad smell or a bad taste, a funny feeling in the pit of the stomach or a choking sensation.

These seizures are sometimes called simple partial seizures of temporal lobe origin or temporal lobe auras.

Simple Partial Epilepsy

Motor

Other simple partial seizures include (clonic, jerking) convulsive movements.

Jerking typically begins in one area of the body – the face, arm, leg, or trunk – and may spread to other parts of the body.

Complex Partial Epilepsy

Sensory Seizures –

Some simple partial seizures consist of a sensory experience.

The person may see lights, hear a buzzing sound, or feel tingling or numbness in a part of the body.

These seizures are sometimes called Jacksonian sensory seizures.

Complex Partial Epilepsy

Complex Partial Seizures involve change in consciousness:

These seizures usually start in a small area of the temporal lobe or frontal lobe of the brain.

They quickly involve other areas of the brain that affect alertness and awareness.

So even though the person’s eyes are open and they may make movements that seem to have a purpose, in reality “nobody’s home.”

If the symptoms are subtle, other people may think the person is just daydreaming.

Complex Partial Epilepsy

A complex partial seizure does not involve convulsions but consciousness is impaired.

Someone experiencing one will no longer respond to questions after the seizure starts.
Complex Partial Epilepsy

- A complex partial seizure often begins with a blank look or empty stare.
- They will appear unaware of their surroundings and may seem dazed.
- The seizure may progress to include chewing movements, uncoordinated activity, or sometimes performing meaningless bits of behaviour which appear random and clumsy.
- These automatisms may include actions such as picking at their clothes, trying to remove them, walking about aimlessly, picking up things, or mumbling.
- Someone experiencing a complex partial seizure may become frightened and try to run and struggle. Following the seizure, there will be no memory of it.

Partial Epilepsy with Secondary Generalization

- secondary generalization may be the most striking feature to the family,
- the partial onset of these seizures that matter most to the clinician.
- A “Jacksonian march” is the label given to a seizure which spreads along the cortex with resultant spread of the clinical seizure along one hemisphere

Generalized Epilepsy

- Absence
- Tonic
- Clonic
- Tonic/Clonic
- Atonic
- Infantile Spasms
- Lennox Gastaut
- Myoclonic
Generalized Epilepsy

- Tonic
- Clonic
- T/C

Idiopathic generalized epilepsy:

Recurrent generalized seizures in the absence of detectable brain lesions or metabolic abnormalities.

There are EEG changes of generalized, symmetrical, bilateral synchronous discharges.

Syndromes of IGE

- Childhood absence epilepsy
- Juvenile absence epilepsy
- Juvenile myoclonic epilepsy
- Others

Childhood Absence Epilepsy:

Ca++ channel disorder with one type of abnormality known to arise from more than 20 known mutations

Onset between 4-10 years

Staring spells, may have automatisms

May have hundreds of seizures per day

Seizures thought to arise in the Thalamus

Localization related Epilepsy

Partial epilepsy with secondary generalization

May arise in setting of structural abnormality

Likely refractory to anticonvulsants

(2 yo old who required resection)

Some genetic causes exist
Benign Epilepsy with Central Temporal Spikes

- Starts age 4-12, usually stops age 14-18
- EEG abnormality over the central sulcus
- Seizures are often simple partial involving the face
- Seizures usually occur at night

1988 Aicardi published this article in Dev Med & Child Neurology Vol 30 Issue 4 pp 429-440

6 steps to consider in managing epilepsy

1. Pick a first line anticonvulsant – manufacturer recommended dosing (carbamazepine or Valproate)
2. Push dose to maximum tolerated dose – that level at which acceptable side effects are noted
3. Lower dose; and add second first line drug
4. Push both to toxicity
5. Continue two drugs, consider switching medications use other first line anticonvulsants/ add a benzodiazepine
6. Refer for seizure surgery
Use of Anticonvulsants

5. Continue two drugs, consider switching medications use other first line anticonvulsants/ add a benzodiazepine

6. Refer for seizure surgery

Use of Anticonvulsants

<table>
<thead>
<tr>
<th>Commonly used anticonvulsants</th>
<th>Related information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamotrigine</td>
<td>Hepatic dysfunction</td>
</tr>
<tr>
<td>Levetiracetam</td>
<td>Hepatic dysfunction</td>
</tr>
<tr>
<td>Topiramate</td>
<td>Renal toxicity, nausea, vomiting</td>
</tr>
<tr>
<td>Placebo</td>
<td>No adverse effects</td>
</tr>
<tr>
<td>Valproic acid</td>
<td>No adverse effects</td>
</tr>
</tbody>
</table>

Refills and instructions about continued use of medications:
- Refill as prescribed
- Refills may be necessary
- Be sure to refill medications

Special Problems in Epilepsy

- Refill of anticonvulsants when you did not initiate therapy
  - Refill please – seizures can be severe

- Travelling with children with epilepsy
  - Where are the medications
  - Getting stuck somewhere
  - Rosman’s idea of Valium

- Importance of routine
  - Sleep
  - Meds on time
### Living Well with Epilepsy
- Enhance professional education on seizures and epilepsy, particularly to primary care providers and health professionals in training
- Improve understanding of seizures and epilepsy and best practices for management including referral to tertiary level of care, particularly for primary care providers

### Community Approach to Epilepsy
- Develop Tertiary Centers for epilepsy referral
  - Teaching and research
- Communicate with Primary Care Providers
  - Two important roles
    - Manage new onset Epilepsy
    - Manage drug resistant Epilepsy

### New Research Ideas
- Deep brain stimulation for management of Epilepsy
- VNS like device to monitor seizure occurrence
- Effects on cognition of better seizure control