Epilepsy
Hailey Scofield and Lindsay Kuhn

Symptoms

Aura: Described as a sensory abnormality by those who experience them, such as olfactory, visual, or a visceral sensation. Usually the result of a charge build-up in a focal point in the brain, priming the discharge of multiple action potentials across the entire neural network.

Seizure Event: Can range from mild 10 second absence seizures, to 3 minute grand mal, to life threatening status epilepticus, a seizure that does not stop on its own.

Postictal Period: A time when the patient is disoriented, lacks auditory comprehension and acts in a manner uncharacteristic of the individual’s personality. Many patients sleep during this time. May last seconds or hours, depending on the type of seizure and individual differences and areas of the brain affected by electrical discharge.

Seizure Onset and Cause

Abnormal AP firing and synaptic signals

Hyperexcitability and Hypersynchrony of neurons

Dysregulation of Glial function

Many factors can contribute to the onset of seizures. The most common is high fever, and next is concussion or traumatic brain injury. Early epilepsy can trigger brain synapses and contribute to the likelihood of future events. Early treatment is critical for success.

Seizure Categories:

Non-Epileptic
Febrile
Generalized
Partial

Did you know? You can have two seizures in your lifetime before you qualify for an epilepsy diagnosis.
Seizure Types
- Petite Mal (Absence)
- Simple Partial
- Complex Partial
- Myoclonic
- Tonic
- Atonic (Drop)
- Grand Mal (Tonic Clonic)

Diagnostics
The Electroencephalogram (EEG) Types:
- Short Term Sleep
- 24 Hour
- Video Telemetry
- MRI & PET Scan

Non-invasive scans are useful for determining pathological causes of abnormal electrical activity in the brain. These could include tumors, legions, malformations, or atrophy.

Treatments
Treatments range from invasive and life altering, to simply popping a pill on a regular schedule.

Invasive
- Surgery
- Vagus Nerve Stimulator (VNS)
- Responsive Neurostimulation (RNS)
- Thermal Ablation

Non-Invasive
- Antiepileptic drugs, diet changes

Living Life with Epilepsy
Many who are diagnosed go on to live a fairly normal life as long as they take care of seizure triggers such as:
- Maintaining their medications, avoiding missed doses
- Getting enough sleep
- Avoiding strobile lights
- Eating a balanced diet
- Avoiding alcohol and illicit drug use

Science continues to make breakthroughs in this field, and it is exciting to see the expansion of possible therapies for those who are refractory to traditional treatments.
An Average Keto Meal

Magnetic Resonance Imaging and PET Scan

Non invasive scans are useful for determining pathological causes of abnormal electrical activity in the brain. These include tumors, lesions, malformations, or atrophy.

MRI scans are able to give a slice of brain layers, like this coronal view showing left hippocampus.

PET scans utilize a dye that allows active regions to light up in colors.

Treatments Continued

Non invasive:

Antiepileptic Drugs (AED): From Phenobarbitol to the latest drugs being trialed, research has aided development of multiple AED’s for patients to try. There is still approximately 30% of the epileptic population who are refractory to drugs, and they have limited options beyond surgery or dietary intervention.

Cannabidiol (CBD Oil): This is the taboo topic lately on all epilepsy group pages, but has gained popularity now that Phase 2 and 3 trials have begun. Preliminary data support a role in treating refractory epilepsy, which is a breath of fresh air for those who are desperate for seizure control.

The Ketogenic Diet: This high fat, low protein, low carbohydrate diet existed for thousands of years, based on the idea of fasting or eliminated seizure activity. The diet is difficult for the average person to maintain, and has side effects making it necessary to modify, whether in order to avoid complications such as kidney failure and stunted growth.