

ALL ABOUT EPILEPSY

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Jaime Sagona, M.A.

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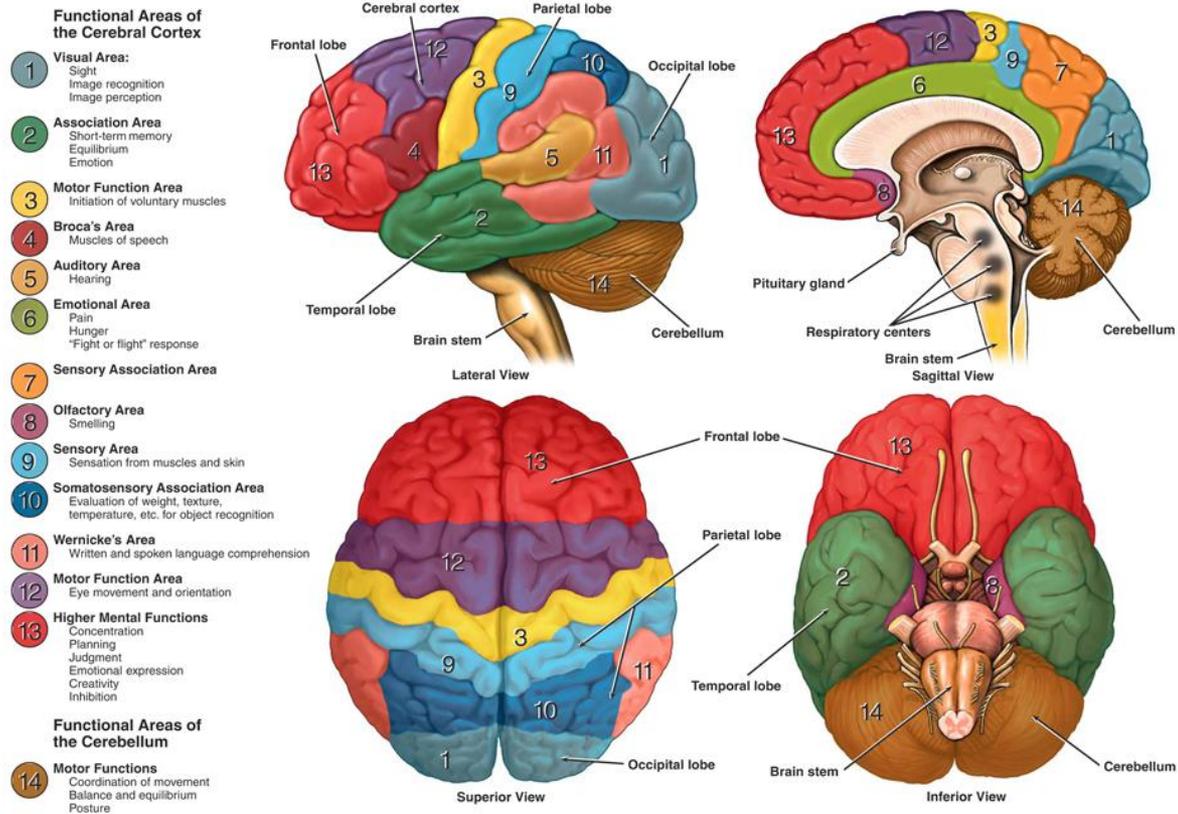
Kimberley Spire-Oh, Esq.

The Brain

- The brain is the center that controls and regulates all voluntary and involuntary responses in the body.
- It consists of nerve cells, also known as neurons, that communicate with each other through electrical activity.

Brain Anatomy and Function

Anatomy and Functional Areas of the Brain



What is a Seizure

- A seizure occurs when neurons in the brain create abnormally increased electrical activity that temporarily interrupts normal electrical brain function.
- If the seizure spreads through the entire brain, many brain functions may be involved. This is called a generalized seizure.
- If electrical activity is localized or isolated to a specific area of the brain. That is called a focal seizure.
- <http://www.youtube.com/watch?v=3QLkgA08elc>

What is Epilepsy

- There are many variations of epilepsy, depending on age of onset, seizure type(s), family history, and neurological history, among other factors.
- The seizures may result from a hereditary tendency or a brain injury, but often the cause is unknown.
- Many use the term “seizure disorder” instead of epilepsy because “epilepsy” seems more serious or stigmatizing. However, almost all seizure disorders are epilepsy.
- Epilepsy can develop at any age and can be a result of genetics, stroke, head injury, and many other factors.

What is Epilepsy

- Epilepsy is a seizure disorder.
- A person with epilepsy has had two or more unprovoked seizures, regardless of seizure type.
- Unprovoked means that the seizures are not brought on by a cause such as alcohol withdrawal, heart problems, or extremely low blood sugar.

Causes of Epilepsy

Epilepsy has no identifiable cause in about half of those who have the condition.

In the other half, it may be traced to various factors.

- Genetic Influence
- Developmental Disorders
- Prenatal Injury
- Head Trauma
- Medical Disorders
- Dementia
- Diseases
- Recent research has found a link to calcium channelopathies

Person First Language for Epilepsy

- A person who has epilepsy
- People with seizure disorders

NOT

- An epileptic
- A victim of epilepsy



Famous People with Epilepsy

- * Socrates * Vincent Van Gogh * Charles Dickens
- * Danny Glover * Edgar Allen Poe * Lil' Wayne
- * Bud Abbott * Teddy Roosevelt * Neil Young
- * Richard Burton * Lewis Carroll
- * Justice John Roberts * George Gershwin
- * Prince * Florence Griffith Joyner * Napoleon I
- * Tiki Barber * Julius Caesar * Ronde Barber
- * Fyodor Dostovsky * Harriett Tubman

Statistics

- Epilepsy affects over 3 million Americans of all ages - more than Multiple Sclerosis, Cerebral Palsy, Muscular Dystrophy, and Parkinson's Disease combined.
- In America, Epilepsy is as common as Breast Cancer, and takes as many lives.

Statistics

- Epilepsy affects 50,000,000 people worldwide.
- One in 10 people will experience a seizure in their lifetime.
- One in every 100 people will develop Epilepsy.

Statistics

- Almost 500 new cases of Epilepsy are diagnosed every day in the United States.
- This year another 200,000 people in the U.S. will be diagnosed with Epilepsy.
- Of that number 45,000 will be children under the age of 15.

Statistics

- In two-thirds of patients diagnosed with Epilepsy, the cause is unknown.
- In over 30% of patients, seizures cannot be controlled with treatment.

Statistics

- Uncontrolled seizures may lead to brain damage and death.
- Up to 50,000 Americans die each year from seizures and related causes.
- The mortality rate among people with Epilepsy is two to three times higher than the general public.

Statistics

- Epilepsy results in an estimated annual cost of \$15.5 billion in medical costs and lost or reduced earnings.
- Historically, epilepsy research has been under-funded. Each year the National Institute of Health spends \$30 billion on medical research, but just $\frac{1}{2}$ of 1% is spent on epilepsy.

Types of Seizures

- There are over 40 different types of seizures.
- Seizures are classified into two main types: **generalized** and **partial (focal)**.
- The difference between the two main seizure types is in how they begin.
- If the electrical discharge is throughout the entire brain at once, then it is a generalized seizure.
- If the electrical discharge in the brain is isolated to one area, then it is a partial seizure.

Auras

- An aura is a distinctive feeling or some other indication that a seizure is about to occur.
- Auras vary significantly between different people.
- Not every person with epilepsy will experience an aura before a seizure.

Generalized Seizures

- Generalized seizures appear to start in all parts of the brain simultaneously and have no identifiable onset.
- Many generalized seizures start and spread so quickly it is impossible to identify the source.

Types of Generalized Seizures

- Tonic seizures
- Clonic seizures
- Tonic-clonic seizures (formerly known as grand mal seizures)
- Absence seizures (formerly known as petit mal seizures)
- Myoclonic seizures
- Atonic seizures (drop attacks)

Tonic Seizures/ Tonic Phase

- During a tonic seizure, the person's muscles initially stiffen and they lose consciousness. The person's eyes roll back into their head as their muscles contract and the back arches. As the chest muscles tighten, it may become harder for the person to breathe. The lips and face may take on a bluish hue, and the person may begin to make gargling noises.
- Many observers have the misconception that the person is in danger of "swallowing their tongue," so they attempt to put something in the person's mouth.
- Swallowing your tongue is actually impossible, and any attempt to open the tightly clenched jaw may cause more harm than good.

Clonic Seizures/Clonic Phase

- During a clonic seizure, a person's muscles begin to spasm and jerk. The elbows, legs and head will flex, and then relax rapidly at first, but then the frequency of the spasms will gradually subside until they cease altogether.
- It is common for a person to let out a deep sigh, after which normal breathing resumes.
- A tonic seizure is typically accompanied by a clonic seizure. It is rare to experience one without the other. When both are experienced at the same time, this is called a tonic-clonic seizure.

Tonic-Clonic Seizures

- Tonic-clonic seizures can be one of the most shocking seizures to observe. There are two parts to a tonic-clonic seizure. The tonic phase and the clonic phase.

Tonic-Clonic Seizures

- After a person transitions from tonic to the clonic phase to the post-seizure period, they'll likely remain unconscious for a few minutes or more, depending on the severity of the seizure.
- During this time, the brain is extremely active trying to stop the cells from firing to bring the seizure under control.
- When the person wakes up, they may have sore muscles and be tired or confused. The best thing to do is to be assuring and supportive.

Atonic Seizures

- Also known as Drop Attacks or Drop Seizures
- Atonic seizures cause the muscles to go limp.
- The patient's body may slump or crumple to the ground, possibly causing injury.
- <http://www.youtube.com/watch?v=9obFVWW47NE>
- <http://www.youtube.com/watch?v=YdZw9uNQ8k>

Myoclonic Seizures

- Myoclonic seizures result in an increase in muscle tone.
- Patients having myoclonic seizures typically react as if hit from a single jolt of electricity.
- Any part of the body may stiffen, giving a rapid jerking motion.
- The area of the brain stem responsible for increasing and decreasing muscle tone are close together- meaning atonic and myoclonic seizures probably begin in the same place.
- Patients experiencing sudden dramatic changes in muscle tone can often have both types of seizures.
- <http://www.youtube.com/watch?v=zPNVYFRhthg>
- <http://www.youtube.com/watch?v=VC6HJPZr1VU>

Absence Seizures

- An absence seizure is a very uncommon seizure that begins suddenly and occurs without any warning signs.
- People experiencing absence seizures typically appear to stare without moving.
- Usually lasting less than 15 seconds, absence seizures can occur many times a day and may be mistaken for day dreaming.
- <http://www.youtube.com/watch?v=mWK-ogwrjz0>
- <http://www.youtube.com/watch?v=9HIKwTm755o>
- While the people may not remember what happened during the seizure, they'll typically return to being instantly alert as soon as the seizure is finished.

Partial (Focal) Seizures

- Partial (focal) seizures refer to seizures beginning in one area of the brain.
- By observing which area of the body is affected by the seizure, doctors can identify where in the brain the seizure occurred.
- There are two types of Partial Seizures: Complex Partial Seizures and Simple Partial Seizures.

Types of Partial Seizures

- Complex Partial Seizures- consciousness is impaired or lost.
- Simple Partial Seizures- consciousness is retained.

Complex Partial Seizures

- Seizures originating in one area of the brain that affect consciousness.
- <http://www.youtube.com/watch?v=vvG5wY0LgJg>
- <http://www.youtube.com/watch?v=uQWk5Ur5kD8>
- <http://www.youtube.com/watch?v=N34Un6uYejU>

Possible Symptoms of Complex Partial Seizures

- Last 1 to 2 minutes
- May have an aura
- Automatism (such as lip smacking, picking at clothes, fumbling)
- Unaware of environment
- May wander
- May have amnesia of seizure events
- Mild to moderate confusion during
- Sleepy after

Simple Partial Seizures

- Seizure occurs in one area of the brain. May spread to other areas.
- Consciousness is not lost during a simple partial seizure.
- Doctors typically organize them into four areas, depending on the location in the brain and parts of body affected.
- Motor, Sensory, Autonomic, Psychic
- http://www.youtube.com/watch?v=X3_pv6us8A0
- http://www.youtube.com/watch?v=rtjPs_B99Bo

Motor Simple Partial Seizures

- A simple partial seizure with motor symptoms will affect muscle activity, causing jerking movements of the foot, face, arm, or other part of the body.

Sensory Simple Partial Seizure

- A simple partial seizure with sensory symptoms affect the senses.
- For example: hearing, seeing, feeling, tasting, smelling things that are not there. Possible hallucinations, and other distortions.

Autonomic Simple Partial Seizure

- A simple partial seizure with autonomic symptoms affects the part of the brain responsible for involuntary functions.
- It may cause changes in blood pressure, heart rhythm, bowel function, etc.

Psychic Simple Partial Seizure

- A simple partial seizure with psychic symptoms affects parts of the brain that trigger emotions or previous experiences.
- It may cause feelings of fear, anxiety, joy, déjà vu, jamais vu, etc

Multi-Seizure Types & Morphing

- People can have more than one seizure type.
- The type of seizures that people can have can also change. This is called morphing.
- Examples: partial to generalized, generalized to partial (rare), two types of partial, two types of generalized, etc.

Reflex Epilepsies

- Reflex Epilepsies are a group of epilepsies in which seizures are brought on by a certain stimulus.
- A stimulus could be a sound, type of light, an action (like reading), or even thinking about a topic.
- Example: Photosensitive epilepsy

Co-Existing Disorders

- Developmental Disorders
- Metabolic Disorders
- Migraine
- Pulmonary Disorders
- Renal Disorders
- Sleep Disorders
- Infantile Spasms
- Lennox- Gastaut Syndrome

Women and Epilepsy

- The hormones estrogen and progesterone may influence seizure occurrence in women.
- **Catamenial epilepsy:** type of epilepsy that has tendency for increased seizures related to the menstrual cycle.
- Women with epilepsy can have healthy pregnancies, but planning ahead is important.
- Some anti-seizure medications can cause risk to the fetus. It is important to work with your doctor to determine a plan of treatment for pregnancy before you get pregnant.

Headaches & Migraines and Epilepsy

- Ictal headaches are headaches that occur before or after a seizure. Or in rare occurrences during a seizure.
- People with epilepsy have a higher risk for migraines.
- A new study showed a genetic link between epilepsy and migraines.
- People with a strong family history of epilepsy have a strong risk factor for migraines.

Autism and Epilepsy

- New research has shown that adults with epilepsy are more likely to have a greater number of characteristics of autism and Asperger's.
- The scientists found that seizures interfere with neurological function that affects social functioning in the brain--causing the similar characteristics to autism.

Autism and Epilepsy

- It is estimated that as many as 1/3 of individuals with an autism spectrum disorder also have epilepsy.
- Experts propose that some of the brain abnormalities associated with autism may contribute to seizures.

Autism and Epilepsy

- Silently Seizing by Caren Haines R.N. discusses unrecognized seizures and their damaging impact on individuals on the autism spectrum.
- Many children with autism do not receive effective treatment because the epilepsy element is not addressed.
- Measurable gains have been seen for children when treated early for epilepsy.

Depression and Epilepsy

- People with epilepsy may be more likely than other people to experience emotional changes.
- Depression and mood changes can occur before, during, or after a seizure.
- People with a history of depression have a 3 to 7 times higher risk of developing epilepsy.
- There is a higher incidence of depression in people with epilepsy than in the general population or in individuals with other chronic conditions, such as diabetes.

Cognition and Epilepsy

- Cognitive impairment can be associated with chronic epilepsy.
- In adults this can include mental slowness, memory difficulties, and attention deficits.
- In children this include language problems, learning difficulties, poor academic outcome, and behavior problems.

Mortality and Epilepsy

- Epilepsy occasionally can be fatal.
- This uncomfortable truth often is hidden or ignored because it is relatively rare and so hard to discuss.
- Overall, epilepsy increases the risk of dying by between 1.6 and 3 times that of the general population.
- Types of Conditions Causing Increased Mortality in Epilepsy
 - 1. Ordinary mortality from usual causes of death.
 - 2. Death due to the illness that is causing the epilepsy.
 - 3. Death from associated conditions, such as depression.
 - 4. Trauma or drowning from seizures.
 - 5. SUDEP: Sudden Unexpected Death in Epilepsy

Education and Epilepsy

- Schools are required by law to provide accommodations and supports for students with epilepsy when needed.
- 504 Plans can provide accommodations that allow students to access all aspects of their education.
- Under the Individuals with Disabilities in Education Act (IDEA), IEPs may be granted to students from pre-K to grade 12, usually under an OHI eligibility, to provide services and accommodations for students whose epilepsy impacts their education.

Examples of Accommodations and Services for Students with Epilepsy

- Individualized Healthcare Plan: detailed plan for school staff and school nurse to assist student during seizures and handle other medical affects of epilepsy at school.
- Supervision to assist with moving around school safely.
- Allowing assistance animals in the school.
- Specialized instruction to address cognitive effects of epilepsy and anti-epileptic drugs.
- Adjusted schedule to reduce stress and exhaustion from medication or seizure activity.

Higher Education and Epilepsy

- The IDEA does not cover students in university or post-high school work, but Section 504 and the ADA do.
- Students in higher education may obtain accommodations by making their school and instructors aware of their epilepsy, providing medical documentation, and specifically requesting accommodations in each class where it is needed.
- Most colleges/universities have ADA offices that help coordinate accommodations.

Discrimination

- The **Americans with Disabilities Act (ADA)**, **Section 504 of the Rehabilitation Act**, and the **Fair Housing Act** protect individuals with epilepsy from discrimination on the basis of their disability.
- This covers discrimination in the school, in the workplace, in government services, in housing, and in public accommodations (public businesses).

Epilepsy in the Workplace

- In addition to being protected from discrimination, workers with epilepsy are entitled by law to request **accommodations** that will enable them to perform their job. However, they must be **otherwise qualified** for the job. As long as the accommodation is **reasonable** and **does not cause undue burden** on the employer, it should be granted.
- There are limits to the questions employers are allowed to ask during the interview process, and all must be related in some way to the ability of the candidate to perform the job.
- Employees with epilepsy do not have to disclose their diagnosis unless they are using it as the basis to request an accommodation. There are pros and cons to disclosing and to keeping your condition secret.
- Employers must keep employee health information that is disclosed confidential and only make it available to staff who need to know.

Examples of Workplace Accommodations for Epilepsy

- Adjusted work schedule to prevent fatigue.
- Avoiding the use of ladders, tasks involving climbing, etc. when those are not major job duties for the position.
- Providing a checklist for tasks.
- Bringing an assistance animal to work.
- Providing transportation to off-site meetings if the employee cannot drive.

Triggers or What to Avoid

- Sleep Deprivation
- Missing Medication
- Alcohol
- Antihistamines and Decongestants
- Caffeine
- Stress
- Some Antibiotics and herbal supplements
- Strobe Lights

Keeping a journal to identify triggers can be helpful.

So You Think You or Someone You Know Is Having Seizures, but they haven't been diagnosed...What's Next?

- Document when you observe the seizure/spell.
- What is happening? What are you observing?
- Trust your gut
- Be vigilant
- Be persistent. If your doctor cannot answer your questions about what is happening and why, seek a second or third opinion.

Living with Epilepsy

- Dealing with lack of public knowledge/stigma
- Establishing routines and learning to avoid triggers
- Dealing with the side effects of epilepsy treatments
- Adaptations and coping mechanisms for some of the limitations

Epilepsy Organizations

- Epilepsy Foundation
- Epilepsy Foundation: Florida
- Epilepsy Association of Central Florida
- CURE: Citizens United for Research in Epilepsy
- FACES: Finding a Cure for Epilepsy and Seizures
- Epilepsy Society-UK

Resource Websites

- <http://www.epilepsy.com/>
- <http://epilepsyu.com/>
- <http://www.epilepsysociety.org.uk/>
- Epilepsy Foundation of Florida,
<http://www.efof.org/>
- The Anti-Epilepsy Drug Registry,
<http://www2.massgeneral.org/aed/>
- EEOC page on Epilepsy in the Workplace,
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Contact Information

If you would like more information, please feel free to contact us:

Kimberley Spire-Oh, Esq.
4440 PGA Boulevard, Suite 600
Palm Beach Gardens, FL 33410
(561) 307-9620
kimberley@ksolawfirm.com

Jaime Sagona, M.A.
(407) 319-3049
Jaime.sagona@gmail.com