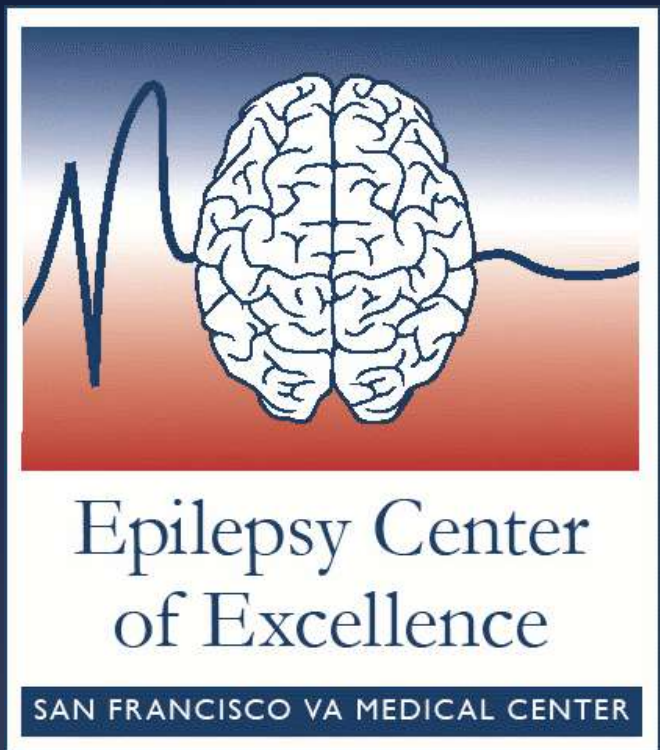


Introduction to Seizures and Epilepsy

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San Francisco VA
Epilepsy Center of
Excellence:

*State-of-the-Art Diagnostic
& Therapeutic Services*

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SFVA Epilepsy Center

- Established in 1997 to provide Veteran patients with access to specialized epilepsy care
- Designated as one of four national Centers of Excellence in 2002
- Named as a regional Epilepsy Center of Excellence site by in 2008



SFVA Epilepsy Center

- Outpatient consultation and long-term care
- Video/EEG Monitoring on inpatient Epilepsy Monitoring Unit
- High-resolution neuroimaging
- Expert pharmacological treatment
- Device-based therapy (vagus nerve stimulation)
- Epilepsy surgery
- Experimental treatments

What Is the Difference Between Epilepsy & Seizures?

- **Epilepsy** is a disorder characterized by recurring seizures (also known as “seizure disorder”)
- **A seizure** is a brief, temporary disturbance in the electrical activity of the brain

Who Has Epilepsy?

- * About 2.3 million Americans have epilepsy
- * Roughly 181,000 new cases of seizures and epilepsy occur each year
- * 50% of people with epilepsy develop seizures by the age of 25; however, anyone can get epilepsy at any time
- * Now there are as many people with epilepsy who are 60 or older as children aged 10 or younger

Groups at Increased Risk for Epilepsy

- About 1% of the general population develops epilepsy
- The risk is higher in people with certain medical conditions:
 - Traumatic Brain Injury
 - Stroke
 - Alzheimer's disease
 - Autism
 - Brain Tumors or blood vessel abnormalities

What Causes Epilepsy?

- * In about 70% of people with epilepsy, the cause is not known
- * In the remaining 30%, the most common causes are:
 - ❖ Head trauma
 - ❖ Infection of brain
 - ❖ Brain tumor and stroke
 - ❖ Heredity

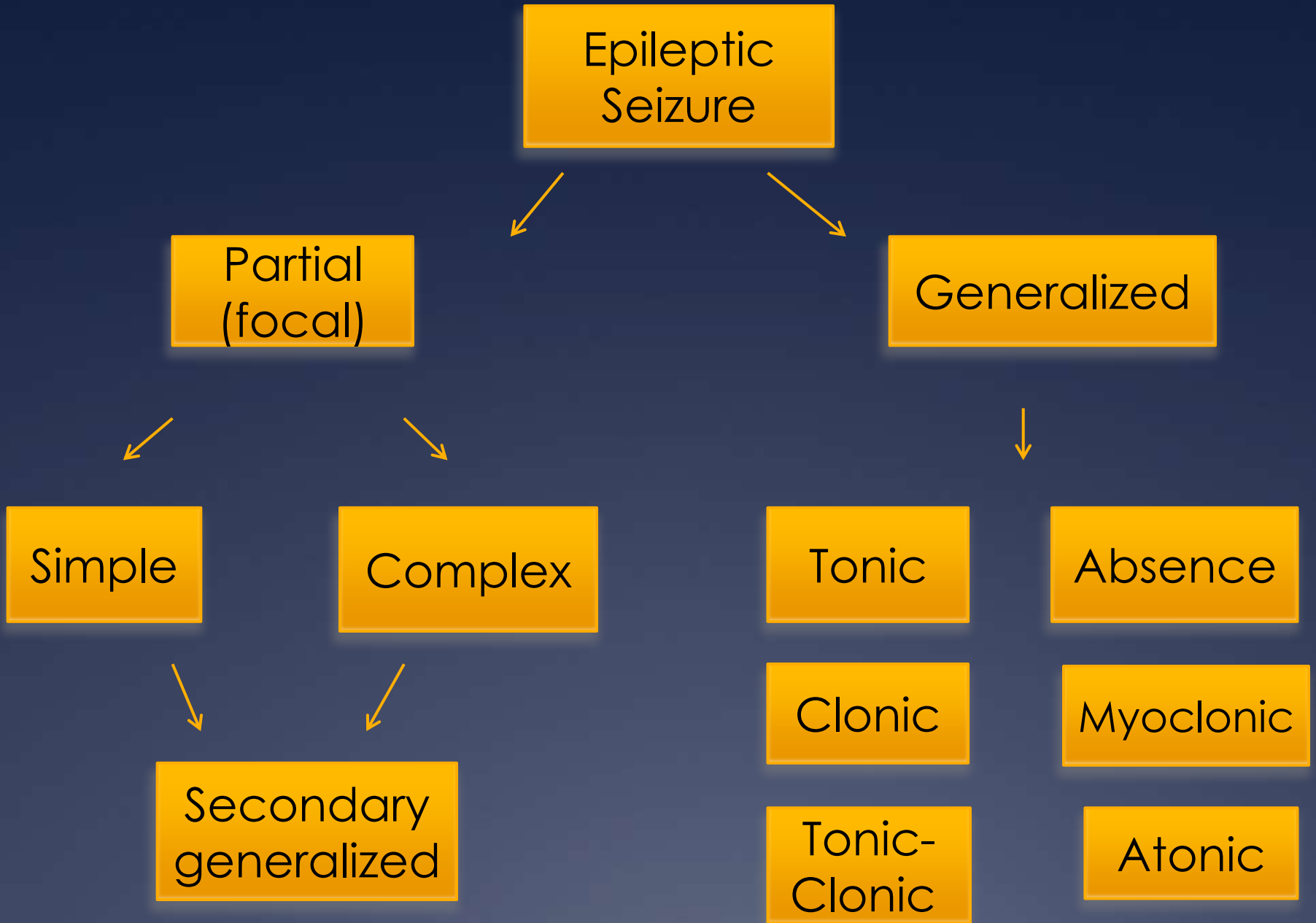
The Brain Is the Source of Epilepsy



- All brain functions -- including feeling, seeing, thinking, and moving muscles -- depend on electrical signals passed between nerve cells in the brain
- A seizure occurs when too many nerve cells in the brain "fire" too quickly causing an "electrical storm"

Seizure Types

- A person with epilepsy may have more than one seizure type.
- Seizures that began early in life may change as the child grows older.



Symptoms That May Indicate a Seizure Disorder

- * Periods of blackout or confused memory
- * Occasional “fainting spells”
- * Episodes of blank staring in children
- * Sudden falls for no apparent reason
- * Episodes of blinking or chewing at inappropriate times

Seizure Triggers

- * Missed medication (#1 reason)
- * Stress/anxiety
- * Hormonal changes
- * Dehydration
- * Lack of sleep/extreme fatigue
- * Photosensitivity
- * Drug/alcohol use; drug interactions



First Aid for Seizures

- * Stay calm and track time
- * Do not restrain person, but help them avoid hazards
 - * Protect head, remove glasses, loosen tight neckwear
 - * Move anything hard or sharp out of the way
 - * Turn person on one side, position mouth to ground
- * Check for epilepsy or seizure disorder ID
- * Understand that verbal instructions may not be obeyed
- * Stay until person is fully aware and help reorient them
- * Call ambulance if seizure lasts more than 5 minutes or if it is unknown whether the person has had prior seizures

Potentially Dangerous Responses to Seizure

DO NOT

- * Do not: Put anything in the person's mouth
- * Do not: Try to hold down or restrain the person
- * Do not: Attempt to give oral antiseizure medication
- * Do: Keep the person on their back with their face up during the seizure

When to Call 911 or Emergency Medical Services

- * A convulsive seizure occurs in a person not known to have seizures or lasts more than 5 minutes
- * A complex partial seizure lasts more than 5 minutes BEYOND its usual duration for the individual
- * Another seizure begins before the person regains consciousness
- * Also call if the person:
 - * Is injured or pregnant
 - * Has diabetes/other medical condition
 - * Recovers slowly
 - * Does not resume normal breathing



How Is Epilepsy Diagnosed?

- * **Clinical Assessment**

- * Patient history
- * Tests (blood, EEG, CT, MRI or PET scans)
- * Neurologic exam



What to Tell Your Doctor About Your Seizures

- * Symptoms
- * Seizure patterns: ? Seizure clusters
- * Pre-seizure activity (if any)
- * How well is your medication working?
- * Medication side effects

Keep a seizure record

Treatment Goals in Epilepsy

- * No or as few as seizures as possible
- * No or acceptable side effects from anti-seizure medication
- * Help person with epilepsy lead full and productive life

What factors influence our decision to treat with medication?

- * We don't have to treat a first provoked seizure if provoking factor removed (low blood sugar, illicit drugs)
- * For an unprovoked seizure
 - * Treat if first presentation was status epilepticus (i.e. a prolonged seizure)
 - * Most doctors will treat after second seizure:
 - * Consider treating after first seizure.
 - * Exam, EEG, MRI
 - * Patient preference
 - * Other Epilepsy risk factors including family history.

Types of Treatment

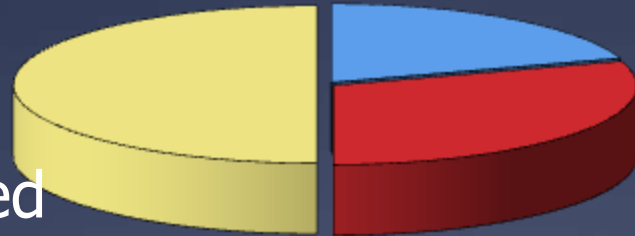
- Medication
- Surgery
- Nonpharmacologic treatment
 - Ketogenic diet-not useful in adults
 - Vagus nerve stimulation
 - Lifestyle modifications

Factors That Affect the Choice of Drug

- Seizure type/
Epilepsy syndrome
- Side effects
- Patient age
- Lifestyle
- Childbearing potential
- Other medications

How well do antiepileptic medications work?

Seizures do not respond (20%)
= Refractory epilepsy



Seizures eliminated
(50% of people)

Seizures markedly
reduced (30%)

What factors influence how well patients respond to antiepileptic medications?

- Consistent use
- Inadequate dosage or ineffective medication
- Drug factors
- Disease

Tolerating Medications

Most Common Side Effects

- Rash
 - Clumsiness
 - Drowsiness
 - Irritability
 - Nausea
-

- ☒ Side effects may be related to dose
- ☒ Care must be taken in discontinuing drug due to risk of seizure recurrence

Warning Signs of Possible Serious Side Effects

- Prolonged fever
- Rash, nausea/vomiting
- Severe sore throat
- Mouth ulcers
- Easy bruising
- Pinpoint bleeding
- Weakness
- Fatigue
- Swollen glands
- Lack of appetite
- Abdominal pain

Surgery

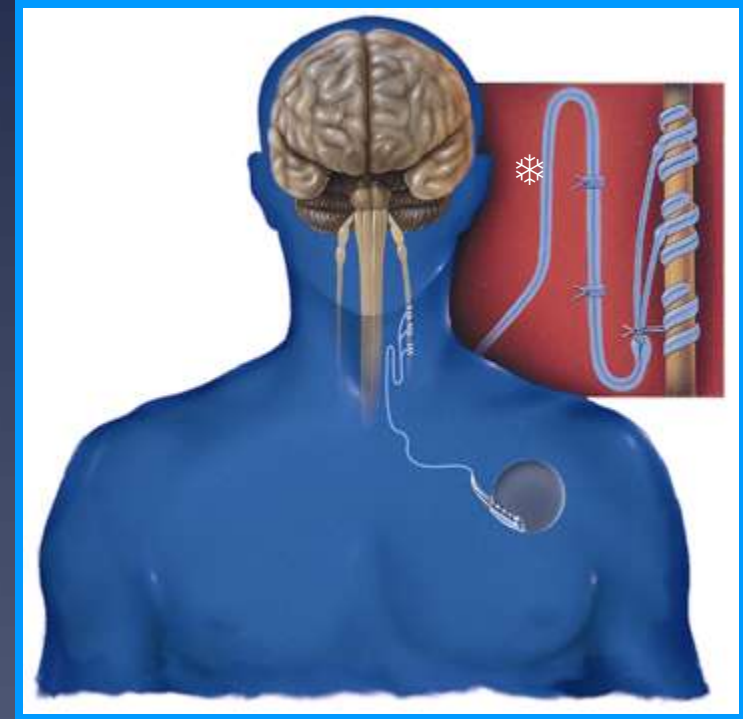
Factors influencing decision

- Likelihood seizures are due to epilepsy
- Likelihood surgery will help
- Ability to identify focus of seizures
- Other treatments attempted
- Benefits vs risks



Vagus Nerve Stimulation

- Delivers electrical stimulation to the vagus nerve in the neck, which relays impulses to widespread areas of the brain
- Used to treat partial seizures when medication does not work
- Often reduces, but usually does not completely control seizures
- Offered at SFVA since 1998



Ketogenic Diet

- Based on finding that starvation -- which burns fat for energy -- has an antiepileptic effect
- Used primarily to treat severe childhood epilepsy, has been effective in some adults & adolescents
- High fat, low carbohydrate and protein intake
- Usually started in hospital
- Requires strong family commitment



Effect of Epilepsy on Family

- Activity restrictions
- Financial stress
- Mood and emotions



Epilepsy in Women

■ **Hormonal effects**

- Hormonal changes during puberty, menopause, and the monthly cycle may affect seizure frequency

- Polycystic ovary syndrome

■ **Sexuality & contraception**

- Sexual dysfunction

- Birth control pills may be less effective

■ **Pregnancy & motherhood**

- Need to continue medication

- Slight increased risk for birth defects



Epilepsy in Older Adults

- Epilepsy is common in the elderly, and is often unrecognized or misdiagnosed
- Special issues:
 - increased susceptibility to side effects
 - Interactions with other medications



Driving and Epilepsy

- * All states have different laws
- * In CA, report any seizure to the Department of Public Health (DPH)
 - * DPH informs DMV, hearing arranged
 - * Doctor fills out Driver Med Eval (DME)
 - * DMV Medical Officer ultimately decides if license gets suspended, guided by DME
- * Typically 6 months seizure free (on or off AEDs) before lifting suspension

Resources

- * VA Epilepsy Website
 - * www.epilpesy.va.gov

- * Epilepsy Foundation Website
 - * www.epilepsynorcal.org

- * Epilepsy.com