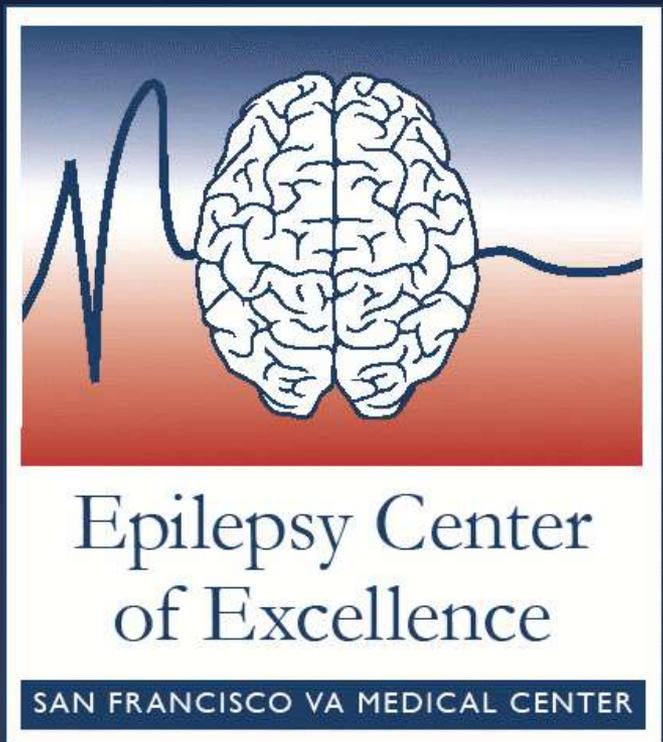


# Introduction to Seizures and Epilepsy

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San Francisco VA  
Epilepsy Center of  
Excellence:

*State-of-the-Art Diagnostic  
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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

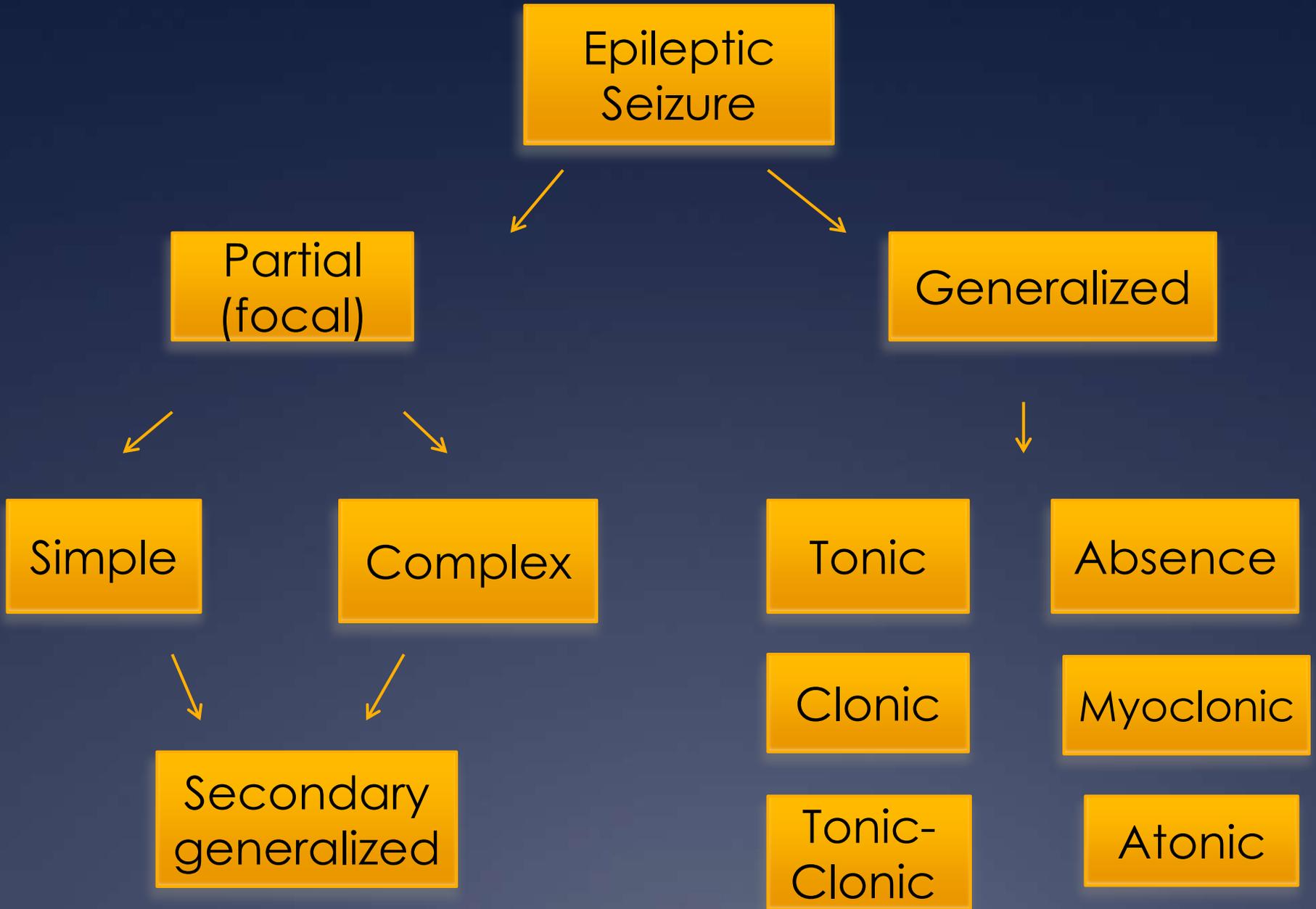
# The Brain Is the Source of Epilepsy



- 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

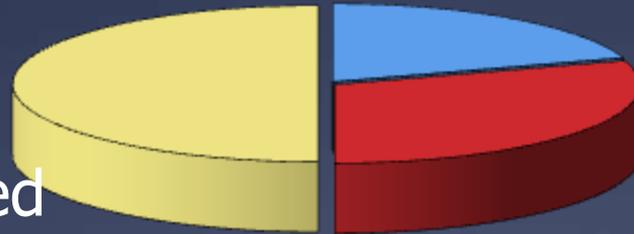
- Medication
- Surgery
- Nonpharmacologic treatment
  - Ketogenic diet-not useful in adults
  - Vagus nerve stimulation
  - Lifestyle modifications

# 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

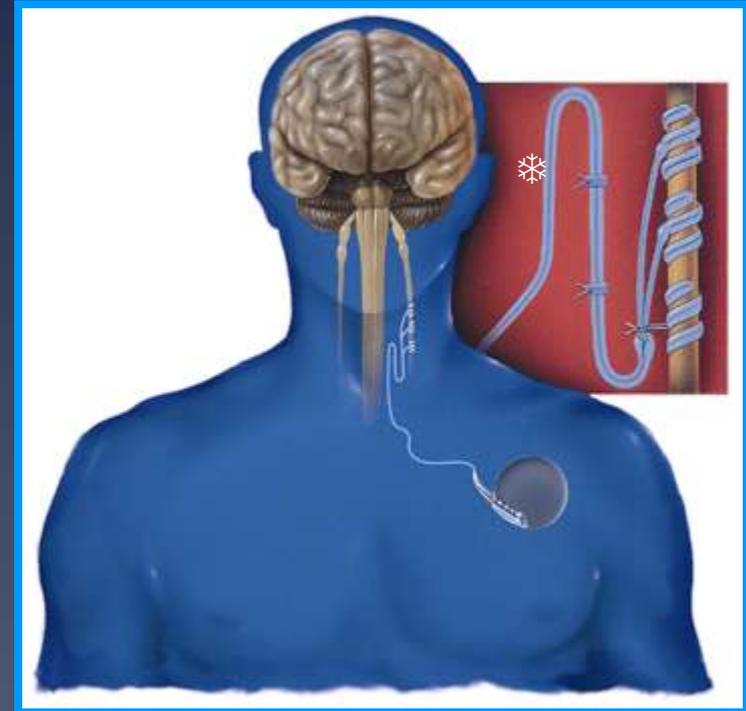
## Factors influencing decision

- 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](http://www.epilpesy.va.gov)
  
- \* Epilepsy Foundation Website
  - \* [www.epilepsynorcal.org](http://www.epilepsynorcal.org)
  
- \* Epilepsy.com