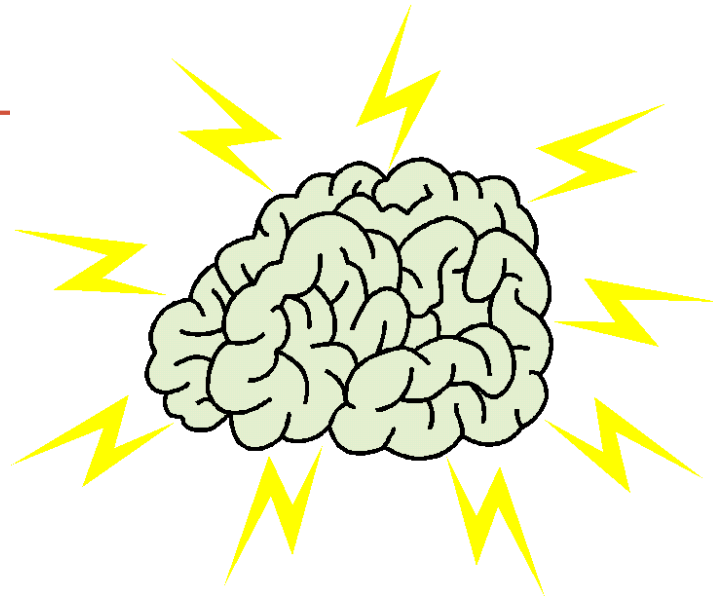


SEIZURES AND EPILEPSY

A Guide for Parents

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What is a Seizure?

- A Seizure is an Abnormal Burst of Excessive Electrical Activity from the Brain

Seizures can be provoked by several things:

Fever (usually only in young children)

Inadequate oxygen getting to the brain

Low blood sugar

Immediately following a head injury

A seizure does not always mean epilepsy

What is Epilepsy ?

- Recurrent unprovoked seizures
- A person has epilepsy after they've had 2 unprovoked seizures
- Epilepsy can start at any age of life
- 1% of the population has epilepsy
- Some people outgrow epilepsy. Others do not

Types of Seizures

- Generalized

This means the seizure arises deep in the brain and spreads through the whole brain all at once

- Partial

This means the seizure starts in one part of the brain. It may stay in one spot or spread

Types of Generalized Seizures

- Generalized Tonic Clonic
“The scary kind!!”

Sudden onset of stiffening of the limbs followed by rhythmic jerking of all the limbs + loss of consciousness.

Duration can be variable

Patient may have a blue tinge to their lips, excessive drooling and incontinence

Types of Generalized Seizures

- Absence

Very brief episodes of loss of consciousness usually lasting less than 5 seconds

There may be eyelid flickering &/or a loss of body tone

They can happen up to a 100 times per day

Types of Generalized Seizures

- Myoclonic Seizures

Extremely brief electric shock-like movements of a limb or whole body

If involves the whole body it may cause the person to have a “drop attack”

Atonic Seizures

- Sudden loss of body tone in the entire body
- Causes the child to drop limply to the ground, unconscious
- Children with atonic seizures may often have many other types of seizures

Types of Partial Seizures

- Simple Partial

The seizure starts in one part of the brain and doesn't spread anywhere

The appearance of the seizure depends on where it is

The patient does not lose consciousness at all

Types of Partial Seizures

- Complex Partial Seizures

The seizure starts in one part of the brain but then spreads.

The patient may have an warning (aura)

The patient has decreased level of consciousness.

There are often unusual gulping noises, lip smacking and fumbling hand movements

Treatment for Seizures

Seizure First Aid

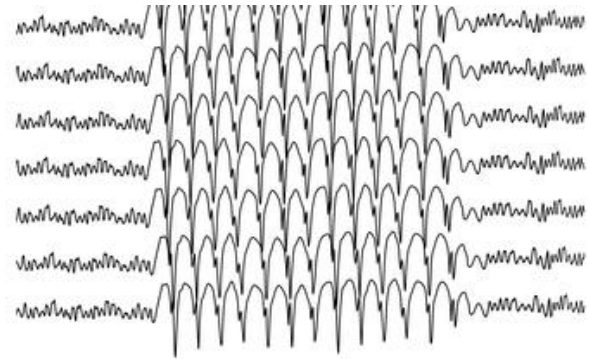
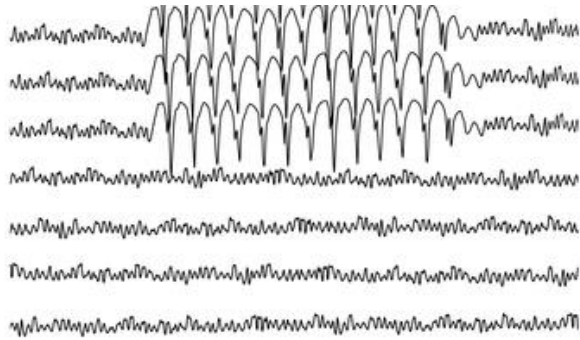
- a. Don't panic! You CAN help
- b. Allow plenty of space
- c. Protect from injury
- d. Loosen anything tight around neck
- e. Put something soft under head
- f. Turn to the side to prevent choking
- g. NEVER put anything in mouth
- h. NEVER restrain
- i. Longer than 5 minutes-Ambulance
- j. After, offer support and allow rest

What Investigations Does a Child Need?

- In the Emergency Room – almost nothing!
- Checking the child's blood glucose level can be helpful but no other bloodwork needs to be done
- As an Outpatient – EEG
MRI

EEG

- This is a test that measures the brain's electrical activity. The potential for a brain to have seizures shows up as a “spike” on the EEG
- Can help to say where the seizure comes from in the brain
- Can help in choosing appropriate medicine
- Does not hurt. No needles. No radiation.
- Child may need to be lightly sedated



MRI

- MRI uses magnetic waves to take very detailed pictures of the brain.
- It may show areas of the brain that have formed in unusual ways.
- Not painful but child needs to lie completely still for an hour so most children will require sedation





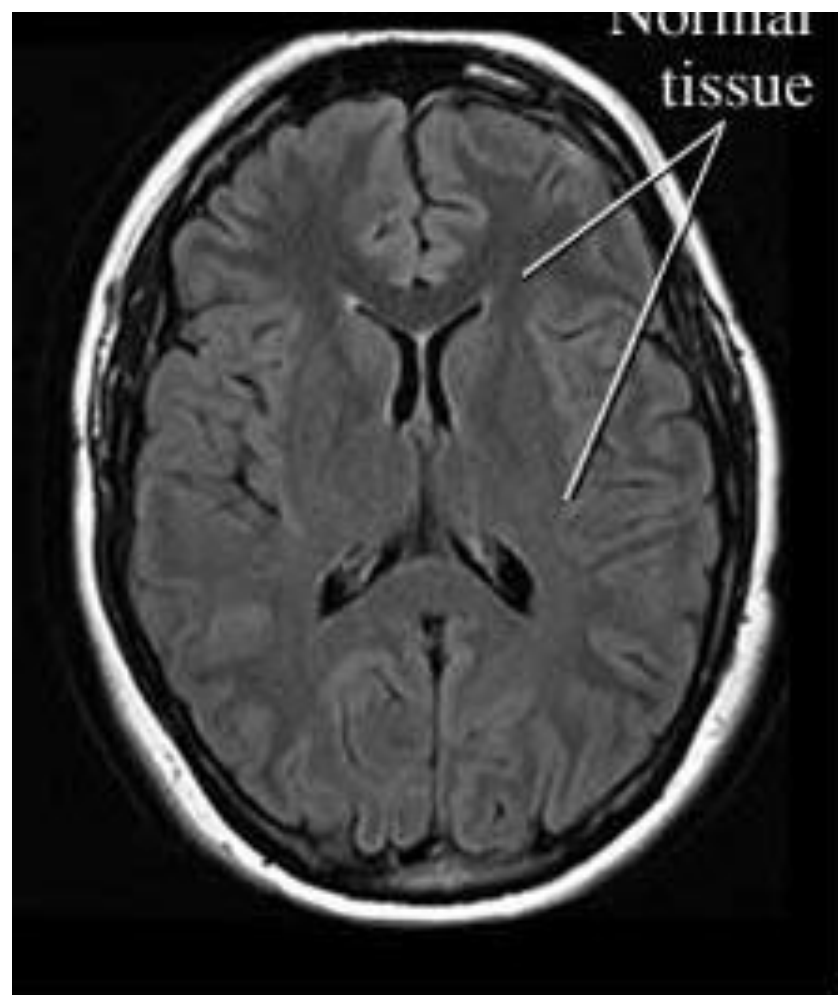


FIGURE 1

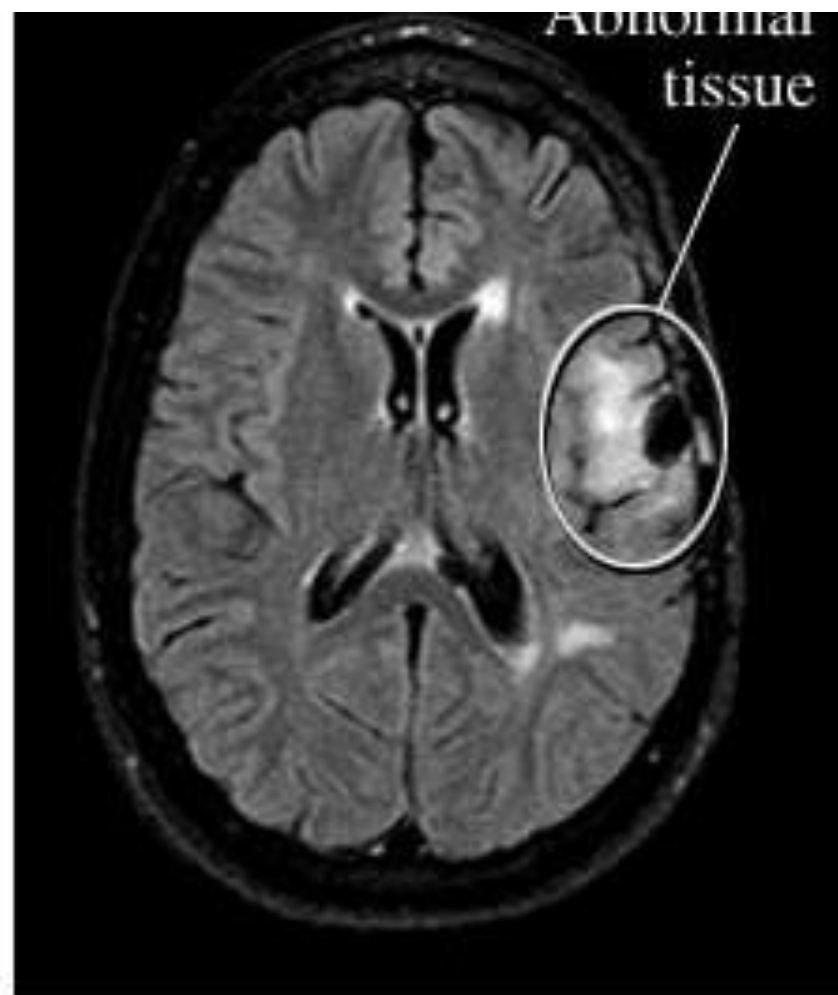


FIGURE 2

How Do We Treat Seizures?

Rescue medication

- Ativan (lorazepam) or Valium (diazepam)
- Used if a patient has a seizure that lasts longer than 3-5 minutes
- Given either inside the cheek or rectally
- Can make the child either sleepy or hyper

Daily Medicine for Seizures

- Most doctors will recommend a child start on an anti-seizure medicine (AED) if they have had 2 or more seizures
- Chances of a 3rd seizure is 80%
- The choice will depend on the type of seizure, the age of the child, other health conditions

Why use a daily seizure medicine?

- Patient safety – prevention of falls, injuries etc
- Possible enhanced development – frequent seizures may interfere with the child's ability to learn
- Research suggests that allowing the brain to continue to have seizures is like “practicing”. May make it less likely for the seizures to be outgrown with time

Status Epilepticus (SE)

- A seizure that lasts longer than 15 minutes
- SE can occur with any type of seizure
- SE is very metabolically demanding on the body and the brain and can result in permanent brain damage and even death
- Must be treated emergently

Tegretol (Carbamazepine)

- Often a first choice
- Tastes good. Very important!!
- Side effects – transient drowsiness
skin rash/allergy – rare
lowering of blood cells – rare
liver dysfunction – Very rare

However, does mean doing a blood test occasionally

Valproic Acid (Depakene, Epival)

- Another frequent first choice
- Comes as a suspension or as a capsule
- Side effects – Increased appetite/weight gain
Mild hair thinning
Changes in blood count and liver –
Rare but also means blood work

Keppra (Levetiracetam)

- Good first choice
- Most common side effect is hyperactivity. Happens more often in children with developmental delay
- No bloodwork to be done
- Comes as a crushable tablet

Lamictal (Lamotrigine)

- Often used as a 2nd line medicine
- Very few side effects except if the dose is started too high or increased too fast, a serious rash can occur
- Comes as a chewable tablet
- No bloodwork

Topamax (Topiramate)

- Add-on medication
- Side effects – decreased appetite and weight loss
attention problems
rarely kidney stones

Bloodwork yearly to check kidney function

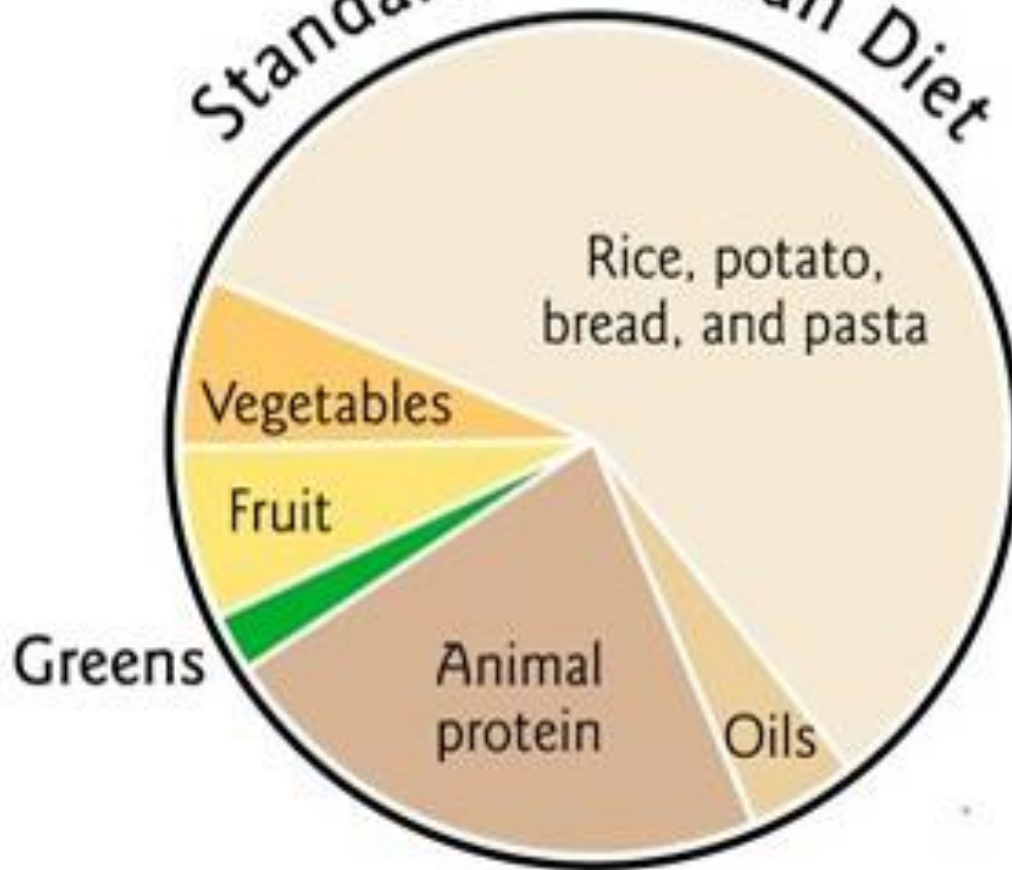
What if Medicines Don't Work ?

Ketogenic Diet

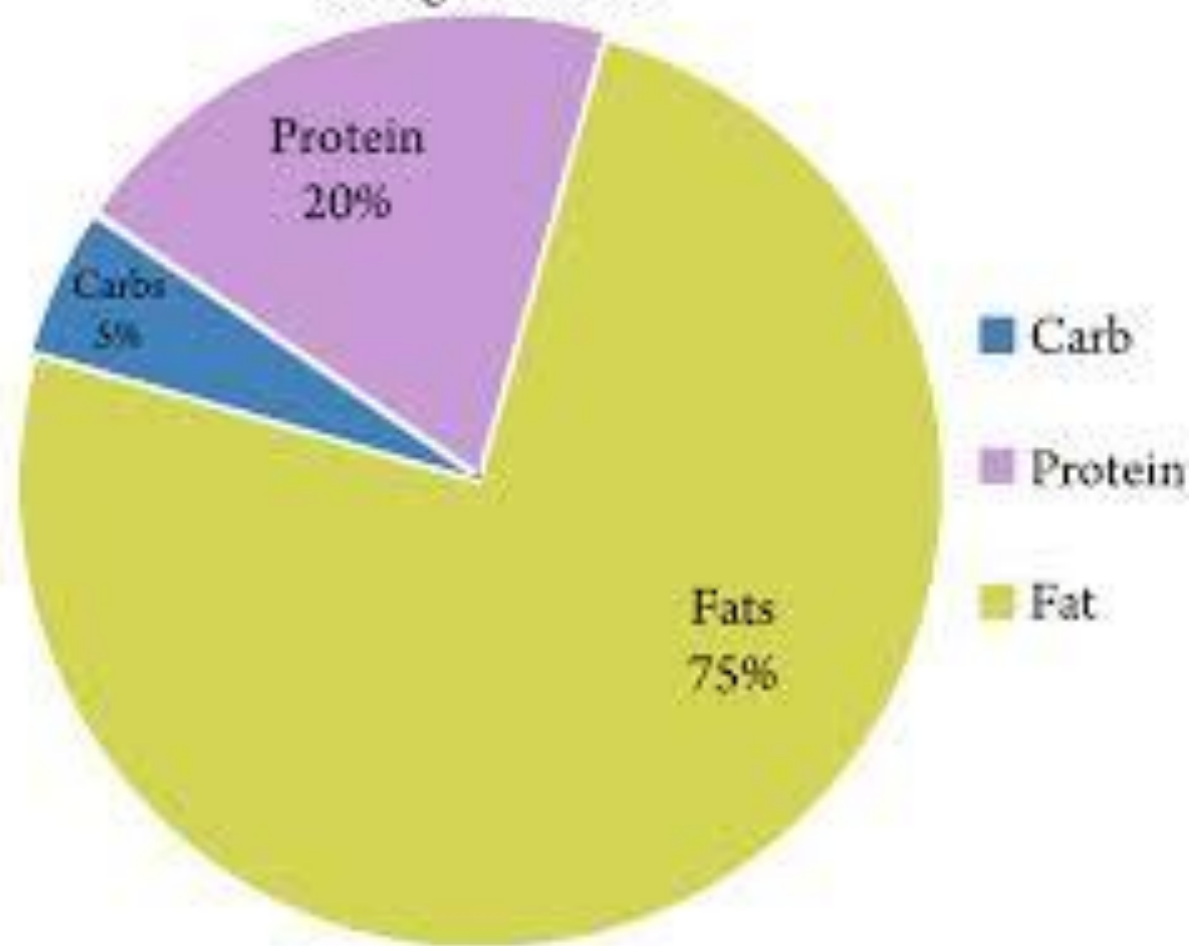
- High fat, low carb, adequate protein diet.
4:1 ratio of fats to protein/carbs

- Eliminates starches like fruits, breads etc and increases consumption of high fat food like butter, cream, nuts

Standard American Diet



Ketogenic Diet





Ketogenic Diet

- Needs to be done under the supervision of a dietician to ensure child's nutritional needs are met
- More effective for children with generalized seizure types rather than partial but can be offered to anyone with intractable seizures
- Side effects – not easy, restrictive
expensive
constipation very common
raised levels of blood cholesterol

Surgery

- Also used for patients who are intractable
- Only possible in patients with a focal-onset of their seizures, especially if they have an abnormality on brain MRI
- Patients need an extensive work-up by an epilepsy surgery team to ensure the patient would not suffer any neurologic deficits from having surgery

Vagal Nerve Stimulation

- Vagal nerve runs from the brain to the body organs
- A vagal nerve stimulator can be implanted in the chest and attached to the nerve and used to give repetitive stimulation at a certain frequency that will potentially override the seizures
- Efficacy poor and not frequently offered

Seizures in NCBRS

- Occur in about 2/3s of patients
- Can start at any age
- All different seizure types can occur. Some patients may have multiple types of seizures
- Seizures sometimes will be difficult to control fully with medication

Seizure Prevention

- Regular mealtimes. Low blood sugar could make a seizure more likely to happen
- Lots of sleep. Fatigue can also trigger seizures
- Treat fever with acetaminophen (Tylenol) every 4 hours or ibuprofen (Advil, Motrin) every 6 hours
- If your child is on daily AED give it at the same time every day

Sudden Unexpected Death in Epilepsy Patients (SUDEP)

- Occurs in 1 out of 1000 people with epilepsy
- Defined as the sudden death in an epileptic patient who has no other acute health problems. Autopsy shows no cause for death
- Occurs more commonly in patients with poorly controlled, frequent seizures

SUDEP

- Often the patients are found dead in bed lying on their stomach but they have not necessarily had an evident seizure
- Theories about why – abnormal cardiac rhythm, suffocation from impaired breathing

SUDEP Prevention

- No known prevention but...
- Aim for best seizure control possible
- If they have nocturnal seizures consider having child sleep without a pillow if they have nocturnal seizures and put a baby monitor in their room

Seizure Alert Devices

- Different types available
- Some go under mattress and detect vibrations
- Some are worn as wristbands and alert if repetitive movements occur
- Only detect seizures that have large, repetitive movements

- Cannot pick up changes in heart rate or breathing which may be important in SUDEP
- Therefore efficacy in preventing SUDEP not known
- Information available on Epilepsy Ontario Website

Epilepsy and Marijuana

- Almost all reports of efficacy are anecdotal
- Only 1 scientific study done on humans looking at marijuana as a treatment for epilepsy and that was done in 1980 and not conclusive
- Some animal studies that suggest 9-THC component of marijuana may be helpful but other studies suggest marijuana can trigger seizures
- Lots more research needed!!!!

Other things you should know

- People with epilepsy can participate in all activities
Swimming is fine as long as a lifeguard/
responsible adult is present
- Consider a medic alert bracelet, especially if child is independent of caregivers i.e. taking public transit
- Understand your child's triggers – fatigue, illness, stress

Lil Wayne and His Epilepsy

- Lil Wayne's Epilepsy Revealed
- “The bad news is I'm an epileptic, I'm prone to seizures,” he told Los Angeles hip-hop radio station Power 106 on March 28. “Like, this isn't my first, second, third, fourth, fifth, sixth, seventh seizure. I've had a bunch of seizures, y'all just never hear about them. But this time it got real bad 'cause I had three of them in a row and on the third one, my heart rate went down to like 30 percent. Basically, I could've died, so that is why it was so serious. But the reason being for the seizures is just plain stress, no rest, overworking myself.”

Resources

- Epilepsy Ontario
www.epilepsyontario.org
- Epilepsy Toronto
www.epilepsytoronto.org
- About Kids Health
www.aboutkidshealth.ca
- SUDEP Aware
www.sudepaware.org