

	<p style="text-align: center;">GRID PATIENT'S By: Jenilea Hueftle and Morganna Kuehn</p>

	<p>Disclosure</p>
	<ul style="list-style-type: none">■ We do not receive anything of value from or own stock in a commercial company or institution related directly or indirectly to the subject of our presentation.

	<p>What is a Grid Patient?</p>
	<ul style="list-style-type: none">■ A patient who has seizures that occur on one side of the brain■ Have a decrease in both intellectual and behavioral functions■ Attempted AED's, ketogenic diet, and VNS with no treatment of seizures.

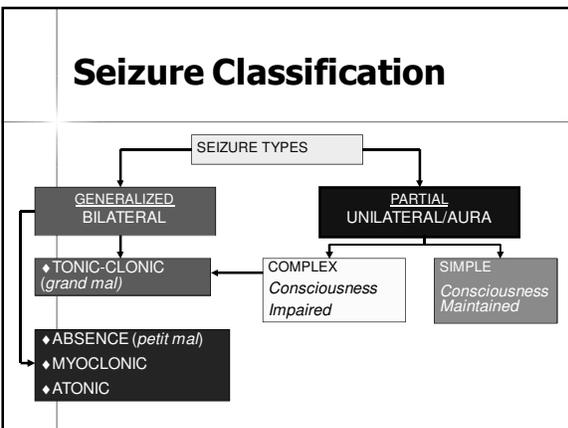
	<h2>Epilepsy</h2>
	<ul style="list-style-type: none"> ■ Chronic neurological condition resulting in recurrent, unprovoked seizure activity (greater than 2). A person who has had two unprovoked seizures has a 70% chance of having another seizure. ■ Approximately 50 million people have epilepsy. ■ Epilepsy is associated with a high degree of morbidity and mortality ■ Medications remain the mainstay of treatment. When medication has failed treatment of seizures may consist of a vagal nerve stimulator, Ketogenic diet and surgery or a combination of the aforementioned modalities. <ul style="list-style-type: none"> • <50% of newly diagnosed patients become seizure-free on anticonvulsants. • ~33% are refractory to all available medications. • Many fail therapy secondary to side effects. ■ Quality of Life ≠ 50% reduction in seizures.

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none"> ■ Epilepsy affects about 2 million people in the United States and accounts for \$15.5 billion in direct costs (medical) and indirect costs (lost or reduced earnings and productivity) each year. ■ More than one-third of people with epilepsy continue to have seizures despite treatment. ■ Children younger than age 2 and adults older than age 65 are particularly vulnerable because the risk factors for epilepsy are more common in these age groups. ■ About 10% of Americans will experience a seizure sometime during their lives. About 3% will receive a diagnosis of epilepsy by age 80.

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none"> ■ Seizures occur when there is a disruption in electrical system of the brain. Seizures are the result of abnormal firing of cortical neurons. When brain cells keep firing in an uncontrolled manner, the result is unconsciousness and contractions of the muscles. ■ Seizures may arise from only one area of the brain and may affect awareness, prevent normal communication, and produce a variety of uncontrolled, unorganized body movements. ■ There are several seizures types. Seizures can occur in one or both hemispheres of the brain. In addition, seizures can begin in one hemisphere and quickly spread to the other. ■ Some people with epilepsy experience more than one seizure type. ■ Most seizures are brief and last only one to two minutes. However, confusion in the post-ictal period lasts much longer.

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none"> ■ Approximately half of all seizures have no known cause and the remaining half is often linked to disease or injury of the brain ■ Potential Risk Factors: <ul style="list-style-type: none"> - Prematurity - Brain lesion (tumor, vascular malformation, cortical dysplasia) - Traumatic brain injury - Anoxic brain injury - Brain infections (abscess, meningitis, encephalitis) - Family history - Alzheimer's disease - Febrile seizures - Medications and illicit drugs - Electrolyte Imbalances

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none"> ■ Seizures are broadly divided into generalized seizures and partial seizures ■ Seizures may be classified as symptomatic, idiopathic or cryptogenic ■ Consider non-epileptic seizures (pseudoseizures, syncope, vasovagal episode), unclassified seizures, subclinical seizures (without visible symptoms) and status epilepticus (prolonged seizure lasting >= 15 minutes) ■ Partial seizure types include: <ul style="list-style-type: none"> - Simple - Complex ■ Generalized seizure types include: <ul style="list-style-type: none"> - Absence - Atonic - Tonic-clonic - Myoclonic



	<h2>Epilepsy</h2>
	<ul style="list-style-type: none">■ Absence Seizures<ul style="list-style-type: none">- Usually subtle but sudden onset- Often present as staring and last a few seconds (<30)- Can interfere with learning as well as with attention and full consciousness- No warning and no after-effect- Common in children and almost always start between ages 4 and 12 years- So brief that they escape detection, even if the child is experiencing 50 to 100 episodes daily

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none">■ Myoclonic seizures<ul style="list-style-type: none">- Sudden, brief, involuntary muscle jerks (face, arms or legs)- May be mild and affect only part of the body, or be strong enough to throw the child abruptly to the floor- May occur as a single seizure or a cluster of seizures

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none">■ Atonic seizures or "drop attacks"<ul style="list-style-type: none">- Produce an abrupt and complete loss of muscle tone with brief loss of consciousness- Other names for this type of seizure include drop attacks, astatic or akinetic seizures- They produce head drops, loss of posture, or sudden collapse- Begin without any warning and people who experience them may fall with force, atonic seizures can result in injuries to the head and face- Protective headgear is recommended- These seizures tend to be resistant to drug therapy

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none">■ Generalized tonic-clonic seizures<ul style="list-style-type: none">- Begin with stiffening of the extremities (the tonic phase), followed by jerking of the limbs and face (the clonic phase)- During the tonic phase, breathing may decrease or stop altogether- Breathing typically returns during the clonic phase, but it may be irregular. This clonic phase usually lasts less than a minute.- Incontinence may occur- Injuries to tongue, inside of the mouth, head, and extremities may occur- Respiratory patterns may be altered and labored- In the post-ictal period, the patient will be lethargic, confused and will want to sleep- Headaches and vomiting are common- Full recovery may take minutes to hours

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none">■ Partial Seizures<ul style="list-style-type: none">- Simple Partial<ul style="list-style-type: none">■ Somatosensory (Aura)<ul style="list-style-type: none">- Simple partial seizures do not lose consciousness but can affect movement, emotions, sensations and feelings- Fully aware but mayor may not be able to speak or move until the seizure is over- Could have motor involvement and cause shaking of a hand or foot which may spread to involve an arm or a leg or even one whole side of the body- A sudden feeling of fear

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none">■ Partial Seizures<ul style="list-style-type: none">■ In rare cases, partial seizures can produce feelings of anger and rage, or even sudden joy and happiness■ All five senses—touch, hearing, taste, smell and sight—are controlled by various areas of the brain■ Simple partial seizures in these areas can produce odd sensations such as a sense of a breeze on the skin; unusual hissing, buzzing or ringing sounds; voices that are not really there; unpleasant tastes; strange smells; and, perhaps most upsetting of all, distortions in the way things look■ Sudden nausea or an odd, rising feeling in the stomach is quite common. Stomach pain also may, in some cases, be caused by simple partial seizures

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none">■ Partial Seizures<ul style="list-style-type: none">■ Episodes of sudden sweating, flushing, becoming pale or having the sensation of goosebumps are also possible■ Well-known places may suddenly look unfamiliar. On the other hand, new places and events may seem familiar or as if they've happened before, a feeling called déjà vu.■ Simple partial seizures can also produce sudden, uncontrolled bursts of laughter or crying.

	<h2>Epilepsy</h2>
	<ul style="list-style-type: none">■ Partial Seizures<ul style="list-style-type: none">- Complex partial seizures affect a larger area of the brain than simple partial seizures and they impair consciousness- These seizures are often accompanied automatisms- Can affect any area of the brain, but often take place in one of the temporal lobes- May be referred to as temporal lobe epilepsy or psychomotor epilepsy- Starts with a blank stare and loss of contact with surroundings, followed by chewing movements with the mouth, picking at or fumbling with clothing, mumbling and performing simple, unorganized movements over and over again. Some people may wander around their environment.

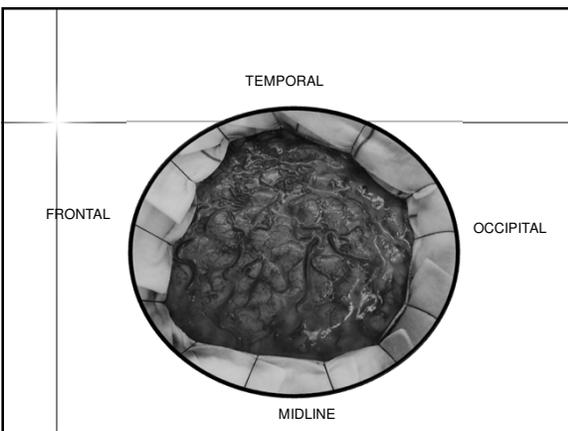
	<h2>Epilepsy</h2>
	<ul style="list-style-type: none">■ Nursing Care<ul style="list-style-type: none">- ABCs<ul style="list-style-type: none">■ Oxygen■ BVM■ Suction- Safety<ul style="list-style-type: none">■ Don't grab or hold■ Block hazards■ Pad bed side rails■ Speak calmly■ Time the seizure■ Loosen tight clothing■ Cushion head

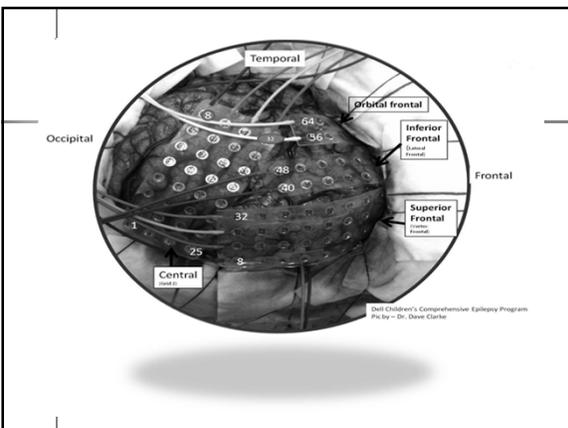
	<h2 style="margin: 0;">Epilepsy</h2>
	<ul style="list-style-type: none"> ■ Nursing Care <ul style="list-style-type: none"> – Medications <ul style="list-style-type: none"> ■ Prolonged seizures or seizure cluster <ul style="list-style-type: none"> – Diastat – Drug of choice for status epilepticus – Versed – Ativan – Fosphenytoin – Phenobarbital – Keppra – Clonazepam

	<h3 style="margin: 0;">How do the type of seizures relate to the localization of epileptogenic area?</h3>
	<ul style="list-style-type: none"> ■ Temporal lobe- déjà vu, epigastric aura, exaggerated motions, visual images ■ Frontal lobe- muscle and motor activity, forced eye deviation, speech arrest or speech disturbance ■ Parietal lobe- paresthesias/ sensory phenomenon ■ Occipital- positive basic visual phenomenon

	<h3 style="margin: 0;">GRID Work-up</h3>
	<ul style="list-style-type: none"> ■ Prior to being a grid candidate for surgery the pt's has to have tried <ul style="list-style-type: none"> – AED'S – Vagal nerve stimulators – Ketogenic diet ■ EEG ■ MRI ■ PET scan ■ SPECT ■ Neuropsych testing ■ Neuro rehab evaluation

	<h2 style="margin: 0;">Surgery Day</h2> <ul style="list-style-type: none"> ■ Craniotomy and placement of electrodes <ul style="list-style-type: none"> - Placement of the electrodes depends on the region of the brain that is seizing - Types of electrodes: strip, subdural grids, and depth electrodes - ICP monitoring - PICC placement - JP placed - Skull is left on or off ■ Once surgery completed pt goes to the PACU for 4 hours to stabilize. ■ MRI completed and skull x-ray
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	Post-op Complications
	<ul style="list-style-type: none">■ Electrolytes<ul style="list-style-type: none">- Sodium- Potassium- Magnesium- Calcium■ Hemoglobin and Hematocrit■ Seizures■ Cerebral Swelling■ JP output/ replacement■ Dressing changes■ Arrhythmias<ul style="list-style-type: none">- Electrolyte abnormality- Other

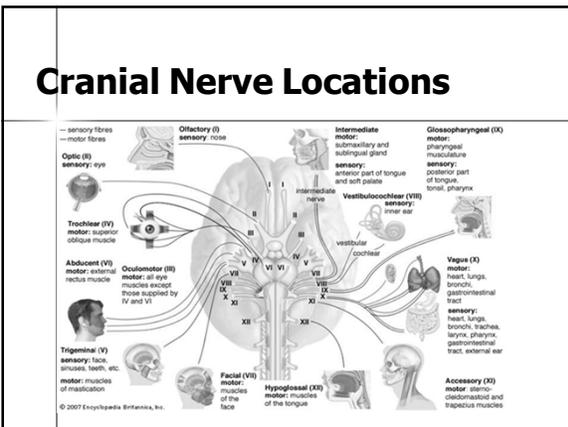
	Mapping
	<ul style="list-style-type: none">■ Mapping is completed in the EMU unit■ EMU unit pt is set up with VEEG.■ The results of the VEEG and the direct recording of the subdural grids are reviewed to interpret the exact seizure focus.

	Resection Surgery
	<ul style="list-style-type: none">■ Temporal lobectomy■ Frontal lobectomy■ Lesionectomy■ Hemispherectomy■ Disconnect

	<p>Resection Post-op Complications</p> <ul style="list-style-type: none"> ■ Cerebral Swelling ■ CSF leak ■ Infection ■ Epidural hematoma ■ Dysphasia, memory deficits, injury to cranial nerves, and injury to blood vessels leading to ischemic damage
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	<p>Resection Post-op Complications</p> <ul style="list-style-type: none"> ■ Monitor <ul style="list-style-type: none"> - Labs: sodium - Neurological status - Level of consciousness - Drainage at the site - Changes in motor and language function - SIADH - Urine output - JP output - Seizures
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	<p>Neurological Exam</p> <ul style="list-style-type: none"> ■ Appearance and observation ■ Level of consciousness ■ Cranial nerve assessment <ul style="list-style-type: none"> - I. Olfactory - II. Optic - III. Oculomotor - IV. Trochlear - V. Trigeminal - VI. Abducens - VII. Facial - VIII. Acoustic - IX. Glossopharyngeal - X. Vagus - XI. Accessory - XII. Hypoglossal
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Neurological Exam

- Vital signs
- Motor sensory function
- Assessment of reflexes
- Gait and balance
- Assessment of external monitoring apparatus

Rehab/Follow-up

- Inpt/outpt rehab
- Follow up in two weeks, 3 months, and then 6 months

	Questions?
