Seizures, Submersion and Special Needs

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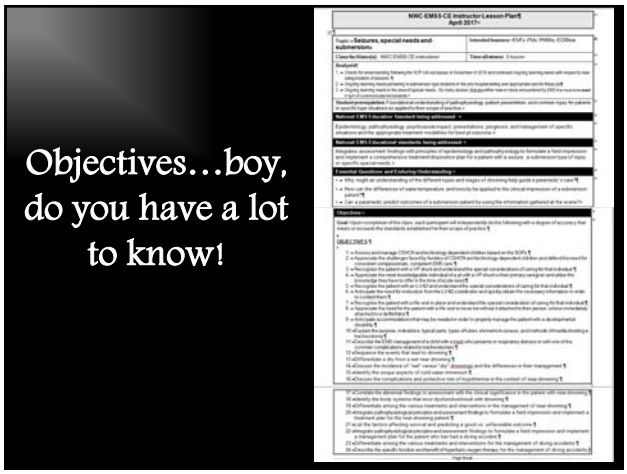
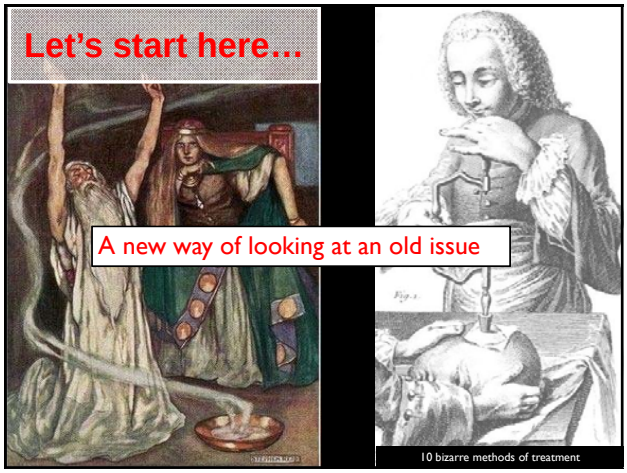


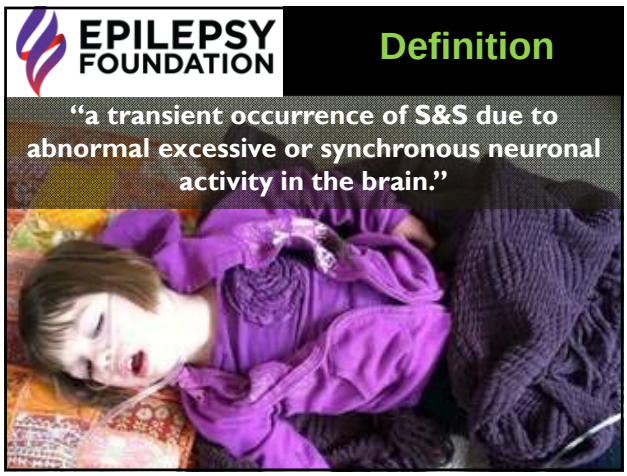
Goals

Seizures:
- Simplifying the process through new categorization
- What are you actually seeing
- When and how should this patient be treated

Submersion:
- Walk through the basics
- When and how should this patient be treated

Special Needs:
- Technology seen in the pre-hospital setting
- Trust the caregiver
- How should EMS approach caring for patient throughout transport





Old Term vs New

- Absence – **Generalized** absence
- Atonic or drop attack – **Focal** or **generalized** atonic
- Grand mal – **Generalized**
- Infantile spasms – **Focal**
- Myoclonic – **Focal** or **generalized** myoclonic
- Petit mal – **Generalized** absence
- Tonic clonic – **Generalized** Tonic or drop attack – **Focal or generalized**
- Complex partial – **Focal**
- Focal motor – **Focal** motor
- Focal sensory – **Focal** sensory Limbic – Focal impaired awareness
- Psychomotor – **Focal** impaired awareness
- Simple partial – **Focal** aware

The 2017 ILAE Seizure Classification. Presented at the American Epilepsy Society Annual

The New Basic Classification

The basic classification is a simple version of the major categories of seizures. The new basic seizure classification is based on 3 key features.

- **Where seizures begin in the brain**
- **Level of awareness during a seizure**
- **Other features of seizures**

ILAE 2017 Classification of Seizure Types Basic Version [1]

Focal Onset	Generalized Onset	Unknown Onset
Aware / Impaired Awareness	Motor: Tonic-clonic, Other motor	Motor: Tonic-clonic, Other motor
Motor Onset / Non-Motor Onset	Non-Motor (Absence)	Non-Motor
focal to bilateral tonic-clonic		Unclassified [2]

[1] Definitions, other seizure types and descriptors are listed in the accompanying paper & glossary of terms

[2] Due to inadequate information or inability to place in other categories

PREVALENCE:

- Epilepsy is the 4th most common neuro disorder in US after Alzheimer's, stroke & migraine
- Greater prevalence than CP, MS & Parkinson's combined.
- Nearly 3M people (1% of US pop have some form of epilepsy. Nearly 4% (1 in 26) will develop epilepsy at some point in their lives.

INCIDENCE:

About 150,000 new cases are diagnosed each year in the United States

CAUSES:

~70% cases = unknown

Remaining 30%, the following are most frequent:

Brain tumor, stroke, and Alzheimer's disease

Heredity
- – One parent ~ 6% chance
- – Risk > when mother has it

TBI

Genetic Factors

Poisoning

Infection

Prenatal or birth trauma

LONG - TERM TREATMENT

Achieves full /partial control in ~ 75% of cases

Medication The major form of tx is drug therapy
- – >20 antiepileptic drugs are currently in use
- – multiple-drug therapy is sometimes necessary

Surgery
- – takes place when tissue causing sz is confined to a small area

Ketogenic Diet MD-prescribed, ↑ fat, ↓carb, ↓ cal diet
- – (success in some childhood cases when standard tx fails)

Vagus Nerve Stimulator —implanted device periodically stimulates brain through vagus nerve & can reduce seizures in some pts

Defining where Seizures begin

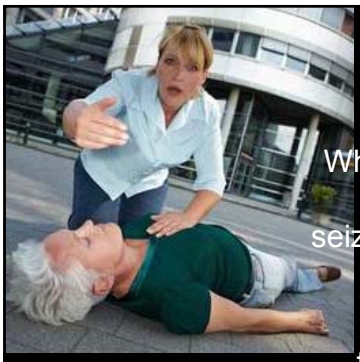
Focal seizures: Previously "partial seizures" these start in area on one side of the brain.

Generalized seizures: Previously "primary generalized," these engage or involve networks on both sides of the brain at onset.

Unknown onset: self explanatory; unsure if starts on one or both sides of brain.

Focal to bilateral seizure: starts on one side or part of the brain and spreads to both called "secondary generalized seizures."

(Now the term "generalized" refers only to the start of a seizure.)



Describing Awareness

Whether a person is aware during a seizure is of practical importance

It is one of main factors affecting a person's safety during episode

Describing Awareness

Focal aware: If awareness remains intact, even if the person is unable to talk, it would be called "focal aware". (Simple partial)

Focal impaired awareness: If awareness is impaired or affected at any time, even if pt has vague idea of what happened, it would be called "focal impaired awareness". (Complex partial)

Awareness unknown: Sometimes it's not known if a person is aware or not. It would be described as "awareness unknown."

Describing Awareness

Generalized seizures:

- ✓ Are all presumed to affect a person's awareness or consciousness in some way
- ✓ Thus no special terms are needed to describe awareness

Describing Motor/Other Symptoms in Focal Seizures

- **Focal motor seizure:** some type of movement occurs Ex. twitching, jerking, stiffening movements of a body part or automatisms (automatic licking lips, rubbing hands, walking, or running).
- **Focal non-motor seizure:** This type has other sx that occur 1st (Δ sensation, emotions, thinking)
- **Auras:** term to describe symptoms a person may feel in the beginning of a seizure (not new)

Describing Generalized Onset Seizures

- **Generalized motor seizure:** The gen. tonic-clonic term is still used to describe seizures with stiffening (tonic) & jerking (clonic).
  - This loosely corresponds to "grand mal."
- **Generalized non-motor seizure:** primarily absence seizures and the term corresponds to the old term "petit mal." These seizures involve brief changes in awareness, staring, and some may have automatic or repeated movements like lipsmacking.

List the 3 ways in which seizures are classified

Where seizures begin in the brain
Level of awareness during a seizure
Other features of seizures

Partial Seizures

https://youtu.be/jJUeWeHnv-4

Baby Zacchaio 6 months

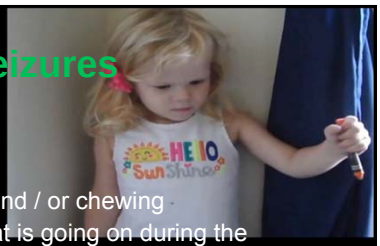
https://www.youtube.com/watch?v=yczul9sNGfc

Psychomotor Seizure

Myoclonic

Absence

Absence Seizures



Characterized by:

- Rapid blinking and / or chewing
- Unaware of what is going on during the episode with a quick return to full awareness after the event
- Can occur a few or up to hundreds of times a day!
- Often mistaken as day dreaming or poor attention
- Usually respond well to long term treatment

Tonic clonic

https://youtu.be/BKiu_yJT9Jo

Generalized Tonic Clonic

- Often begin with a sudden cry, a fall, rigidity or stiffness and muscle jerks
- Usually last only a couple of minutes
- The person may be irritable and sleepy for minutes to hours afterwards

Febrile Seizures

Perhaps the most common of all for EMS

Not considered a diagnosis of epilepsy

VERY SCARY for parents/caregivers

Self limited diagnosis

How do we intervene?

PEDS SEIZURES

- History
- History/frequency/type of seizures
- Prescribed meds and patient compliance; amount and time of last dose
- Recent or past head trauma; predisposing illness/disease; recent fever, headache, or stiff neck
- History of ingestion/drug or alcohol abuse; time last used
- SOPS p. 85

What other etiologies should be considered?

- Anoxia/hypoxia
- Anticonvulsant withdrawal/noncompliance
- Cerebral palsy or other disabilities
- Infection (meningitis, fever)
- Metabolic (glucose, electrolytes, acidosis)
- Toxin/intoxication (cocaine, cyclic)
- Trauma/child abuse
- Epilepsy

What particulars of the seizure should be documented if able?

Seizure description: focus of origin (one limb or whole body), progression / duration; presence of an aura,

simple/complex; partial/generalized (focality/muscle activity); eye deviation prior to or during sz; incontinence;

trauma to oral cavity; abnormal behaviors (lip smacking); duration of LOC.

Duration / degree of MS Δ in postictal period.

Other symptoms

- Unresponsiveness
- Loss of consciousness
- Possible loss of bladder or bowel control
- Excessive drooling
- Shallow breathing

Those susceptible

- Exhaustion, fatigue or under stress
- Excitement, anxious, fearful or sleepy

❖Fevers or infection can cause seizures

When should EMS intervene?

If generalized tonic / clonic seizure activity still present upon arrival of EMS

What treatment is needed?

- SAFETY; protect the pt
- Airway-SUCTION!
- MIDAZOLAM 0.1 mg/kg IVP/IO q. 30-60 sec (0.2 mg/kg IN/IM) (Max single dose 5 mg) up to 10 mg IVP/IN/IO/IM to stop seizure.
- If seizures persist: contact OLMC for additional orders.
- Oxygen

For more information on specific seizures…

- Angelman Syndrome
- Benign Rolandic Epilepsy
- CDKL5 Disorder
- Childhood Absence Epilepsy
- Doose Syndrome
- Dravet Syndrome
- Early Myoclonic Encephalopathy (EME)
- Epilepsy with Generalized Tonic-Clonic

Seizures Alone

- Epilepsy with Myoclonic-Absences
- Frontal Lobe Epilepsy
- Glut1 Deficiency Syndrome
- Hypothalamic Hamartoma
- Infantile Spasms/West's Syndrome
- Juvenile Absence Epilepsy
- Juvenile Myoclonic Epilepsy
- Lafora Progressive Myoclonus Epilepsy
- Landau-Kleffner Syndrome
- Lennox-Gastaut Syndrome (LGS)
- Neurocutaneous Syndromes
- Ohtahara Syndrome
- Panayiotopoulos Syndrome
- PCDH19 Epilepsy
- Progressive Myoclonic Epilepsies
- Rasmussen's Syndrome
- Ring Chromosome 20 Syndrome
- Reflex Epilepsies
- TBCK-related ID Syndrome
- Temporal Lobe Epilepsy
- Epilepsy of Infancy with Migrating Focal Seizures

http://www.epilepsy.com/learn/types-epilepsy-syndromes

Populations with special considerations for EMS

Where to start?

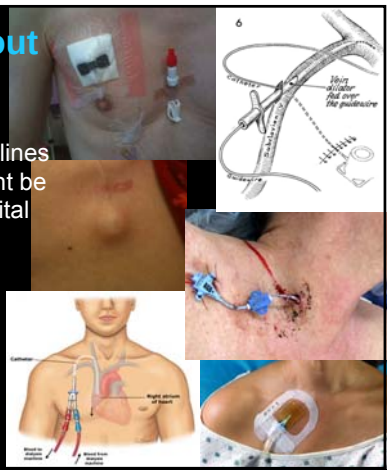
- Lifespan differences
- Ethnic and cultural group needs
- Diversity in population
- Physical or mental disability
- Homelessness
- Bariatric
- Verbal impairments
- Cardiac devices
  - Implanted defibrillators
  - Life vests
  - LVADS
- High-tech kids
  - AV shunts
  - Trachs
  - G tubes
- Hearing devices

Handout p. 8-14

In your handout p. 8-9

Central & peripheral lines & catheters that might be seen in the pre-hospital setting

- Hickman
- PICC
- Triple lumen
- Port-a-cath
- Medi-port



Shunts

Lets read: start on the right column on p. 9 through left column on p. 10

Why do patients require insertion of a shunt?

↑ CSF

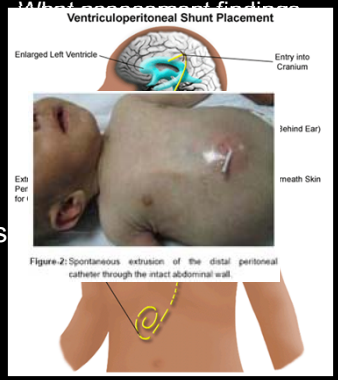
What is the purpose of the shunt for the patient?

To divert the CSF and decrease pressure on the brain

Shunt Malfunctions

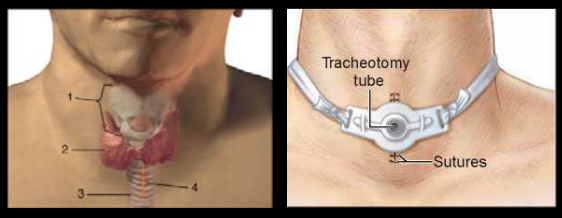
What is the usual cause of malfunction?

Mechanical malfunction such as obstruction

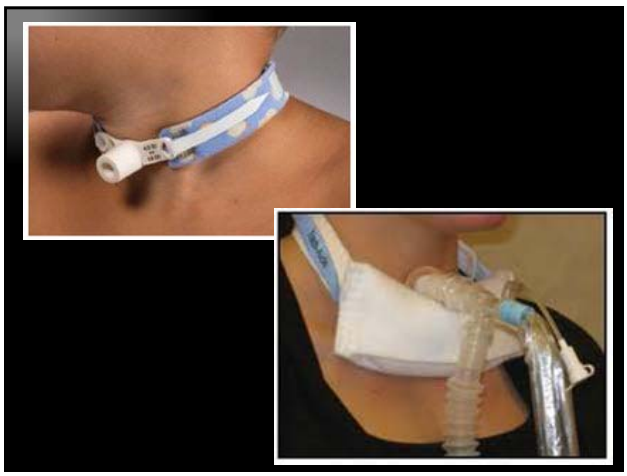


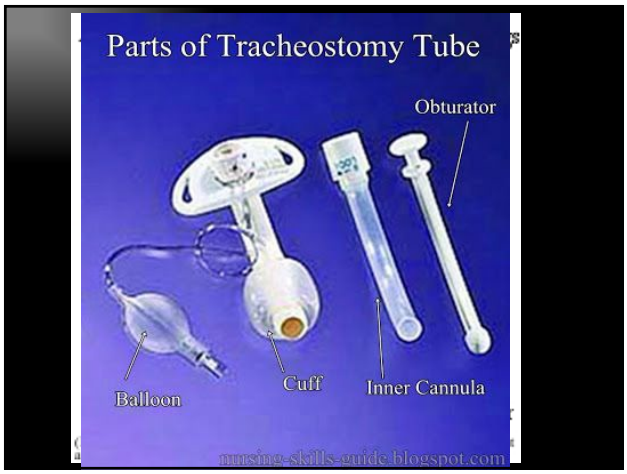
Tracheostomy

We are familiar with crics that EMS places in the emergent pre-hospital setting, but what is unfamiliar is the equipment



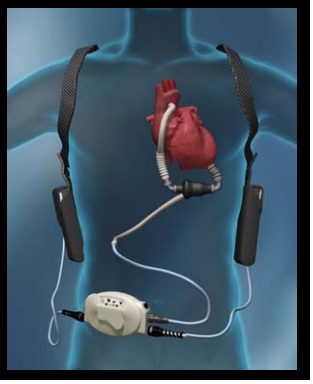
SOP p. 15





Ventricular Assist Devices

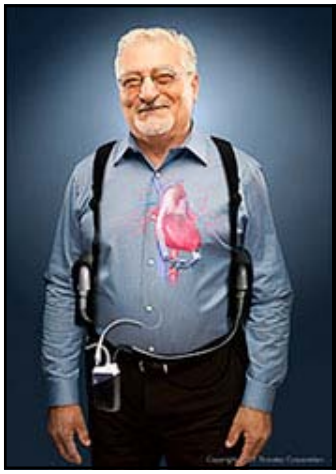
A **VAD** is a mechanical pump that is used to support heart function and blood flow in people who have weakened hearts



SOP p. 23

How does it work?

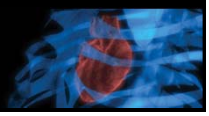
The device takes blood from the left ventricle in the heart and supplements the ejection fraction to adequately supply it to the rest of the body and vital organs



So what's the power source?

BATTERIES

AC power



Interesting facts about VADs?

*Patients may NOT have a pulse and still be alive, therefore;

Auscultate the chest wall to hear if the device is functioning (whirling sound)

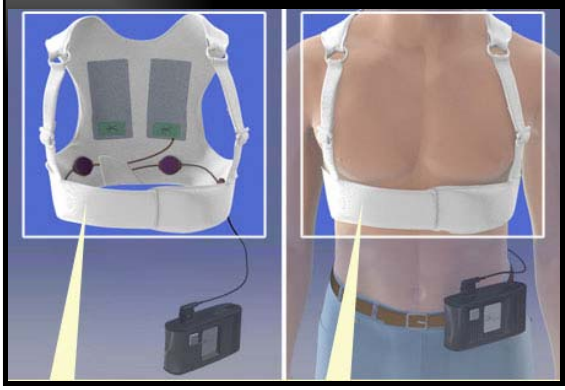
*BP may NOT be heard except with doppler

Highest PRIORITY

CALL the VAD coordinator!!!

Life Vests for defibrillation

Wearable defibrillator



Autism

Please read in handout bottom of page 12-13

https://www.youtube.com/watch?v=odrjh_89Iwo

PCRs


Dry Drowning
http://www.click2houston.com/news/a-look-at-dangers-symptoms-of-dry-drowning


Ryan Kim


Questions?
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