Stroke and Seizure

Common causes of brain disorder
- Can affect LOC, speech, and muscle control
- If the problem is caused by the heart and lungs, the entire brain will be affected
- If the problem is in the brain, only that portion of the brain will be affected
- Stroke, CVA’s

Cerebrovascular Accident and Stroke
- CVA: interruption of blood flow to the brain that results in the loss of brain function
- Stroke: the loss of brain function that results from a CVA
  - Hypertension is the number one risk factor for a CVA

Potential causes of a CVA
- Thrombosis: clotting of the cerebral arteries
- Cerebral embolism: obstruction of a cerebral artery caused by a clot that was formed elsewhere and traveled to the brain
  - Arterial rupture: rupture of a cerebral artery
- Blood kills brain tissue

Ischemic Stroke
- Results when blood flow to a particular part of the brain is cut off by a blockage inside a blood vessel
  - Number one cause is hypertension

Atherosclerosis and Aneurysm
- Dissecting aneurysm: weak arterial wall becomes thin due to the destruction of inner layers of the vessel causing a balloon-like bulge.

Hemorrhagic stroke
- Results from bleeding in the brain; arterial rupture
  - High bp is a risk factor
  - Some people are born with aneurysms

Sighs and Symptoms of Stroke
- Worst headache ever
  - Hemiparesis (one-sided weakness/paralysis)
  - Patient may have difficulty swallowing (watch airway)
    - Place patient in left-lateral when the airway is compromised
    - Excessive bleeding in the brain may slow pulse and cause erratic respirations
    - Blood pressure is usually high (cushing’s triad: hypertension, bradychardia, irregular respiration)
    - Excessive bleeding in the brain may cause changes in pupil size and reactivity (unequal pupils caused by pressure on 3rd cranial nerve)
      - Was there an MOI? Then assume ICP
      - If not, then assume a stroke
        - Dysarthria (slurred speech)
        - Aphasia: inability to speak or understand speech
          - Receptive aphasia: ability to speak, but unable to understand speech
          - Expressive aphasia: inability to speak correctly, but able to understand speech
            - Expressive also called dysarthria
            - Keep the patient calm to prevent further damage

Cincinnati stroke scale
- Performed any time during the secondary assessment
  - Speech: abnormal if words are slurred or confused
    - “the sky is blue in Cincinnati”
Facial droop: abnormal if asymmetrical (have the patient smile)
Arm drift: abnormal if the arms start at equal heights and then one arm drops down lower than the other
The patient must close their eyes and extend both arms straight out, palms up, for 10 seconds.
Notify the hospital if patient is positive for any of these tests

Time is Brain
Thrombolytics (fibrolytics) may reverse stroke symptoms or stop a stroke if given within 3-6 hours of onset
- Contraindicated outside of this window
- Spend as little time on scene as possible
- Elevate head approximately 6"
- Quickly determine when patient last appeared normal
- Place patient in a lateral position, affected side down (not always a left)
- Always perform a rapid and detailed physical exam before placing the patient on gurney/backboard

Emergency Care for Stroke
- Patient needs a CT
- Treatment needs to start ASAP

Transient Ischemic Attack (TIA)
- A TIA is a mini-stroke
- Stroke symptoms go away within 24 hours, with no lasting neurological deficits
- Every TIA is an emergency
- TIA may be a warning sign of a larger stroke, but not always
- Patients with possible TIA should be evaluated by a physician
- The normal body processes remove the clot naturally

Stroke Mimics
- Hypoglycemia
- Postictal state (seizure phase)
- Subdural or epidural bleeding

Causes of seizures
- Congenital (epilepsy)
- Structural problems in the brain: trauma, tumor, infection, stroke
- Metabolic disorders: hypoglycemia, poisoning or drug OD, alcohol (withdrawal)
- Fevers (febrile)

Seizures
- Generalized (grand mal) seizure
  - Unconscious and generalized severe twitching of the body’s muscles (chaotic brain activity)
  - Usually last 3 to 5 minutes and are followed by postictal state
- Absence (petit mal) seizure
  - Seizure characterized by a brief lapse of attention; unaware that they were gone
  - Often misdiagnosed as ADHD
- Focal seizures: occur on one side (usually in an extremity) and can gradually progress to a generalized seizure

General Phases of Seizures
- A seizure has three distinct phases: aura, ictus, and postictal state
- The aura phase involves alterations in smell, taste, visual, perception, hearing, and emotional state
- Tonic-clonic (grand mal): there is loss of consciousness during the seizure. The tonic phase, consisting of increased muscle tone (rigidity), is followed by the clonic phase, which involves jerking of the extremities. (lasts ~3-5 minutes)
There is a buildup of acid in the tissues
· Postictal state: drowsiness and confusion are commonly experienced during this phase. The postictal state is the period in which the brain recovers from the insult it has experienced.
· Once normal LOC is regained, the postictal state is over

Postictal State
· Labored breathing
· Possible hemiparesis
· Lethargic, confused, combative
· Consider underlying conditions:
  o Congenital
  o Fevers
  o Structural problems in the brain
  o Metabolic disorders (hypoglycemia)
  o Chemical disorder (poison or drug OD)
  o Trauma
  o Alcohol withdrawal
  · When performing painful stimulus, do so standing away from the patient leaning back so they cannot strike you

Status Epilepticus (SE)
· 30 minutes of continuous focal, partial, or absence seizures
· lack of recovery between two seizures
· > 5 minutes of continuous convulsive seizures
· 3 discrete convulsions within an hour
· SE lasting longer than 60 minutes carries a mortality of 32%. Mortality is about 2.7% for shorter duration
· Major problem of all seizures is 1. Hypoxia, 2. Trauma
  o Protect from trauma
  o Place in left-lateral/recovery/recumbent position
  o Give oxygen
  § NRB is difficult to attach to face, administer blow-by oxygen (holding it as close as possible to their face)
  § Digression: peds do not tolerate NRB or nasal cannula. Use blow-by O2, have parent hold it. Oxygen bear: place oxygen PR to the bear and have the child hold it. Cup method: attach O2 in a cup, the child will hold the cup to their face.

Interventions and Transport Decision
· Spinal immobilization may be needed
· Treat ABCs while waiting for seizure to finish
· Protect the seizing patient from his or her surroundings
· Place patient in recovery position if possible.
· O2 if possible, blow-by with NRB
· Never restrain
· Not every patient who has a seizure wishes to be transported
  o They may have experience with their condition
· Encourage every patient to be seen and evaluated in the emergency department (especially if this is a first seizure)
· Instruct patient not to drive
  o Notify law-enforcement if they do not cooperate
· Most seizures will be over by the time you arrive. Treat for trauma as you would any other patient
· For patients who continue to seize, suction the airway according to local protocol, provide positive
pressure ventilation, transport quickly to the hospital
  · Consider ALS ETA, who have medications to stop prolonged seizure
  o If the patient is seizing when you arrive summon ALS
  o Medications are administered PR
  · Febrile Seizures
  o Mostly occurs in children
  o Caused by a spike in body temperature
  o DOT: active cooling to lower body temperature; cold-packs
  § One pack behind neck, packs under armpits, down sides, in groin to create a perimeter around the core
  o LA County: passive cooling; remove excess clothing, turn on A/C in ambulance
  § The seizure can also be caused by a sudden drop in temperature.
Documentation
  · Note additional seizure activity
  · Always document ABCs, interventions, vital signs
  · Provide complete history to receiving facility
  · Include descriptions of seizure from witnesses if available
  · Document whether this is first seizure or whether patient has history of seizures
Altered Mental Status (AMS)
  · Hypoglycemia
  · Hypoxemia
  · Intoxication
  · Drug overdose
  · Unrecognized head injury
  · Brain infection
  · Body temperature abnormalities
  · Glandular deficiencies
  · Poisoning
Assessing a Patient with AMS
  · Same assessment process
  · Patient cannot tell you reliably what is wrong
  · Use family member of caregiver if available
  o Family members first
  · Be vigilant in ongoing assessment
  · Monitor for changes or deterioration
  · Provide prompt transport to hospital while monitoring the patient