Neurological Emergencies
Pathophysiology

**Central Nervous System (CNS)**
- Consists of brain/spinal cord

**Peripheral Nervous System (PNS)**
- Consists of everything else
Afferent (sensory)

Efferent (motor)

Autonomic (involuntary)
- Sympathetic (fight or flight)
- Parasympathetic (feed or breed)

Somatic (voluntary)
Initial Assessment

General Appearance
Speech
Skin
Face
Posture/Gait
Mental Status
  A-Alert
  V-Responds to verbal stimuli
  P-Responds to painful stimuli
  U-Unresponsive
Emotional State
Patient History

Is the neurological emergency due to trauma or a medical problem?

Trauma:
- When did the incident occur?
- What is the MOI?
- Was there any LOC?
- What is the chief complaint?

Medical:
- What is the chief complaint?
- Details of present illness?
- PMH
- Environmental clues (Medic Alerts, alcohol bottles, HazMat)
Physical Exam (head-to-toe)

Face
Eyes
Nose/Mouth
Respiratory Status
Cardiovascular Status
Nervous System Status
Vital Signs
Additional Assessment Tool

• Capnography
• Pulse Ox.
• Glucometer
Ongoing Assessment

Reassess every 5 minutes! Constantly re-evaluate and monitor the patient’s airway and neurological system!!!
Management of Specific Nervous System Emergencies

- ABC's
- Circulatory Support
- Pharmacological Interventions
- Transport Considerations
Management of pts with AMS

- ABC's
- Use info. provided by family, friends, etc.
- Physical Exam
- Establish IV
- Blood glucose-D50%, glucagon, oral glucose if needed
- Consider Narcan
Strokes

• Stroke- “brain attack,” Injury or death of brain tissue due to interruption of blood flow
• Types of stroke: occlusive vs. hemorrhagic
**Occlusive-**
Cerebral artery is blocked by a clot or other foreign matter

**Embolic-**
- solid, liquid, gas
- carried to a vessel

**Hemorrhagic-**
Rupture of a cerebral vessel

**Thrombotic-**
- blood clot gradually develops and obstructs cerebral artery
Assessment of the stroke patient

Symptoms:
Facial drooping
Confusion/ agitation
Difficulty or inability to speak
Vision problems
Weakness on one side
Paralysis to one side
Numbness or tingling
Incontinence
Dizziness
TIA's-Transient Ischemic Attack

- Indicates a temporary interference with blood supply to the brain
- One or a combination of stroke symptoms may be present
- Usually resolve in 24 hours.
- 1/3 of TIA patients have a stroke thereafter
Management of the stroke patient
- ABC's
  - O2
  - Keep pt in supine or recovery position
  - Blood glucose
  - IV
- Cardiac monitoring
- Protect paralyzed extremities
- Complete PMH and history of current illness
- Give reassurance
- Rapid transport to appropriate facility with early notification to the ER
Time is brain!!! Know the onset of the symptoms!!!

tPA or a “clot buster” may be administered within 6 hours (at WMC) from the onset of symptoms!!! Consider Air Care!!!
Seizures and Epilepsy

Generalized
- Small electrical discharge in small area of the brain but spreads causing widespread malfunction

Partial
- Remained confined to a limited portion of the brain causing localized malfunction
Generalized seizures

1) Tonic clonic (grand mal) seizures - includes tonic phase which is characterized by tense contracted muscles then a clonic phase which involves jerking movements of the extremities

- Intercostal muscles are paralyzed - pt not breathing
- Secreations from mouth
- Incontinence
Generalized Seizures cont'd

- Progression of events
  - Aura
  - Loss of consciousness
  - Tonic phase
  - Clonic phase
  - Post seizure
  - Postictal
2) Absence seizure (petit mal)- 10-30 second loss of consciousness or awareness

- Eye or muscle fluttering or occasional loss of muscle tone
- Patient or observers may be unaware of episode
- Rarely occurs after age 20
Partial Seizures

- Simple partial-characterized by chaotic movement of one area of the body (only area affected by that portion of the brain will be affected), no LOC, may progress into tonic-clonic
- Complex partial-characterized by distinctive auras, lasts 1-2 minutes, pt has a loss of contact with surroundings, pt may have explosive anger, act confused or stagger
1. Patient assessment including vital signs, initiate pulse oximetry monitoring, and apply oxygen based on patient condition / need.

2. Focused neurological exam: Cincinnati Prehospital Stroke Scale.

3. Obtain blood glucose level. If hypoglycemia is suspected:
   - EMT-Basic: Instant Glucose 15 grams (1 tube) orally for hypoglycemic patient who is able to swallow on their own and can continue to protect their airway.
   - EMT-Basic (OPTIONAL) administers Glucagon 1 mg SQ, if no response to oral glucose.
STROKE
SPECIAL CONSIDERATIONS

☐ Is the patient taking *Warfarin (Coumadin)* or other anticoagulant medications?

☐ Reassess neurological status, minimum every 15 minutes.

☐ If the patient can be considered for stroke intervention, it is very important that their baseline neurological status can be identified, that the time of onset of symptoms is identified, that their medications are known, and that a family member or medical decision maker can be available if needed.

☐ For patients with a known time of onset of symptoms and a symptom onset to Emergency Department time of less than two (2) hours and who also have two (2) or more CPSS criteria; contact Winchester Medical Center (WMC) Medical Control immediately.

The Cincinnati Prehospital Stroke Scale (CPSS) is useful for identifying patients with acute stroke symptoms. The Cincinnati Prehospital Stroke Scale (which is located on the back side of the PPCR) consists of evaluation of Facial Droop, Arm Drift and Speech.
1. Patient assessment including vital signs, initiate pulse oximetry monitoring, and apply oxygen based on patient condition / need.

2. Protect the actively seizing patient but do not attempt to restrain.

3. Manage airway appropriately.

4. EMT-Basic (OPTIONAL), if seizure persists and hypoglycemia is suspected, administer Glucagon 1 mg SQ.

SPECIAL CONSIDERATIONS

- If patient is pregnant, refer to OB/GYN Emergencies guidelines for further guidance.

- The patient’s history of seizures and any medications they might be taking are of particular interest to the receiving hospital.
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2. For suspected hypoglycemia:
   - EMT-Basic: Instant Glucose 15 grams (1 tube) orally for hypoglycemic patient who is able to swallow on their own and can continue to protect their airway.
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3. Spinal immobilization, if indicated
Blood glucose determinations in the field may be helpful in determining whether hypoglycemia is a potential cause of altered mental status, but should be interpreted with caution, particularly if values are borderline. If hypoglycemia is considered, it should be treated.

Medications are a common cause of altered mental status and every effort should be made to identify the patients medications and obtain the medications and/or an accurate list for the receiving hospital.