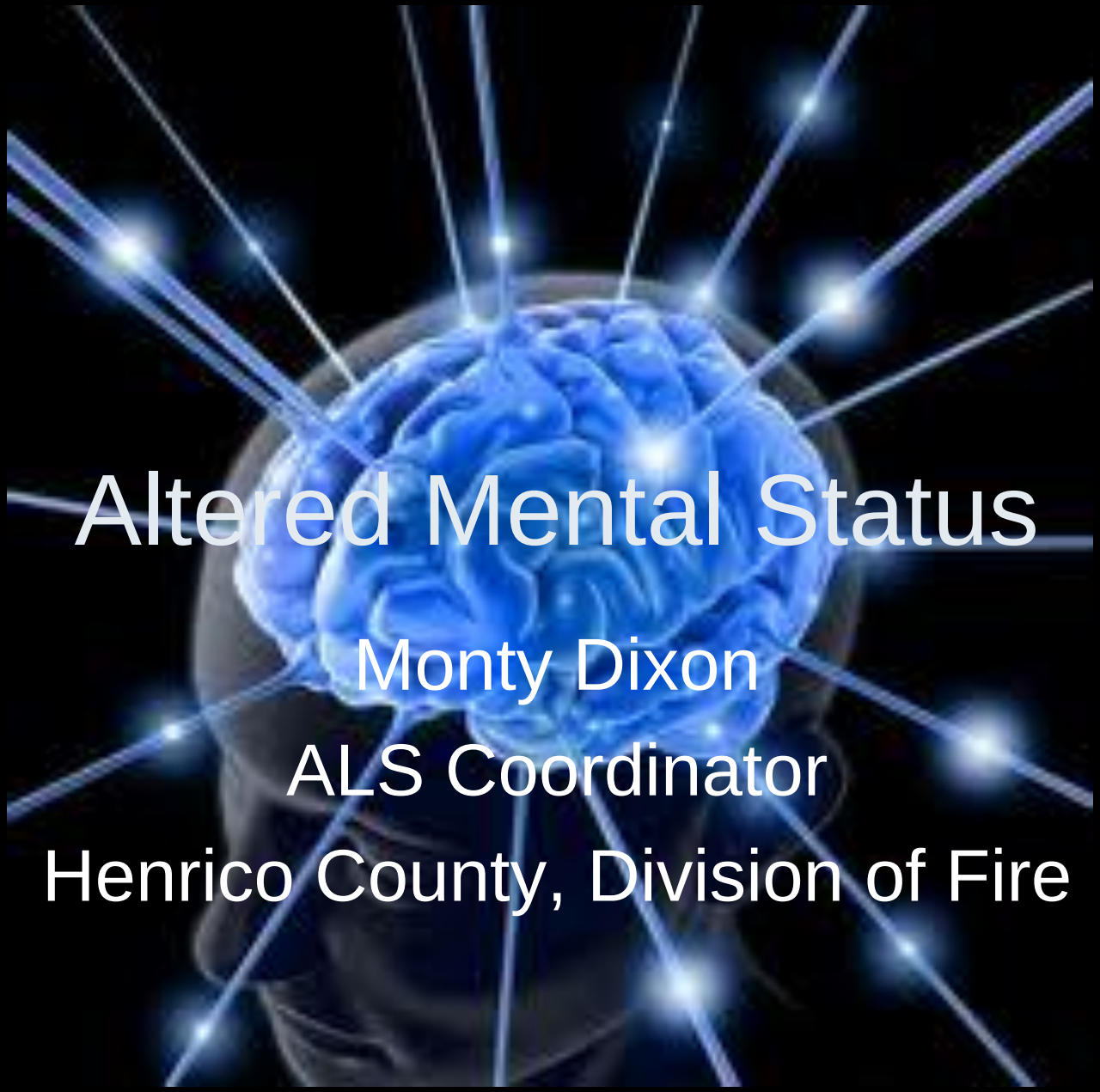


Altered Mental Status

Monty Dixon
ALS Coordinator
Henrico County, Division of Fire

Goals

- To visit and explain the levels of the brain and the impact on AMS
- To examine using videos metabolic and structural causes of AMS

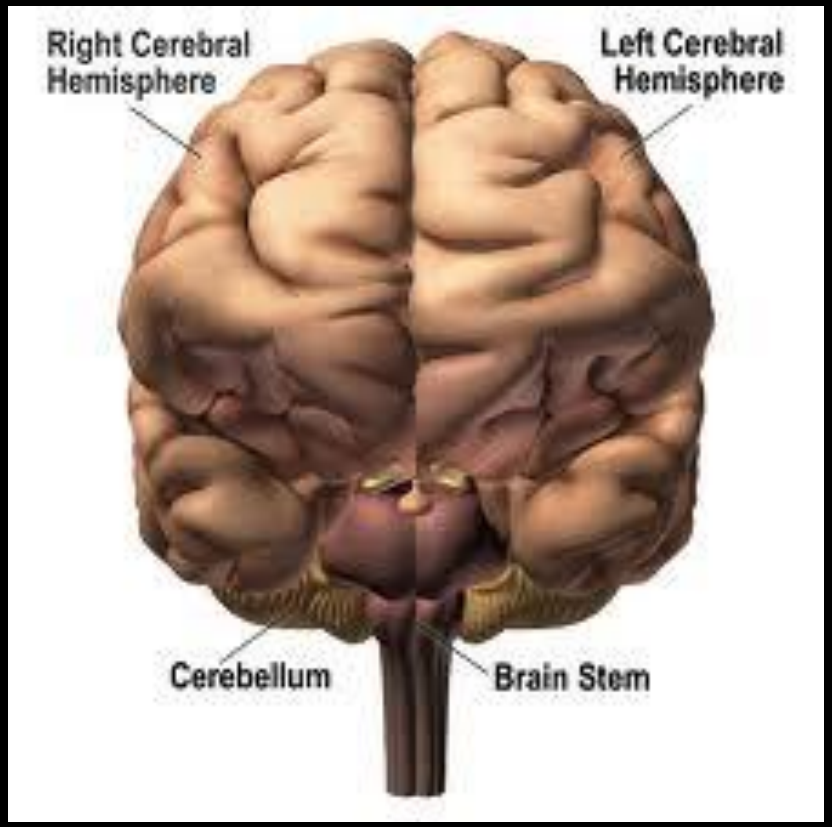
ETOH

Consciousness

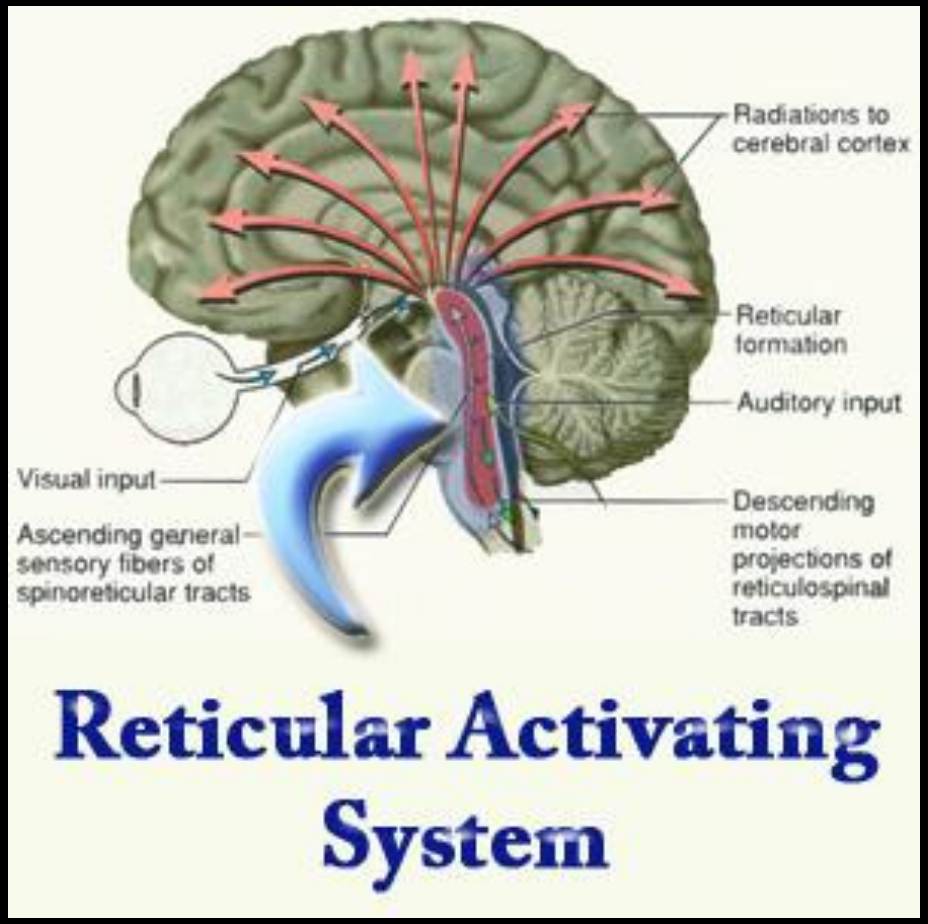
- The ability to perceive ourselves and the environment in which we exist

- Direct function of
  - RAS
  - Cerebrum

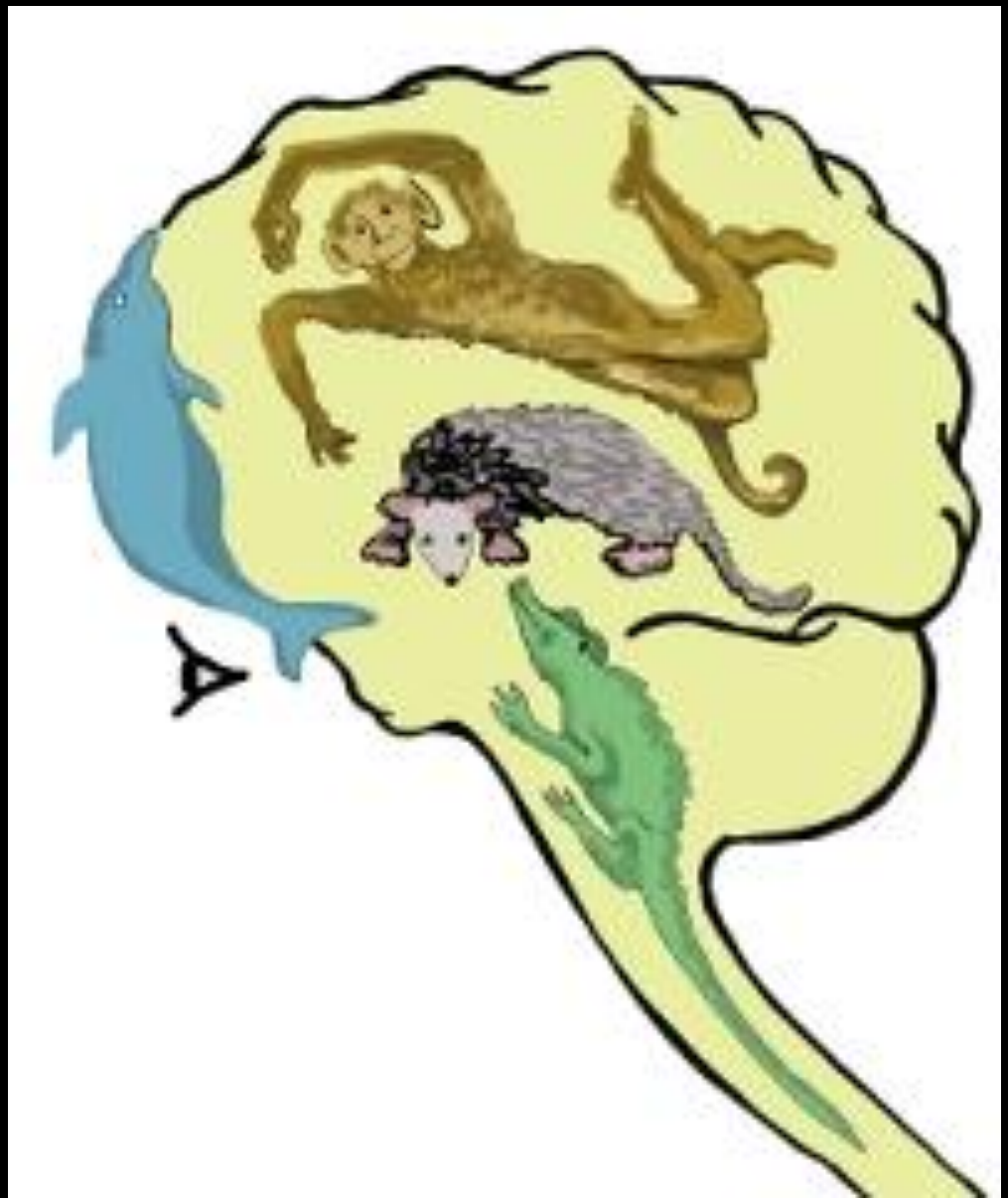
Cerebral Hemispheres



Reticular Activating System

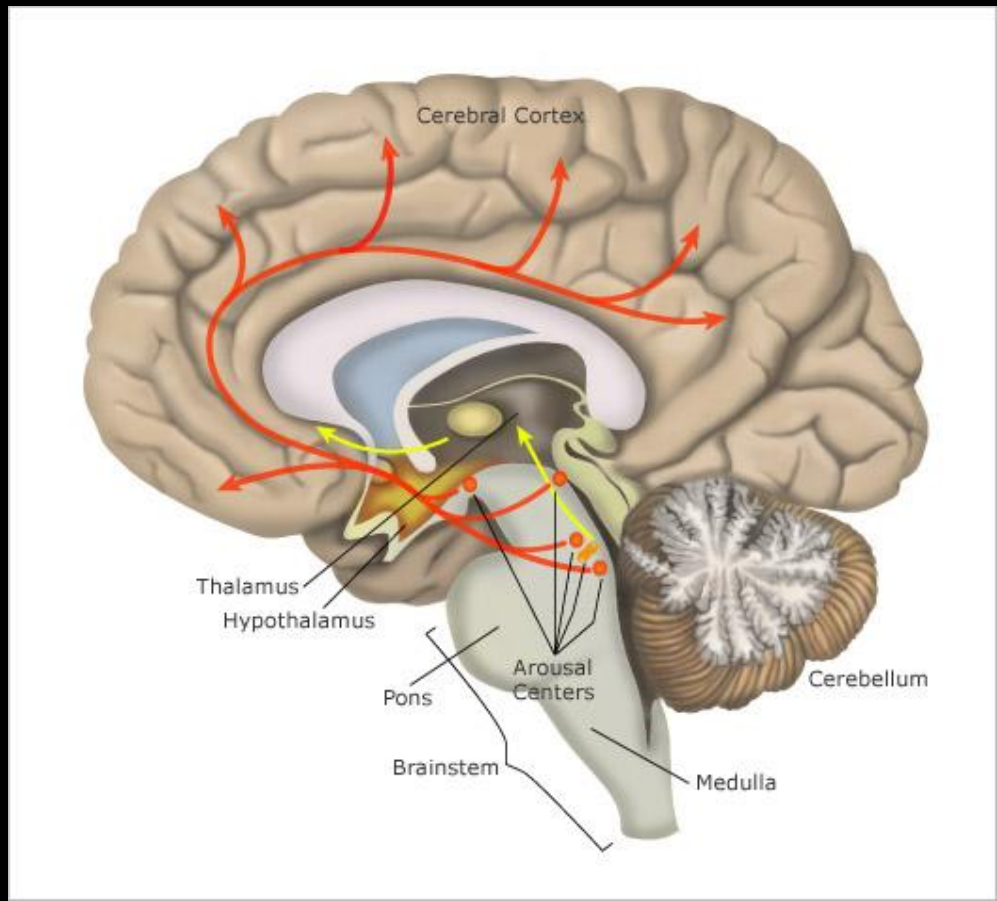


Triune Brain



The Fish Brain

- Cerebellum
  - Coordinated Movement



Reptilian Brain (R-Complex)

Typical instinctual behaviors involved in:

- aggression
- social dominance
- territoriality
- Reproduction
- Execution of the “fight or flight” response

R-Brain

The Limbic Brain

Responsible for

- Motivation
- Emotion
- Bonding

The right kind of energy - Calm and Assertive.

The Dog Whisperer

Neocortex (Neomammalian)

- ability for language
- abstraction
- planning
- perception

Categories of AMS

Metabolic

A chemical environment that impairs normal brain function

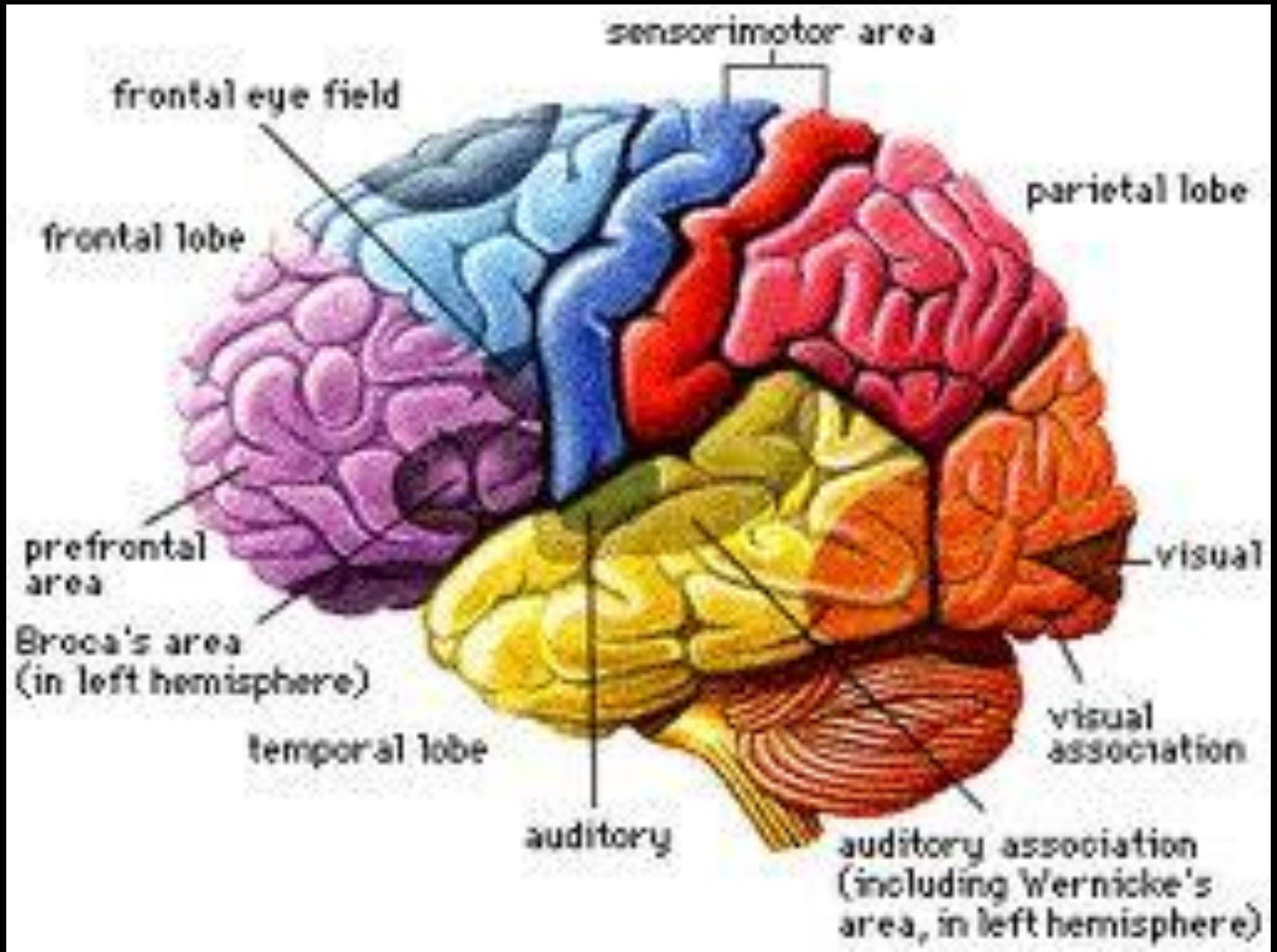
- Drugs/Toxins
- Hypoxia
- Hypoglycemia
- Electrolyte imbalances

Structural

Physical damage to the brain that impairs function in the either the RAS or areas of the cerebrum

- Trauma
- Strokes
- Tumors
- Infection

Regions of the Brain



Metabolic/Global Changes

- Drugs/Toxins
- Hypoxia
- Hypoglycemia
- Hyperglycemia
- Electrolyte Imbalances

Hypoxia

The Brain and Oxygen

- Cellular metabolism needs to be aerobic
- The brain unable to store reserve energy (ATP)
- Backup: Anaerobic metabolism.

Hypoxia and the Brain

Most patients show signs of agitation.

- Mild Hypoxia
  - Restlessness
  - Confusion
  - Personality changes
    - Euphoria
    - Irritability
- Moderate to Severe
  - Impaired judgment
  - Motor ability
  - Seizures
  - Delirium
  - Coma
  - Death

The Flip Side
Hypercapnia

- Increased ICP
- Headache
- Blurred vision
- Confusion
- Somnolence
- Fatigue
- Weakness

Causes

- Pulmonary Causes
- Pulmonary HTN
- COPD
- Pneumonia
- Asthma
- Toxic Inhalation
- Pulmonary embolism

- Cardiac Causes
- Ischemia/MI
- Dysrhythmias
  - Bradycardia
- Orthostatic Hypotension

Asthma

Metabolic/Global Changes

- Drugs/Toxins
- Hypoxia
- Hypoglycemia
- Hyperglycemia
- Electrolyte Imbalances

Hypoglycemia

The Brain and Hypoglycemia

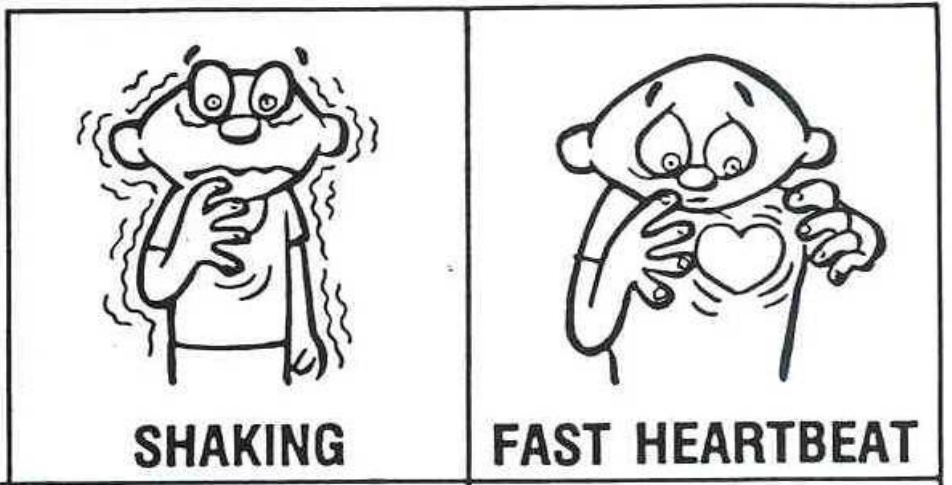
- Brain cells need glucose
- No glycogen stores
- Don’t need insulin
- Fat and lipid metabolism not a viable alternative

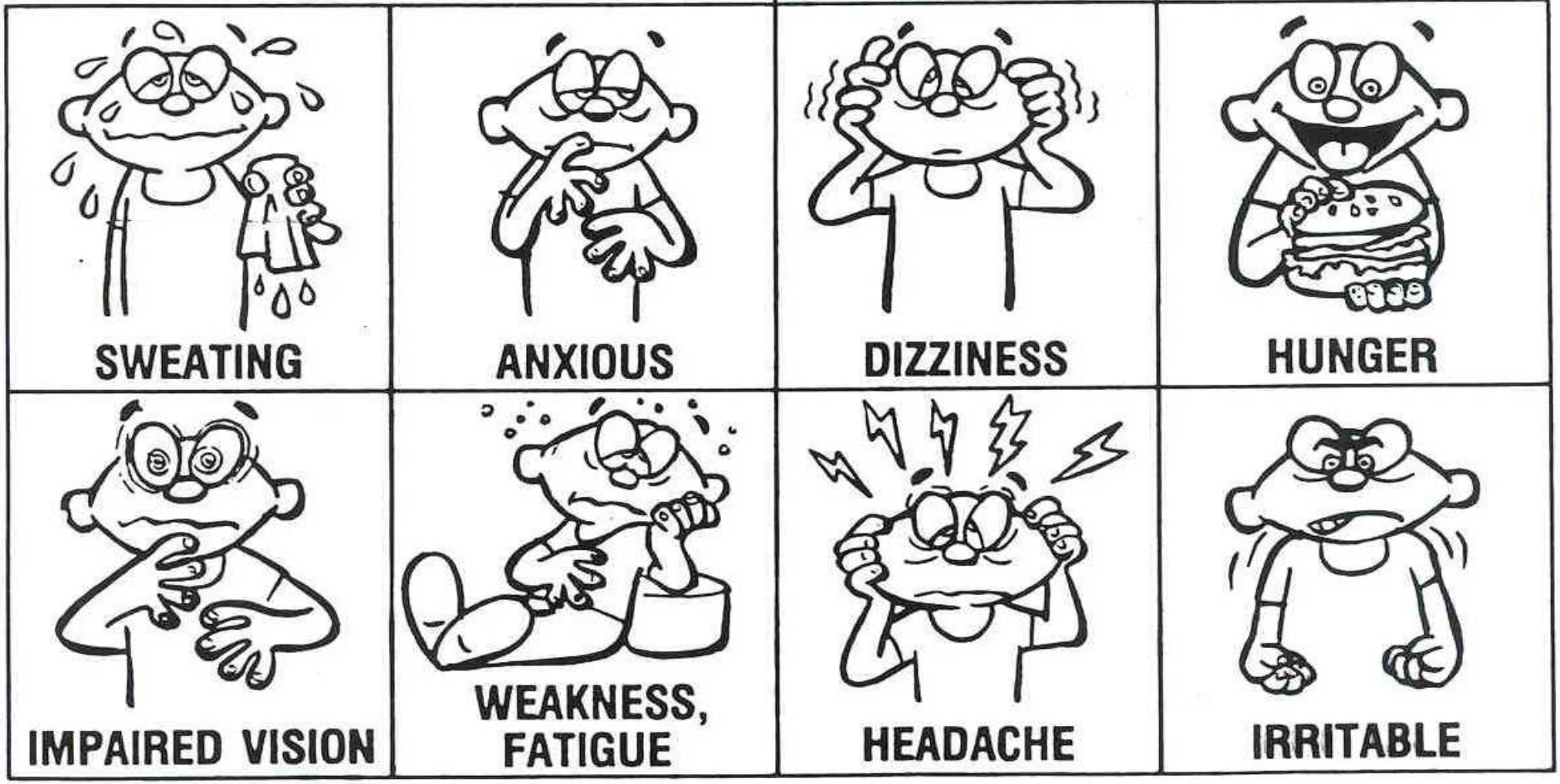
Panic Room

Signs and Symptoms

- Fight or Flight response
  - Sweating
  - Tachycardia
  - Pale, cool, moist
  - Hunger
- Anxious
- Bizarre behavior
- Irritability
- Stupor
- Confusion
- Seizure
- Coma

Hypoglycemia Symptoms





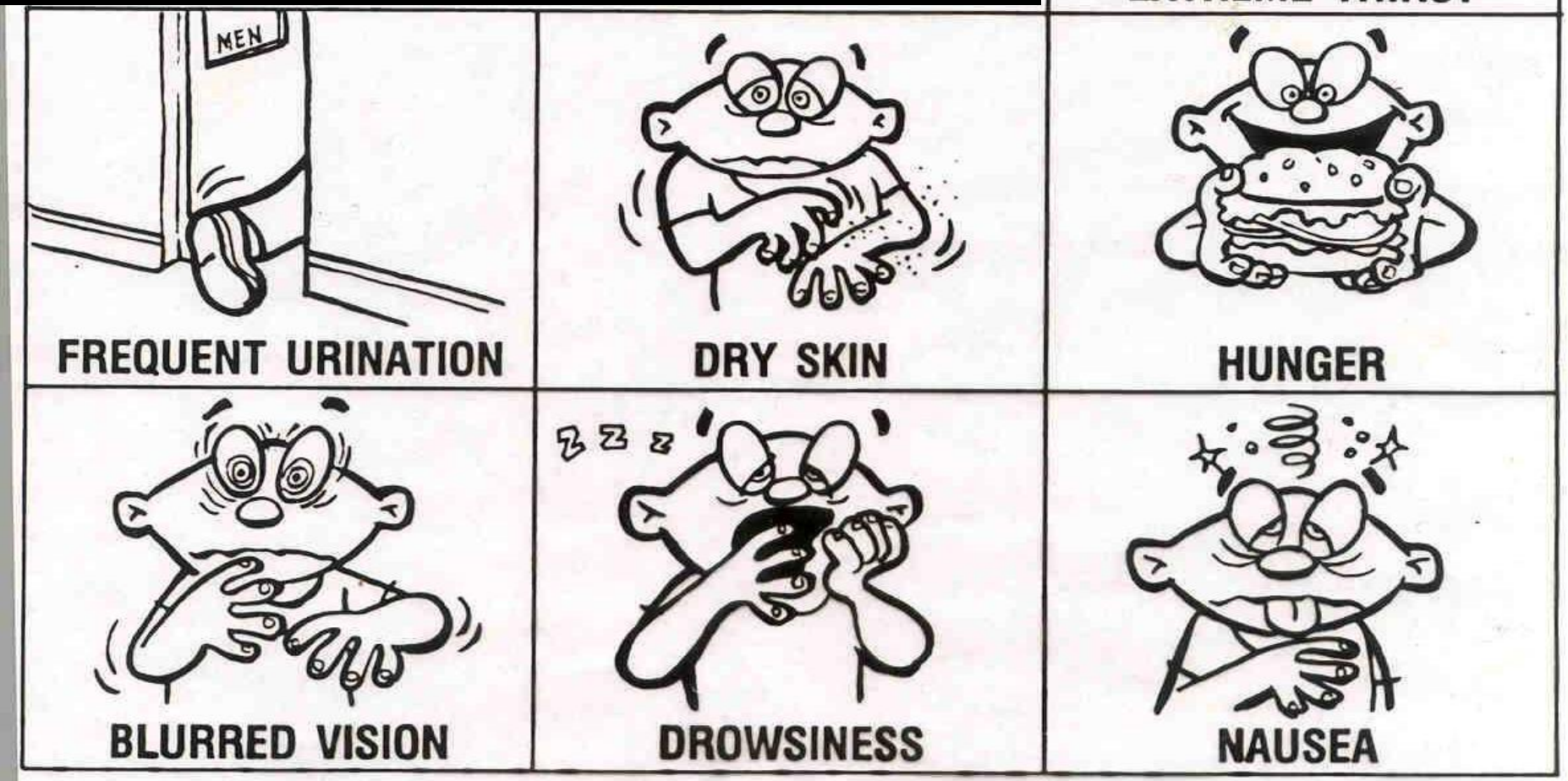
Panic Room

Panic Room (Continued)

Metabolic/Global Changes

- Drugs/Toxins
- Hypoxia
- Hypoglycemia
- Hyperglycemia
- Electrolyte Imbalances

Hyperglycemia Symptoms



Diabetic Coma

Metabolic/Global Changes

- Drugs/Toxins
- Hypoxia
- Hypoglycemia
- Hyperglycemia
- Electrolyte Imbalances
  - Dehydration

Dehydration

Dehydration

- Fluid deficits precipitate cerebral dysfunction
- Intravascular osmotic shift
- Water follows sodium

- Shrinkage of brain cells, causes a decrease in overall brain size
- Tension on cerebral vessels occurs
- Cerebral metabolism disturbed

Mild Dehydration S/S

- Tachycardia
- Poor skin turgor
- Decreased B/P
- Agitation
- Restlessness
- Blurred vision

Signs and Symptoms

Profound dehydration and electrolyte imbalances severely depress the CNS system

- Lethargy
- Confusion
- Delirium
- Greater propensity for seizure activity
- Brain damage
- Coma

Dehydration Profile

- Any patient unable to digest fresh water
- Decreased thirst perception or any patient who has the inability to drink
- Massive ingestion of sodium through diet or ingestion or intake of hypertonic saline solutions

Cujo

Categories of AMS

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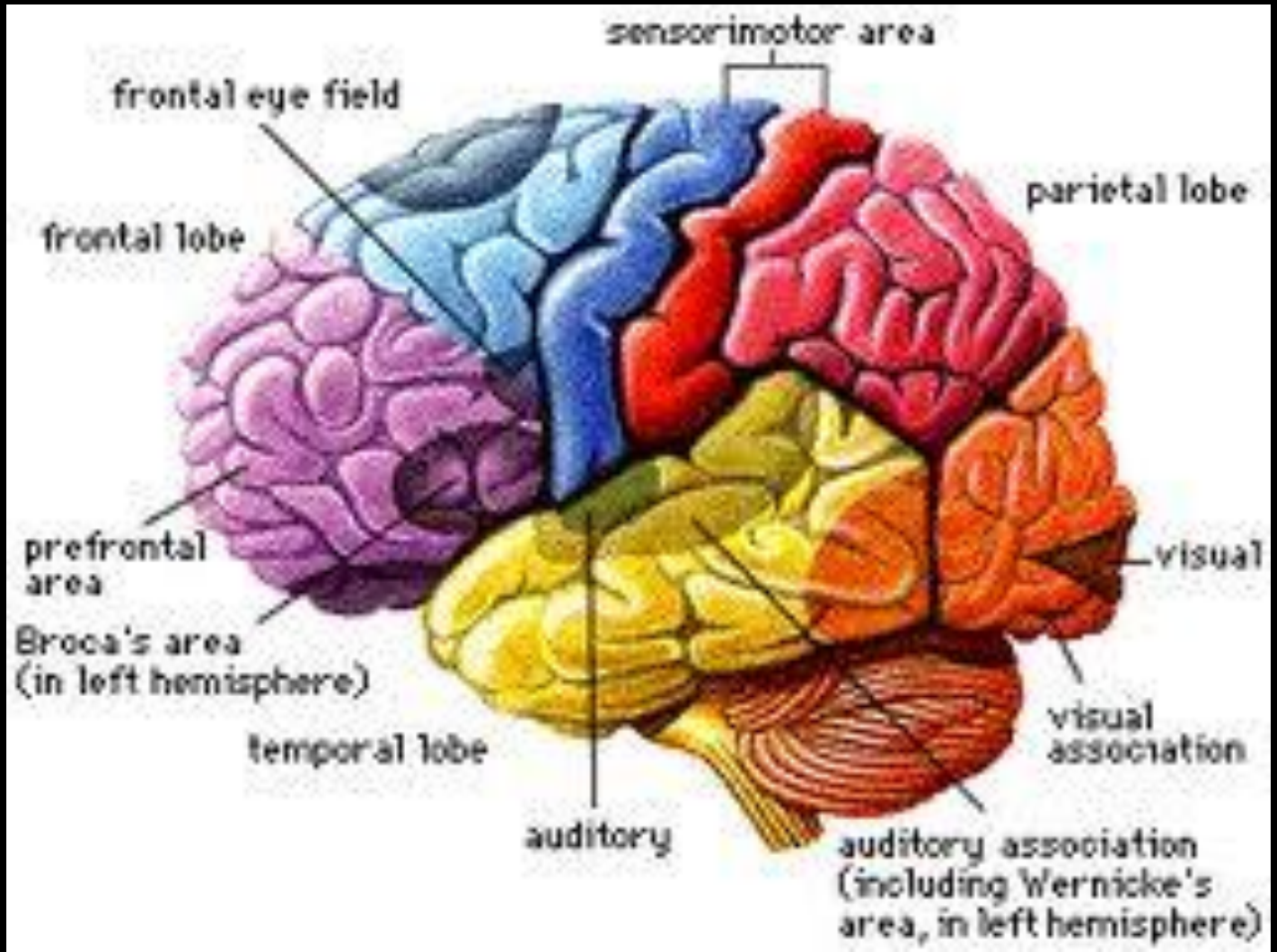
Regions of the Brain



Structural

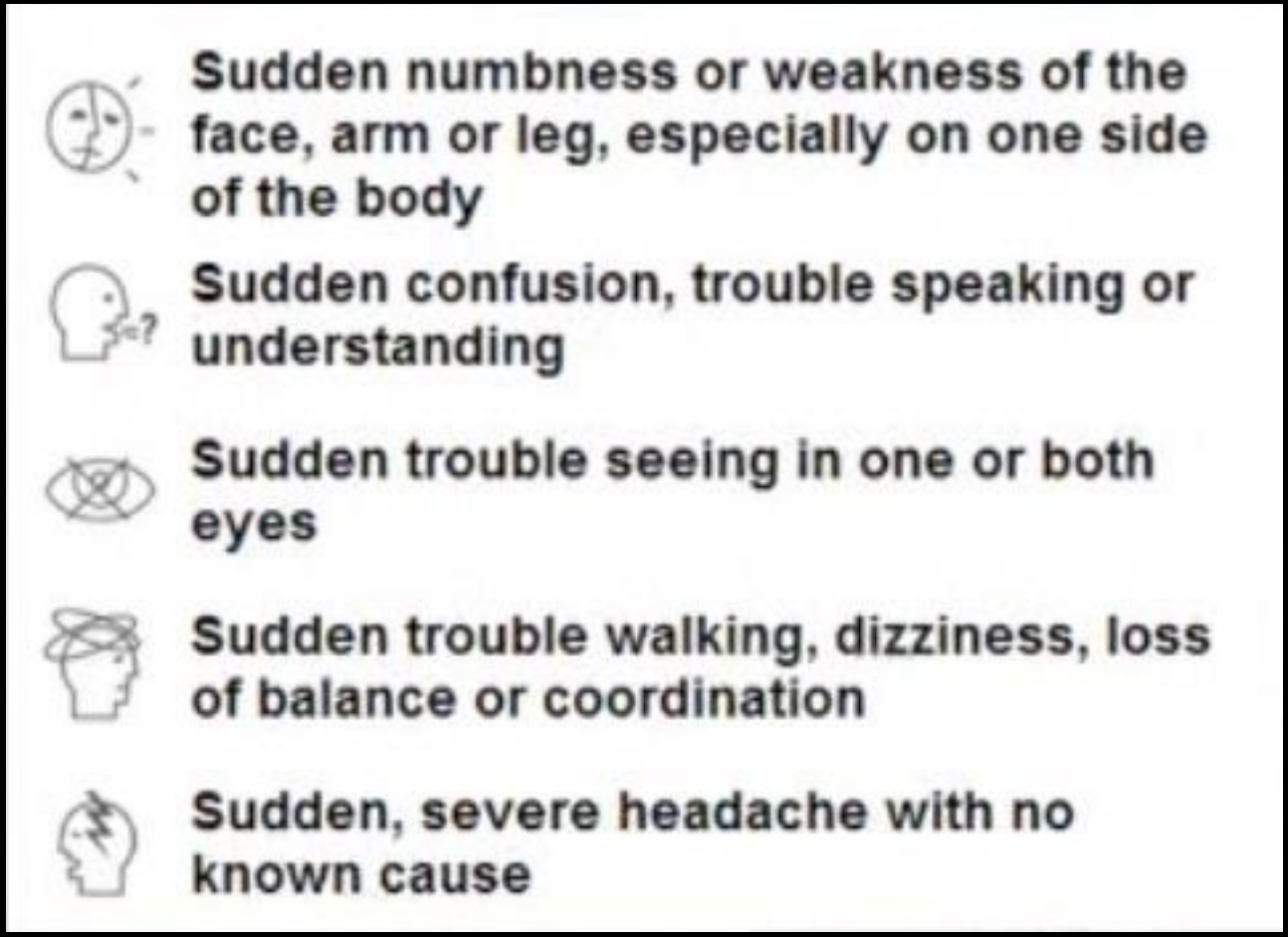
Physical damage to the brain that impairs function in the either the RAS or areas of the cerebrum

- Strokes
- Trauma
- Tumors
- Infection

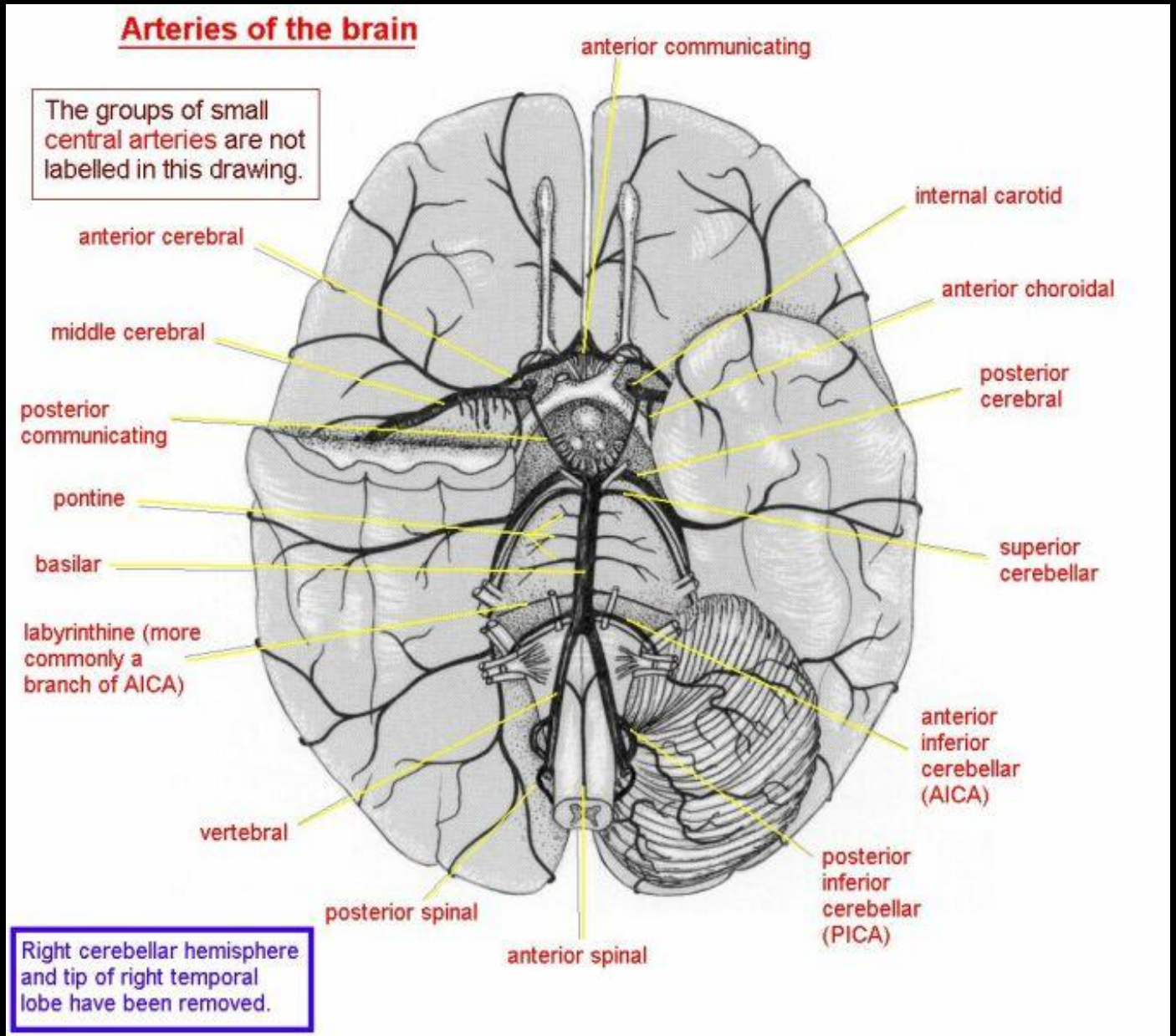
Stroke

Branson

Stroke Signs and Symptoms



Cerebral Arteries



Legends of the Fall

Cincinnati Prehospital Stroke Scale

Treatment

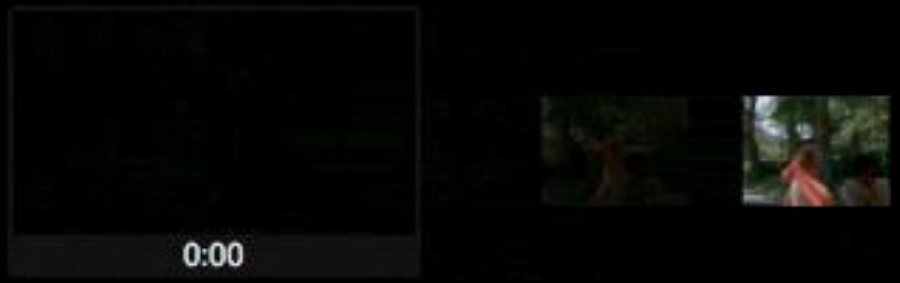
- Pay attention to airway
- Rule out
  - Trauma
  - Hypoxia
  - Hypoglycemia
- Hemorrhagic versus Ischemic

Structural

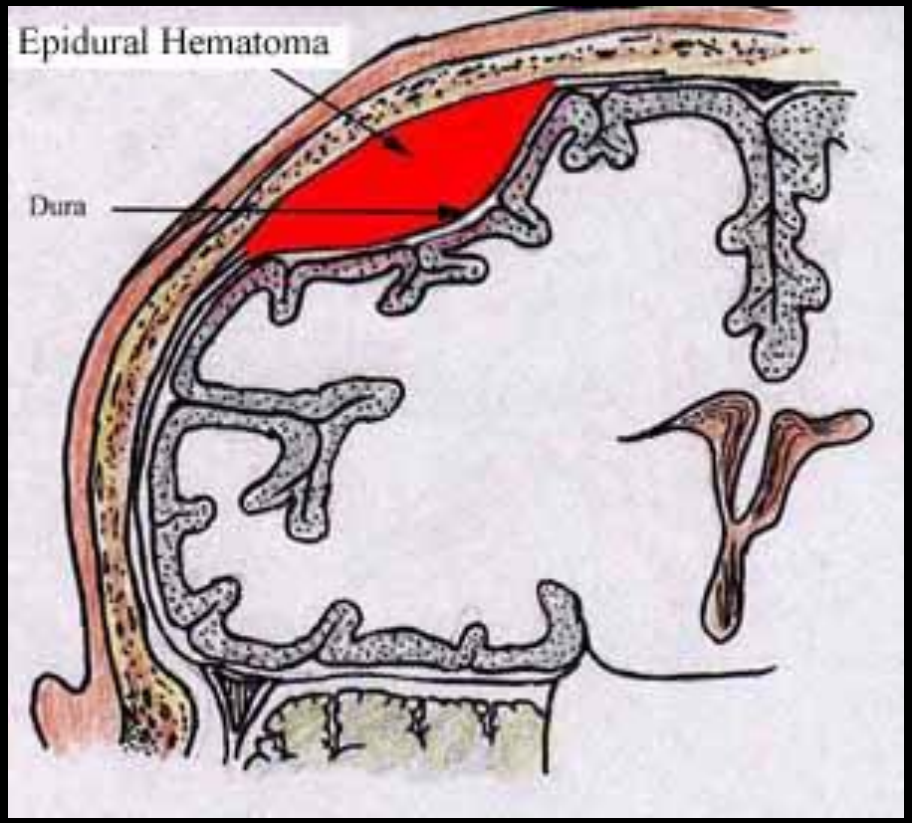
Physical damage to the brain that impairs function in the either the RAS or areas of the cerebrum

- Strokes
- Trauma
- Tumors
- Infection

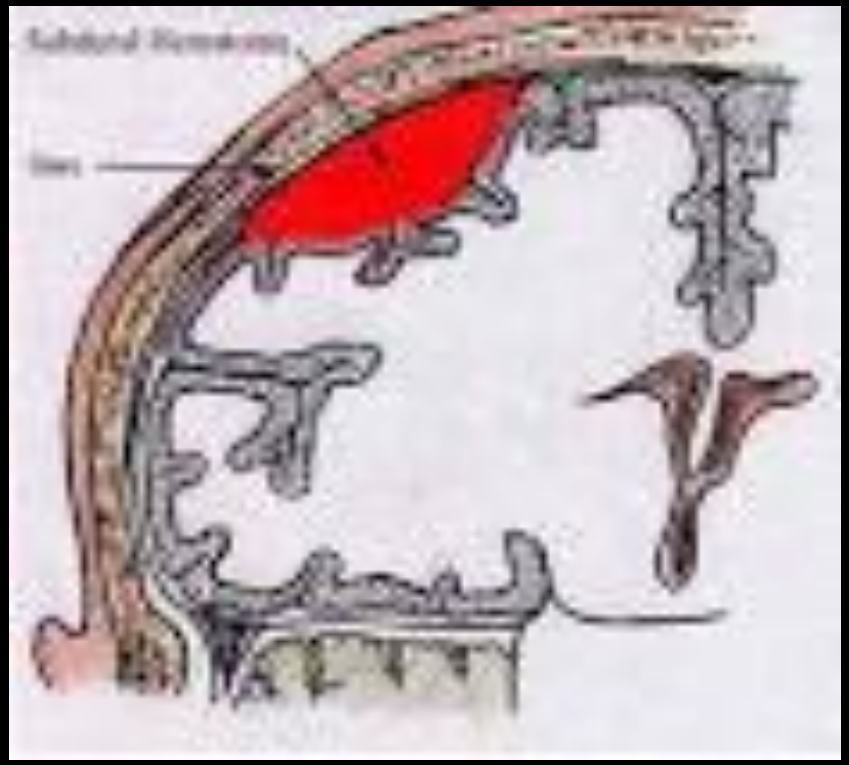
The Man with Two Brains

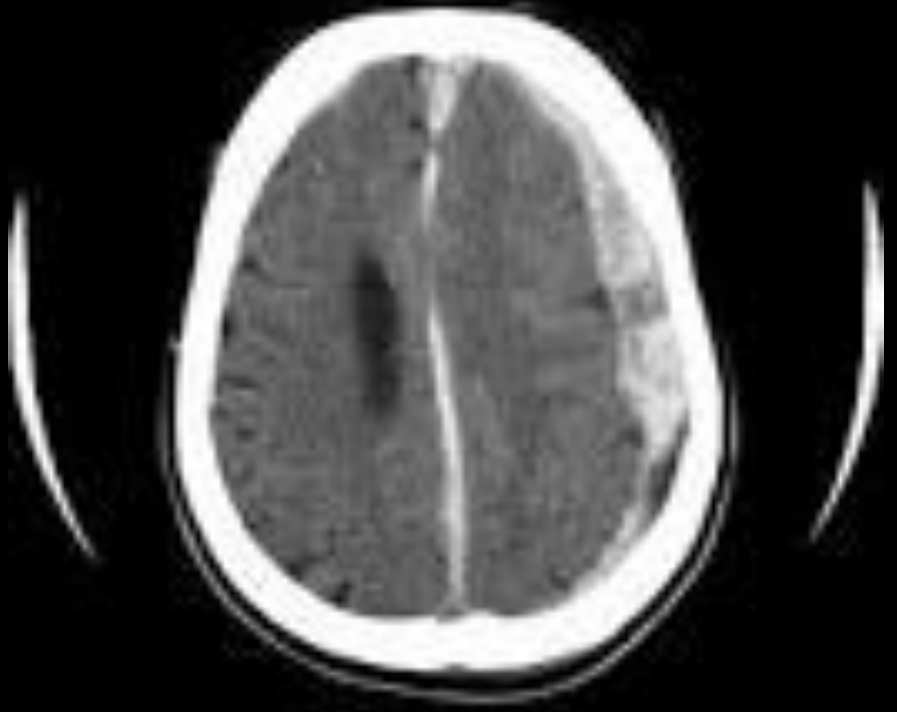


Epidural



Subdural





Treatment

- No more overzealous ventilation
- Always remember to ask about trauma in any patient exhibiting signs of a stroke
- Consider hypoxia and hypoglycemia

Questions?

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