STROKE

EMD CE

MARCH 2015

What Is Stroke ?

A stroke occurs when blood flow to the brain is interrupted by a blocked or burst blood vessel.

Stroke Stats and Stuff

- *Stroke is the 3rd leading cause of death*
- One person dies of stroke every 3 minutes
- Stroke is the leading cause of serious, long term disability
- 5 million stroke survivors, but with substantial morbidity:
  - 18% unable to return to work
  - 4% require total custodial care

Stroke Stats and Stuff

- Only 50-70% of stroke survivors regain functional independence
- 700,000 strokes per year
- 20% are institutionalized within 3 months
- 22% of men & 25% of women die within 1 year of their first stroke
- Locally, African-Americans have 50% more strokes than Caucasians, and twice as many as Asians and Hispanics (Statistics from the American Stroke Association)

Women & Stroke

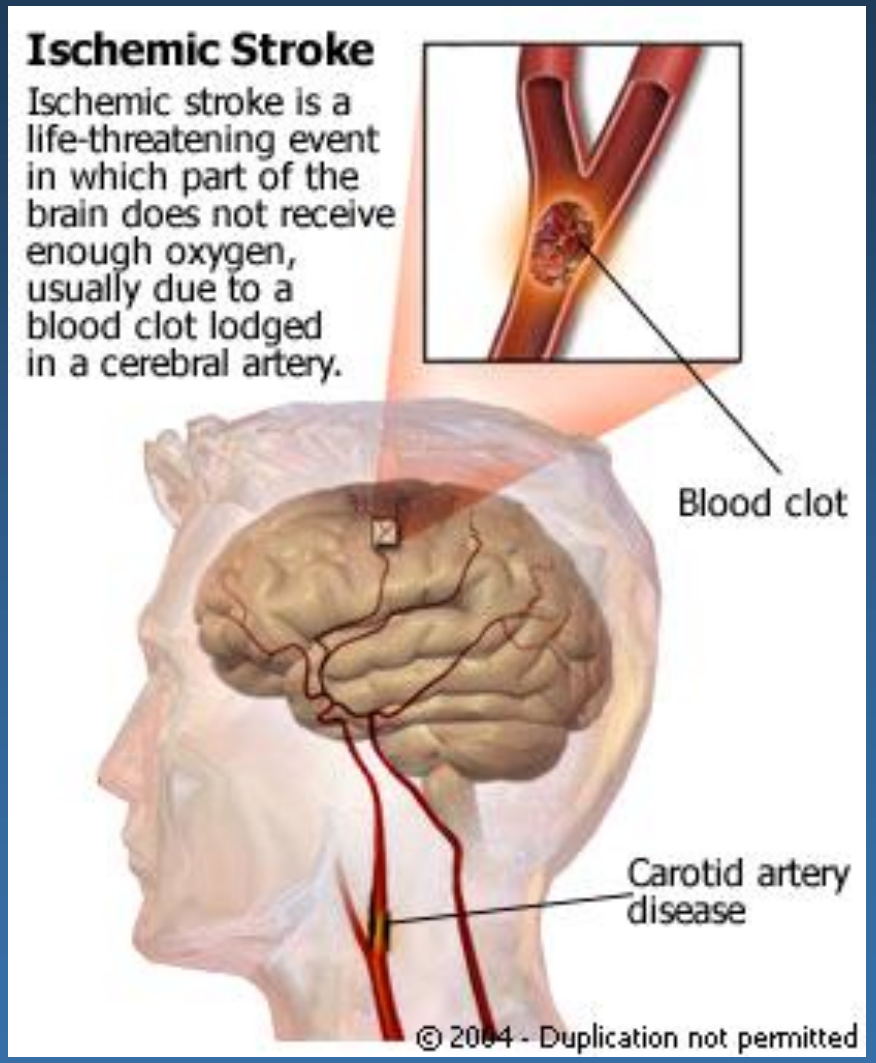
- Stroke kills more than twice as many American women every year as breast cancer
- More women than men die from stroke
- Women over age 30 who smoke and take high-estrogen oral contraceptives have a stroke risk *22 times higher* than average

(National Stroke Association)

What are the risks factors for Ischemic Stroke?

- Modifiable Risks
  - HTN
  - CAD/Carotid Disease/PVD
  - Atrial Fibrillation
  - Diabetes
  - Weight
  - High Cholesterol/Diet
  - Lack of exercise
  - ETOH/Drug abuse
  - Coagulopathy- Cancer, Sickle Cell Anemia
- Non-Modifiable Risks
  - Age->55
  - Race- African Americans have 2x the risk of death and disability. Asians have 1.4x the risk of death and disability.
  - Sex- 9% greater chance in men. (61% of stroke deaths occur in women)
  - Previous Stroke or TIA
  - Family History of Stroke

What is Stroke?



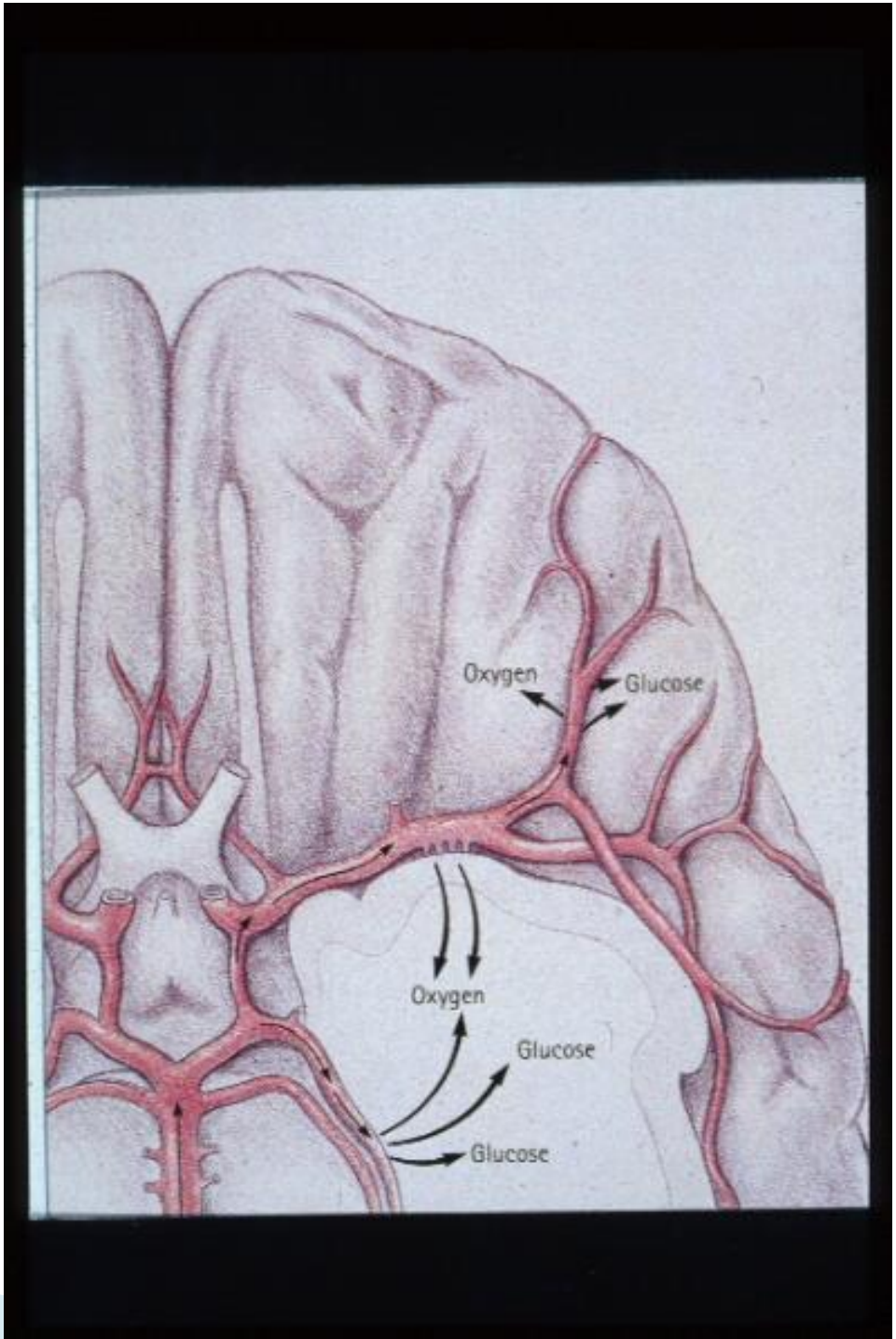
- **No oxygen, nerve cells die in minutes**
- **In first three hours, some cells can be saved (up to 35% recovery)**
- **Thrombolytics ('clot-busting') drugs dissolve clots; prevent more strokes:**
  - Administered via IV pump
  - Heparin (mixed results)
  - t-PA, "Activase" (good results)

One quarter of cardiac output goes to the 5-6 pound brain.
The brain needs a constant supply of:

- Oxygen
- Glucose
- Other nutrients

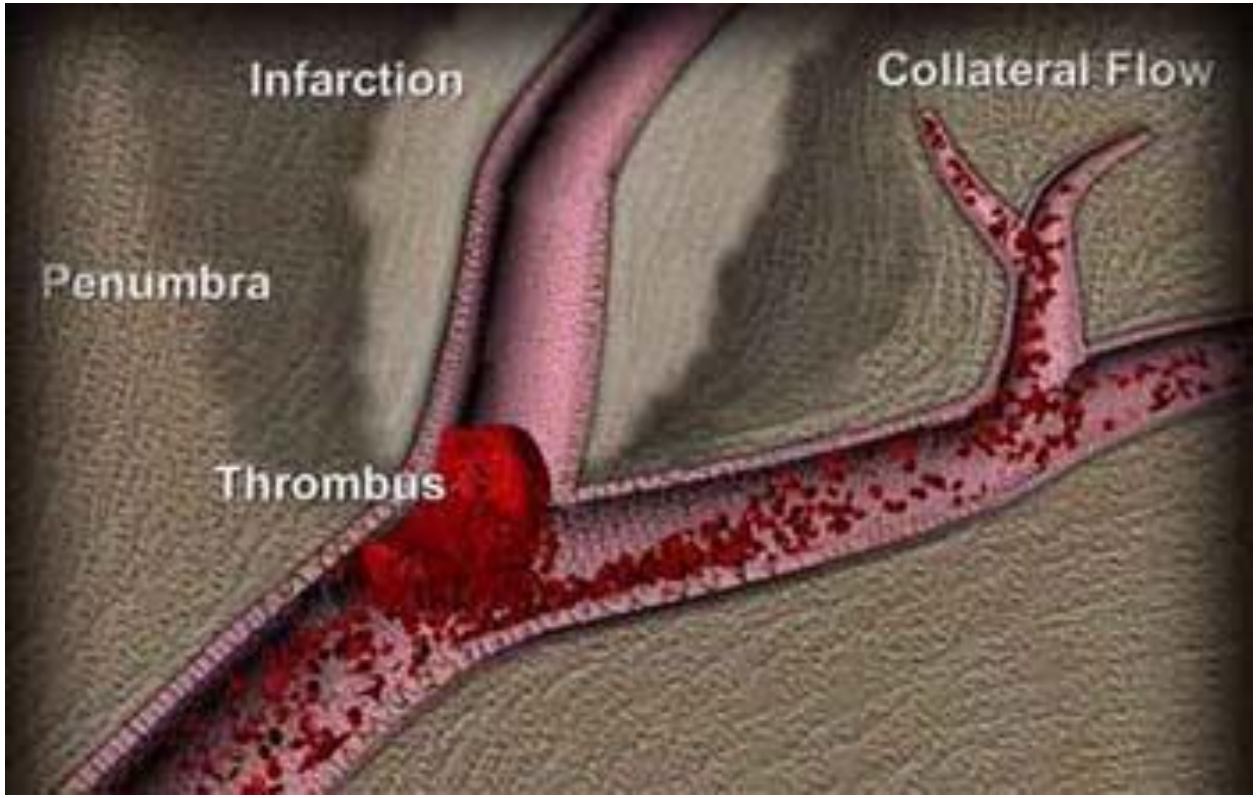
Circulation is supplied via 2 pairs of arteries:

- Internal carotids
- Vertebrals



PENUMBRA

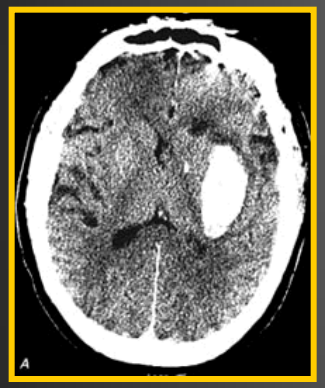
(That tissue surrounding the infarct that is salvageable, but at risk.)



Rapid transfer to the stroke center will allow for protection of penumbra through emergency interventions and medical management.

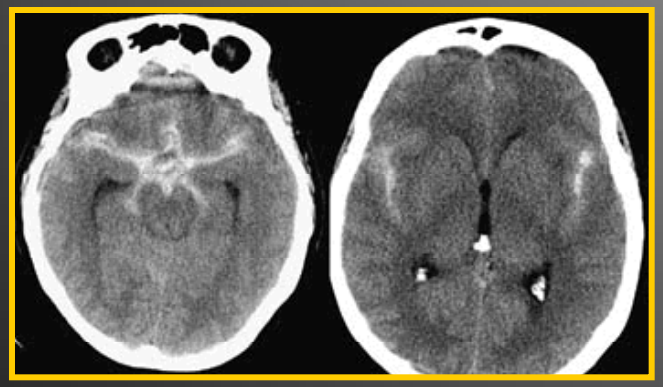
Cerebrovascular Disease

Hemorrhagic Stroke (17%)



Intracerebral Hemorrhage

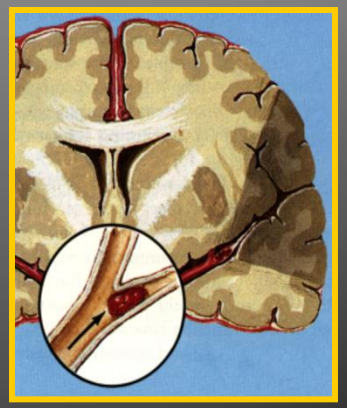
Subarachnoid Hemorrhage



Ischemic Stroke (83%)

Atherothrombotic Cerebrovascular Disease

Embolism



Albers GW, et al. *Chest*. 1998;114:683S-698S.
Rosamond WD, et al. *Stroke*. 1999;30:736-743.

Act F.A.S.T for stroke

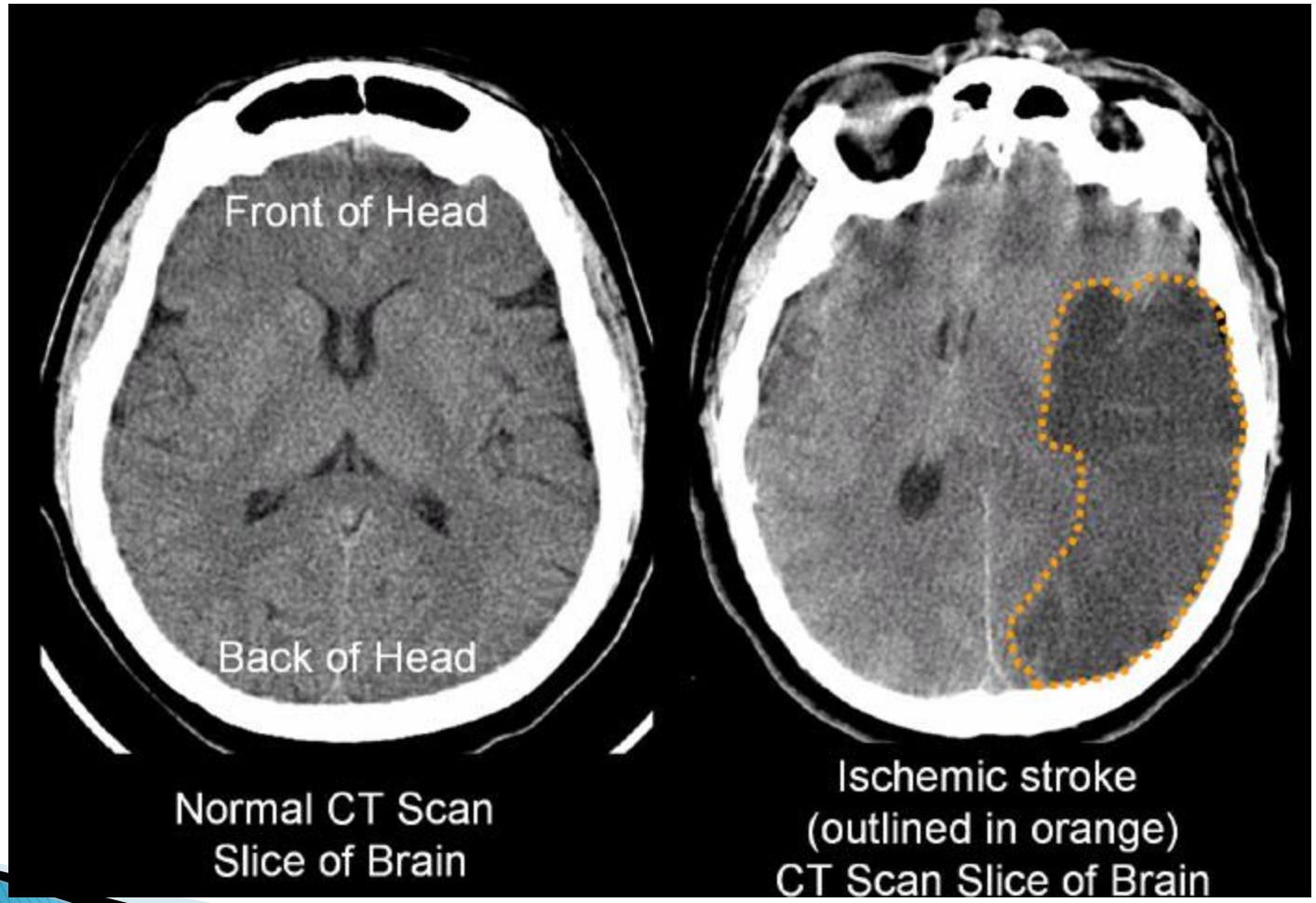
- The National Stroke Association recommends using the **FAST** method for recognizing and responding to stroke symptoms.
- **F** (face)
- **A** (arms)
- **S** (speech)
- **T** (time)

Acute Ischemic Stroke

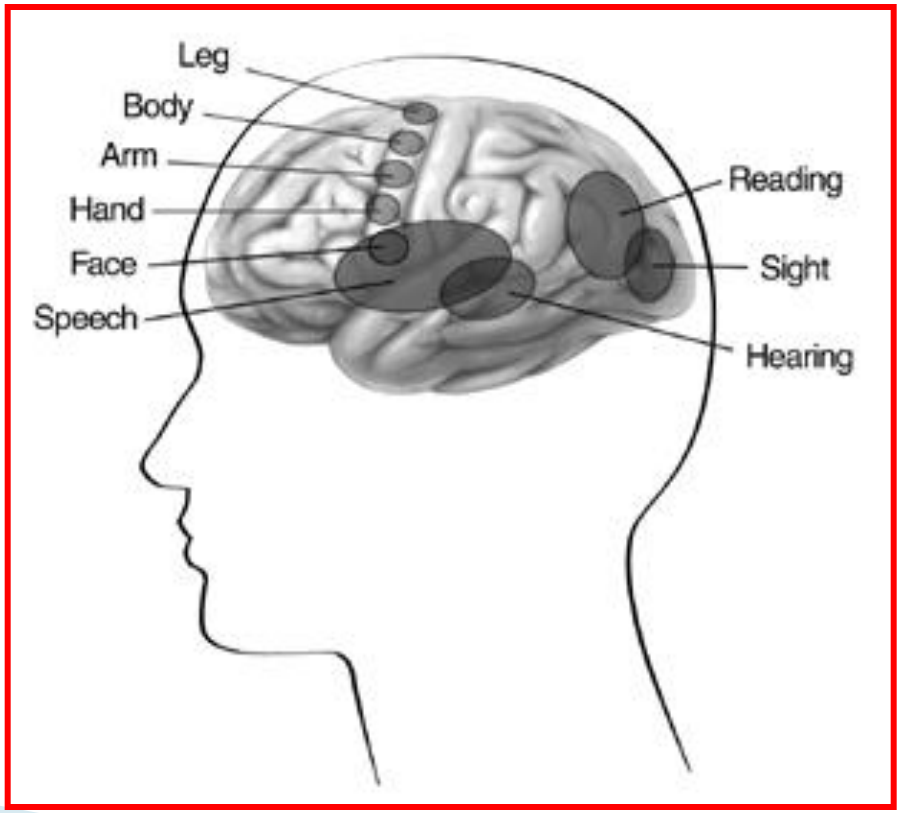
- Deficits:
  - One sided (though not always) weakness or sensory deficit
  - Visual deficits (blindness, gaze palsy, double)

  - Speech (slurred – a motor dysfunction)
  - Language (aphasia – damage to the brain's speech center)
  - Ataxia (lack of coordinated movement)
  - Cognitive impairment
- Signs & Symptoms will depend on location

CT Scan of Acute Ischemic Stroke (Left MCA territory stroke)

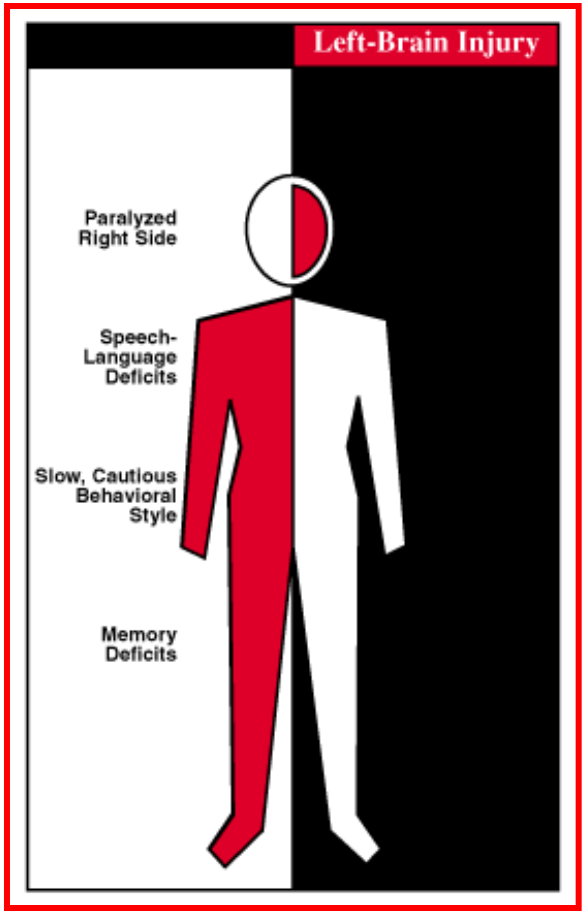


What Parts of the Brain Are Affected by Stroke?



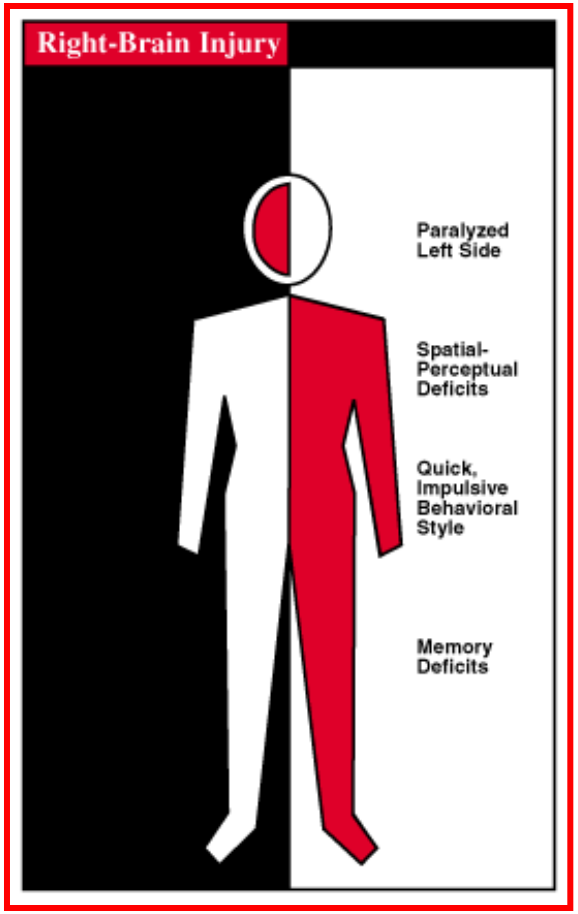
What Are the Effects of Stroke?

- Left Brain



What Are the Effects of Stroke?

- Right Brain

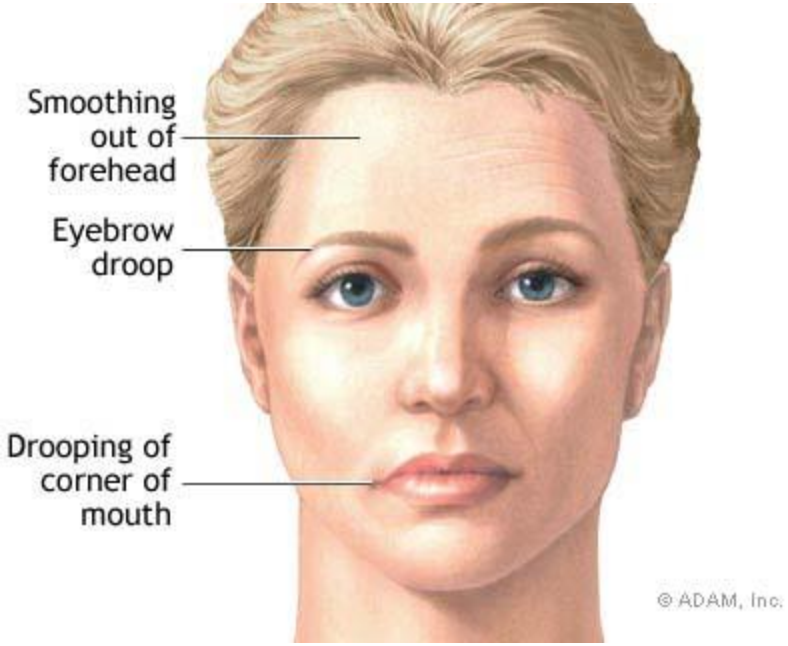


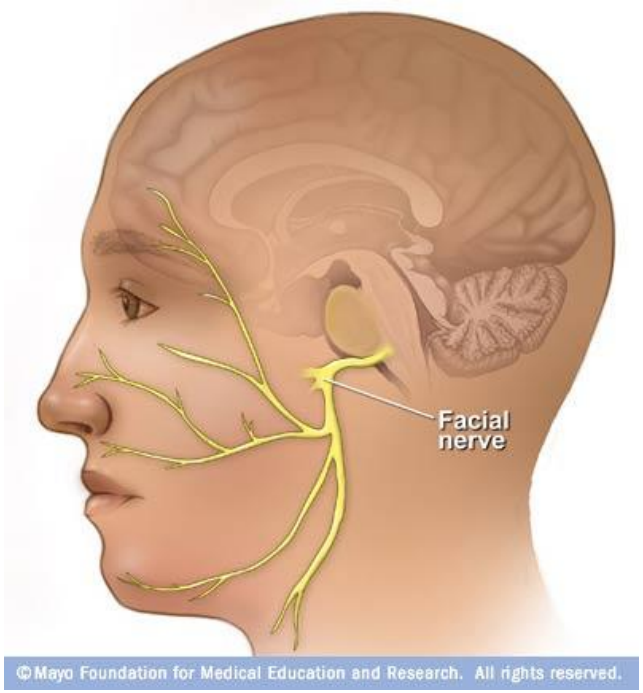
Conditions That Mimic AIS

- Bell's Palsy
- Todd's Paralysis
- Hemorrhagic Stroke
- Subdural Hematoma
- Hypoglycemia
- Metabolic conditions – fever, hyponatremia, drugs, etc.
- Psychogenic
- Complex migraines
- Hypertensive crisis

Conditions That Mimic AIS

- Bell's Palsy





Bell's Palsy is a viral infection of the facial nerve which causes stroke-like symptoms: unilateral facial droop, sensory deficit, dysarthria, etc.

Conditions That Mimic AIS

- Todd's Paralysis: one sided weakness that occurs after a seizure.
  - Can involve speech, language, visual and sensory
  - May be due to hyperpolarization in the area of the seizure
  - Resolves within 48 hours
  - Key concern in regard to thrombolytic therapy

What can be done for an acute ischemic stroke?

- These patients may be appropriate for “clot busting” drugs. Tissue Plasminogen Activator (TPA).
- Requires a rapid, coordinated response.
- IV TPA can only be given within the first 3 hours of symptom onset. **It is important to determine when the patient was last seen normal.**
- Expected response: “60 minutes from door to needle.”

Hemorrhagic Stroke

(Intracranial Hemorrhage—ICH & Subarachnoid Hemorrhage—SAH)

- Intracranial Hemorrhage (Hypertensive):
  - > twice as common as SAH
  - more likely to result in death or severe disability
  - 37,000 Americans/year
  - 35-52% dead within 1 month (half of deaths in the first 2 days)
  - Only 10% living independently in 1 month; improves to only 20% within 6 months

Hemorrhagic Stroke

(Intracranial Hemorrhage—ICH & Subarachnoid Hemorrhage—SAH)

- Risk factors:
  - Hypertension
  - Advancing age
  - Coagulation disorders & therapy
  - ETOH abuse
  - Drug use (meth, cocaine, crack, etc.)
  - Ischemic stroke—hemorrhagic transformation

Hemorrhagic Stroke

(Intracranial Hemorrhage—ICH & Subarachnoid Hemorrhage—SAH)

- Presenting signs:
  - Sudden—signs over minutes to hours
  - Headache
  - Nausea and vomiting
  - Decreasing LOC
  - Extremely elevated blood pressure
  - (All of these are signs of increased Intracranial Pressure)

Hemorrhagic Stroke

(Intracranial Hemorrhage—ICH & Subarachnoid Hemorrhage—SAH)

- Differential Diagnosis:

AIS—often high BP
AIS—rare decreased LOC
AIS—rare or vague H.A.
AIS—rare nausea & vomiting
AIS—often wake up with the symptoms

ICH—usually very high BP
ICH—50% of the time ↓ LOC
ICH—40% of the time H.A.
ICH—50% of time vomiting
ICH—rarely wake up with symptoms (15%)

- Final diagnosis is by CT scan.

Large hemorrhagic stroke

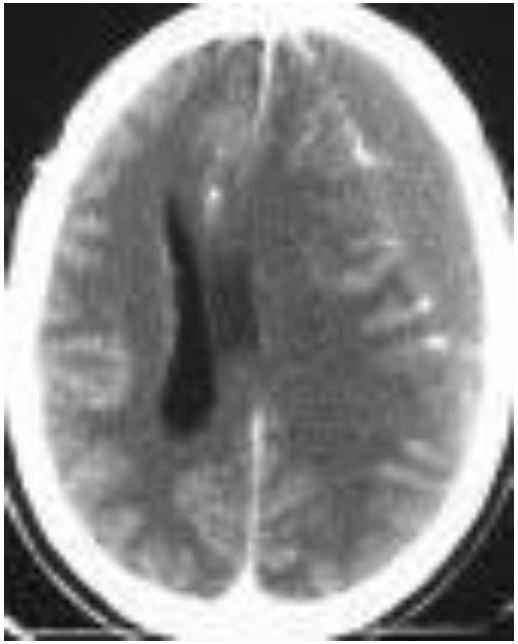
Hemorrhagic Stroke
(Subarachnoid Hemorrhage)

- Acute bleeding around the outside of the brain and into the subarachnoid space.
- Usually from an aneurysm or arterio-venous malformation.
- Statistics:
  - 50% are fatal
  - 15% die before reaching the hospital
  - Those who survive are often impaired
  - 7% of all strokes

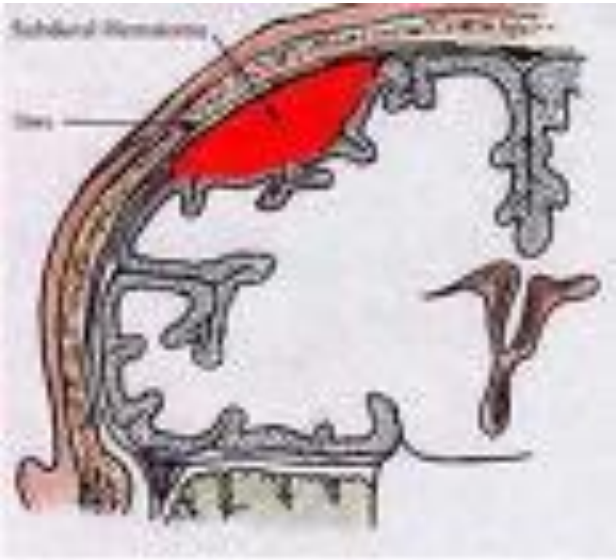
Hemorrhagic Stroke
(Subarachnoid Hemorrhage)

- Diagnosis:
  - "Thunderclap" headache. "It is the **worst** headache of my life!"
  - Lumbar puncture (blood in the CSF not due to traumatic tap)
  - "Star pattern" on CT scan

Subdural Hematoma



(Not a true stroke but symptoms can mimic stroke.)



Subdural Hematoma

- Symptoms:
  - One sided weakness, sensory deficit
  - Facial weakness
  - Dysarthria – difficulty speaking
  - Altered level of consciousness
- Onset:
  - Can be rapid
  - Can take months to show symptoms

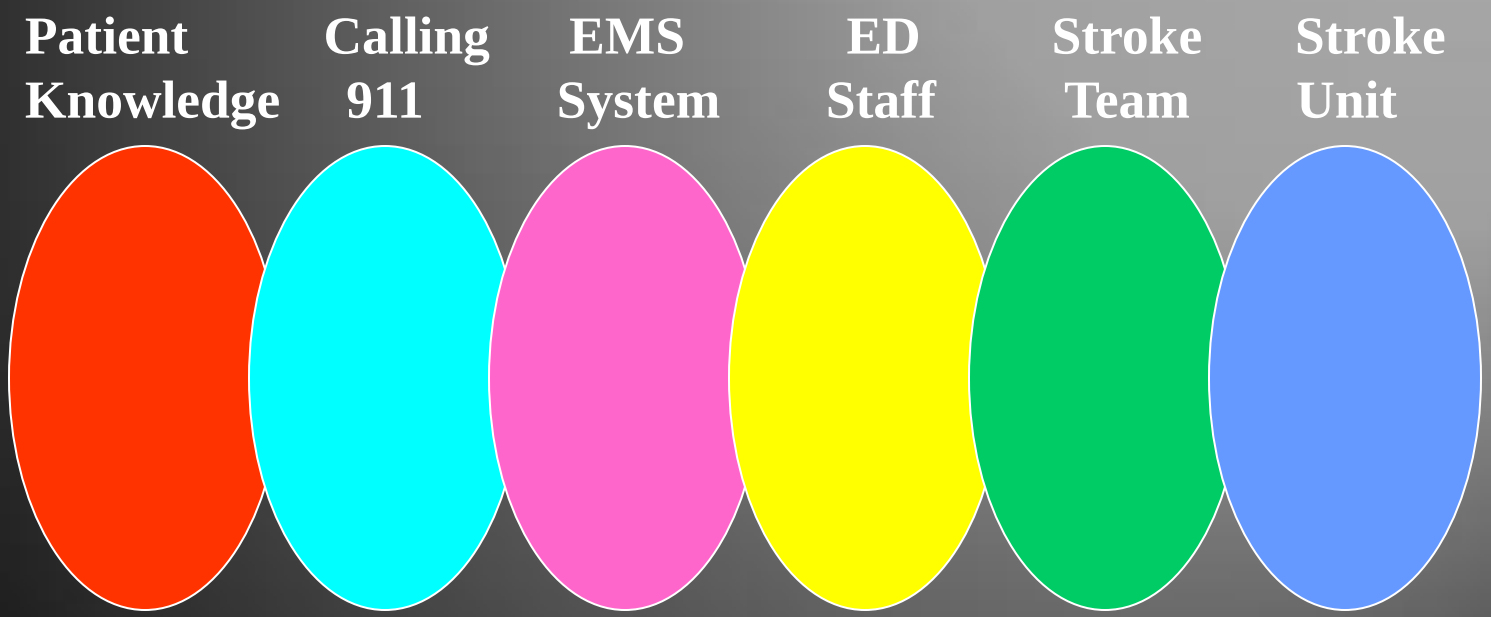
Subdural Hematoma Causes

- Anticoagulation (Heparin, Coumadin)
- Antithrombotics (Aspirin, Plavix)
- ETOH abuse
- Trauma (could be recent or months ago)
- Advanced age (most common cause)

Summary

- The best stroke care is a coordinated approach and developed in a stroke center system of care.
- Requires everyone to be on board:
  - Patients/Families, calling 9-1-1 early!
  - EMS
  - ED
  - Stroke Unit
  - Stroke Rehabilitation

Emergent Stroke Care and the Chain of Survival



EMDPRS – Stroke

1. Is the pt. alert and responding appropriately?
2. Was the onset of symptoms gradual or sudden?
3. Is the pt. experiencing any numbness or tingling?
4. Is the pt. able to move their arms and legs?
5. Does the pt. have any facial drooping or slurring?

Key Questions

1. Do not give the pt. anything by mouth
2. If conscious, elevate the head and shoulders with a pillow
3. If drooling, turn pt. on their side
4. Gather pt's meds for EMS
5. Call back if the pt's condition worsens prior to the arrival of medical personnel

Pre-Arrival Instructions

Silver Cross Hospital EMS System

- Within SCEMSS, there are 3 IDPH approved PSC or ESRH facilities:
  - Silver Cross Hospital – PSC
  - Presence St Joseph Medical Center – PSC
  - South Suburban Hospital – PSC
- Other associate/participating facilities within SCEMSS have IDPH applications pending approval

Sources

- WILL CO. 9-1-1 EMDPRS
- SILVER CROSS EMSS, Oct 2014 3rd Trimester ALS-ILS-BLS PP CE