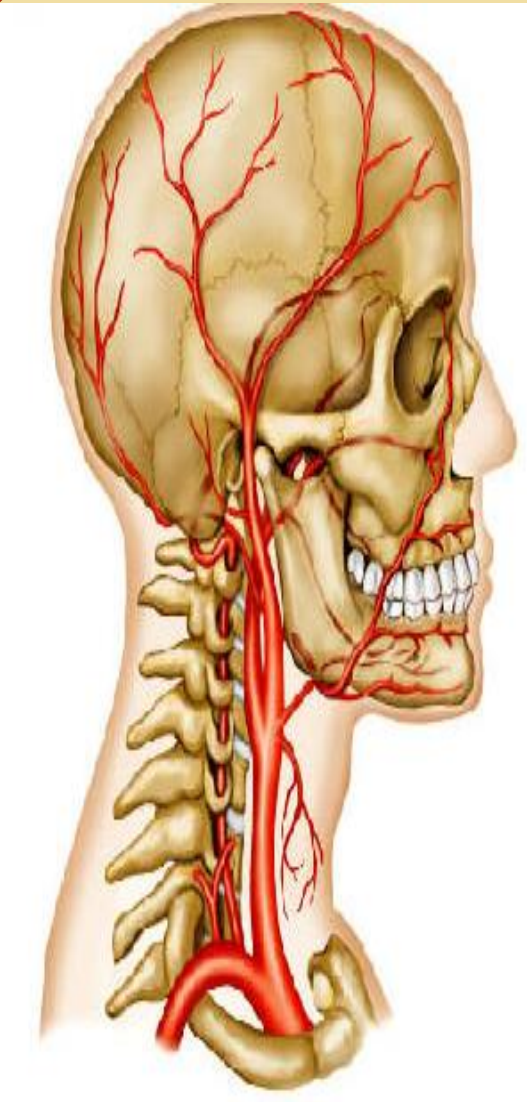
Initial Stroke Education

Mohawk Valley Health System

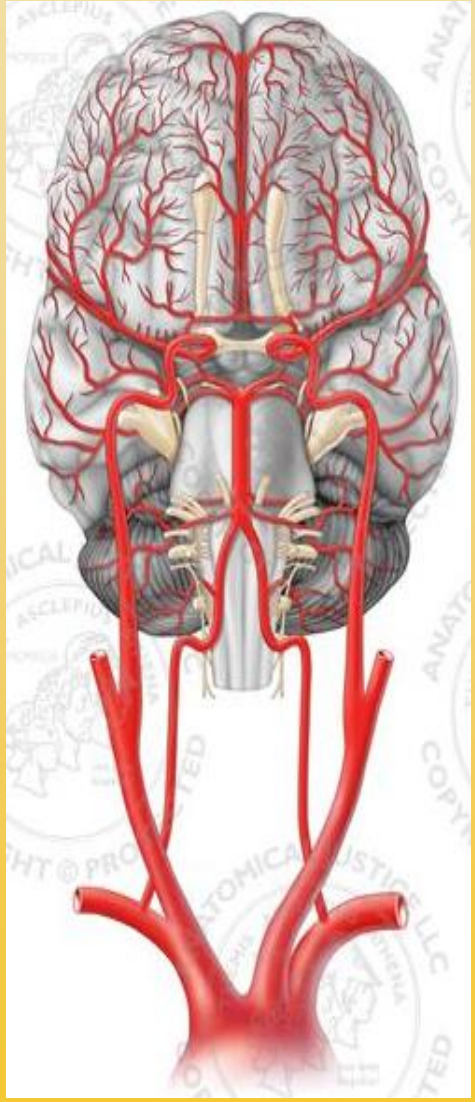
2022

On line Net Learning education

It's all about the vessels!



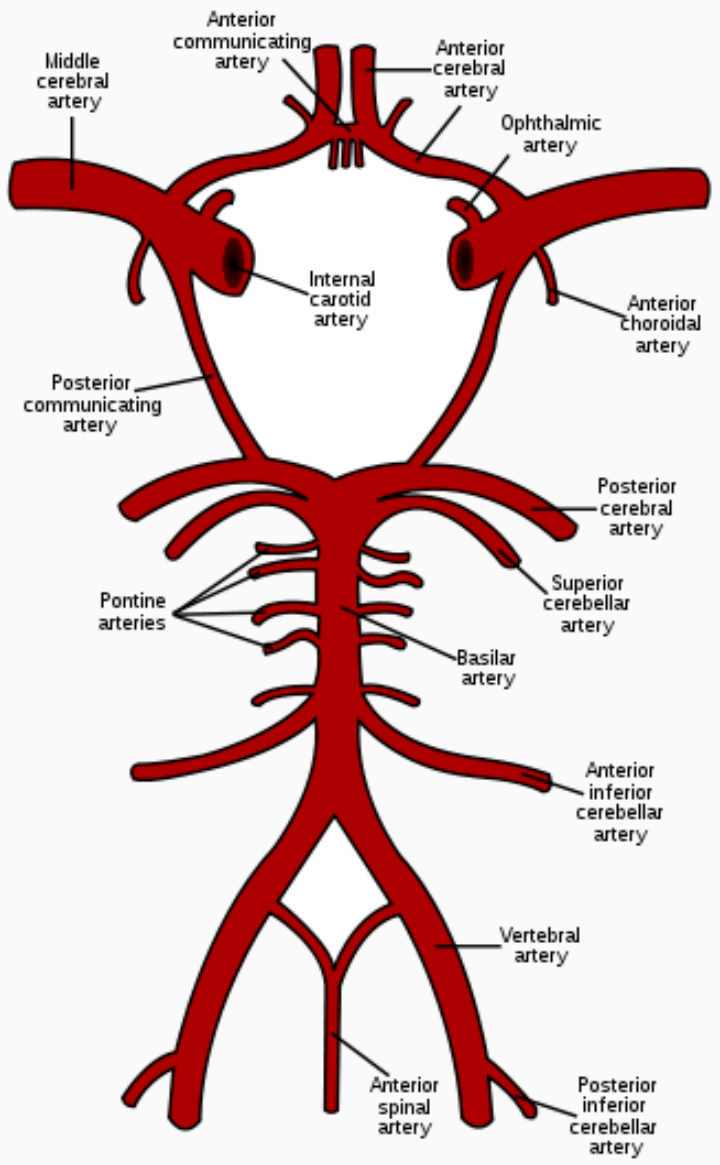
The Goal?
To keep the vessels open!



Blood Supply to the Brain

- Normal function of the brain's control centers is dependent upon adequate supply of oxygen and nutrients through a dense network of blood vessels

Blood Supply to the Brain



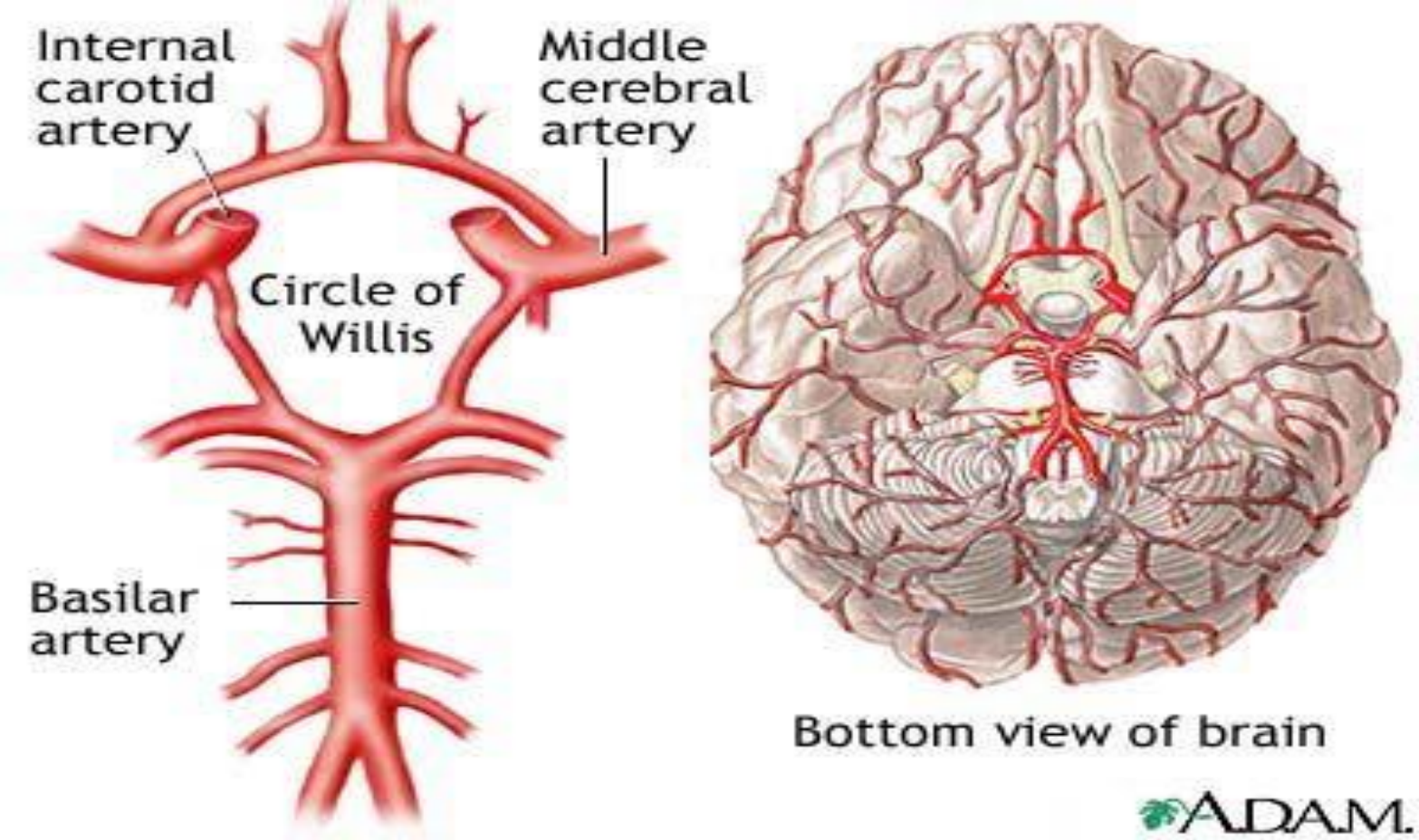
Blood Supply to the Brain

- Anterior Cerebral Artery
  - Supplies the Frontal Lobes
- Middle Cerebral Artery
  - Supplies portion of frontal lobe & lateral surface of temporal & parietal lobes
- Posterior Cerebral Artery
  - Supplies temporal and occipital lobes of left cerebral hemisphere and right hemisphere
- Right and left common carotid arteries
  - Common carotid has 2 divisions.
  - External carotids supply face and scalp.
  - Internal carotids supply blood to anterior 3/5ths of cerebrum.

Blood Supply to the Brain

- Right and left vertebral arteries
- Occlusion of one of the vertebral arteries can cause many serious consequences, ranging from blindness to paralysis.
- Vertebrobasilar arteries supply the posterior 2/5th of cerebrum part of cerebellum, and the brain stem.
- Circle of Willis
  - At base of brain
  - A circle of communicating arteries
    - Because it is circular in nature, if a main artery is occluded, the smaller arteries can receive blood thru collateral circulation.

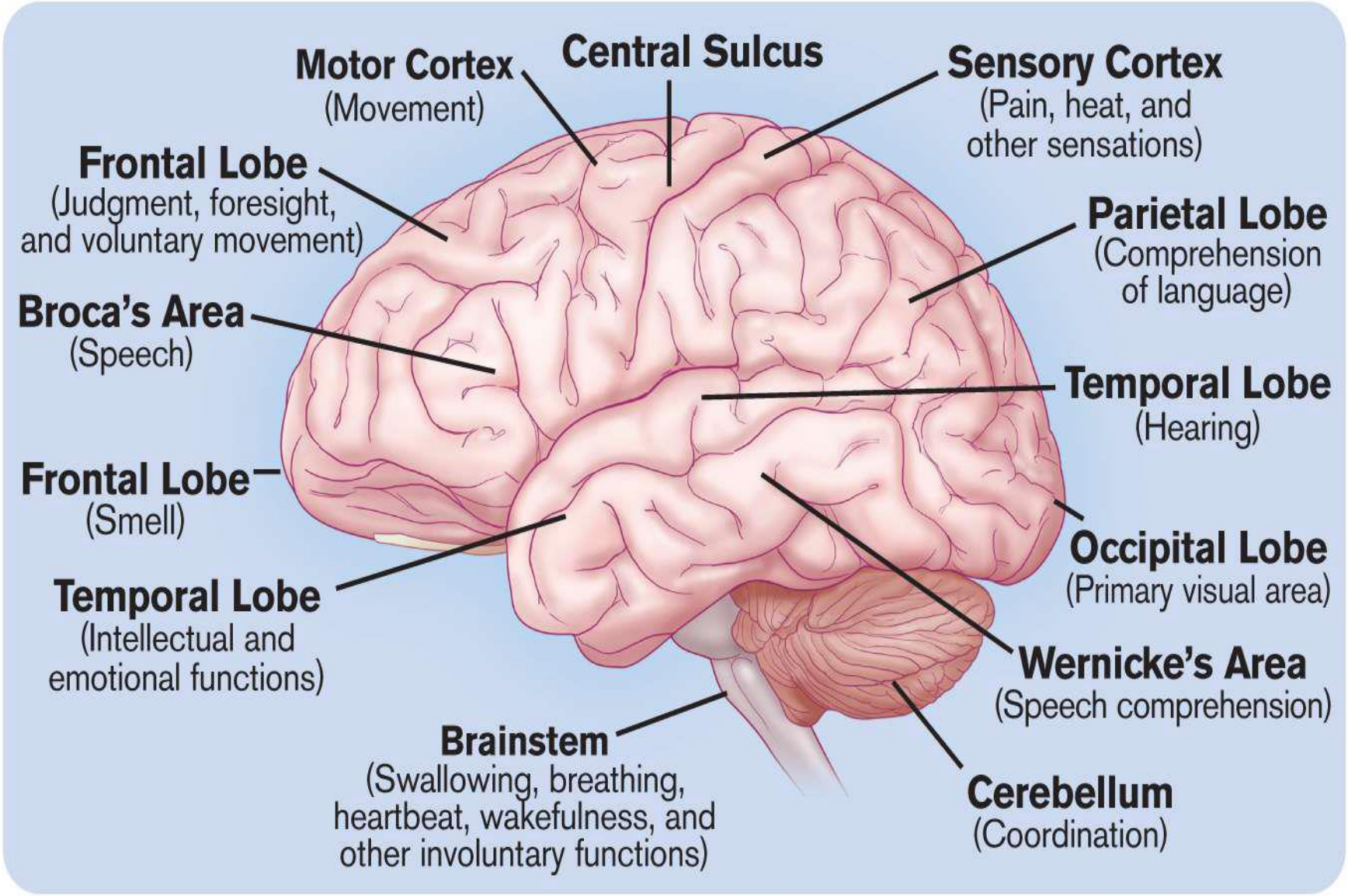
Blood Supply to the Brain



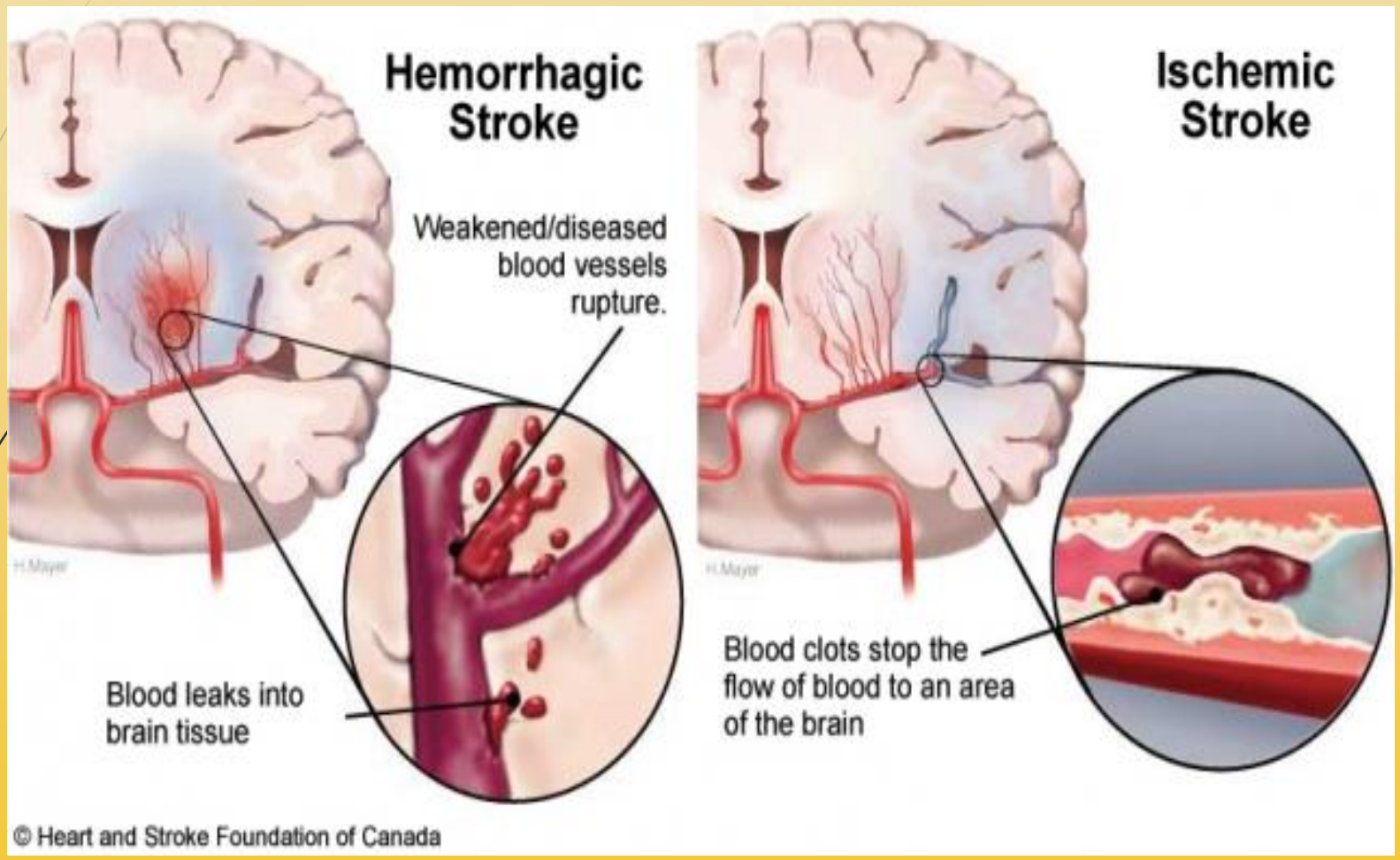
Circle of Willis

- **Anterior Cerebral Artery**
  - supplies frontal lobes (parts of the brain that control logical thought, personality, and voluntary movement especially of the legs. Stroke results in opposite leg weakness. If both anterior cerebral territories are affected, profound mental symptoms can results – akinetic mutism.
- **Middle Cerebral Artery**
  - largest branch. Supplies portion of frontal lobe and lateral surface of temporal and parietal lobes, including primary motor and sensor areas of face, throat, hand and arm, and in the dominant hemisphere, the areas for speech. Most often affected in stroke.
- **Posterior Cerebral Artery**
  - supply temporal and occipital lobes of left cerebral hemisphere and right hemisphere. Infarction here is usually secondary to embolism from lower segments of the vertebral basilar system or heart.
- **Lenticulostriate arteries**
  - small, deep penetrating arteries branch from MCA. Occlusions here are know as lacunar strokes.

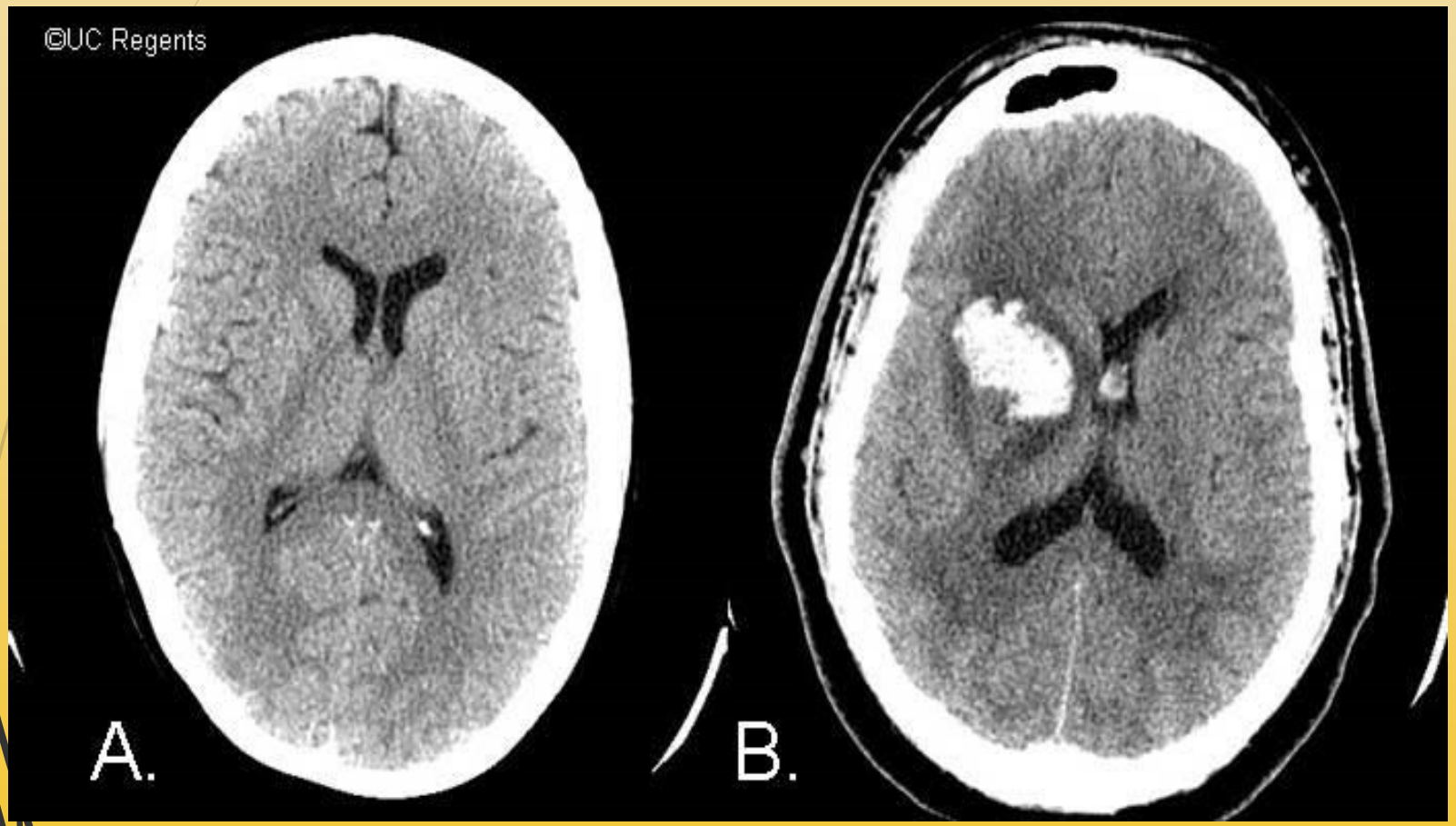
Stroke symptoms depend on infarct location



Types of Strokes



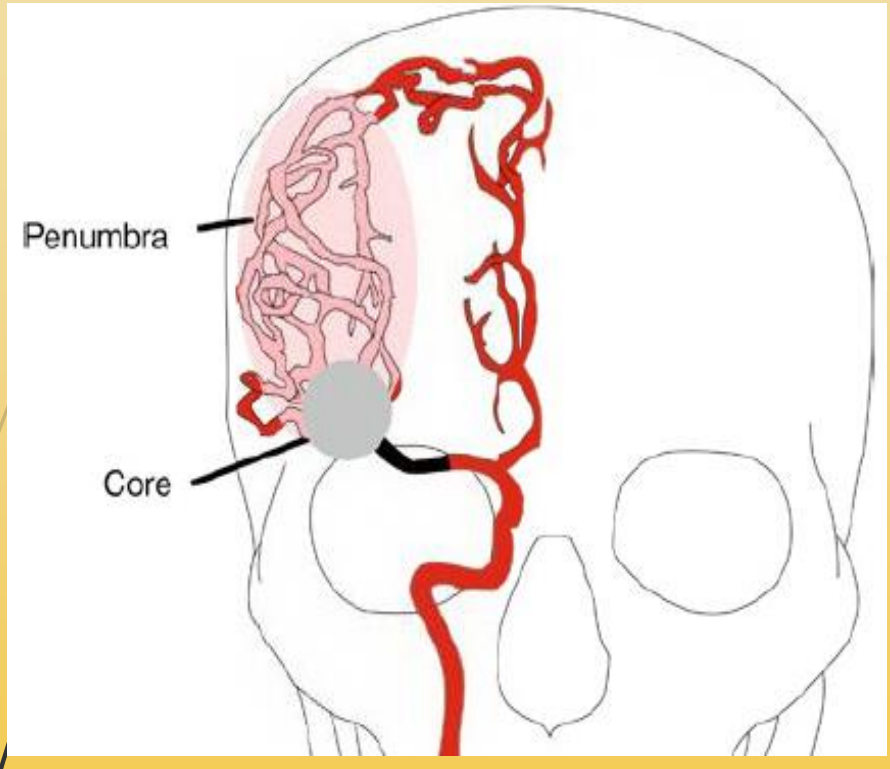
CT scan:
Ischemic vs. Hemorrhagic



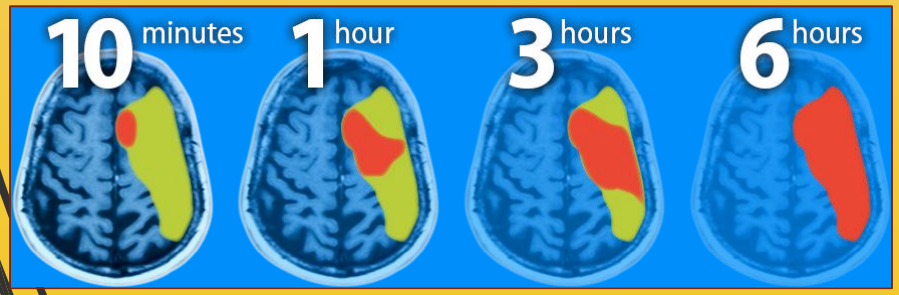
Ischemic Stroke

- Definition:
  - A blockage of the blood supply to part of the brain preventing brain tissue from getting oxygen and nutrients.
- Signs and symptoms of a stroke normally come on suddenly
- Time is brain, so a stroke victim must seek medical attention at the closest facility that can provide the highest level of care
- CT scan is the first line of diagnostic testing and should be done and read within the first 35 minutes of arrival to a hospital
- The goal is to restore blood flow back to the brain
  - The area that surrounds the blockage that can be saved is called the Penumbra
  - The area of the brain that cannot be saved is called the Core

What is a PENUMBRA?



Red=Core / **Green**=Penumbra



- The penumbra was classically defined as the hypo-perfused tissue surrounding the ischemic core in which blood flow is too low to maintain electric activity but sufficient to preserve ion channels.
- Penumbra **can have blood flow restored!!!**
- Core = Dead area & no perfusion can ever be restored
- Goal is to re-perfuse the penumbra
- We can do that by quickly identifying the signs and symptoms of a stroke and getting help!

Think FASTER!

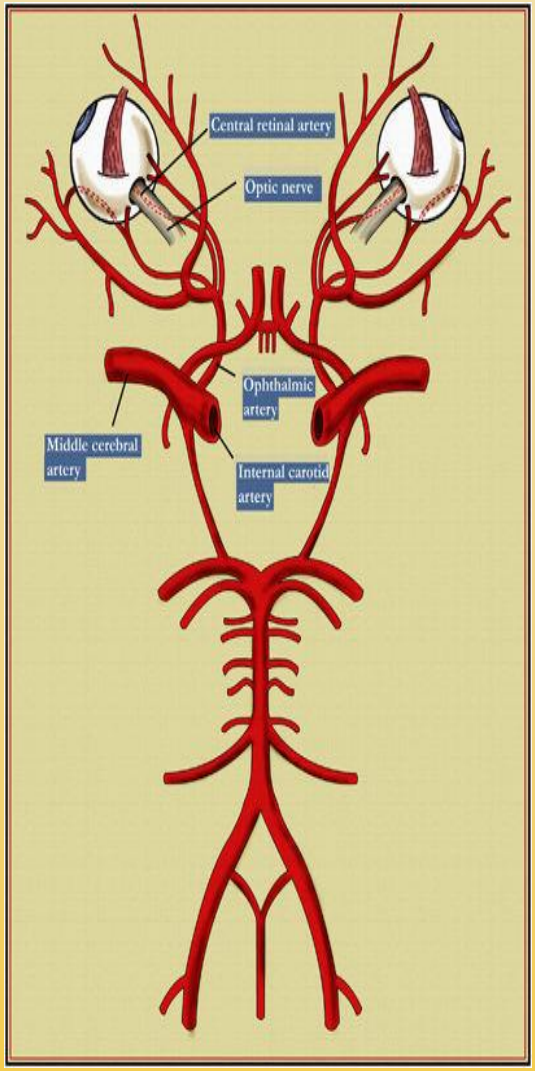
- Use this easy pneumonic to quickly identify the signs and symptoms of a stroke and get to a hospital as soon as possible! Even if symptoms go away!!!!

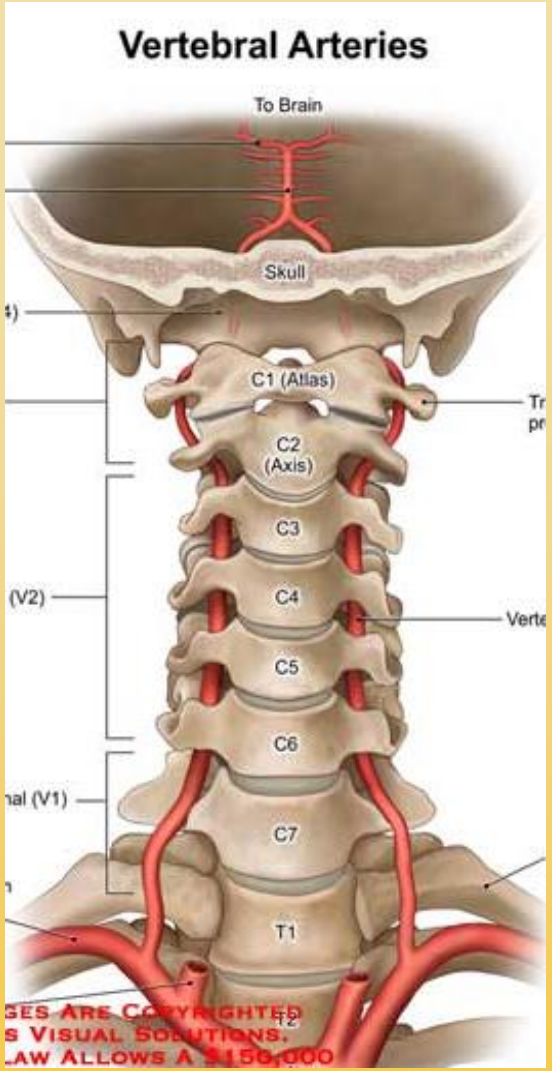
TIA (Transient Ischemic Attack)

- It is a temporary blockage of blood flow to the brain
- TIA is a medical emergency
- Symptoms usually last less than 5 minutes with an average of about 1 minute.
- TIA can be relatively benign in terms of immediate consequences. But the term "warning stroke" is more appropriate for these temporary episodes, because they can indicate the likelihood of a coming stroke.
- When an episode is diagnosed as a TIA, it's because there is evidence of a blockage but no lasting damage has happened yet.
- About 1/3of the people who have a TIA and don't get treatment go on to have a more severe stroke within a year
- Identifying / Managing risk factors is key in preventing future TIA's and or strokes from happening in the future

Posterior Circulation Stroke

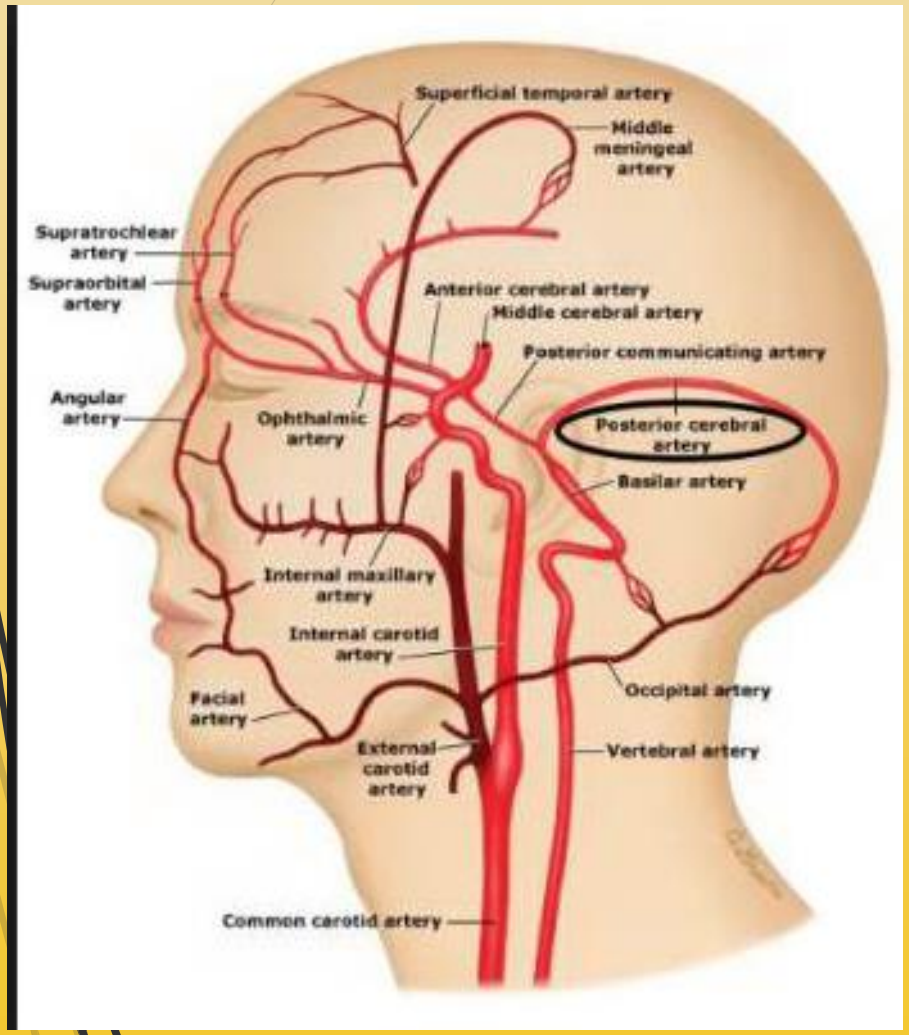
- Most commonly missed due to symptomology
- Most fatal due to location and treatment options
- ***Sudden*** onset
  - Dizziness
  - Unilateral limb weakness
  - Dysarthria
  - Nausea / Vomiting
  - Headache
  - Imbalance
  - Nystagmus
- Most common causes
  - atherosclerosis
  - embolism
  - dissection

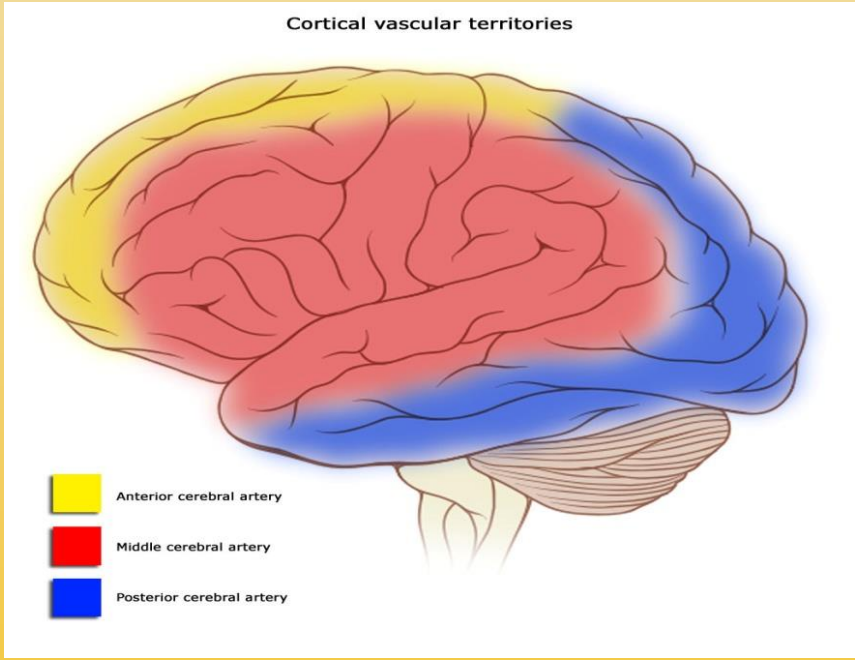




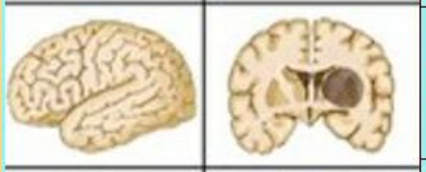
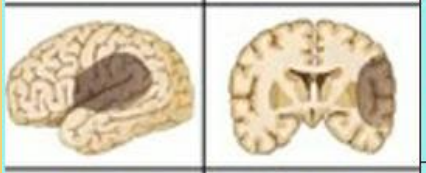
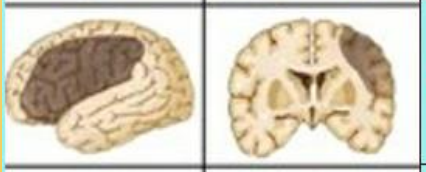
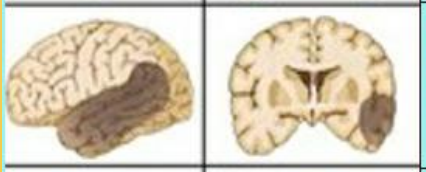
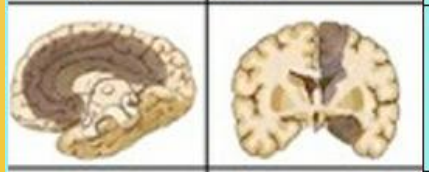
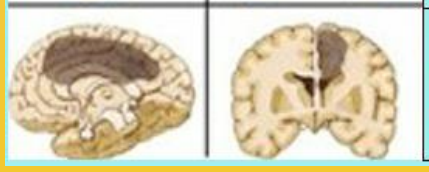
- Circle of Willis connects the:
  - Anterior (carotids)
  - Middle cerebral artery
  - Posterior communicating artery
  - Basilar artery
    - Does not have 'collateral circulation' so if there's a blockage here, there is nothing to keep you alive.

Vascular Supply to the brain

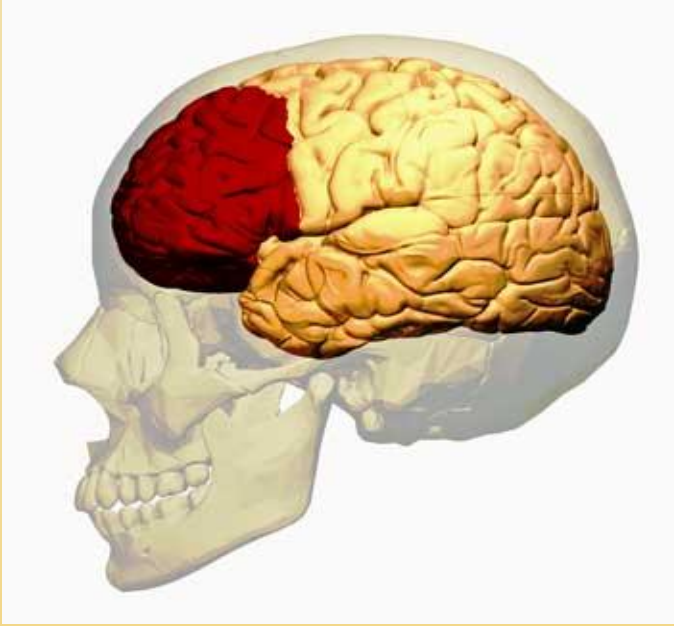




Effects on areas of the brain

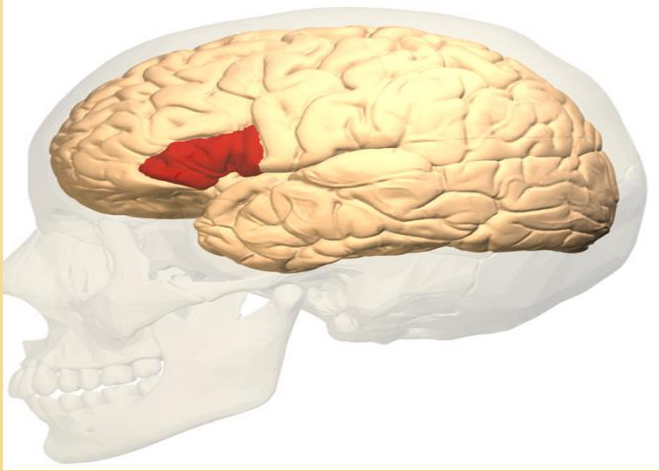
	•Contralateral gaze palsy, hemiplegia, hemi sensory loss, spatial neglect. •Global aphasia (if on the left side). •May lead to decreased consciousness and even coma secondary to edema
	•Contralateral hemiplegia, hemi sensory loss,. •Transcortical motor and / or sensory aphasia (if on the left side).
	•Contralateral weakness and sensory loss of face and hand. •Conduction aphasia, apraxia, and Gerstmann syndrome (if on the left side). •Constructional dyspraxia (if on the right side).
	•Contralateral hemiplegia, hemi sensory loss, gaze palsy, spatial neglect. •Broca aphasia (if on the left side).
	•Contralateral hemianopsia or upper quadrantanopsia. •Wernicke aphasia (if on the left side). •Constructional dyspraxia (if on the right side).
	•Incontinence •Contralateral hemiplegia •Abulia •Transcortical motor aphasia or motor and sensory aphasia •Left limb dyspraxia
	•Contralateral weakness of the leg, hip, foot, and shoulder. •Sensory loss in the foot •Transcortical motor aphasia or motor and sensory aphasia •Left limb dyspraxia

Frontal Lobe



- Primary motor cortex
- Voluntary motor functions
- Frontal eye fields
- Broca's area
- Higher executive function
- S/S
  - Weakness
  - Non-fluent (Broca's) aphasia
  - Labile emotions
  - Loss of insight, judgment, and tact/Unethical behavior
  - Loss of abstract thinking
  - Memory loss
  - Gaze palsies (on the side of the lesion)
  - Unilateral blindness (if ophthalmic artery involved)

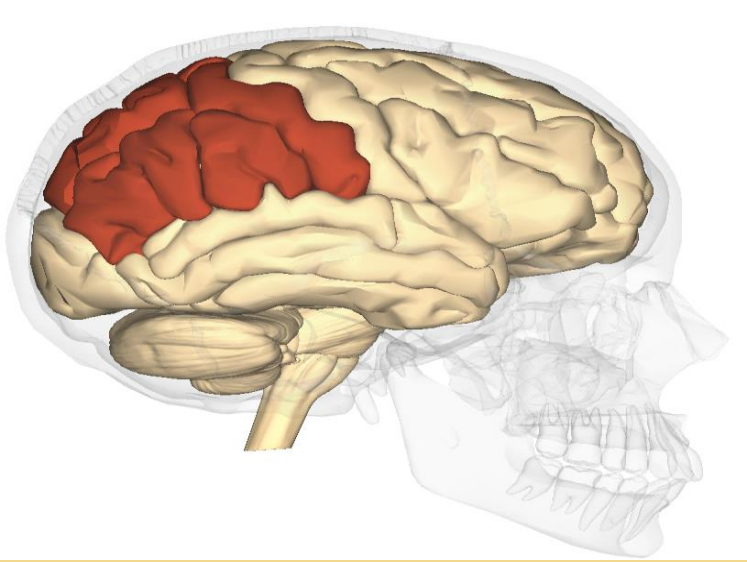
Broca's Aphasia



- Inability to express self
- Patients with Broca's aphasia understand what is being said to them, but are unable to speak fluently. Patients may become frustrated because they know something is wrong.
- Slow speech
- Problems with articulation
- Difficulty with Word finding
- Word repetition
- Producing and comprehending complex grammatical sentences both orally and written.
- This is # 10 on the NIHSS

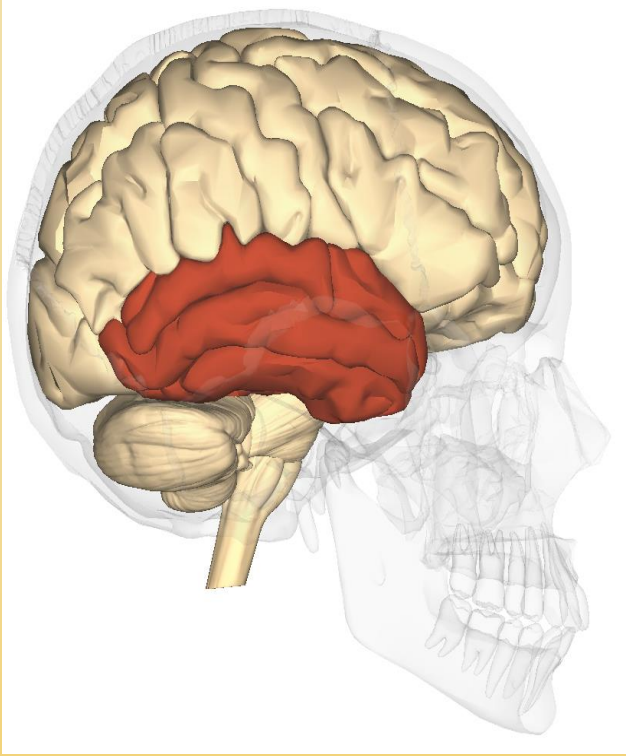
MAMA
TIP – TOP
FIFTY – FIFTY
THANKS
HUCKLEBERRY
BASEBALL PLAYER

Parietal Lobe



- Primary somatosensory cortex
  - Touch
  - Temperature
  - Pain
- Sensory functions
- Proprioception (knowing where your limbs are in space)
- Comprehension of language

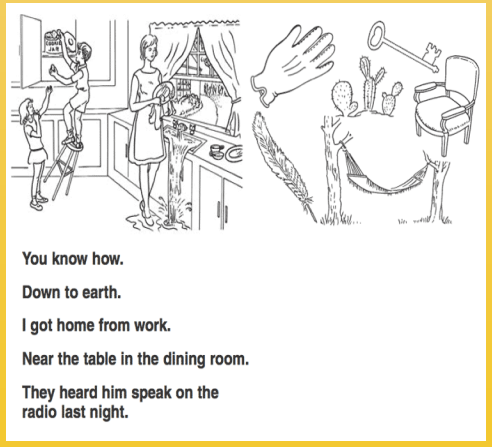
Temporal Lobe



- Wernicke's area
- Interpretation and storage of auditory and olfactory sensations
- Severe language deficits:
  - Unable to understand or repeat
  - Unaware they are speaking nonsense
  - Reading comprehension may be spared

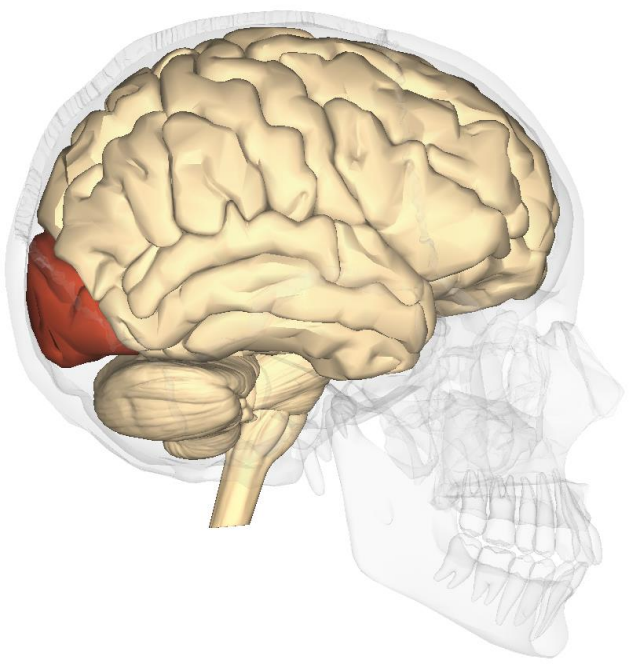
Wernicke's Aphasia

- Inability to understand the spoken language
- Patients often are not aware of their problem
- Patient can speak clearly
- Trouble with speech comprehension
- Can not produce meaningful sentences
- Can put words together but words don't make sense. Example: "Word salad"
- This is # 9 on the NIHSS



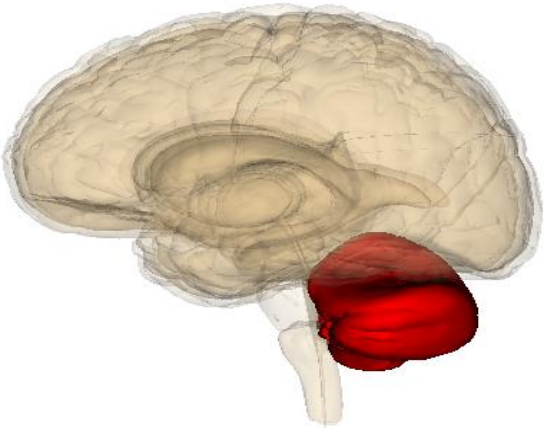

Broca
Wernicke

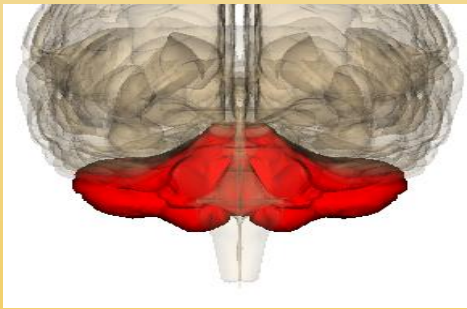
Occipital Lobe



- Visual cortex
- Processing of visual information
- Storing visual memories
- Gaze fixation on objects

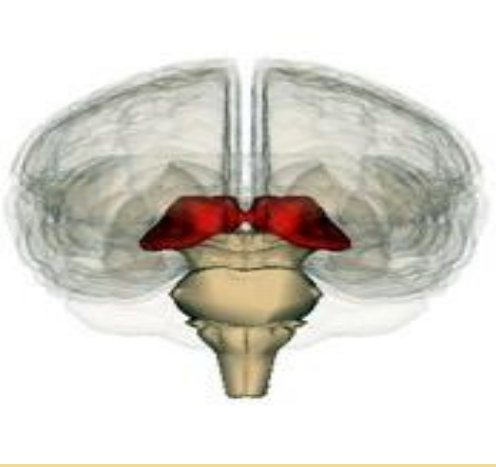
Cerebellum





- Coordination
- Balance
- Muscle tone
- Equilibrium
- Memories of previously learned movement patterns

Thalamus

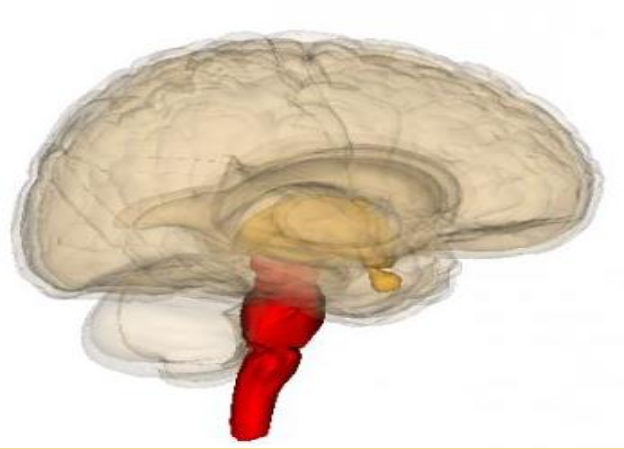


- Relay station for the cortex
  - All primary sensory modalities
  - All motor relay information
- S/S
  - Loss of coordination or balance
  - Numbness/tingling
  - Facial palsy
  - Drooping eye lid
  - Double vision
  - Headaches
  - Nausea/vomiting
  - Difficulty speaking, swallowing, ready & writing

Basal Ganglia

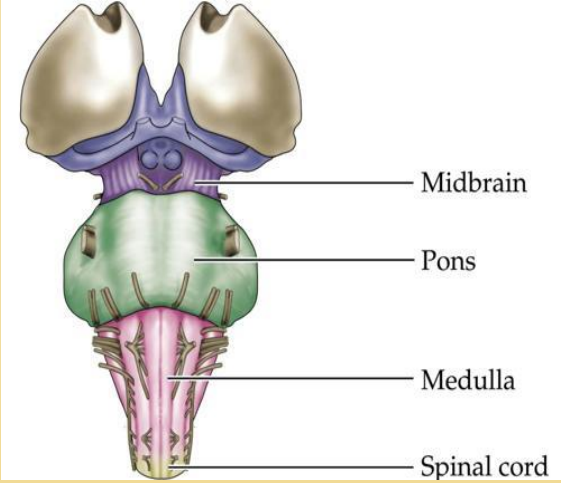
- Severe headache
- Numbness or weakness to the face, arm, or leg on one side of the body
- Difficulty walking
- Loss of balance or coordination
- Visual changes
- Confusion, difficulty communicating or understanding
- Facial droop
- Difficulty swallowing
- Neglect
- Personality changes

Brain stem



- Made up of
  - Midbrain
    - Vision
    - Hearing
    - Eye movement
    - Body movement
  - Pons
    - Involved I motor control and sensory analysis
  - Medulla
    - Maintains vital body functions such as breathing and heart rate

Brain stem

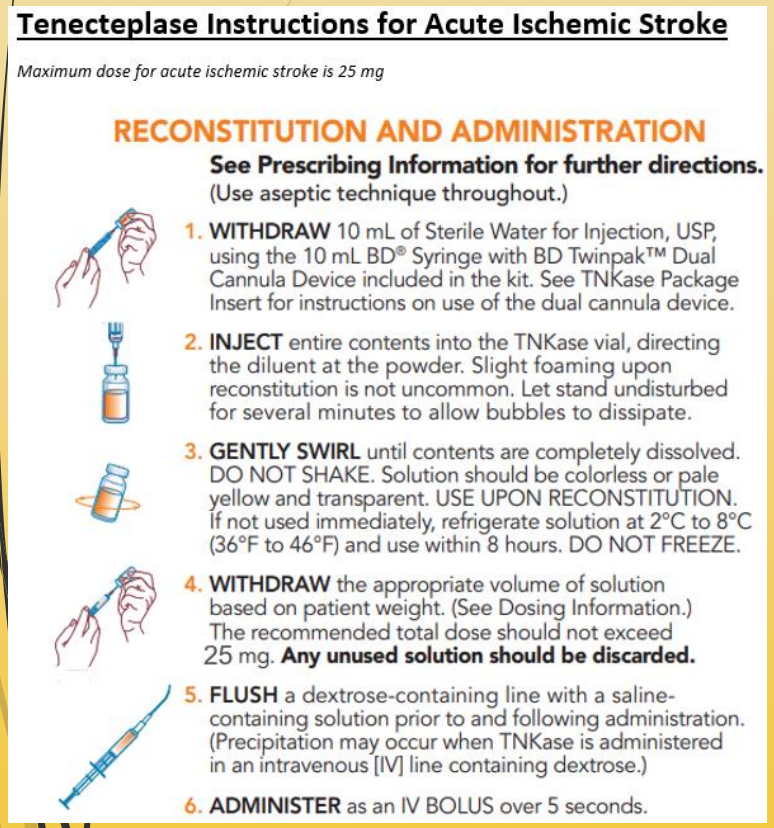


- Problems with vital functions (ex. breathing, HR, BP)
- Difficulty with chewing, swallowing, and speaking
- Weakness or paralysis in the arms, legs, and/or face
- Problems with sensation
- Hearing loss
- Vision problems
- Vertigo(feeling of spinning or whirling when you are not moving)
- "Locked-in syndrome" (only the eyes are able to move)
- Coma

Common Treatment options for ischemic stroke

- Thrombolytic Therapy
  - TNK (Tenecteplase) preferred IV Lytic up to 4.5 hours
  - TPA (Alteplase)
- Mechanical Thrombectomy
  - Can be used in combination with Thrombolytic Therapy
- Medical Management
  - When the options above are not recommended

TNK (Tenecteplase)



Tenecteplase Instructions for Acute Ischemic Stroke

Maximum dose for acute ischemic stroke is 25 mg

RECONSTITUTION AND ADMINISTRATION

See Prescribing Information for further directions.
(Use aseptic technique throughout.)

1. **WITHDRAW** 10 mL of Sterile Water for Injection, USP, using the 10 mL BD® Syringe with BD Twinpak™ Dual Cannula Device included in the kit. See TNKase Package Insert for instructions on use of the dual cannula device.
2. **INJECT** entire contents into the TNKase vial, directing the diluent at the powder. Slight foaming upon reconstitution is not uncommon. Let stand undisturbed for several minutes to allow bubbles to dissipate.
3. **GENTLY SWIRL** until contents are completely dissolved. DO NOT SHAKE. Solution should be colorless or pale yellow and transparent. USE UPON RECONSTITUTION. If not used immediately, refrigerate solution at 2°C to 8°C (36°F to 46°F) and use within 8 hours. DO NOT FREEZE.
4. **WITHDRAW** the appropriate volume of solution based on patient weight. (See Dosing Information.) The recommended total dose should not exceed 25 mg. **Any unused solution should be discarded.**
5. **FLUSH** a dextrose-containing line with a saline-containing solution prior to and following administration. (Precipitation may occur when TNKase is administered in an intravenous [IV] line containing dextrose.)
6. **ADMINISTER** as an IV BOLUS over 5 seconds.

- Mixing: TNK comes in a kit – follow manufacturer's instructions
  - Total concentration of TNK per vial is 5mg/ml
- Total dose to administer: 0.25mg x kg = Total dose mg/kg **(Max dose=25mg)**
  - Reconstitute using a 10ml syringe
  - Ex. 0.25 mg x 75.5 kg = 18.9 mg (round to nearest 10th of an ml)
- Calculate bolus dose: Take dose desired & divide it by total mg & multiply by mls
  - 18.9 mg ÷ 50 mg x 10 ml = 3.8 ml (round to nearest 10th of an ml)

  or
  - 50mg in 10 ml so 18.9 mg in x ml. Cross multiply 189/50=3.78 rounded to a dose of 3.8 ml.
  - Draw up total dose in a **5** ml syringe so you can't exceed the max dose of 25 mg.
- Supplies needed:
  - TNK-TNK 50 mg kit containing lyophilized powder, diluent, needle, a 10 ml and 5 ml syringe & alcohol prep

- Always refer to MV-02-053 stroke policy for the most current, up to date information

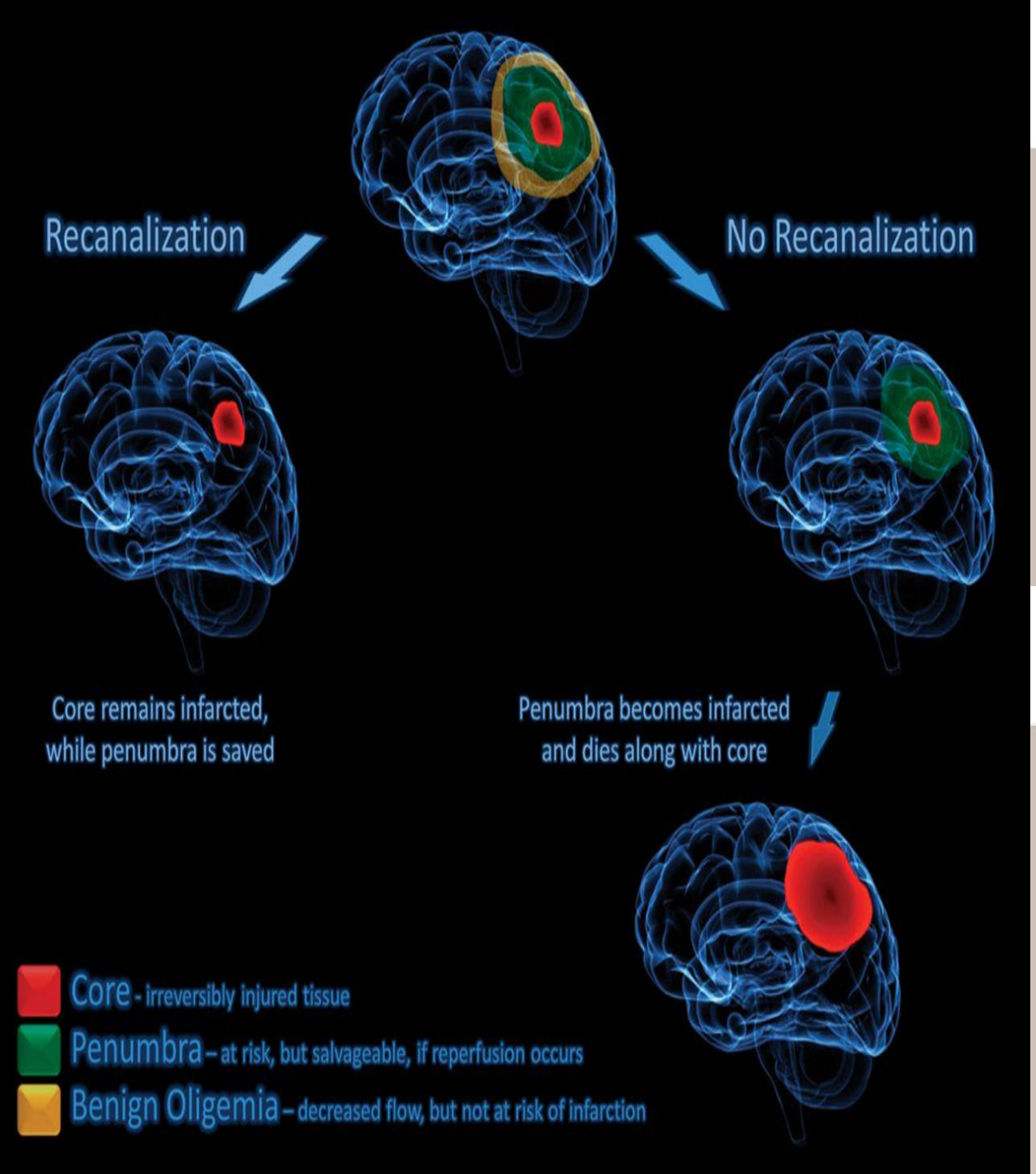
TPA

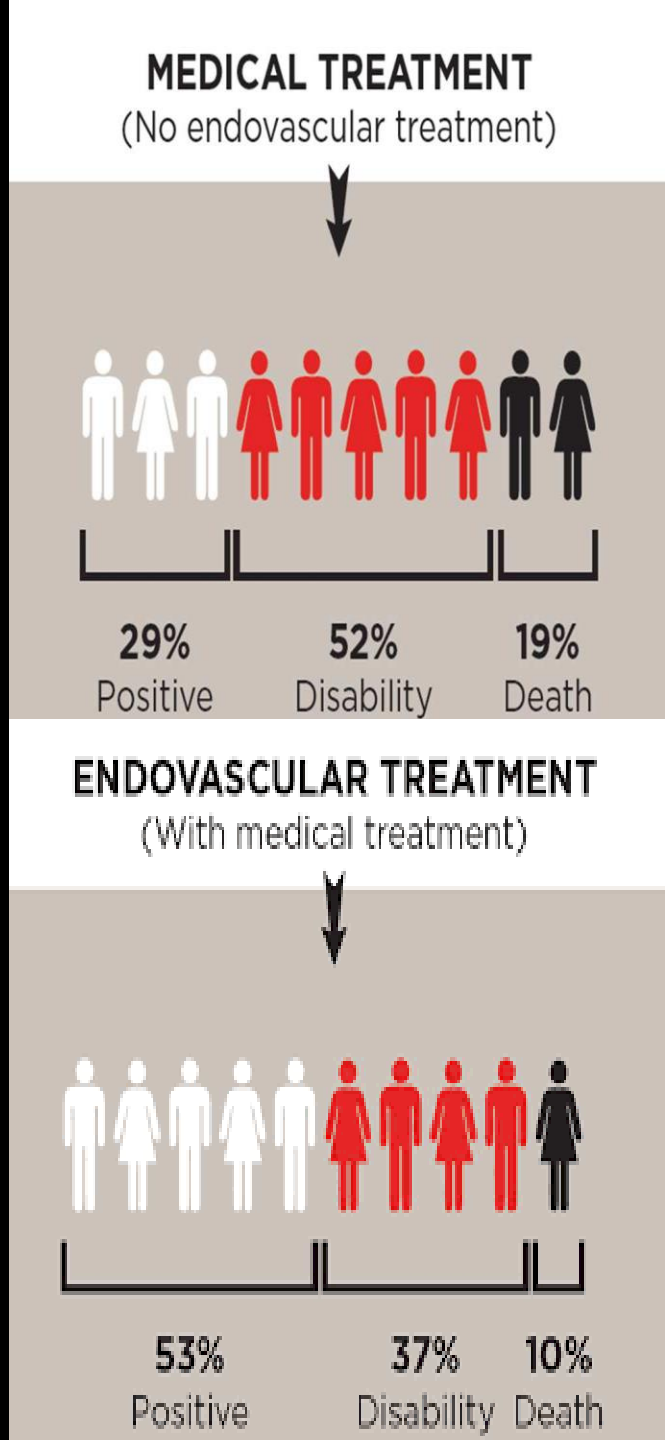
- Always refer to MV-02-053 stroke policy for the most current, up to date information

- Total dose to administer: 0.9mg x X kg = Total dose mg/kg
  - Ex. 0.9mg x 75.5kg = 67.9mg/kg
- Calculate total dose to discard: Total dose in THROMBOLYTIC THERAPY vial – total dose of THROMBOLYTIC THERAPY to administer = dose to discard.
  - Ex. 100ml – 68ml =32ml
- Calculate bolus dose: take total dose to infuse and divide it by 10.
  - Ex. 68ml / 10 = 6.8ml
- Dose to infuse: total dose to infuse minus bolus dose will = infusion dose
  - Ex. 68ml – 6.8ml =61.2ml
- Bolus dose = 6.8ml
- Final dose to infuse over 1 hour via pump = 61.2ml
  - NOTE: Flush must be infused at same rate as t-PA & completed within the 60 minutes.
  - (DNV will be observing to see if waste is removed and if flush is infused within the 60-minute timeframe.)
- Supplies needed:
  - t-PA- t-PA kit, Pump, 100ml saline, primary tubing, syringe, and manual BP cuff
- Always refer to MV-02-053 stroke policy for the most current, up to date information

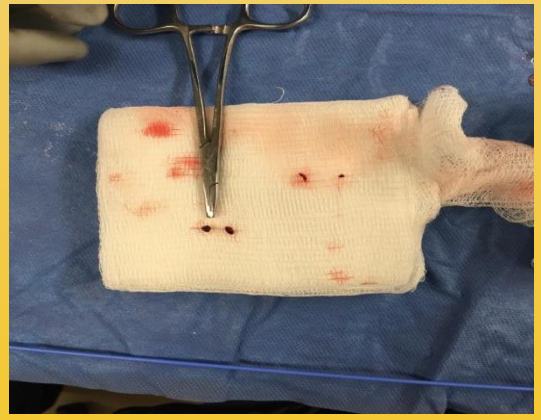
Neuro-endovascular procedures (just a few examples)

- Mechanical Thrombectomy
- Endovascular coiling for aneurysm repair
- Endovascular embolization
- Acute Stroke Thrombectomy
- Angioplasty & Stenting


Recanalization
No Recanalization
Core remains infarcted, while penumbra is saved
Penumbra becomes infarcted and dies along with core
Core - irreversibly injured tissue
Penumbra – at risk, but salvageable, if reperfusion occurs
Benign Oligemia – decreased flow, but not at risk of infarction


MEDICAL TREATMENT
(No endovascular treatment)
29%
Positive
52%
Disability
19%
Death
ENDOVASCULAR TREATMENT
(With medical treatment)
53%
Positive
37%
Disability
10%
Death

Mechanical Thrombectomy

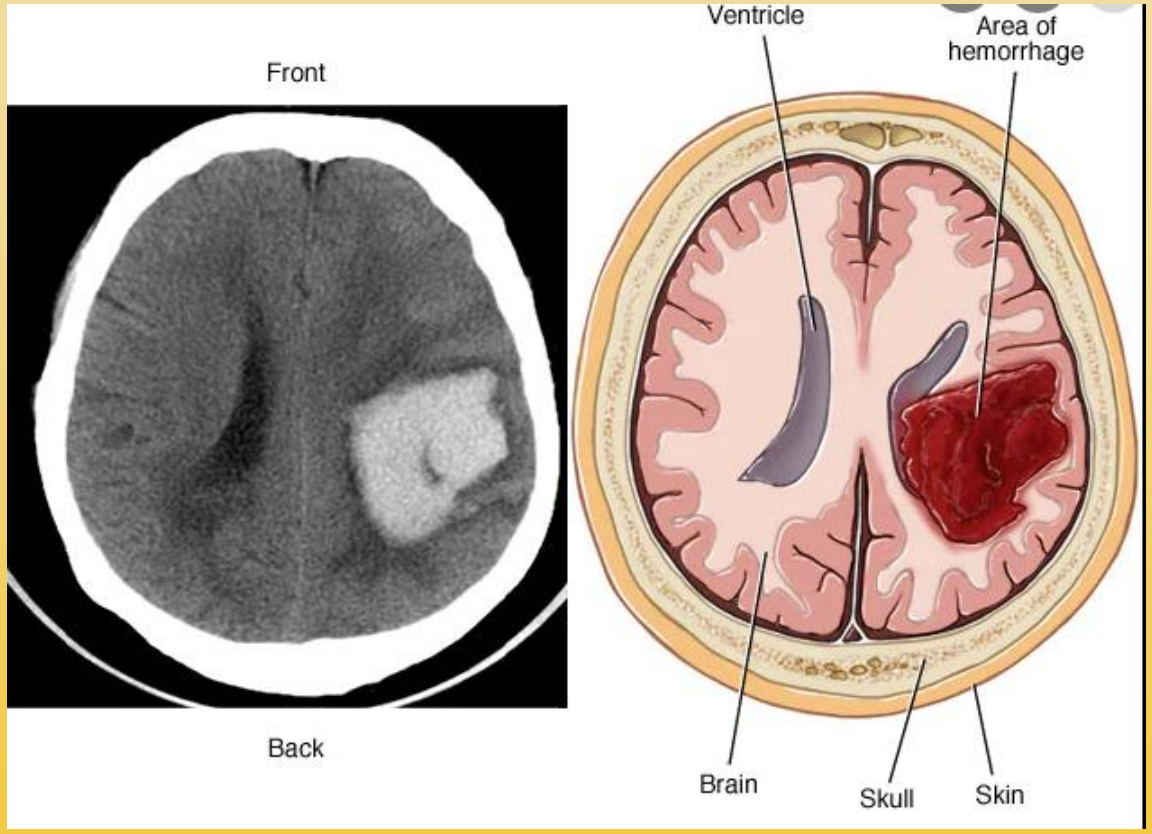


Mechanical Thrombectomy

Hemorrhagic Stroke

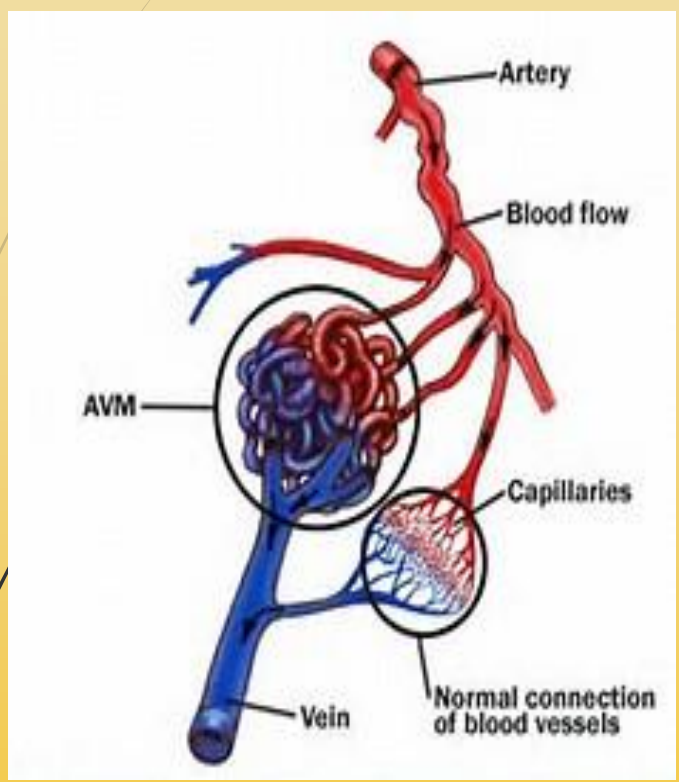
- Definition:
  - A blood vessel breaks and bleeds into the brain.
- Two types
  - Intracerebral Hemorrhage (ICH)
    - bleeding into the brain tissue
  - Subarachnoid Hemorrhage (SAH)
    - bleeding in the space that surrounds the brain
- Common causes for hemorrhagic stroke
  - Hypertension (HTN)
  - Aneurysm
    - a ballooning of a weakened region of a blood vessel. If left untreated, the aneurysm continues to weaken until it ruptures and bleeds into the brain
  - AVM (Arteriovenous malformation)
    - a cluster of abnormally formed blood vessels
- Signs and symptoms of a stroke normally come on suddenly
- Time is brain, so a stroke victim must seek medical attention at the closest Comprehensive Stroke Center
- CT scan is the first line of diagnostic testing and should be done and read within the first 35 minutes of arrival to a hospital
- The goal is to stop the bleeding and restore blood flow back to the brain

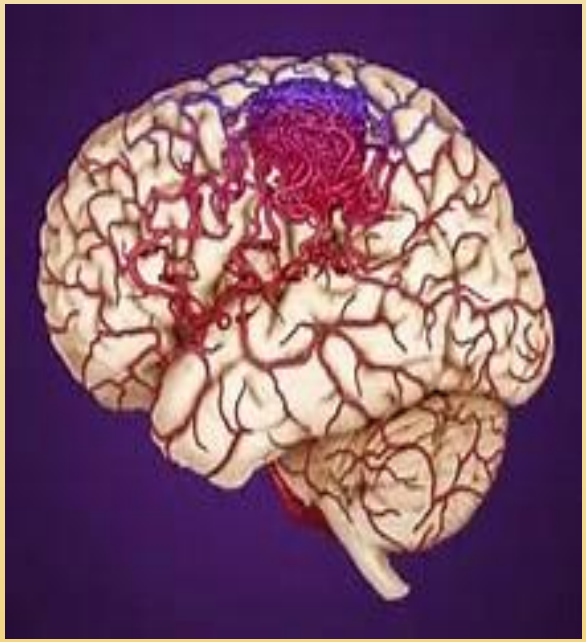
Intracerebral Hemorrhage (ICH)



Subarachnoid aneurysmal hemorrhage

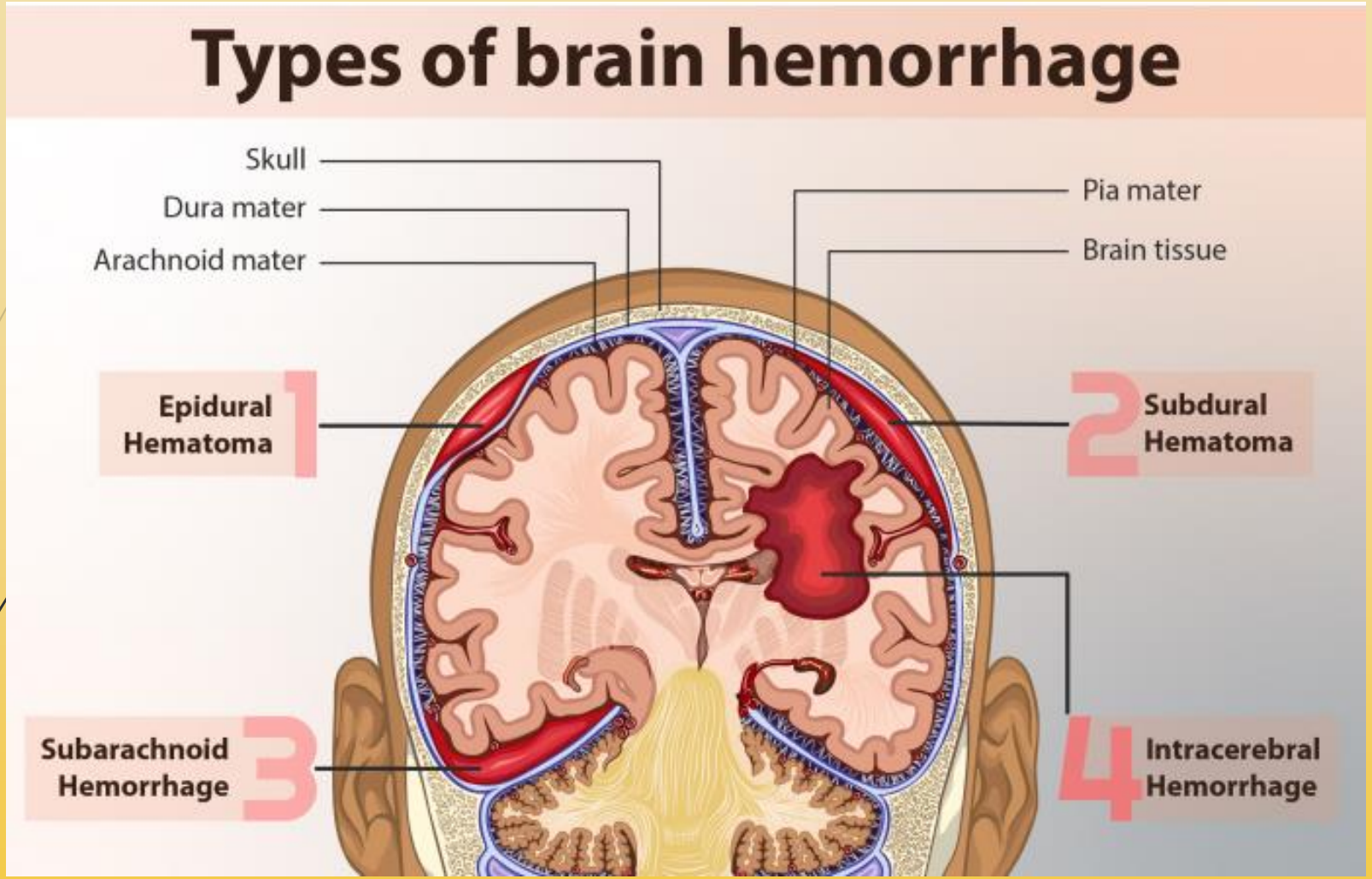
AVM


Artery
Blood flow
AVM
Capillaries
Vein
Normal connection
of blood vessels




AVM
nidus

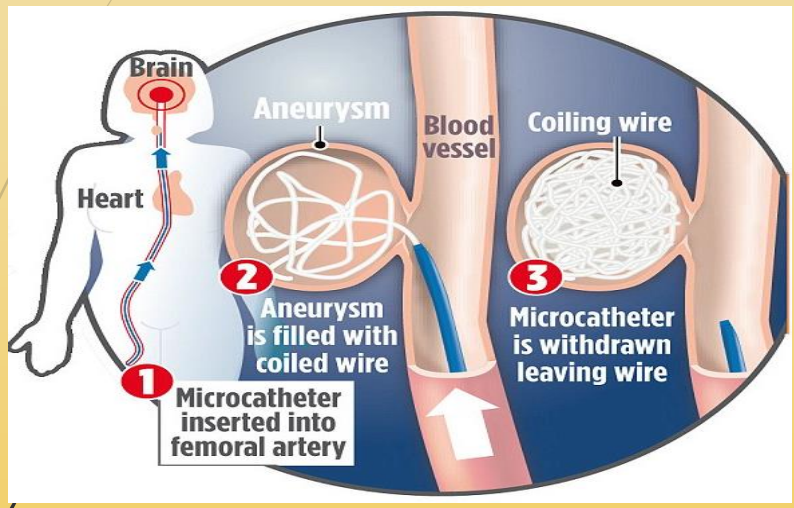
Types of brain hemorrhage

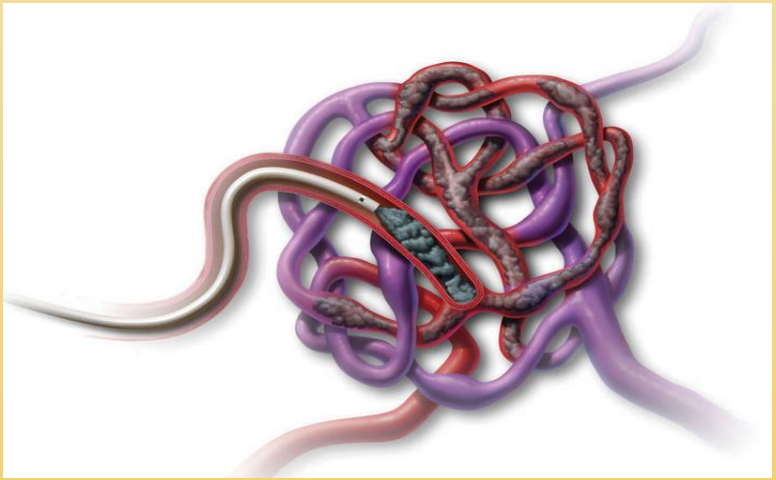


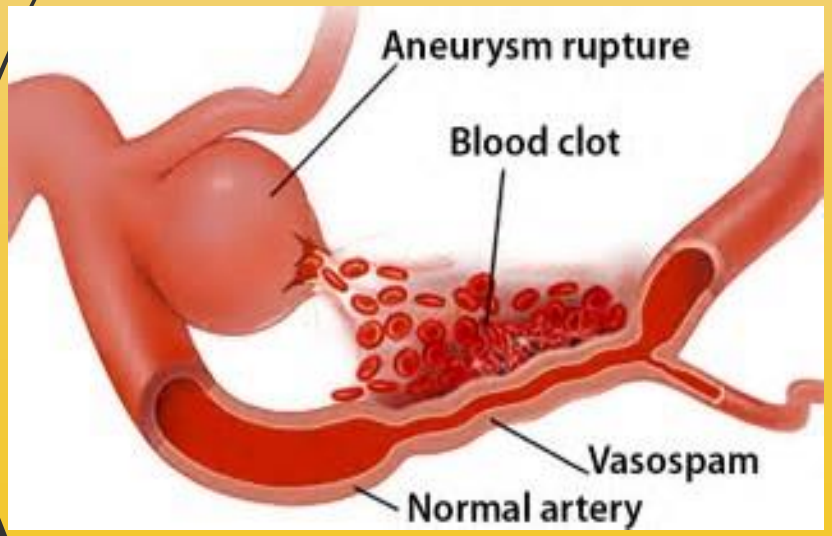
Common treatment options for hemorrhagic stroke

- Aneurysm Repair
  - Coiling
  - Stenting
  - Flow diversion
- Embolization
  - Elective Arteriovenous Malformation (AVM) Embolization
    - Used to stop bleeding or block the flow of blood to an abnormal area of brain.
    - Used to repair cerebral arteriovenous malformations
  - Middle Meningeal Artery Embolization (MMA)
    - Repair or blocking of blood flow via the middle meningeal artery which supplies blood to subdural hematomas through the dura mater

Endovascular coiling for aneurysm repair



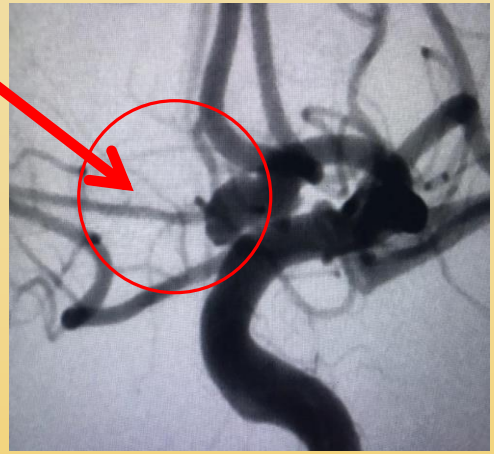


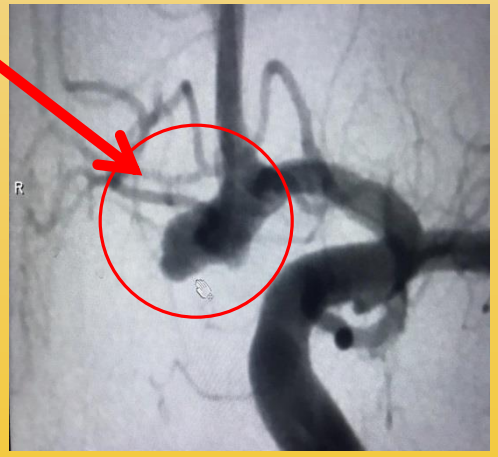


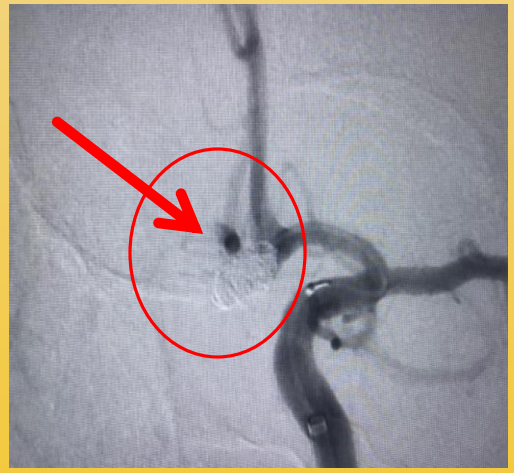
Aneurysm

Coiling

Before Repair





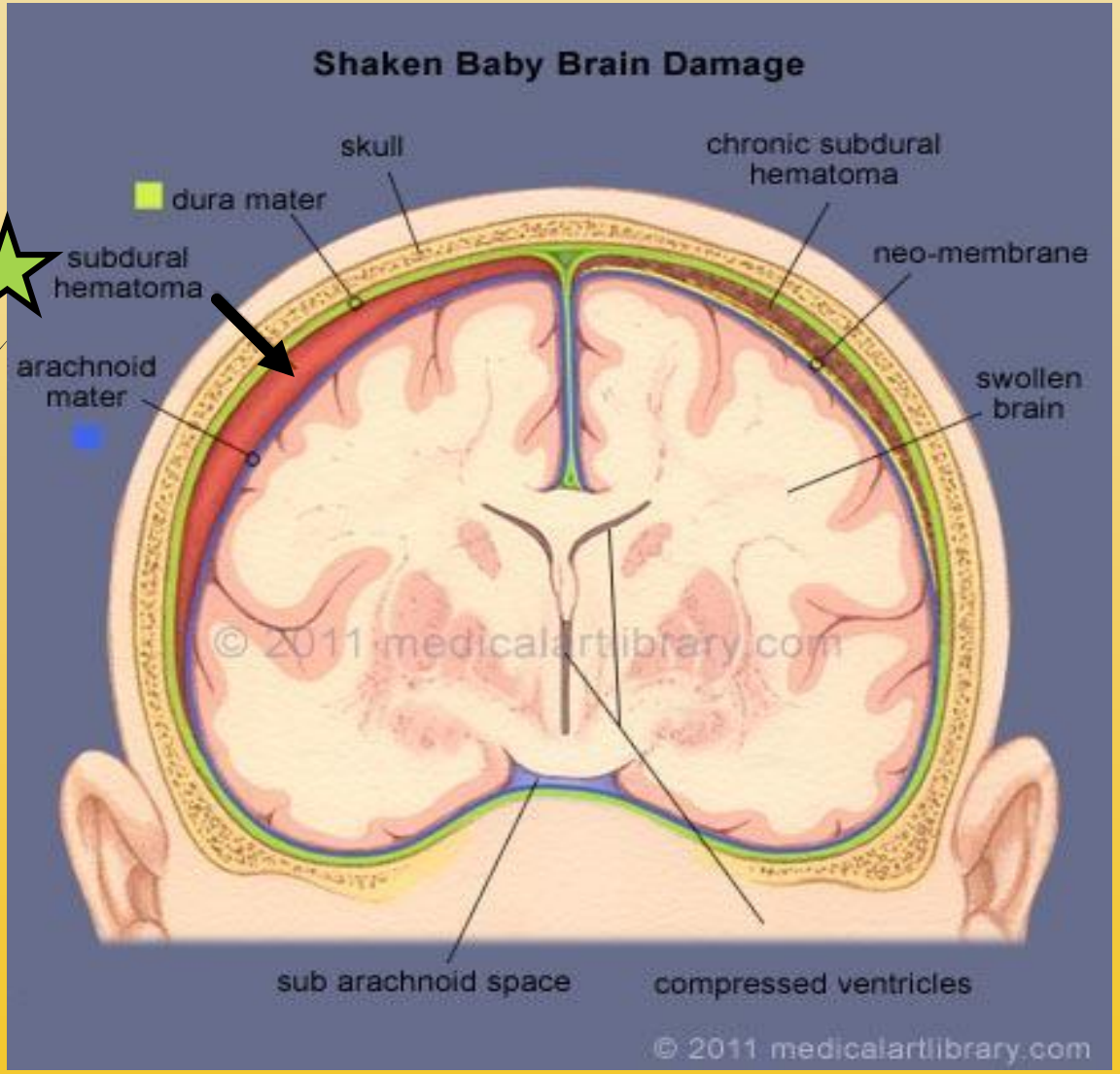


After Repair

What about the Subdural layer?

- Subdural hemorrhage or hematoma is ***NOT*** classified as a Stroke
- Definition of Subdural hemorrhage/hematoma:
  - A kind of intracranial hemorrhage, which is the bleeding in the area *between* the brain and the skull
  - It is were blood collects, and can clot, between the dura layer and arachnoid layer and *does not* directly come in contact with the brain
- Signs and symptoms mimic stroke because as the blood fills the space it puts pressure on the brain causing neurologic changes
- Subdural hemorrhage or hematoma is classified as a head/brain injury and is a medical emergency

Example of Subdural hematoma



- Shaken Baby brain damage

Post Stroke Management

- Per Physician Orders
  - Blood pressure management
  - Post Thrombolytic Therapy patient management
- Cardiac monitoring for a minimum of 24 hours after the stroke occurs
- VS & NIH monitoring & documentation per policy
- RN Dysphagia screening
  - Done asap after stroke symptoms noted
  - Can only be performed **ONE TIME**
  - If patient fails, patient must remain NPO until evaluated by Speech Pathologist (SLP)
    - **DON'T FORGET TO VERIFY Dysphagia screening/SPEECH PATHOLOGISTS CONSULT TIME!**
    - **DOCUMENTATION OF ANY PO INTAKE MUST BE DOCUMENTED *AFTER* THE SCREENING OR SLP CONSULT TIME!!**

Stroke Facts

MYTH	FACT
MYTH: Stroke cannot be prevented.	**FACT:** Up to 80 percent of strokes are preventable.
MYTH: There is no treatment for stroke.	**FACT:** At any sign of stroke call 9-1-1-immediately. Treatment may be available.
MYTH: Stroke only affects the elderly.	**FACT:** Stroke can happen to anyone at any time.
MYTH: Stroke happens in the heart.	**FACT:** Stroke is a "brain attack".
MYTH: Stroke recovery only happens for the first few months after a stroke.	**FACT:** Stroke recovery is a lifelong process.
MYTH: Strokes are rare.	**FACT:** There are nearly 7 million stroke survivors in the U.S. Stroke is the 5th leading cause of death in the U.S.
MYTH: Strokes are not hereditary.	**FACT:** Family history of stroke increases your chance for stroke.
MYTH: If stroke symptoms go away, you don't have to see a doctor.	**FACT:** Temporary stroke symptoms are called transient ischemic attacks (TIA). They are warning signs prior to actual stroke and need to be taken seriously.

Stroke Risk Factors

- Lifestyle
  - Obesity
  - Inactivity
  - Heavy ETOH use or binge drinking
  - Illicit drug use (cocaine, methamphetamines)
- Potentially Treatable
  - HTN (Hypertension)
  - Cigarette exposure
  - Elevated cholesterol
  - Diabetes
  - OSA (Obstructive Sleep Apnea)
  - Cardiovascular disease (including heart failure, heart defects, heart infection or abnormal heart rhythm)
    - Atrial fibrillation is a common abnormal heart rhythm associated with stroke
    - If not detected during hospital stay – LINQ device may be considered to determine if this is a cause

Stroke Risk Factors

- Risk factors specific to women include:
  - Previous pre-eclampsia
  - Use of birth-control pills, especially over age 35 and smoke
  - Long-term use of HRT
  - Menopause
  - pregnancy
- Other Family history of stroke, MI, or TIA
  - Age 55 or greater
  - Race – African Americans have higher risk
  - Gender – men have higher risk
    - Women are usually older when they have strokes and have a higher mortality

So, What do we do if we think someone is having a stroke?

Again! Think FASTER!

- Dial 8911 and call a Code Stroke

Code Stroke Team

- Always refer to your current policy
- All Emergency Department Physicians
- Hospitalist Group
- Neurocritical care
- Neuroendovascular Physicians
- Neurosurgeons
- ED Registered Nurses (RNs)
- All RNs assigned to inpatient units where stroke-related diagnosis patients may be assigned
- Any Community-based Stroke Certified physician
- Critical Care Registered Nurse
- Others
  - CT Scan Radiology Tech
  - Radiologist
  - Neurologist/Neurosurgeon, as applicable
  - Nursing Supervisor (to facilitate bed)
  - Pharmacist

Code Stroke

- Call 8911-indicate code stroke-paged overhead hospital wide
- Obtain history - LKW (Last Known Well) and symptom discovery time
- Obtain blood glucose
- Obtain baseline NIH within 15 minutes of symptom discovery
- Place pt on monitor to assess v/s every 15 minutes
- Place pt on 2 L NC
- Make pt NPO - until patient passes nurse dysphagia screen
- Ensure pt has 2 large IV's
- Elevate HOB 30 degrees
- Ensure labs are drawn and EKG is performed
- Travel with pt to CT scan
- Prepare for possible infusion of Thrombolytic Therapy
- Prepare for possible transfer to NEV suite
- Prepare for unit to unit transfer
- ST. E's campus – prepare for transfer to St. Luke's campus

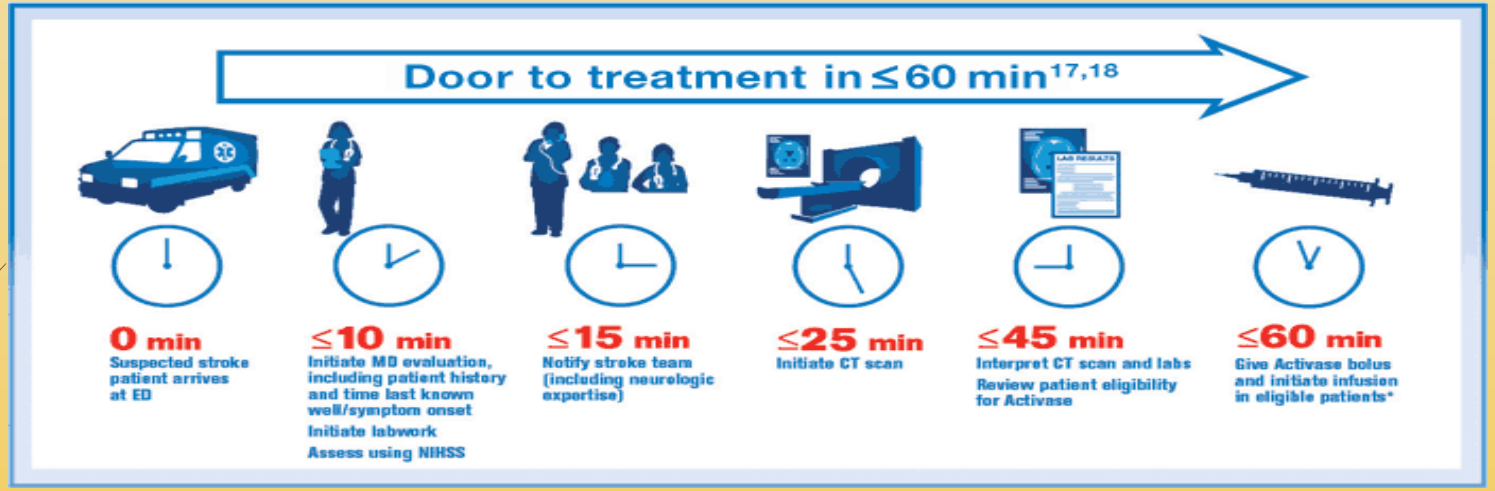
Time Targets

- Door to MD = ≤ 5 Minutes
- Door to CT scan = ≤ 20 Minutes
- Door to CT scan Interpretation = ≤ 35 Minutes
- Door to IV Thrombolytic Therapy = ≤ 30 Minutes
- Door to Groin puncture = 60 Minutes
- Door to Device= 90 Minutes
- Door to first pass if transferred from another facility= 60 Minutes

Rule Out Other Potential Causes of a Focal Neurologic Deficit

- Until you have a definite alternative diagnosis – continue the stroke work up!
- Hypoglycemia
- Mass lesions
- Seizure/postictal state
- Migraine
- Functional hemiparesis
- Encephalopathy

Golden Hour of Stroke Management



- In 2015 the NYS DOH made the timeline even more stringent
- New target for Thrombolytic Therapy is now to be administered within 30 minutes of Code Stroke Team arrival/arrival to Emergency Department
- Minutes count – time is brain! We must save the Penumbra!

What are we hoping for?

- Normal CT

Figure-2: Plain Computed Tomography (CT) Brain Axial Image: Normal ventricles and cortical sulci. No evidence of oedema or abnormal lesion.

MRI/MRA Used for Stroke

- MRI may show early evidence of infarction
- MRA can add identification of large-vessel arterial occlusions
- Perfusion studies may also provide better insight into tissue viability
  - Improved identification of ischemic penumbra

Next Steps

- If Diagnosis of ischemic stroke:
  - Determine eligibility for Thrombolytic Therapy
    - Administration for Acute Ischemic Stroke
      - Inclusion/Exclusion Criteria reviewed by Provider
      - 3 hour vs. 4.5 hour treatment window established by last known "normal" (i.e. symptom free) time
      - If eligible, consent must be obtained by Provider
    - Blood pressure management to control blood pressure below 180/110 mmHg
  - Determine eligibility for Mechanical Thrombectomy
- **GOAL: RESTORE PERFUSION**
- **REMEMBER: TIME IS BRAIN**

Reasons NOT to administer Thrombolytic Therapy

- Hemorrhage on head CT
- Brain mass on head CT
- Active bleeding
- INR greater than 1.7
  - Can be corrected with PCC/Kcentra, as applicable
- Unknown time of symptom onset
- Recent head trauma
- **REASON FOR NOT GIVING MUST BE DOCUMENTED BY PROVIDER!**

Stroke Order sets

- All Stroke Order sets are available in the EMR
- Make sure the Provider selects the correct order set
  - Inpatient vs. Emergency Department
  - Ischemic vs. Hemorrhagic

Remember! If Thrombolytic Therapy used-

- Continued close monitoring of patient per MVHS policy
- Institute bleeding precautions
- ALL antiplatelet and anticoagulant agents are held for a minimum of 24 hours post Thrombolytic Therapy administration
- ***NO*** bladder catheterizations, arterial blood draws, nasogastric tube insertions or invasive procedures for 24 hours after administration

Dysphagia Screening

- RN Dysphagia Screen
  - This is to ensure that patients at risk for aspiration are identified in a timely manner
  - Accurate and consistent patient evaluation will allow for appropriate interventions that mitigate risk to the stroke patient
  - ALL stroke patients need to be screened for dysphagia with the RN Dysphagia Screen prior to initiation of **ANY** oral/dietary intake
    - If the patient fails the screening, patient must remain NPO until evaluated by Speech Pathologist
      - **DON'T FORGET TO VERIFY SPEECH PATHOLOGISTS CONSULT TIME!**
      - **DOCUMENTATION OF ANY PO INTAKE MUST BE DOCUMENTED *AFTER* THE CONSULT TIME!!**
    - Any needed medications must be converted to alternate routes (i.e. IV, suppository, etc)

NIHSS Education

- National Institute of Health Stroke Scale
- The NIHSS is a tool used by healthcare providers to objectively quantify the severity of a stroke
  - NIHSS ranges from 0 – 42
  - The higher the score, the worse the stroke impairment
  - However, a score of 0 does not mean the patient did not have a stroke

Documentation

- Open Code Stroke Navigator in Epic
- Acute Stroke IV Thrombolytic Therapy Response Record
  - To be filled out by RN
  - Must be addressed by RNs administering thrombolytic
  - Co-signatures required
  - Consent for administration of thrombolytic if indicated
- Inpatient Stroke Tracking Form
- At SE's Campus
  - Physicians Orders – Suspected Stroke Panel (Inpatient)
  - Inter-Facility Stroke Patient Transfer Report

Policies & Procedures

- **ALWAYS FOLLOW YOUR CURRENT POLICIES**
- Stroke Patient Management Policy
- Acute Stroke IV thrombolytic Response Record
- Therapeutic Hypothermia Protocol
- NIH Stroke Scale
- Dysphagia Screening

Questions