Nursing Tips & Tricks to Enhance Stroke Care

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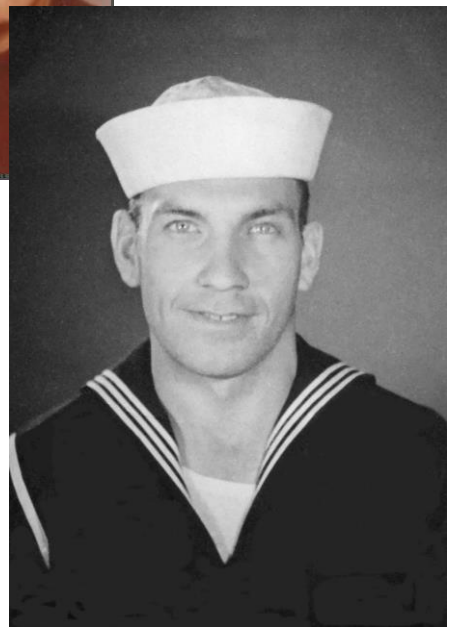
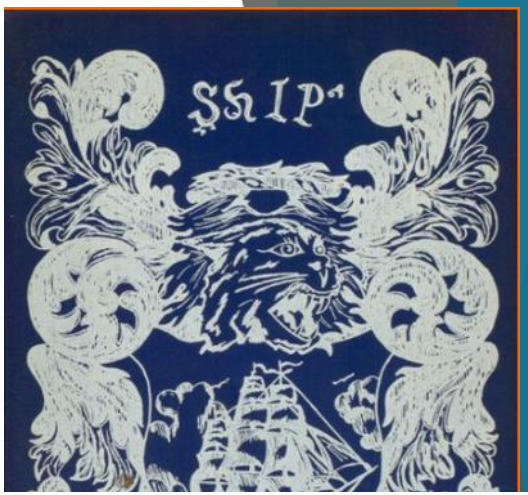
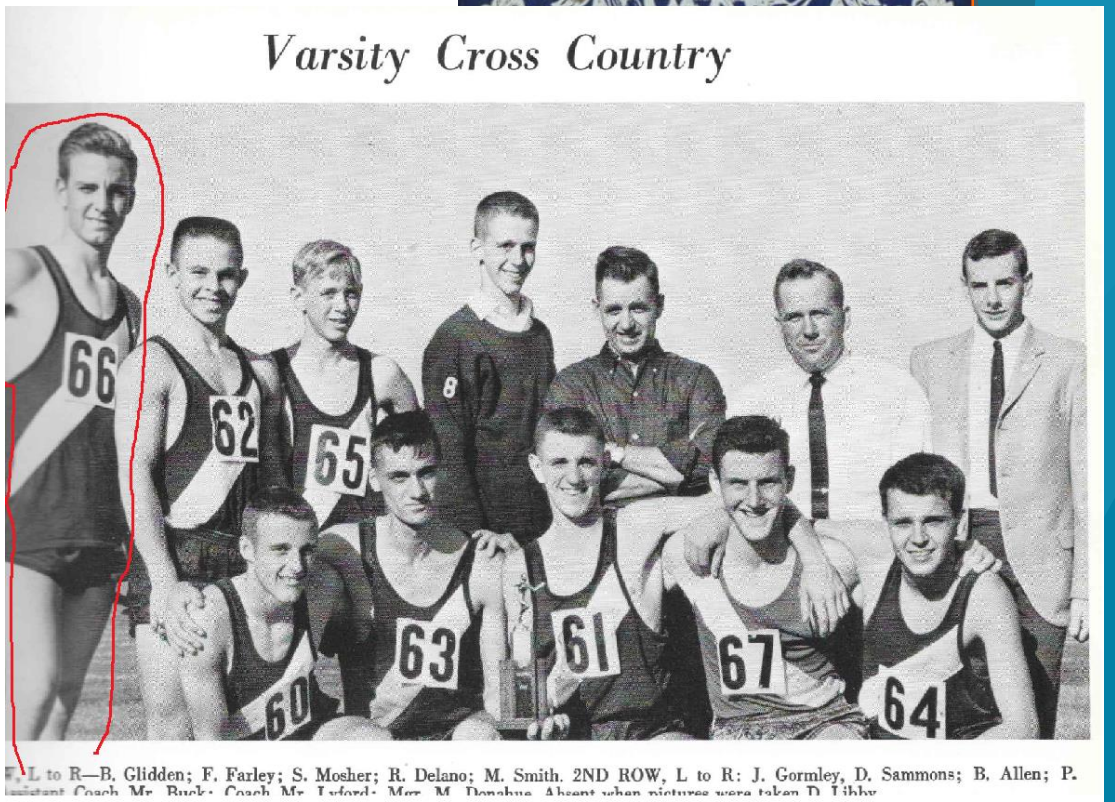
MASSACHUSETTS GENERAL HOSPITAL
TELEHEALTH

Thanks for the honor of representing my Aroostook County Roots!







Continued Maine Connections!

News Weather Sports Coronavirus News 24/7

Death Report For First Quarter 2020

Drug related deaths up 23% from last quarter of 2019

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PRESQUE ISLE, Maine (WAGM) - An increase in deaths related to drug use was reported today by the Maine Attorney General's Office. News Source 8's Cam Smith has more on the report.

Drug related deaths are up 23% for January through March of this year, compared to the final three months of last year. According to a report released by the office of the attorney general, there were 127 deaths related to drug use in the first three months of the year.

Doctor Marcella Sorg of the University of Maine's Margaret Chase Smith Policy Center, says the increase could be linked to the COVID 19 Pandemic.

Agenda

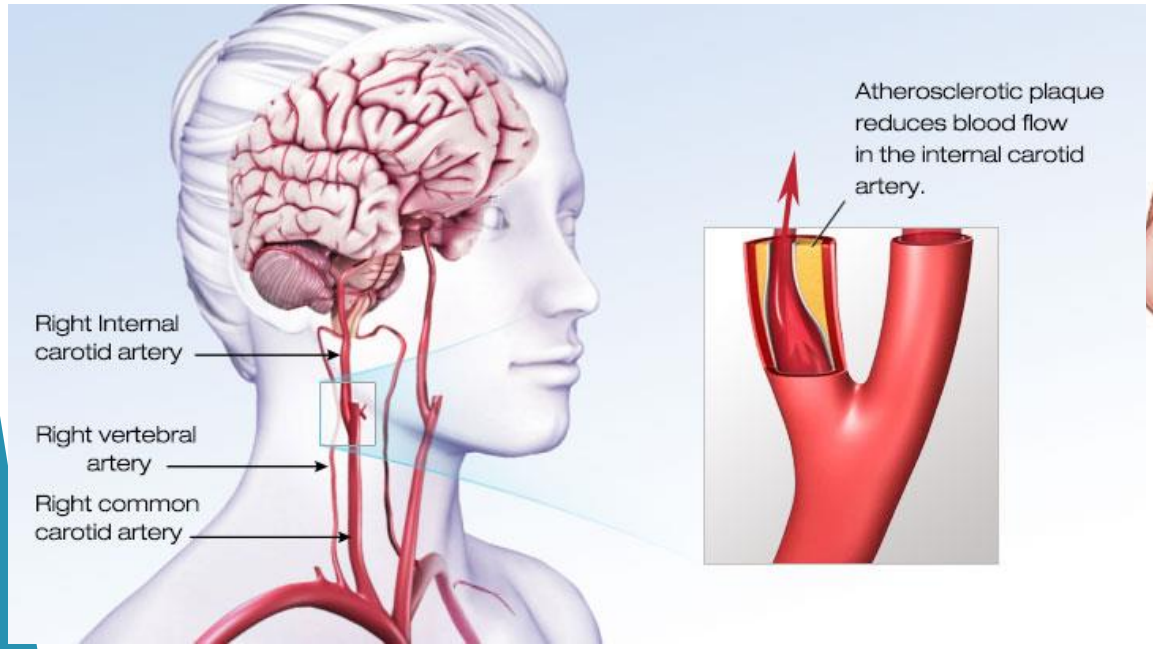
- **Quick Trip Around the Brain:** Localization & Function
- **NIHSS pearls**
- **Acute Stroke Interventions & Transfers to MGH**
- **Wrap-Up/Questions**

Quick Trip Around The Brain: Stroke Localization & Function

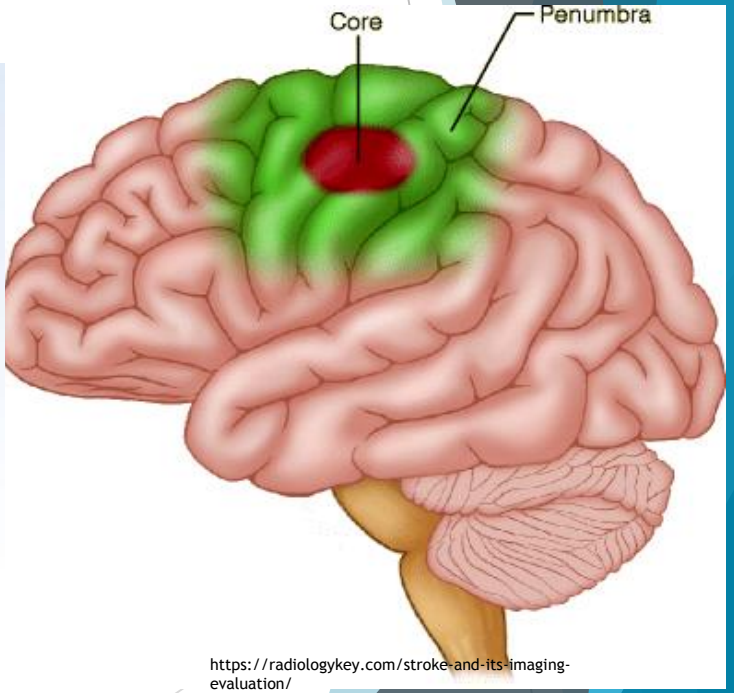
Ischemic Stroke Definition

Blockage in a vessel(s) that disrupts blood flow to other areas of the brain

A central core with severely compromised cerebral blood flow (CBF) is surrounded by moderate ischemic tissue (Penumbra)



https://watchlearnlive.heart.org/CVML_Player.php?moduleSelect=iscstr

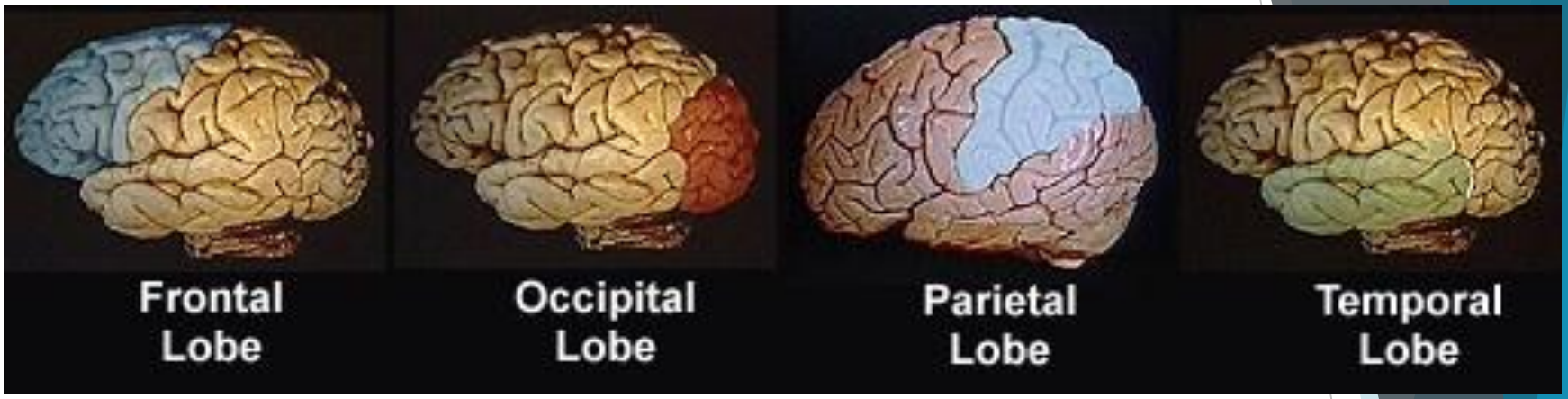


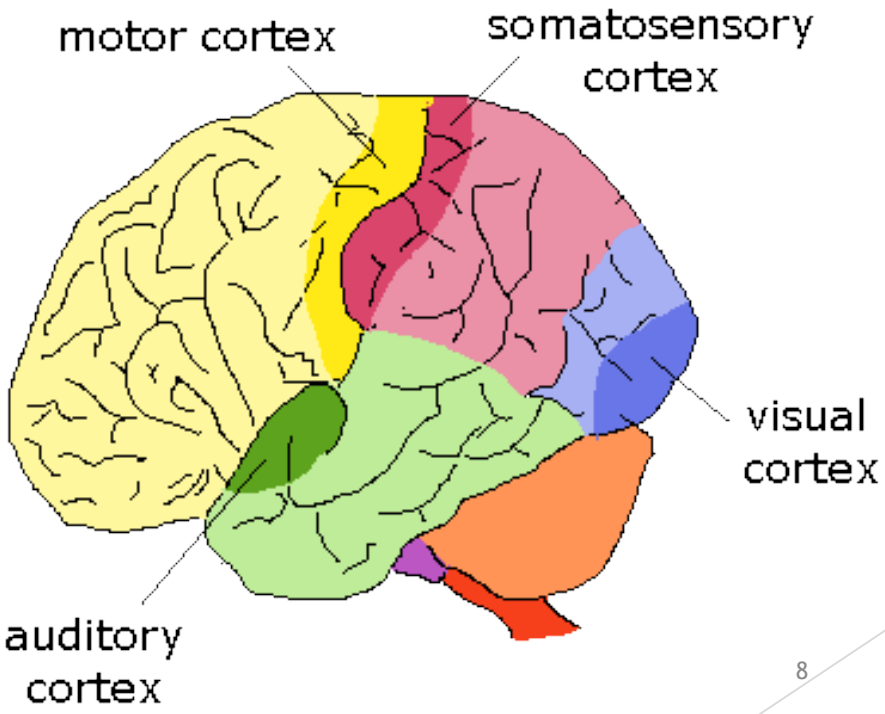
https://radiologykey.com/stroke-and-its-imaging-evaluation/

Review: Signs and Symptoms of a Stroke:

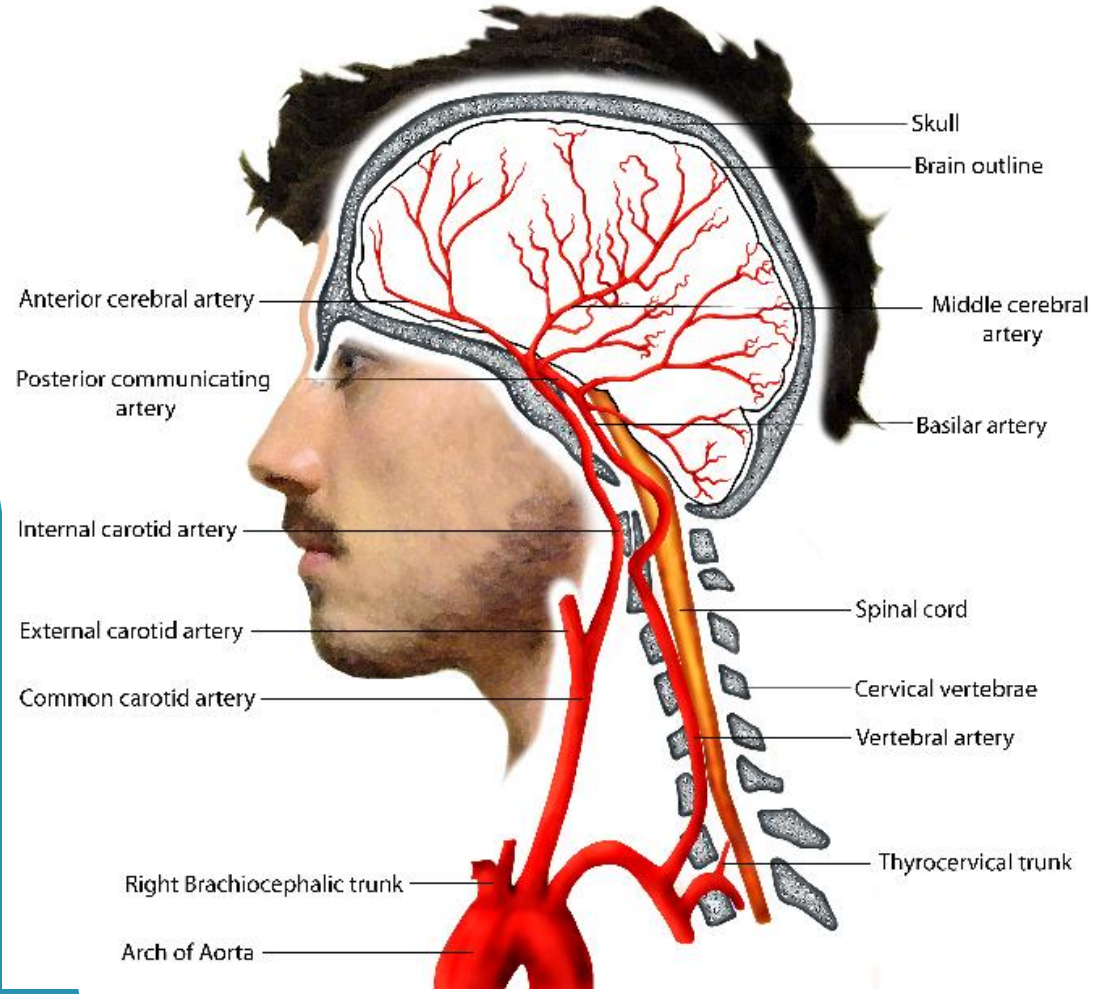
BE FAST is another acronym that includes other less common stroke symptoms.

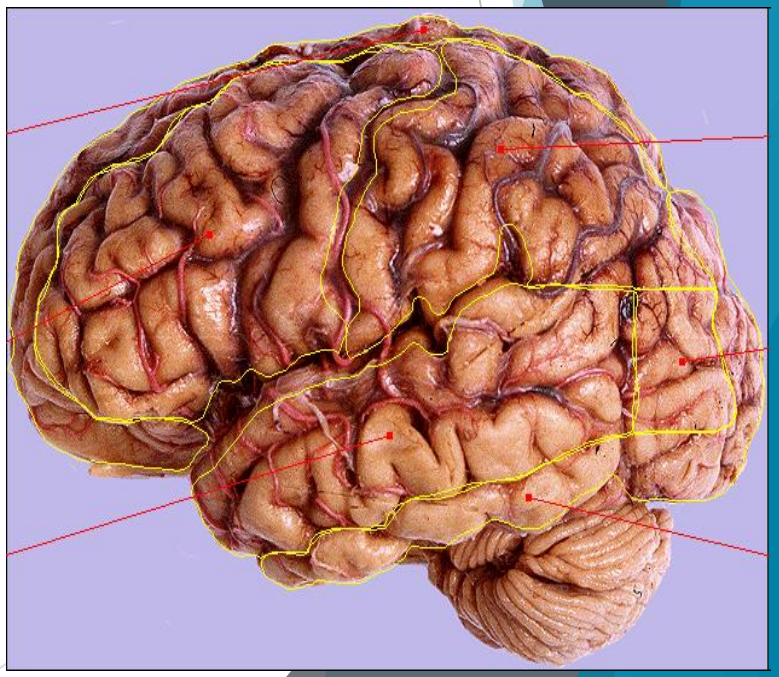
Understanding Brain Anatomy





Understanding Brain Anatomy: Anterior & Posterior Circulation





TIA

Transient Ischemic Attack: Person will have stroke symptom(s), but they will last less than 24 hours , resolve completely, and do not show on DWI (diffuse-weighted imaging)

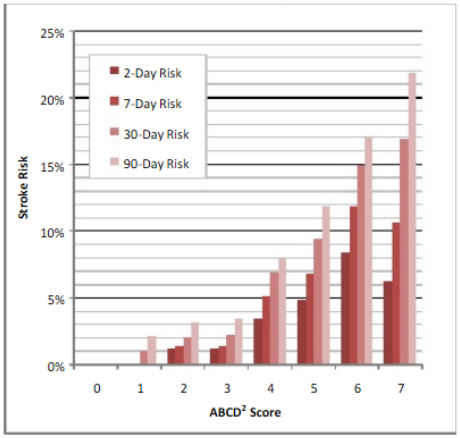
- Stroke Risk Calculation for Persons experiencing a TIA
  - ABCD2

Risk Factor	Points	Score
Age		
≥ 60 years	1	☐
Blood pressure		
Systolic BP ≥ 140 mm Hg *OR* Diastolic BP ≥ 90 mm Hg	1	☐
Clinical features of TIA (*choose one*)		
Unilateral weakness with or without speech impairment *OR*	2	☐
Speech impairment without unilateral weakness	1	
Duration		
TIA duration ≥ 60 minutes	2	☐
TIA duration 10-59 minutes	1	
Diabetes	1	☐
Total ABCD^2 score	0-7	☐

Using the ABCD^2 Score

Higher ABCD^2 scores are associated with greater risk of stroke during the 2, 7, 30, and 90 days after a TIA (Figure). The authors of the ABCD^2 score made the following recommendations for hospital observation:[1]

ABCD^2 Score	2-day Stroke Risk	Comment
0-3	1.0%	Hospital observation may be unnecessary without another indication (e.g., new atrial fibrillation)
4-5	4.1%	Hospital observation justified in most situations
6-7	8.1%	Hospital observation worthwhile



[1] Johnston SC, Rothwell PM, Huynh-Huynh MN, Giles MF, Elkins JS, Sidney S, "Validation and refinement of scores to predict very early stroke risk after transient ischemic attack," Lancet, 369:283-292, 2007.

https://www.scribd.com/document/257537168/Tia-Abcd2-Tool-1

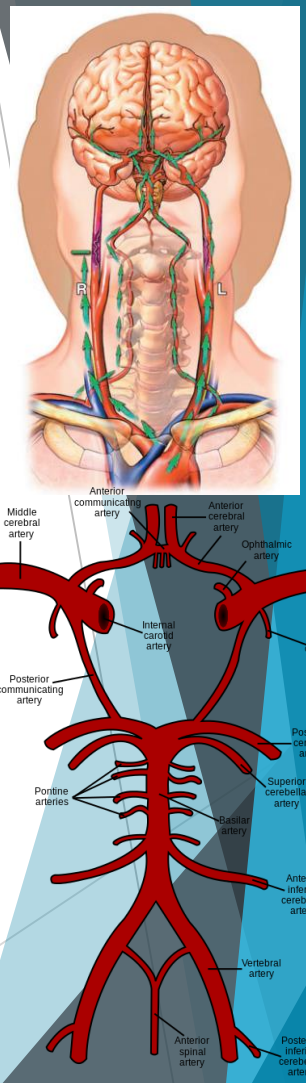
Causes of Ischemic Stroke

Dissection (Carotid or Vertebral): arterial walls begin to separate, forming a false lumen. Risk factors: Neck trauma, recent infection, family history, smoking, hypertension, oral contraception, migraine ha, connective tissue diseases (FMD/Ehlers-Danlos Syndrome Type IV).

Sy/Sx: Carotid: local pain, facial paralysis, pupillary defects (Horner's), tiniitus, scalp tenderness

Carotid vs Vertebral Dissections:

- Mean age was slightly higher for patients with internal carotid artery dissection compared with vertebral artery dissection (46 versus 41 years)
- The proportion of men was higher for internal carotid dissection
- Infection in the previous week was more common with internal carotid dissection
- Minor cervical trauma in the previous month was more frequent with vertebral dissection
- Neck pain was more frequent with vertebral dissection
- Transient monocular blindness occurred only with internal carotid dissection (8 versus 0 percent)

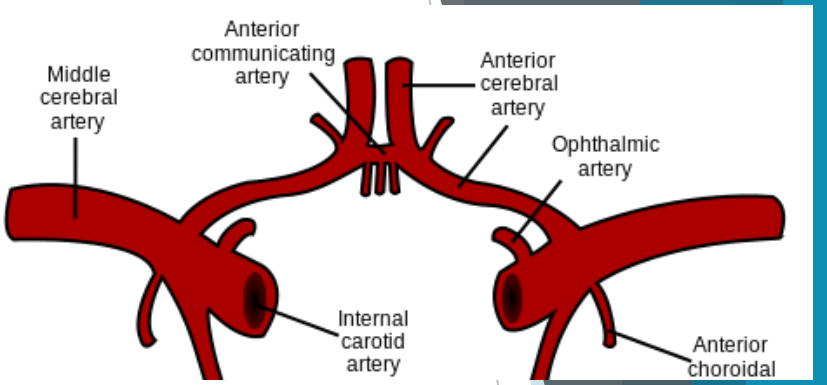


Strokes In The Anterior Circulation: 70% of all strokes

Q: Where does the Anterior Circulation Stem From?

A: Internal Carotid arteries

Internal Carotid Artery
Anterior Cerebral Artery
Middle Cerebral Artery
Anterior Communicating Artery



Anterior Cerebral Artery Stroke: Confusion, personality change, judgment, behavior, apathy, flat affect, disinhibition, **Contralateral** paralysis/ weakness/ sensory loss of leg (foot drop) **Abulia** (inability to make decisions, or perform voluntary acts) Incontinence

Middle Cerebral Artery Stroke: **Contralateral** motor and sensory loss; weakness of arm and face usually greater; loss in leg

On same side: hemianopsia, gaze preference – pt. looks towards the side of the lesion (conjugate gaze paresis) Left hemisphere is dominant for language deficit is language; Broca's aphasia non-fluent expressive aphasia with

Carotids run laterally between the **frontal** and **temporal** lobes and emerge from the Sylvian fissure

Supply the lateral surface of the hemispheres including the primary motor (precentral gyrus) and primary sensory (postcentral gyrus) cortices

Strokes In The Anterior Circulation: 70% of all strokes

Q: What will your exam look like for anterior circulation strokes? What should you be focused on?

A:

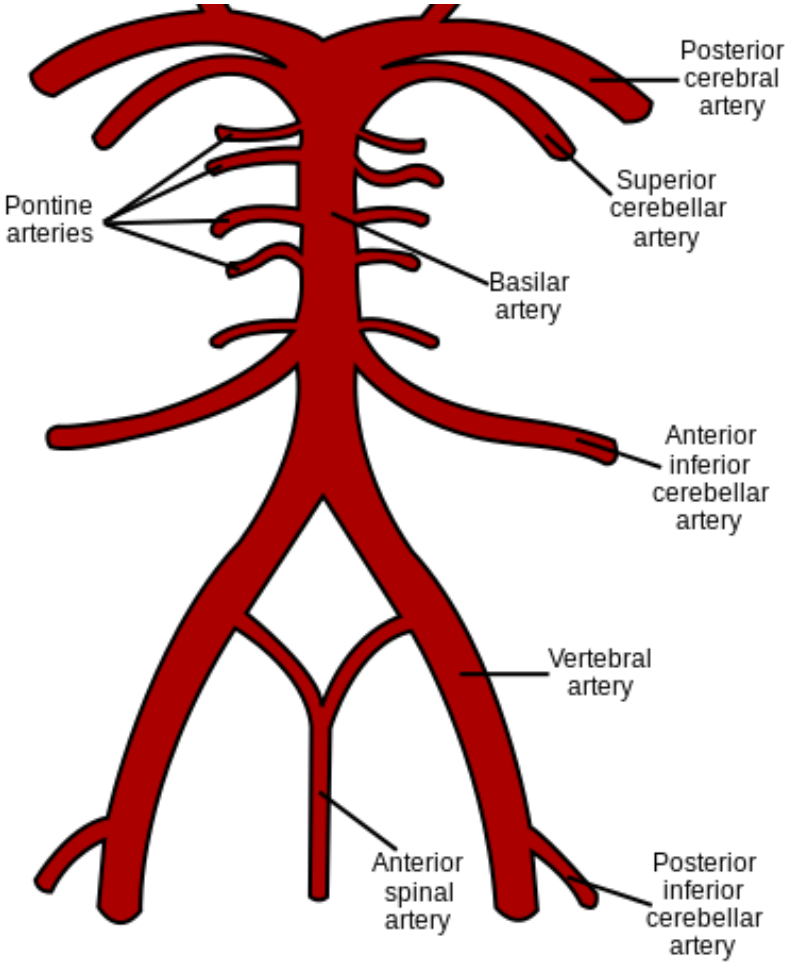
- Participation in exam (abulia, agitation, impulsivity)
- Aphasia
- Vision –

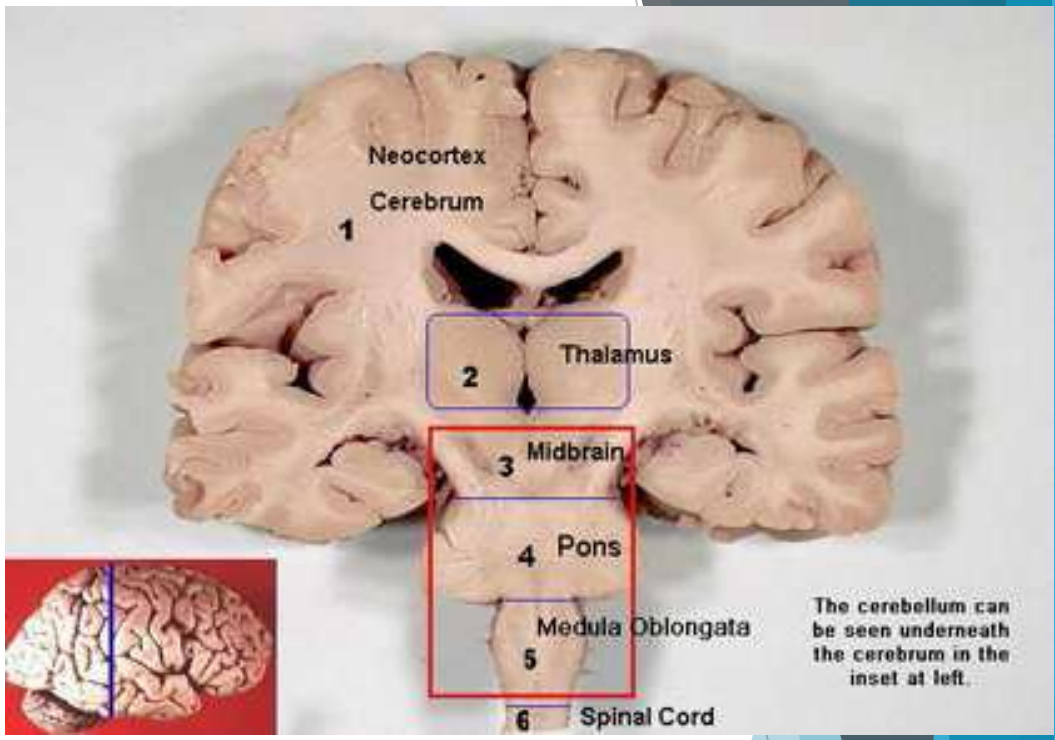
Q: How do you check for homonymous hemianopia.

A: Visual Field Testing

- Motor Weakness (more arms than legs)
- Sensory changes

Strokes in the Posterior Circulation: 20% of all strokes





Vertebral Arteries
Basilar artery & posterior cerebral artery /subsequent branches:

Superior Cerebellar Artery (SCA)
Anterior Inferior Cerebellar Artery (AICA)
Posterior Inferior Cerebellar Artery (PICA)

Common Features of Posterior Circulation Strokes

- Balance
- Coordination
- Vision/Visual Perception
- Temperature/Sensation changes
- Swallowing Challenges/Dysphagia
- Arousal/LOC
  - Coma, decerebrate posturing, pinpoint pupils with brainstem stroke.

Localization & Function through the NIHSS

Vanessa McKenna MSN, CNRN

NIH Stroke Scale International

1.) Levels of Consciousness
   1a.) Identifies alertness Score: 0-3
   1b.) Ask month/age score: 0-2
   1c.) Command following score 0-2

2.) Best Gaze Score 0-2

3.) Visual Score 0-3

4.) Facial Palsy Score 0-3

5.) Motor Arms Score 0-4 for each arm

6.) Motor Legs Score 0-4 for each leg

7.) Limb Ataxia Score 0-2

8.) Sensory Score: 0-2

9.) Best Language Score: 0-3

10.) Dysarthria Score 0-2

11.) Extinction/Inattention Score 0-2

Score	Stroke Severity
0	No Stroke Symptoms
1-4	Minor Stroke
5-15	Moderate Stroke
16-20	Moderate to Severe Stroke
21-42	Severe Stroke

Disadvantages Of the NIHSS

- Certification can be an arduous assignment
- Multiple assessments can become confusing/lead to inaccuracies
- If you don't utilize enough, you become out of practice or confused about certain items in the assessment.
- If neuro isn't your thing, this scale isn't either!

NIH STROKE SCALE IN PLAIN ENGLISH

Sedating medications affecting scale? (Circle Y or N) →		Y / N
Date / Time / Initials →		
1a. Level of Consciousness	0= Alert 1= Sleepy but arouses 2= Can't stay awake 3= No purposeful response	
1b. Questions (month, age)	0=Both correct 1=One correct /intubated 2=Neither correct	
1c. Commands (Close eyes, make fist)	0= Obeys both 1= Obeys one 2= Obeys neither	
2. Lateral Gaze (Eyes open. Eyes follow examiners fingers/face side-to-side)	0= Normal side-to-side eye movement 1= Partial side-to-side eye movement 2= No side-to-side eye movement	
3. Visual Fields (Both eyes open, count 1/2/5 fingers/detect movement, 4 visual fields	0= Normal visual fields ⊕ 1= Blind upper or lower field one side. ◔ 2= Blind upper & lower field one side. ◑ 3= Blind in both eyes/4 fields ●	
4. Facial Weakness (Smile/grimace, raise eyebrows, squeeze eyes shut)	0= Normal 1= Mild one sided droop with smile 2= Obvious droop at rest 3= Upper & lower face weak	
5a. Arm Weakness– Left **5b. Arm Weakness– Right** (Pt. holds arm at 90° if sitting, 45° if supine for 10 sec.)	0= No drift X 1= Drifts dow 2= Drifts dow 3= Can move 4= No movem	
6a. Leg Weakness– Lt **6b. Leg Weakness– Rt** (Pt. holds leg straight out if sitting, 30° if supine) 5 sec.	0= No drift X= Untestable,joint fused, etc 1=Drifts down, does not hit bed 2= Drifts down to hit bed 3= Can move but can't lift 4= No movement	Lt. Rt.
7. Coordination Finger-to-nose, heel-to-shin. Score only if not caused by weakness.	0= Normal or no movement 1= Clumsy in one limb 2= Clumsy in two limbs	
8. Sensation (feeling) (Pin prick face, arm, leg – compare sides)	0= Normal 1= Decreased sensation 2= Can't feel, no pain withdrawal	
9. Speech (content) Intubated pt can write. Give blind pt objects to name. (name objects, describe cookie picture)	0= Correct full sentences 1= Wrong or incomplete sentences 2= Words don't make sense 3= Can't speak at all	
10. Speech (slurring) Slurring. (Listen to patient read/repeat words)	0= No slurring X= Intubated/physical barrier 1= Slurs but you can understand 2= Slurs and you can't understand or mute	
11. Neglect (Ignores one side of body; test vision then test touch on both sides at once)	0= Sees & feels when both sides tested at once. 1= Doesn't see or feel one side when tested at once 2= Doesn't see & feel one side when tested at once	

Dancer, S 2011

NIH Stroke Scale *in plain English*			NIH Stroke Scale	
3. Visual Fields (Both eyes open, count 1/2/5 fingers/detect movement, 4 visual fields)	0=Normal visual fields 1=Blind upper **or** lower field one side. 2=Blind upper **&** lower field one side. 3=Blind in both eyes/4 fields		**3. Visual Fields** (Introduce visual stimulus/threat to pt's visual field quadrants)	0 = No visual loss 1 = Partial Hemianopia 2 = Complete Hemianopia 3 = Bilateral Hemianopia (blind)

7. Coordination (Finger-to-nose, heel-to-shin) Score only if not caused by weakness.	0=Normal or **no movement** 1=Clumsy in one limb 2=Clumsy in two limbs			**7. Limb Ataxia** (Finger-nose, heel down shin)	0 = No ataxia 1 = Present in one limb 2 = Present in two limbs

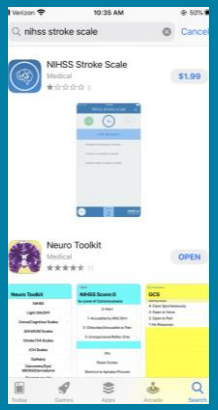
Dancer, S 2011

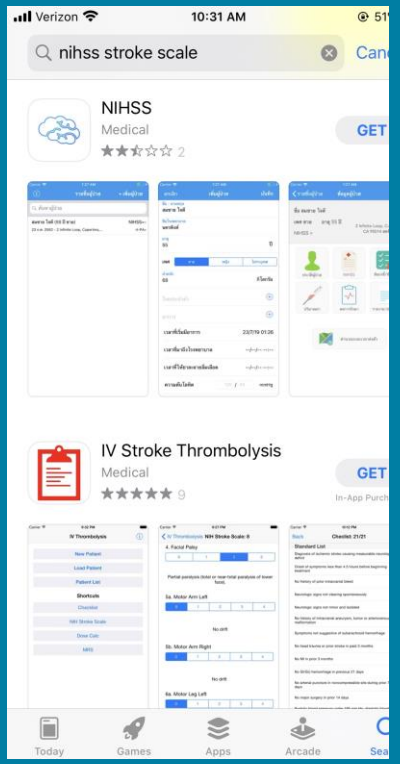
Tips:

- If you can't remember the NIHSS/Don't have an app or physical copy with you, complete a head to toe assessment,
  - include GCS so you can gather information about speech in orientation questions (quality/output/aphasia). Use the swallow screen to gain more information about possible swallowing impairments.
- Neglect & Visual Fields might be the hardest to remember. If you have a Snellen test, sometimes this will be enough to capture visual field deficit
- If you remember to have the patient close their eyes and locate parts of the body you are touching – good for you! Hopefully this education has helped too!
- Be able to report deficits to the neurologist/ED responding clinician.

Where to find the NIHSS

- On your phone:
  - Apps galore
  - On the internet
  - Ask your hospital to print out readily available sheets





Acute Stroke Transfers – What you need to know

Vanessa McKenna MS, CNRN

Why Are Your Transferring?

- TeleNeurology Recommendation
  - Further post-tPA monitoring
  - Endovascular Intervention
  - Other

Post t-PA Monitoring hasn't changed since 2012

Neuro Assessments and vital signs Q 15min X 1 hour, then

Every 30min X 6hours then,

Hourly until 24hours.

Bleeding precautions

Mobility limitations usually for first 6 hours, then liberalized per clinician discretion/patient compliance

Surgical Interventions: Hemicraniectomy for Large MCA Infarction: <48hours since stroke onset

- Patients with malignant MCA infarction show clinical worsening with progressive deterioration in their level of consciousness within the first 24-48 hours after stroke onset, culminating in brain herniation and death in over 80% of patients
- Hemicrani has been shown to be effective in reducing death

Inclusion Criteria:
Patients who are ≤82 yrs of age with large MCA infarction evident on the admission head CT or brain MRI.

Pre-surgical and Surgical Management

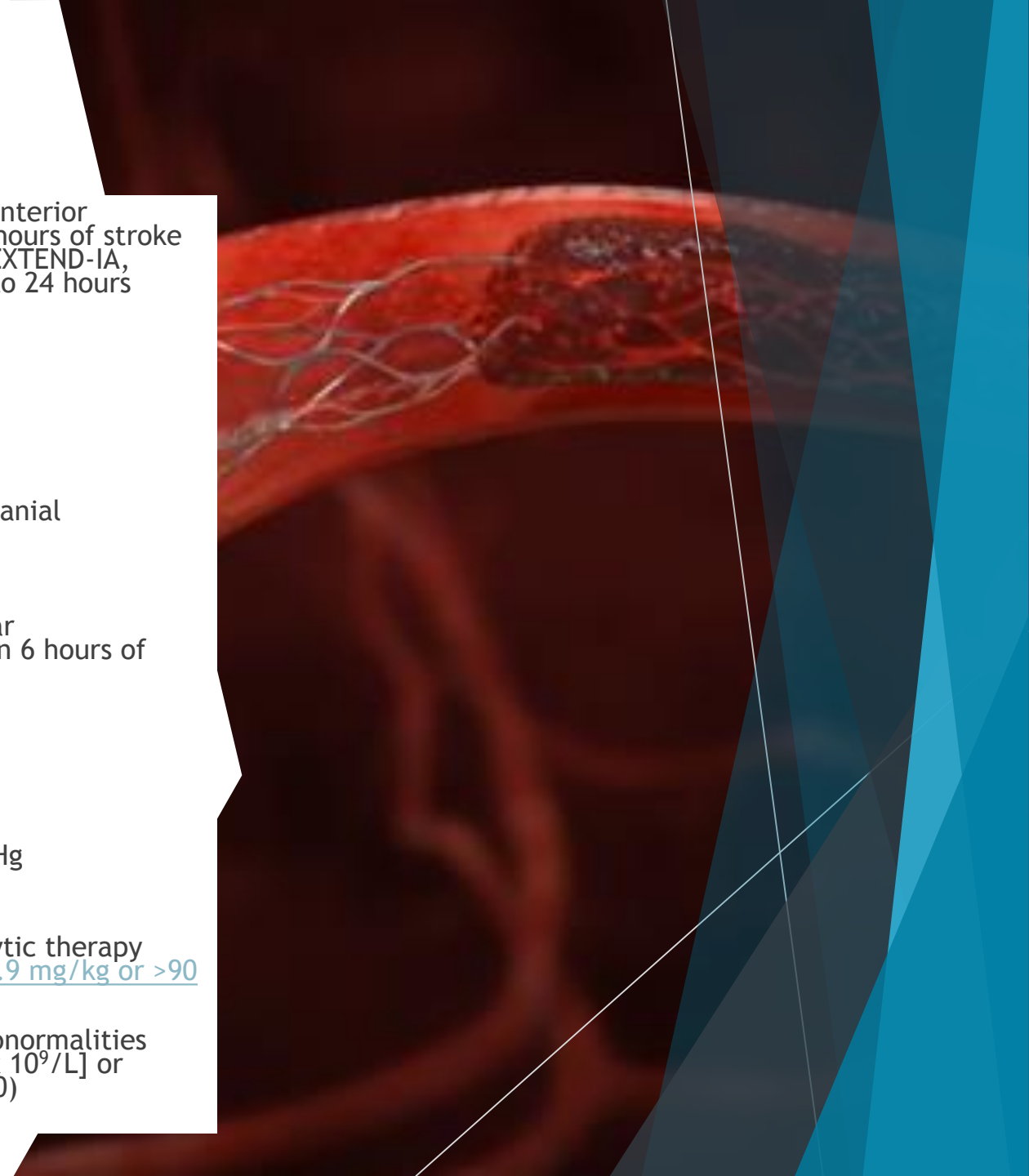
a. If hemicraniectomy is offered, withhold anti-coagulation and anti-platelets until deemed safe post-procedure with input from neurosurgery

b. For adequate external decompression, the size of the bone flap removed should ideally be 12 cm (anterior-posterior) by 9 cm (superior-inferior), combined with duraplasty [4].

c. Temporal lobectomy may be considered during the procedure, at the neurosurgeon's discretion. If performed, tissue should be submitted for neuropathological examination.

d. The bone flap should be placed in a subcutaneous abdominal pouch or stored in the bone bank.

Neuro Interventional: Mechanical Thrombectomy



- **Indication:** Large Artery Occlusion in Anterior circulation who can be treated within 6 hours of stroke onset. Further research (SWIFT PRIME, EXTEND-IA, DAWN) showed successful treatment up to 24 hours

- **Inclusion criteria:**
- •A clinical diagnosis of acute stroke
- •A deficit on the NIHSS
- •Brain CT or MRI scan ruling out intracranial hemorrhage
- •Intracranial arterial occlusion
- •Sufficient time to initiate endovascular thrombectomy (ie, groin puncture) within 6 hours of stroke onset
- •Informed consent given
- •Age ≥18 years
- **Exclusion criteria:**
- •Arterial blood pressure >185/110 mmHg
- •Blood glucose <2.7 or >22.2 mmol/L
- •Intravenous treatment with thrombolytic therapy using an excessive dose (ie, alteplase >0.9 mg/kg or >90 mg total)
- •Laboratory evidence of coagulation abnormalities (eg, platelet count <40,000/microL [40 x 10^9/L] or International Normalized Ratio [INR] >3.0)

The Ideal Transfer

- **Neuro Assessment:**
  - GCS or NIHSS Helpful
- **If tPA given, what was the dose and when did it start?**
  - Why? Now we know where in the 24 monitoring phase the patient is and we can tailor our staffing accordingly. Also be compliant with post-tPA monitoring.
- **Do you know why the patient is transferring?**
  - This is a big one. All LVO cases should go emergently to the OR and be coordinated. All other transfers should go through the ED and be assigned either a Neuro ICU or General Care neuro bed depending on stroke severity/concern for swelling.
- **Swallow Screen** - If you complete a Swallow Screen, handoff should include pass/fail and if you have witnessed them eat, drink or take pills
  - Why? Helpful if there is a change in patient condition during transfer

The Ideal Transfer

- **GU**
- Place indwelling catheter prior to tPA if necessary
- **Skin**
  - Note any baseline skin conditions that would be concerning after tPA
    - Skin tears from a fall will probably ooze
    - IVs can ooze
    - Angioedema risk w/ tPA
- **Risk for Delirium**

Thank You!