KANSAS INITIATIVE FOR STROKE SURVIVAL

A PROJECT BY AND FOR KANSANS

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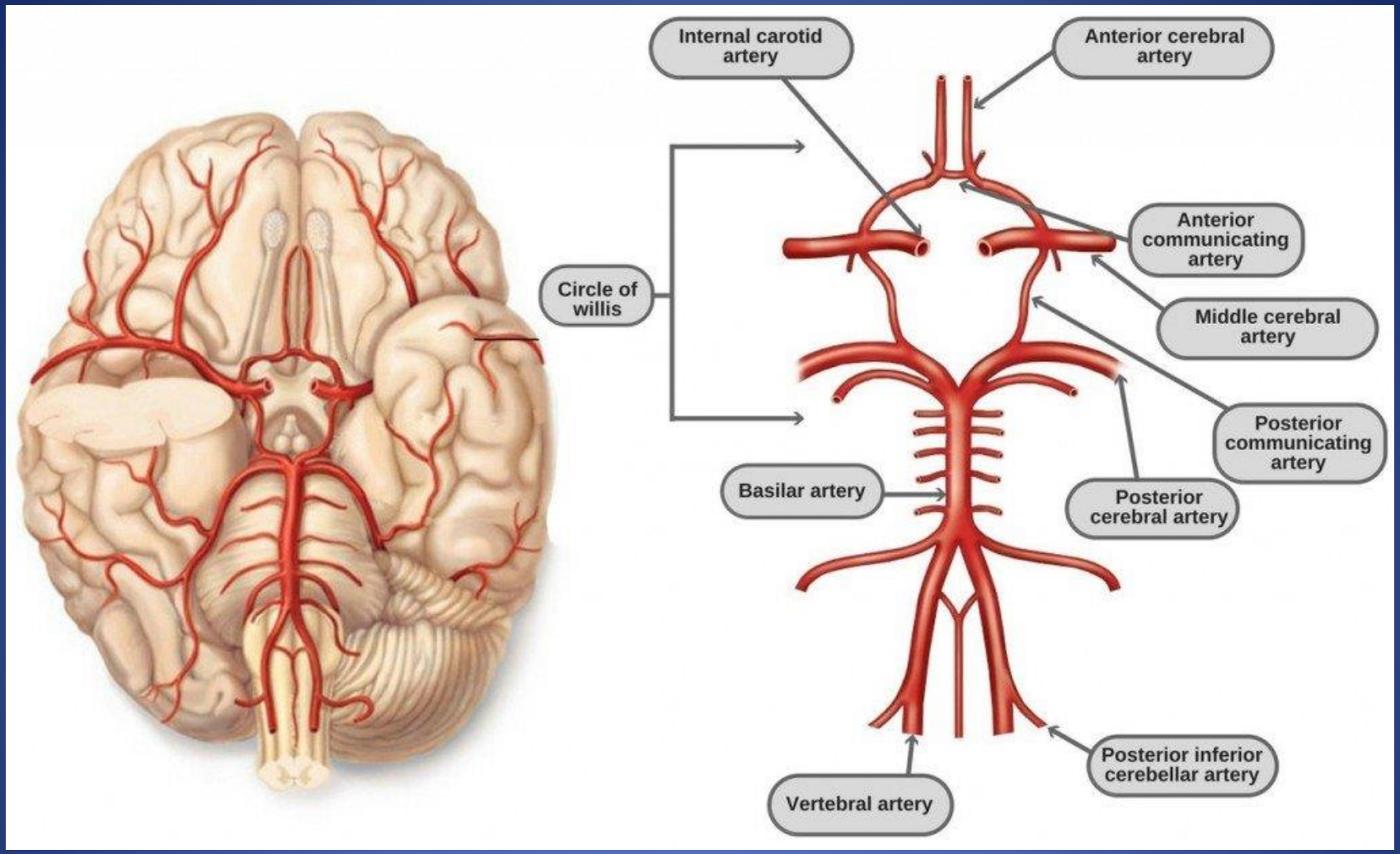
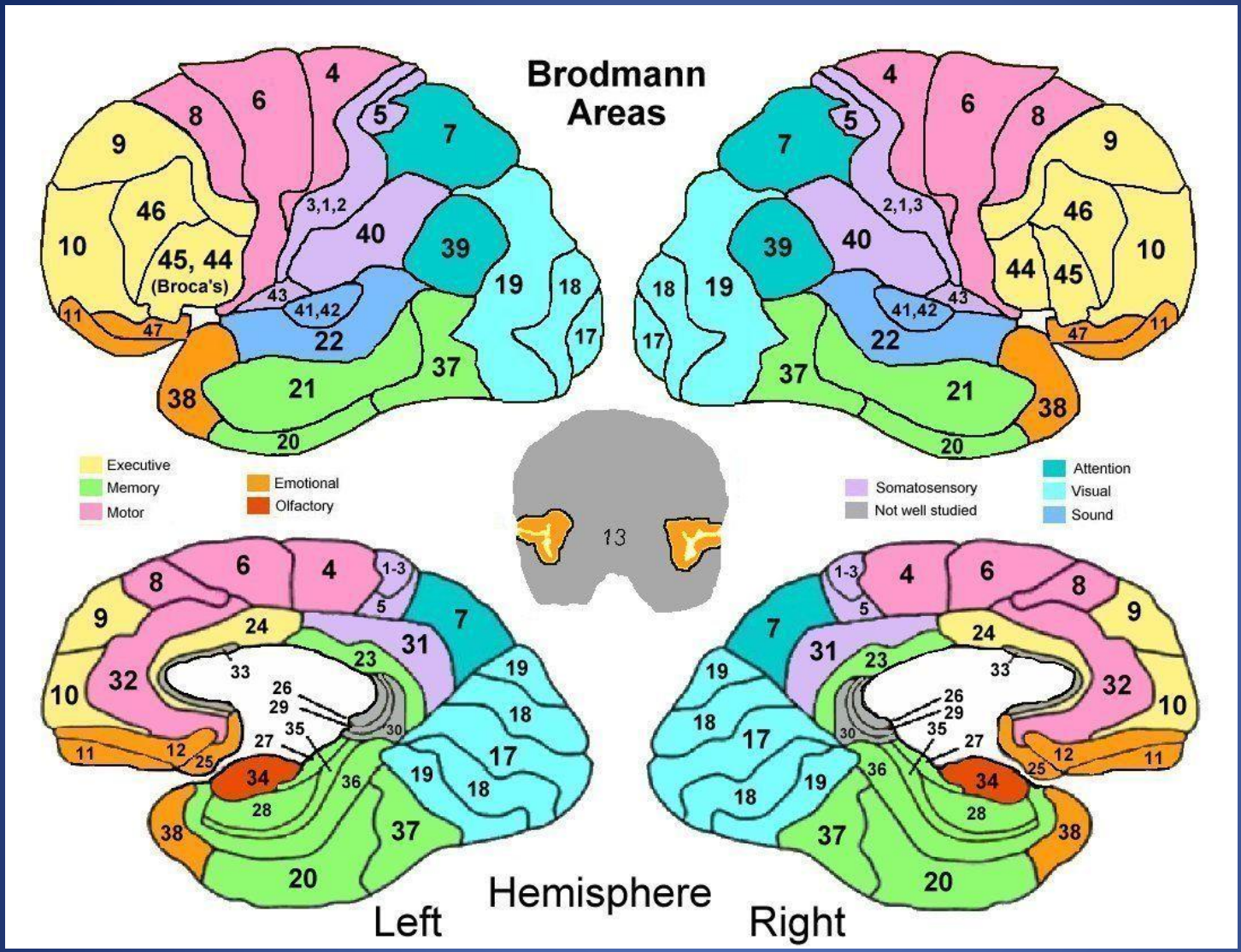
Stroke Location and Why It Matters

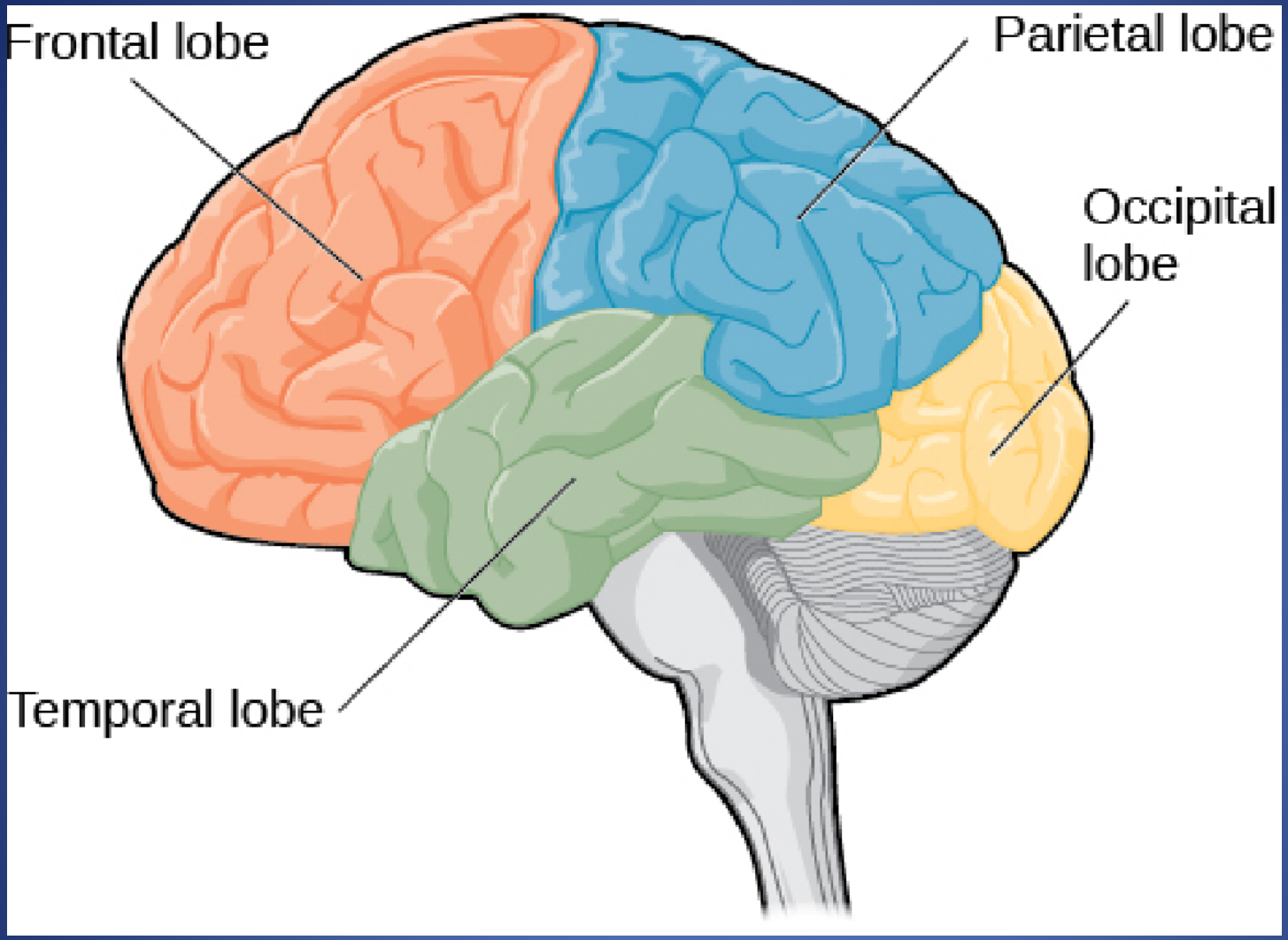
"First Tuesdays" Lecture Series

Introduction and Goal of “First Tuesdays”

- Sabreena Slavin MD – Vascular Neurologist and Neurohospitalist at KU School of Medicine
- Didactic lecture series as part of the Kansas Initiative for Stroke Survival
- Updates in Practice and FAQ’s on Stroke/Acute Stroke Care
- 20 minute didactic, 10 minutes for questions/discussion

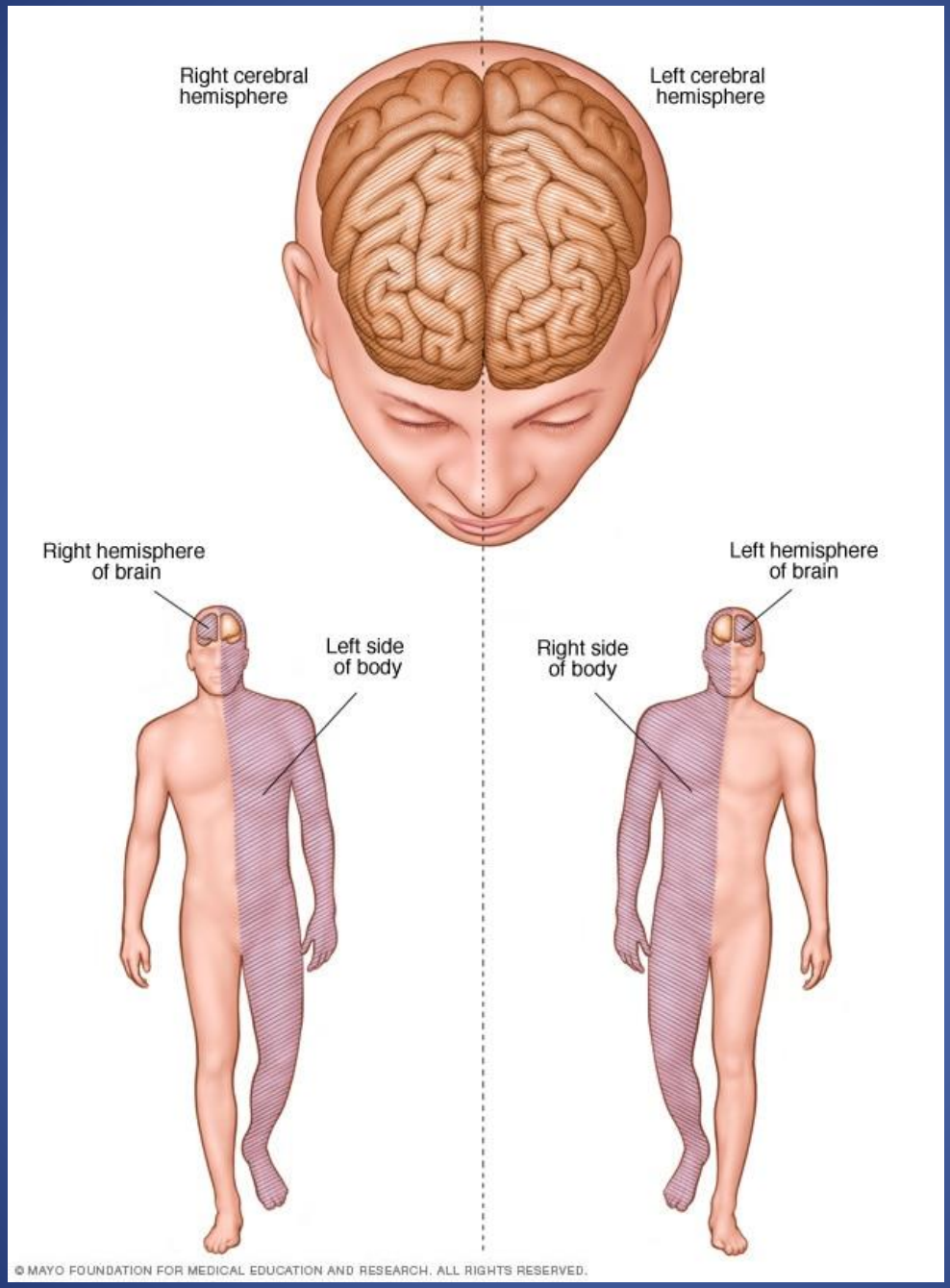

Internal carotid artery
Anterior cerebral artery
Anterior communicating artery
Circle of willis
Middle cerebral artery
Posterior communicating artery
Basilar artery
Posterior cerebral artery
Posterior inferior cerebellar artery
Vertebral artery

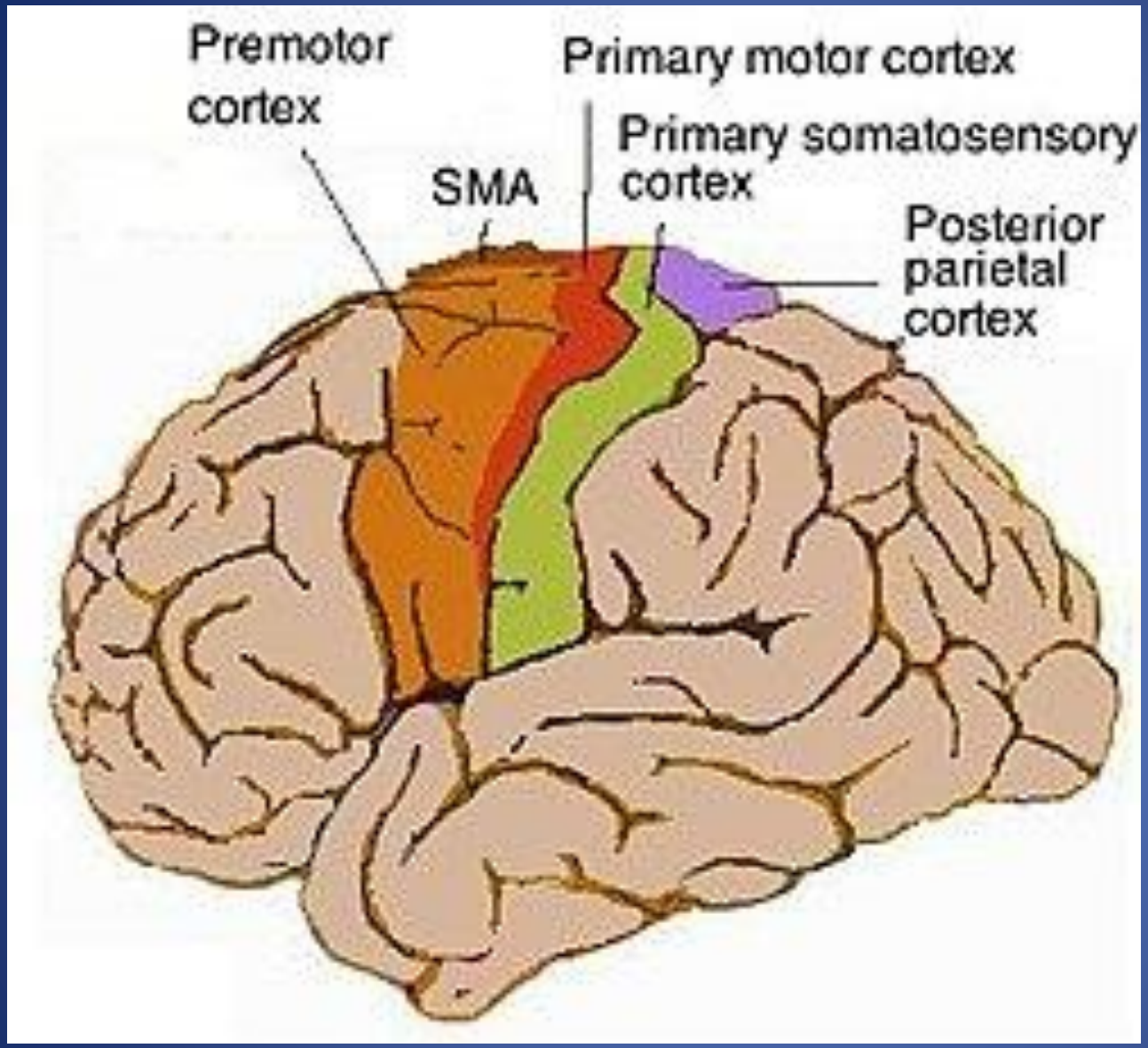

Brodmann Areas
Executive
Memory
Motor
Emotional
Olfactory
Somatosensory
Not well studied
Attention
Visual
Sound
Left Hemisphere
Right

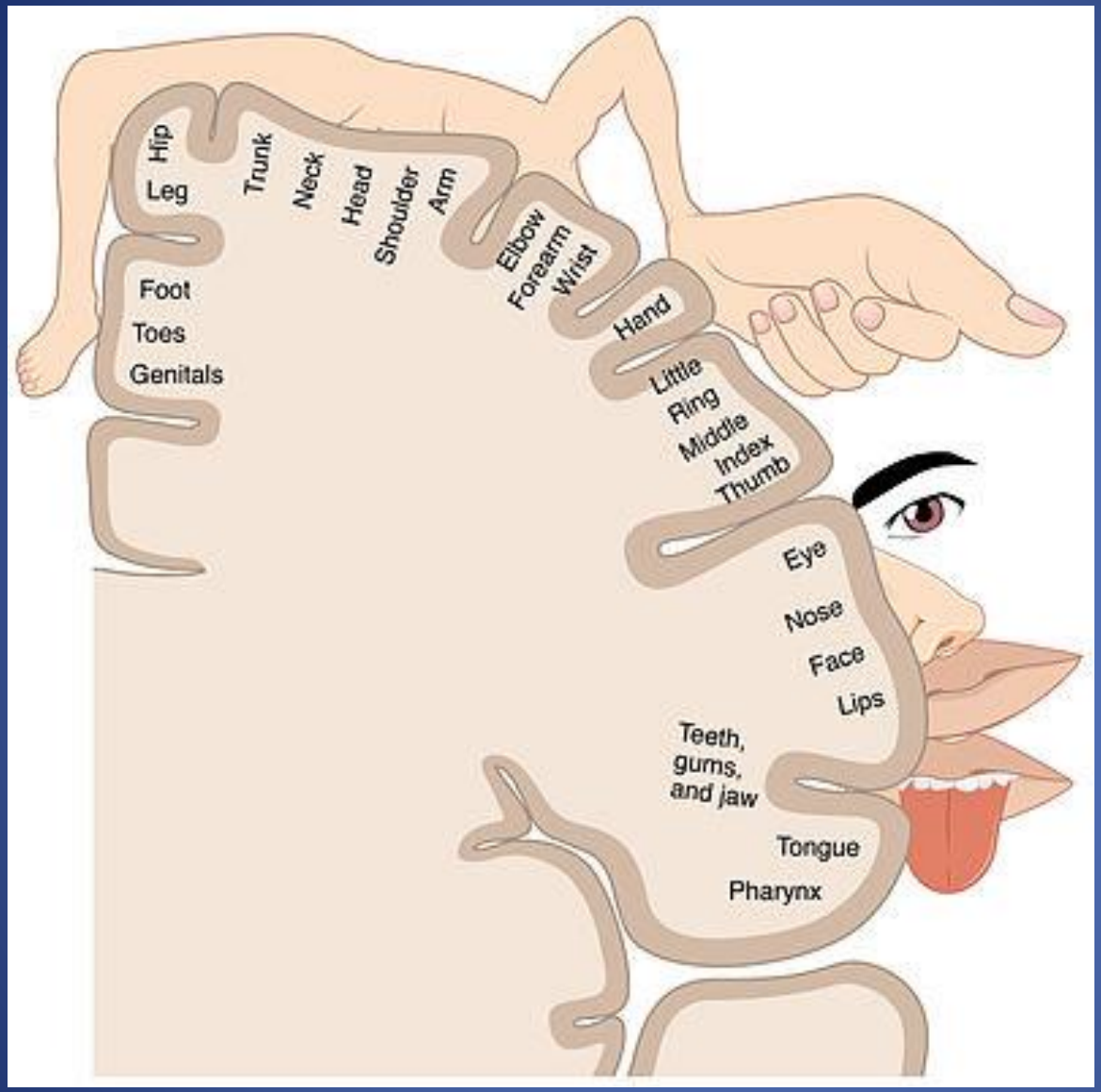

Frontal lobe
Parietal lobe
Occipital lobe
Temporal lobe

Function of different lobes

- Frontal lobe: memory, cognition, executive function/decision making, movement, production of speech
- Parietal lobe: sensation, spatial processing and orientation
- Temporal lobe: memory, comprehension of speech, auditory processing
- Occipital lobe: vision



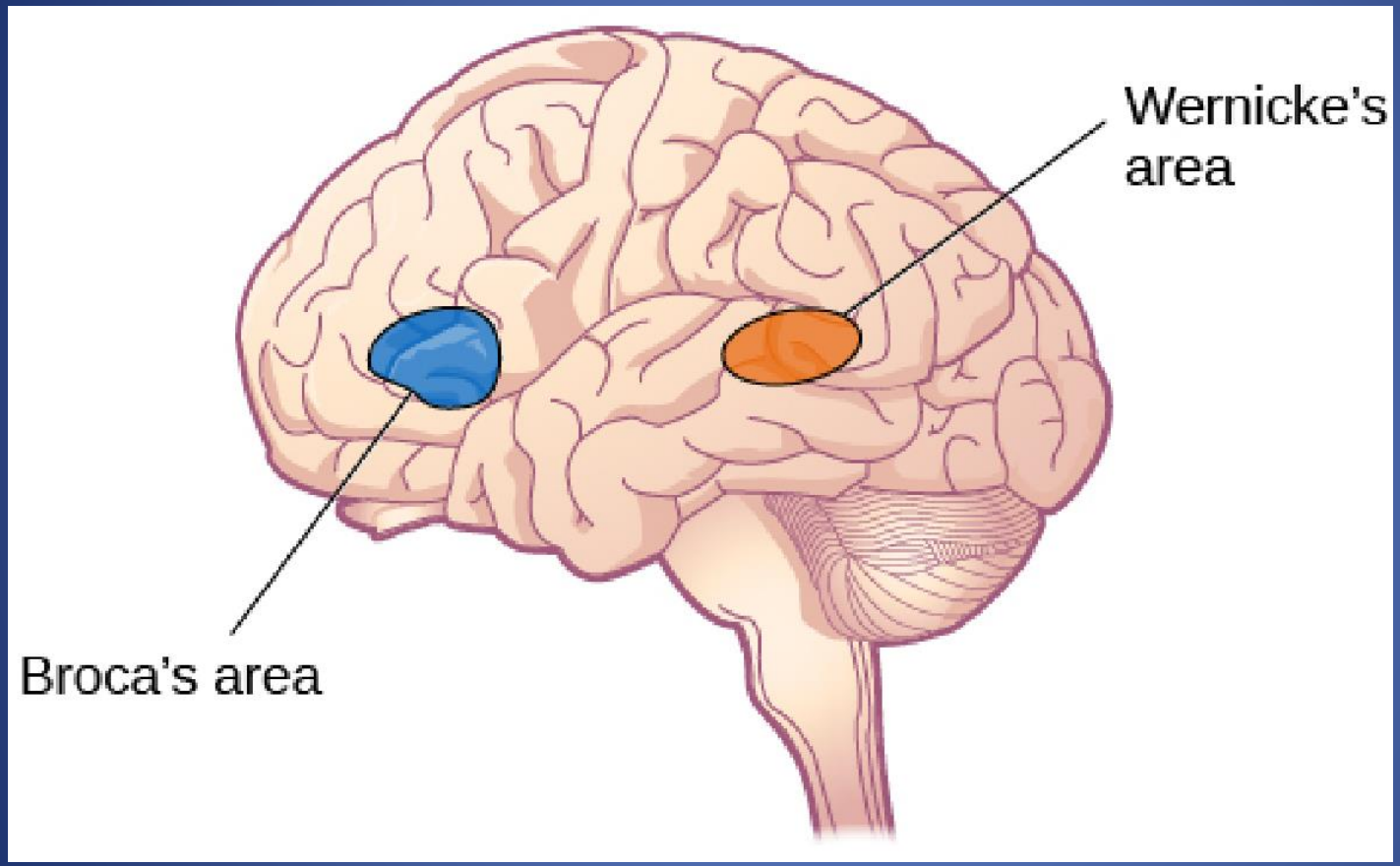

Premotor cortex
Primary motor cortex
Primary somatosensory cortex
SMA
Posterior parietal cortex


Hip
Leg
Trunk
Neck
Head
Shoulder
Arm
Elbow
Forearm
Wrist
Hand
Foot
Toes
Genitals
Little
Ring
Middle
Index
Thumb
Eye
Nose
Face
Lips
Teeth, gums, and jaw
Tongue
Pharynx

Stroke patients usually have distal > proximal weakness for this reason.

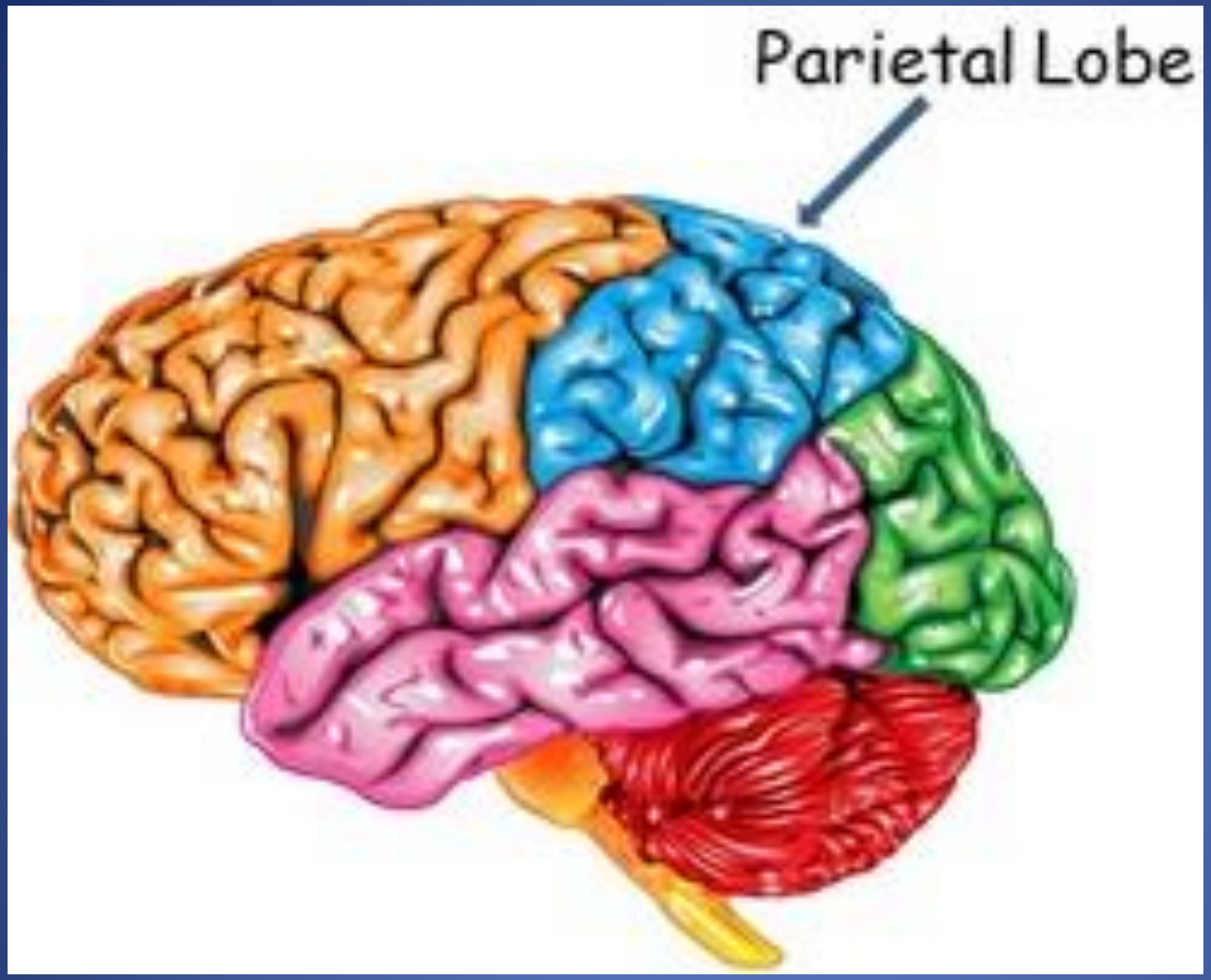
Natural History Museum, London

Left = Language



What about left-handed people?

- About 10% of the population is left handed.
- About half of all left-handed people (5% of the population) will have language dominance on the **right** side of their brain.
- Usually stroke patients with aphasia have right sided weakness.
- It is possible to have aphasia + left sided weakness in a minority of patients.


Parietal Lobe

What does the right side do?

- Analog to Broca's area on the right = emotional learning and emotional perception[1]
- Neglect and "anosognoisia"

1. Grecucci A et al, *Front Hum Neurosci.* 2013

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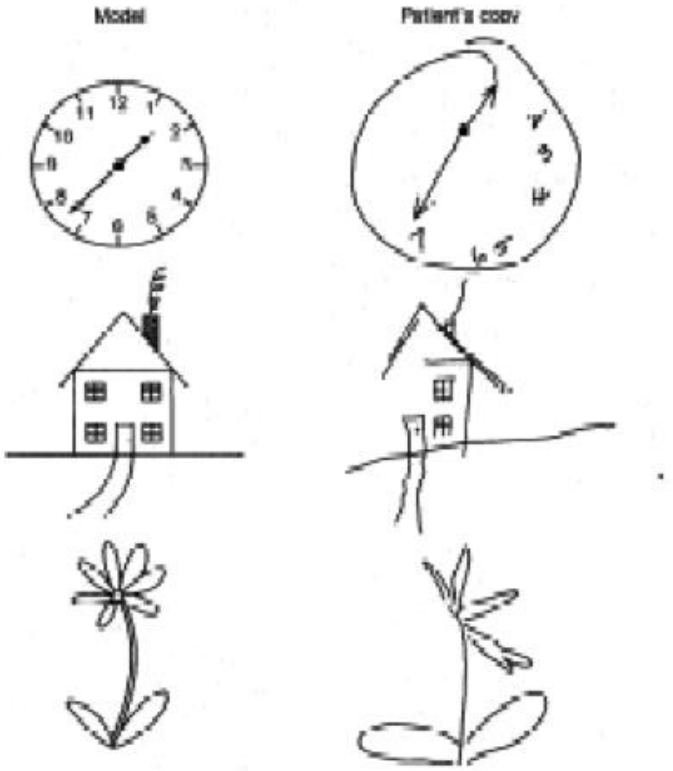
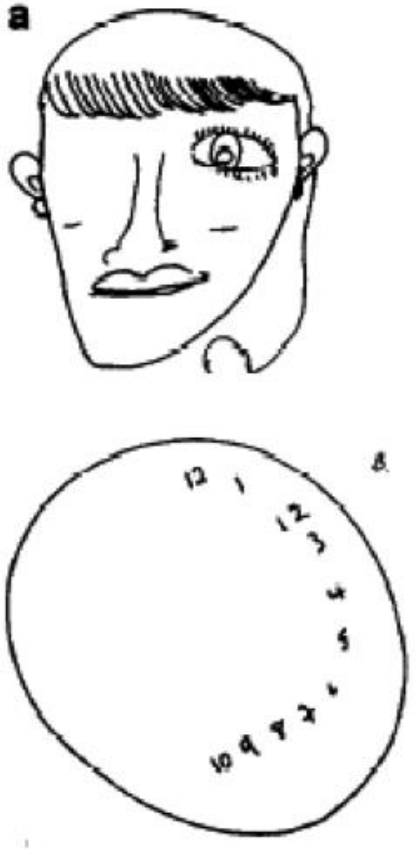
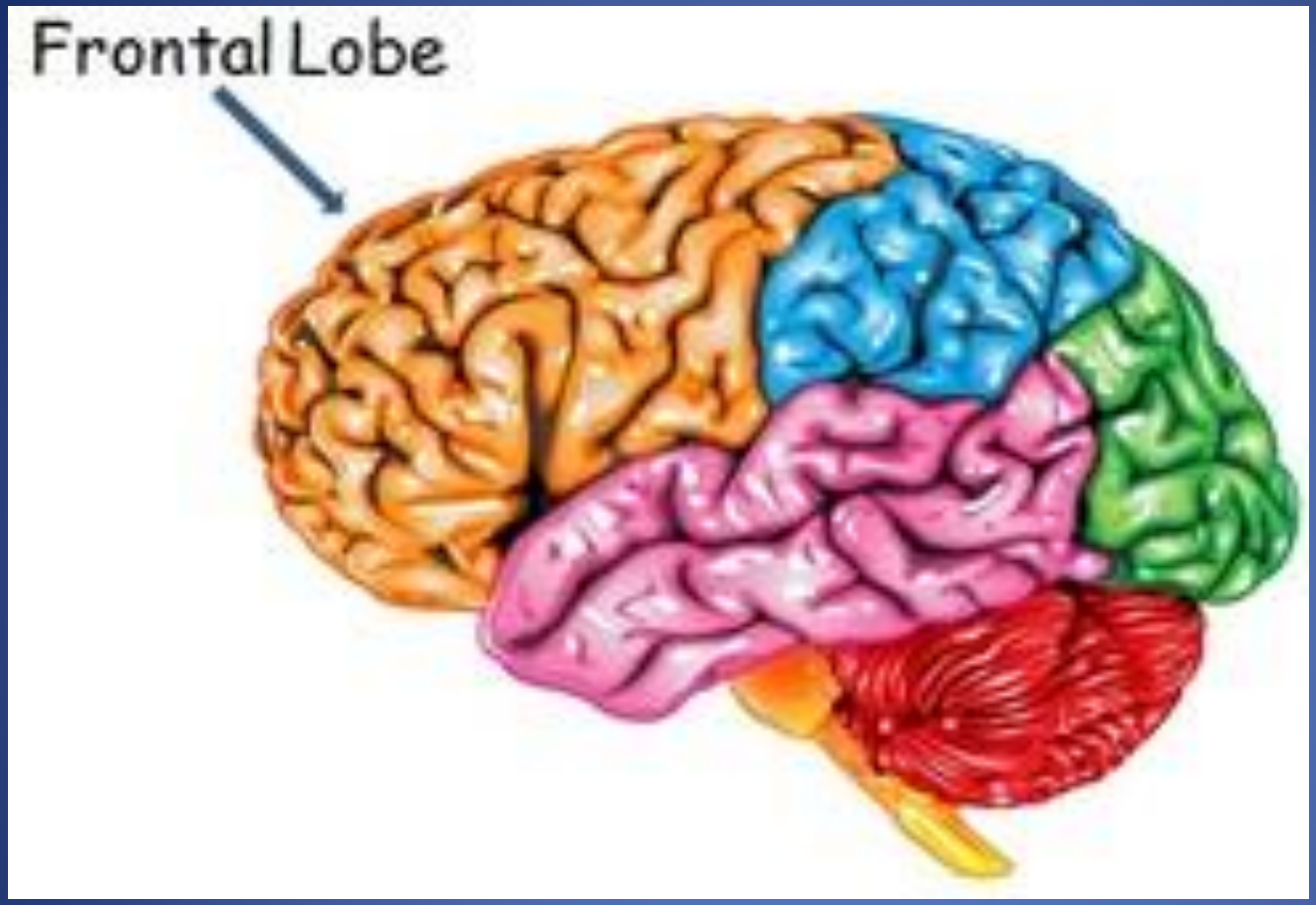


Spontaneous drawing:

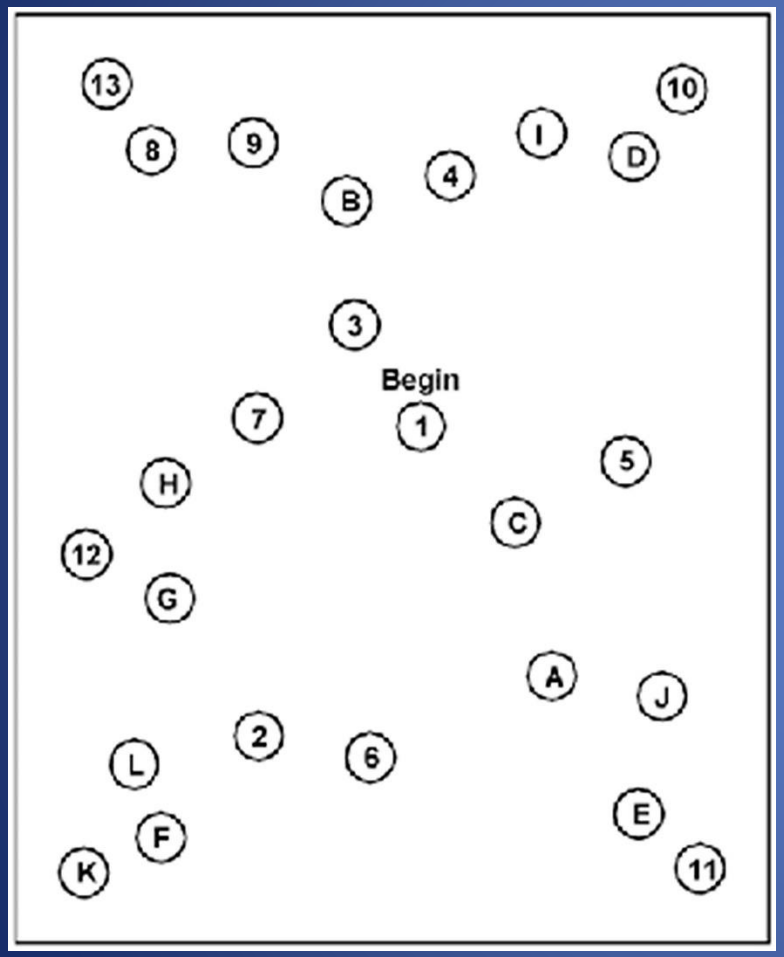


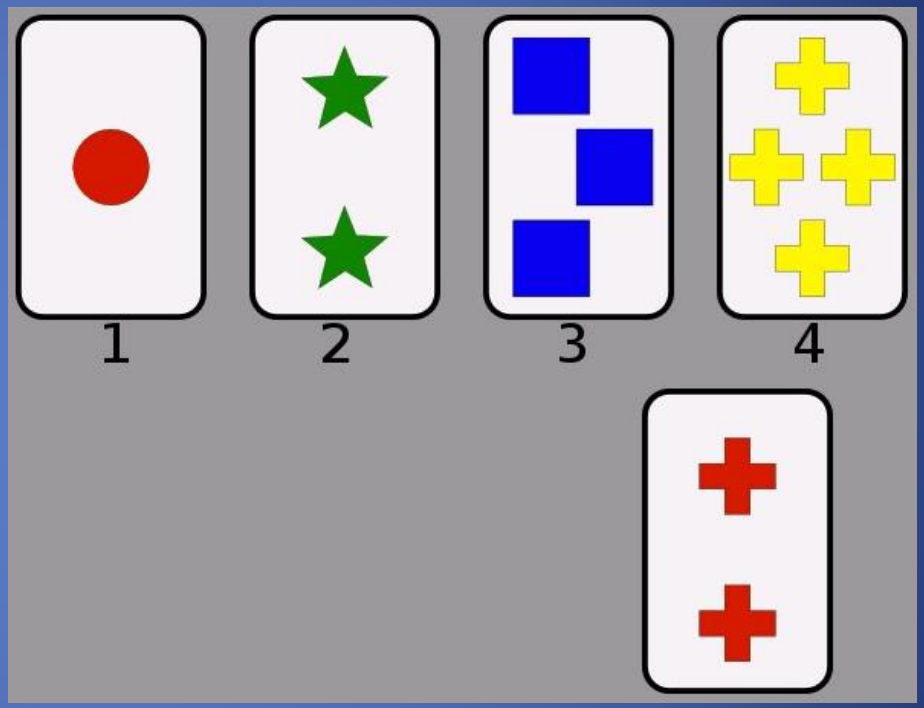
Normal view

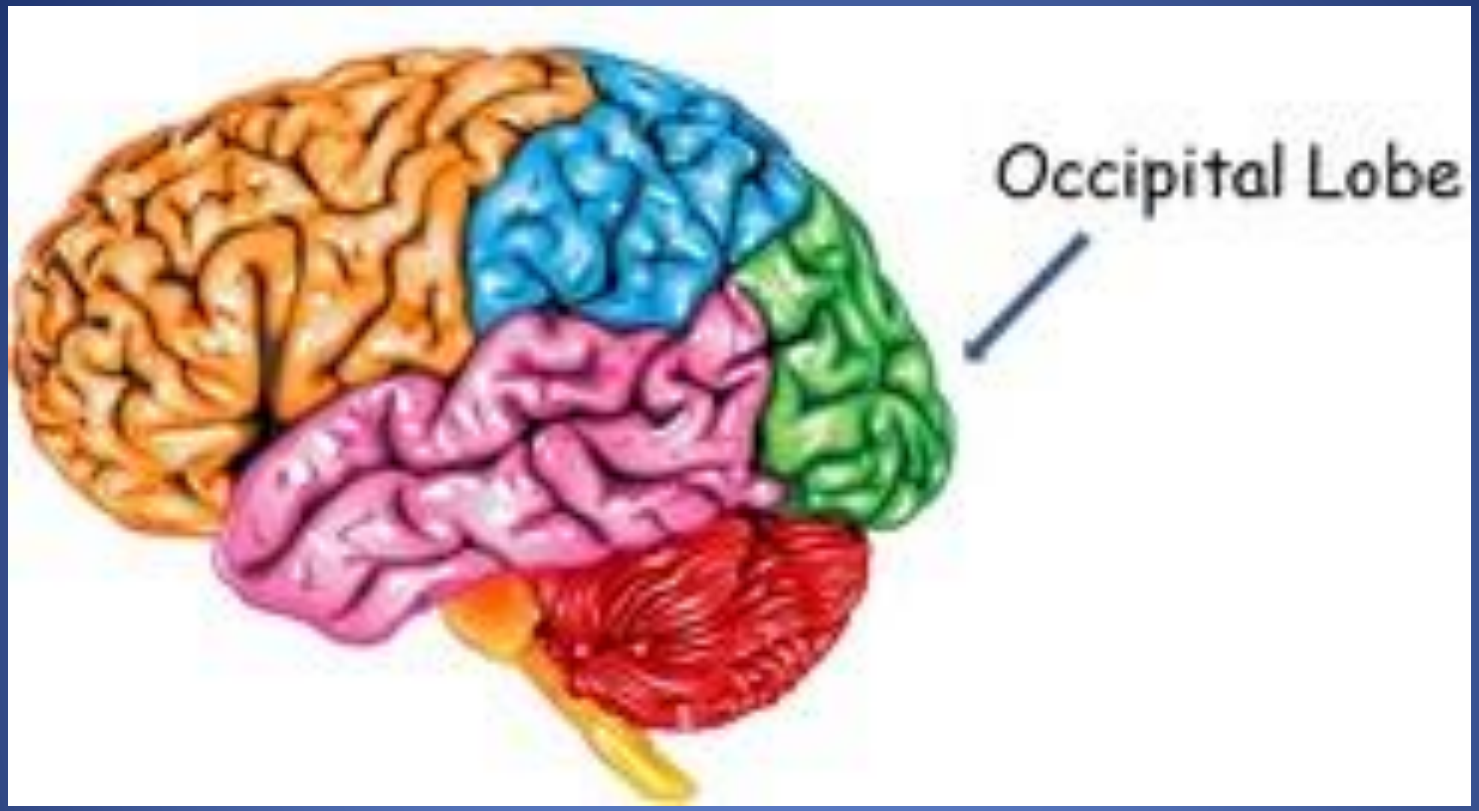
Neglect and Anosognosia


Frontal Lobe

Frontal lobe strokes

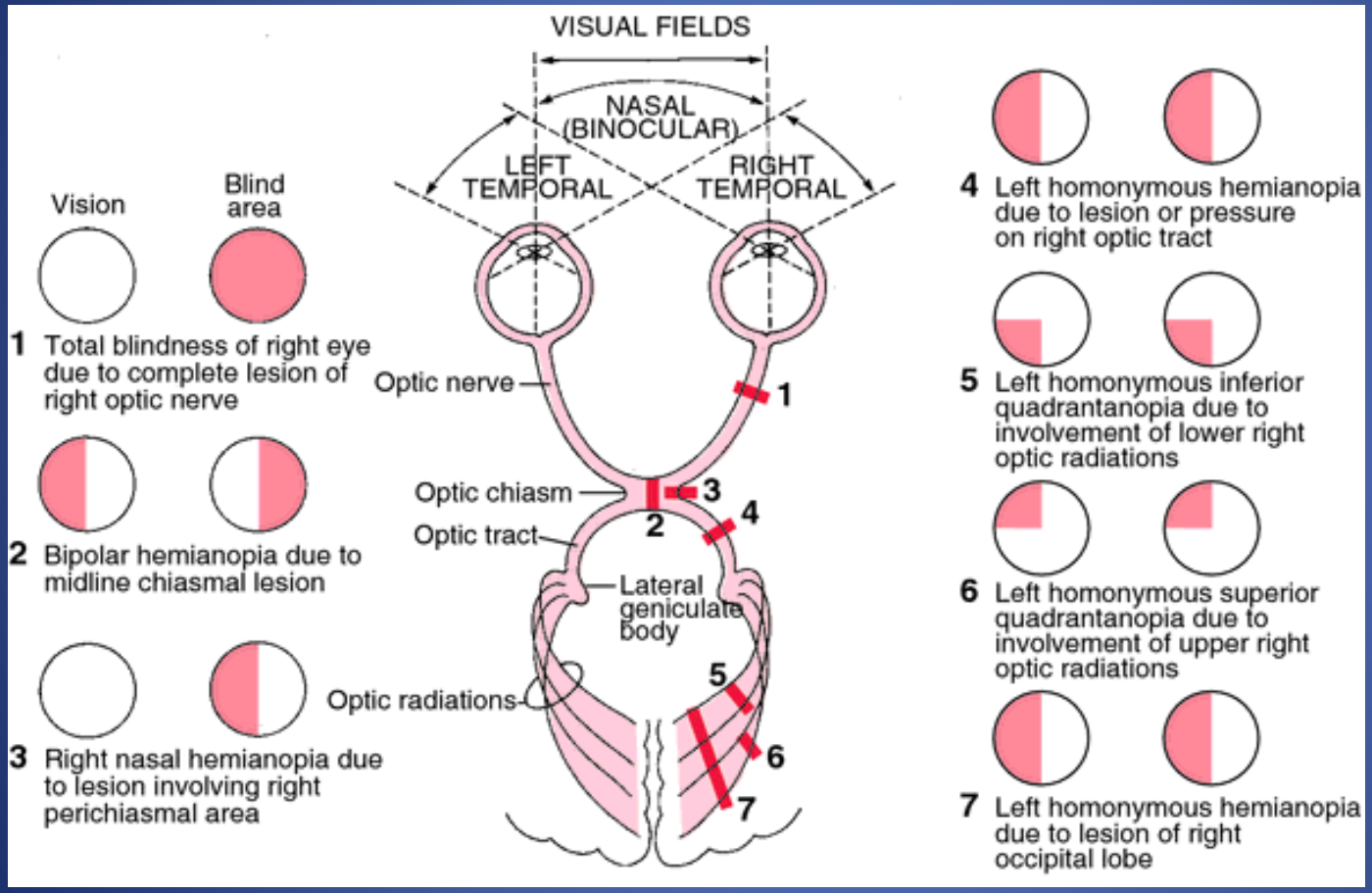


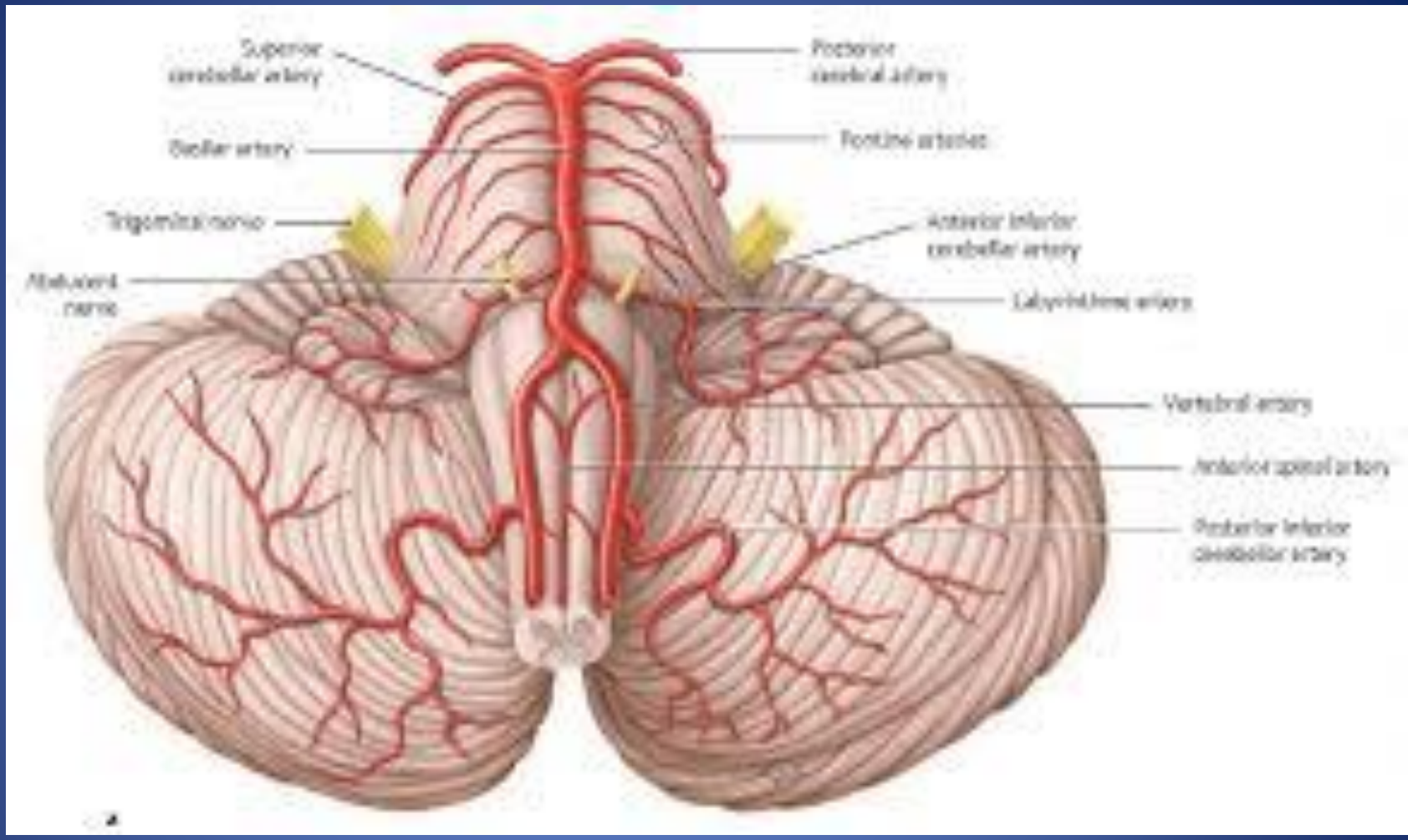


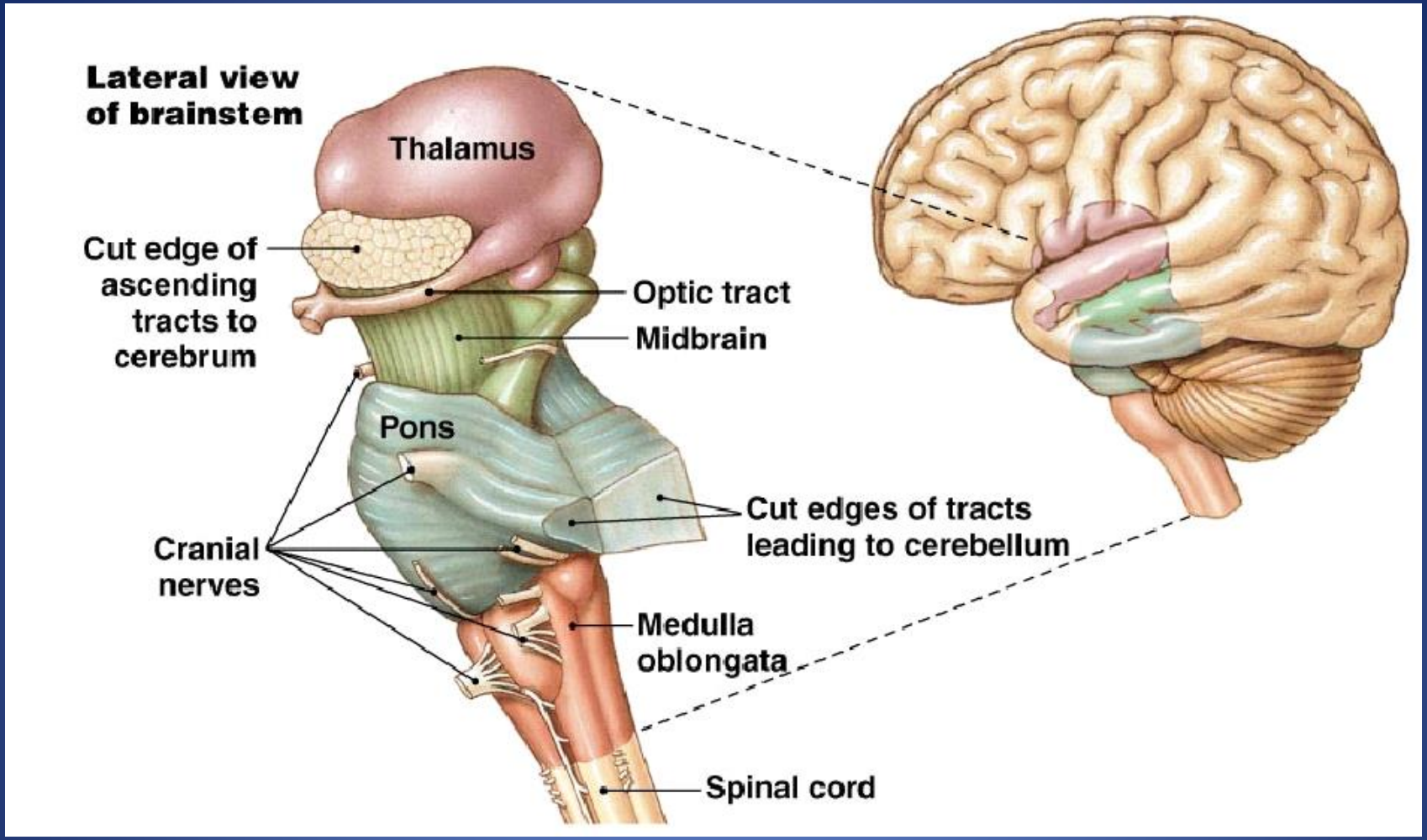

Occipital Lobe

Occipital lobe strokes

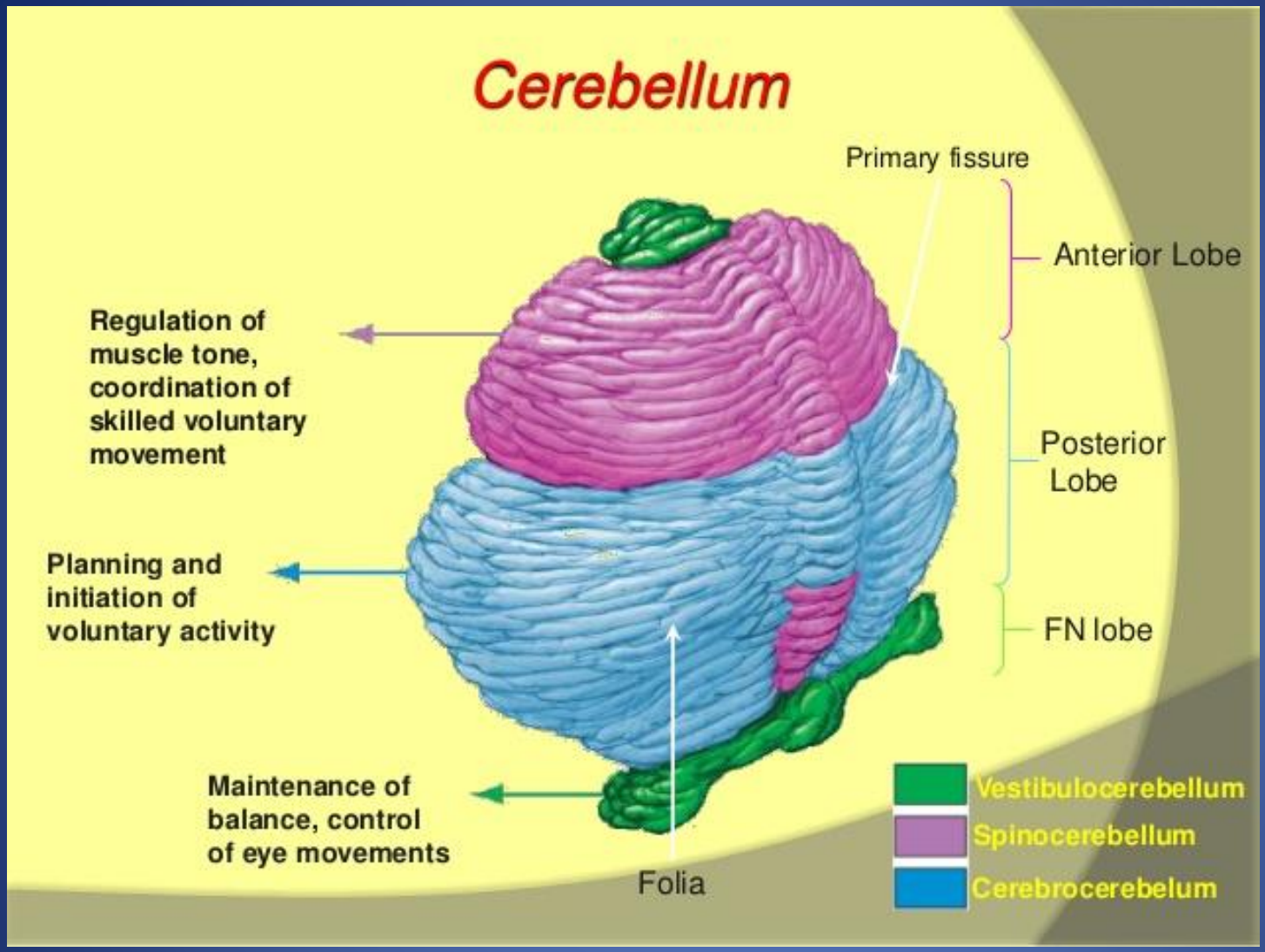
Visual pathways are complicated!




Superior cerebellar artery
Posterior cerebral artery
Basilar artery
Pontine arteries
Trigeminal nerve
Anterior inferior cerebellar artery
Abducent nerve
Labyrinthine artery
Vertebral artery
Anterior spinal artery
Posterior inferior cerebellar artery


Lateral view of brainstem
Thalamus
Cut edge of ascending tracts to cerebrum
Optic tract
Midbrain
Pons
Cut edges of tracts leading to cerebellum
Cranial nerves
Medulla oblongata
Spinal cord

Cerebellum


Primary fissure
Anterior Lobe
Posterior Lobe
FN lobe
Regulation of muscle tone, coordination of skilled voluntary movement
Planning and initiation of voluntary activity
Maintenance of balance, control of eye movements
Folia
Vestibulocerebellum
Spinocerebellum
Cerebrocerebelum

Strokes in thalamus, brainstem, cerebellum

- Account for 10-25% of all ischemic strokes
- More difficult to recognize/diagnose
- Lecture on HINTS exam for acute vestibular syndrome on the website.

Caplan et al, *J Clin Neurolol* 2005

Strokes in thalamus, brainstem, cerebellum

- Can have weakness, speech problems, vision problems
- Can have symptoms on BOTH sides of the body
- Other symptoms: dizziness/vertigo, nausea/vomiting, incoordination, somnolence

Types of therapy available or being studied for stroke survivors

- Physical
- Occupational
- Speech
- Cognitive/communication – for memory, social perception, neglect, attentional deficits
- Vestibular
- Driving
- Music
- Virtual reality
- Vocational

Questions?

- Call for help anytime!
- http://www.kissnetwork.us/
- KU BAT phone: 913-588-3727