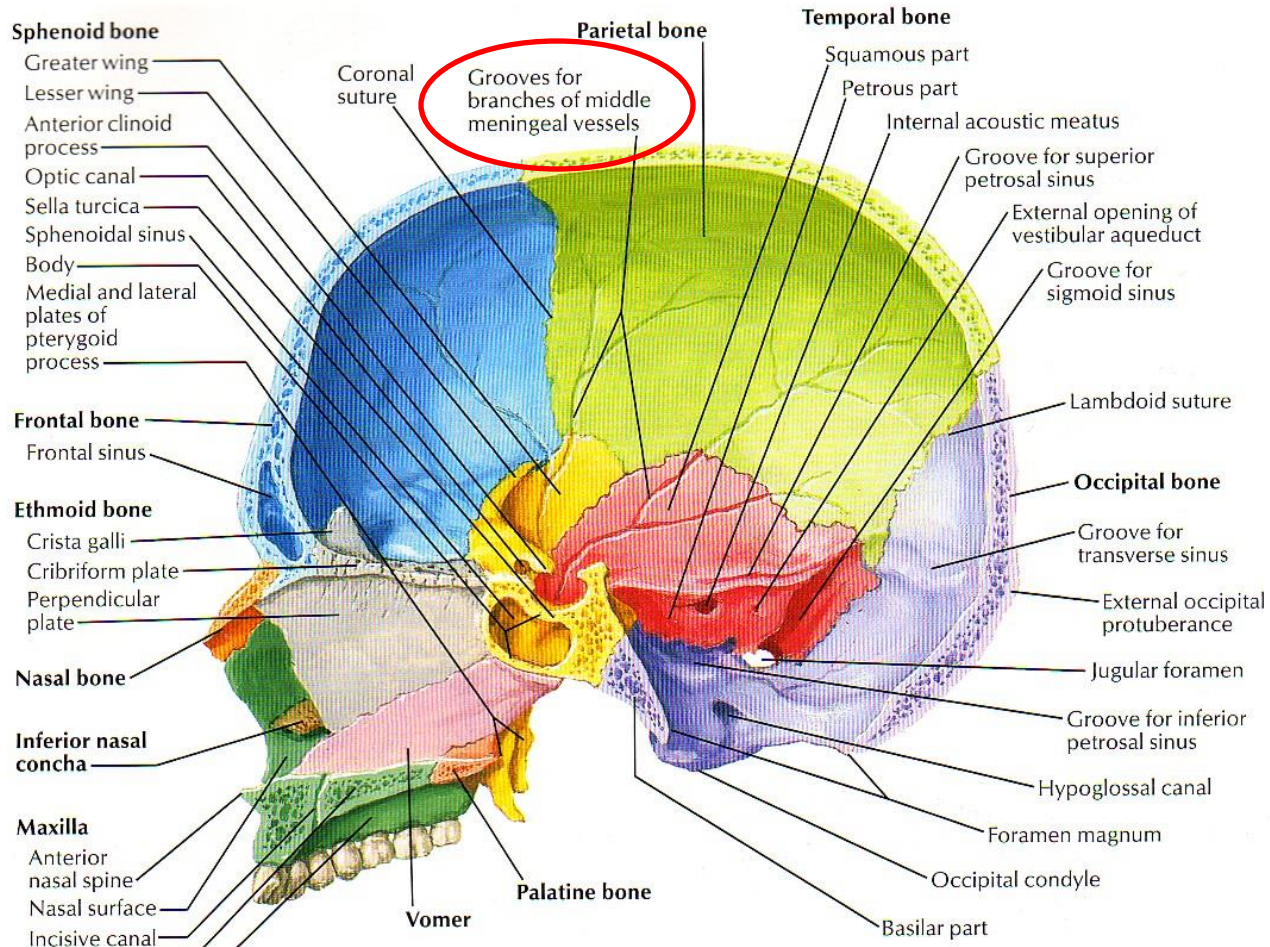


An Epidural Hemorrhage

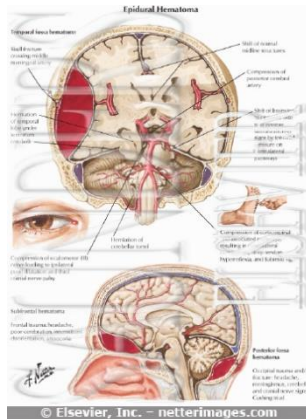
Anatomy and Key Concepts

Anatomy of an Epidural Bleed

Skull: Midsagittal Section



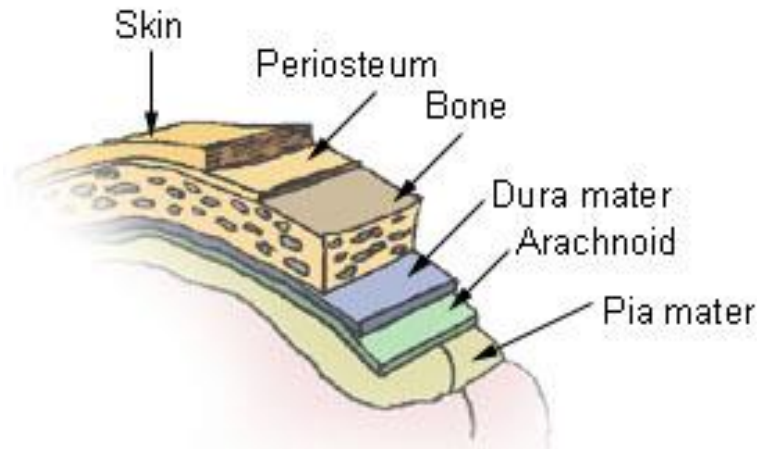
Anatomy of an Epidural Bleed



- The **middle meningeal artery** runs directly below the **temporal bone** of the face
- If the temporal bone is fractured by a blow to the face, the middle meningeal may be lacerated.
- If this happens, the artery bleeds into what is called the **epidural space**.

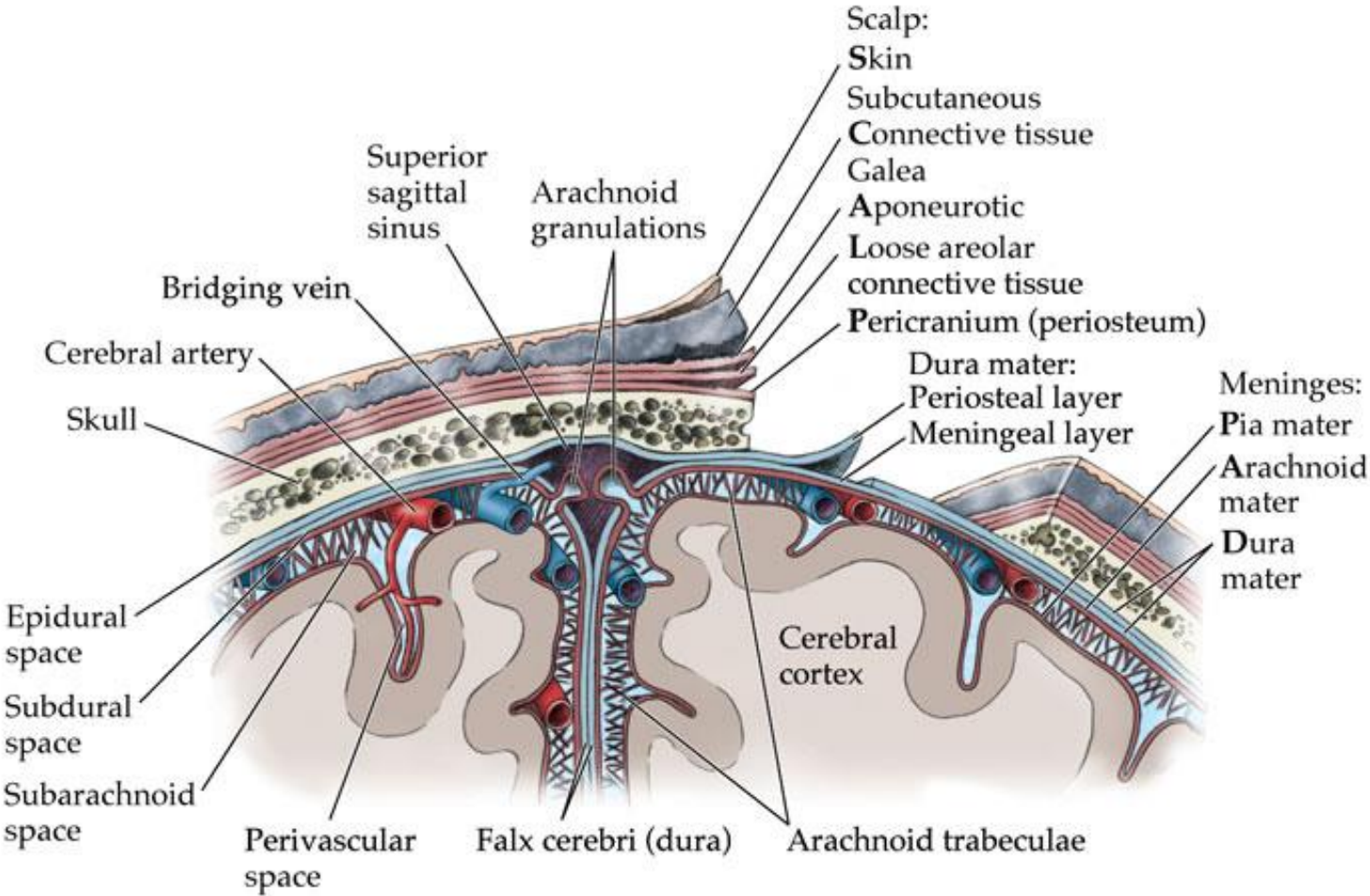
Anatomy of an Epidural Bleed: The Meninges

- Three membranes (the meninges) envelop the brain and spinal cord: **pia**, **arachnoid**, and **dura**



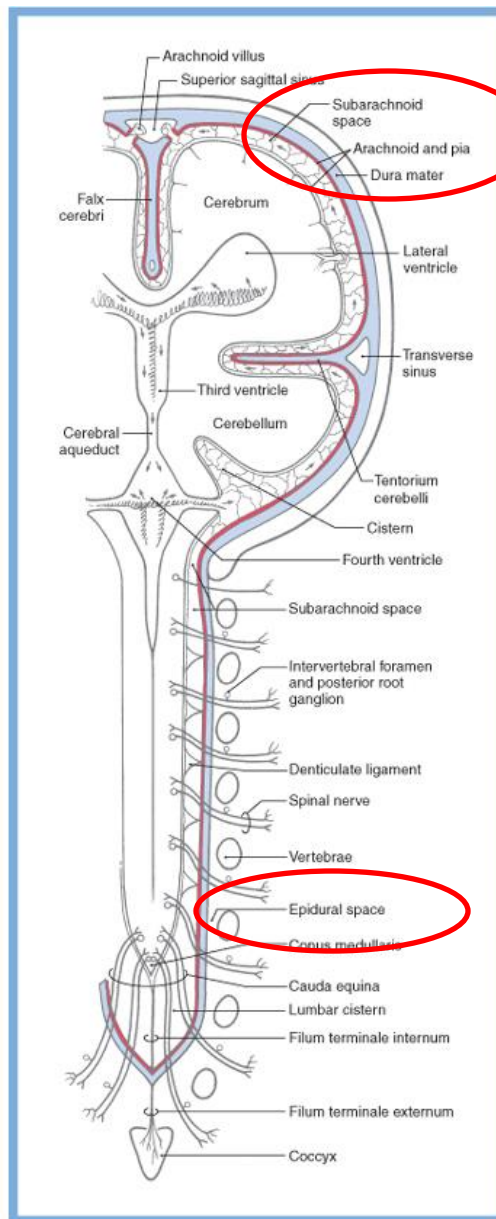
Meninges of the CNS

Meningeal Anatomy



Anatomy of an Epidural Bleed: Spaces and Potential Spaces in the CNS

- The epidural space:
 - the space between the dura (the outermost membrane covering the brain and spinal cord) and skull, or the bony vertebrae that form the spinal canal. In the spine, the epidural space contains lymphatics, small arteries, and the epidural venous plexus. In the brain the epidural space is a *potential space*, meaning that the space does not exist under normal conditions.
- The subdural space:
 - The space between the dura mater and the arachnoid mater, this is a potential space in both the skull and the spine.
- The subarachnoid space:
 - between the arachnoid mater and the pia mater, this space contains the cerebrospinal fluid



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January 17, 2007

Pipeline Neuroscience: Epidural Hemorrhage

Concept: Bleeding Into a Closed Space



CASE

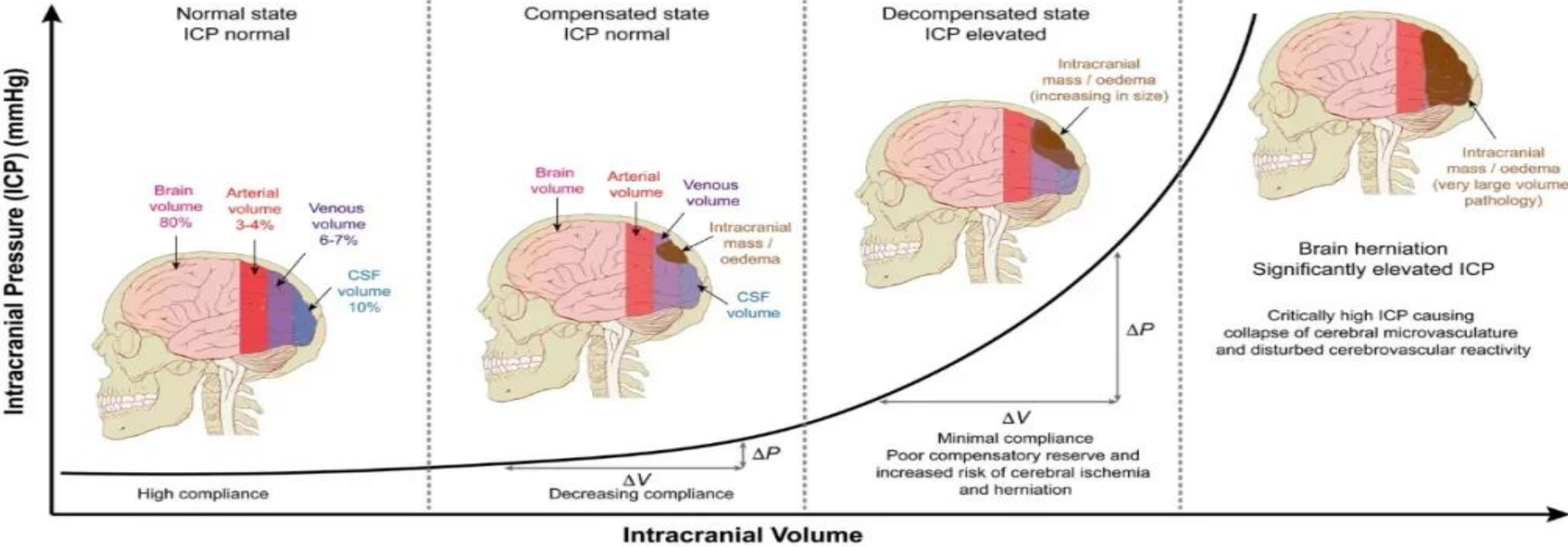
- A 26 y/o male involved in a car accident 5 hours ago and was rescued by paramedics where they state he was conversative during trasfer, upon arrival the patient was unconscious , his BP was 170/90 , HR is 55, with abnormal respiration, further assessment revealed a RT aniosocoria, Glasgow coma score of 7/15 and a RT sided scalp wound over the temporal bone.
- HOW TO MANAGE THIS PATIENT?

The “Lucid Interval”

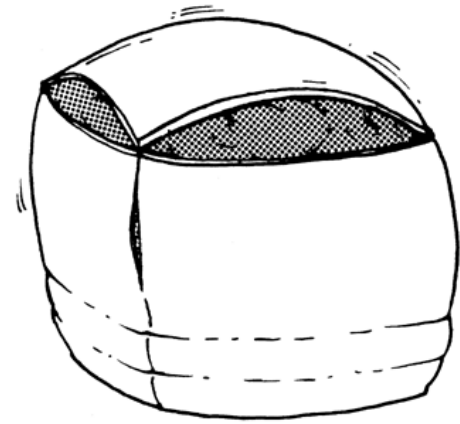
- An epidural hemorrhage is often characterized by the following sequence of events:
 - Blunt trauma/ a blow to the head, followed by:
 - 1) Initial confusion, decreased consciousness, or loss of consciousness
 - 2) A “lucid interval” (20-50%):
 - a brief period of full consciousness/restored mental status. The patient seems back to his/her “normal self.”
 - 3) Change in mental status +/- unstable vital signs (blood pressure, heart rate):
 - the patient becomes confused, somnolent (sleepy), may have neurologic signs such as hemiparesis, one dilated pupil, may become comatose.

Monro-Kellie doctrine

the sum of volumes of brain, CSF, and intracranial blood is constant

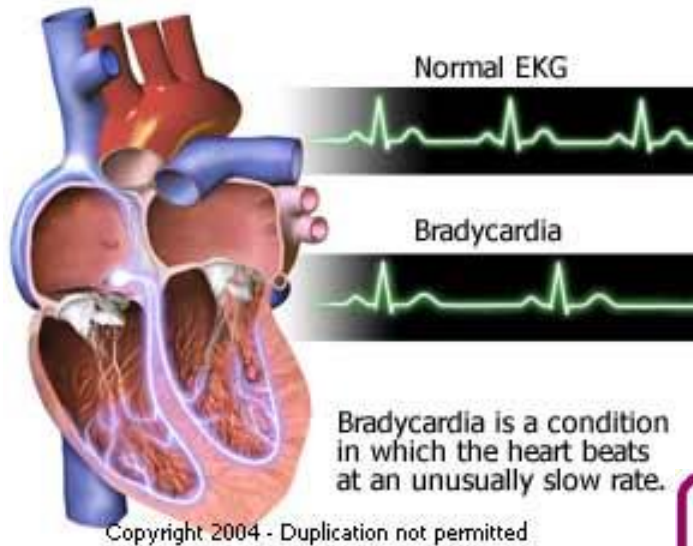


Cushing's Response



- Body's response to increased intracranial pressure (ICP):
 - Increase in blood pressure (Hypertension)
 - Decrease in heart rate (Bradycardia)
 - Altered respiratory rate
- ICP can compress blood vessels in the brain, block off oxygen delivery (ischemia), and put pressure on the brainstem.

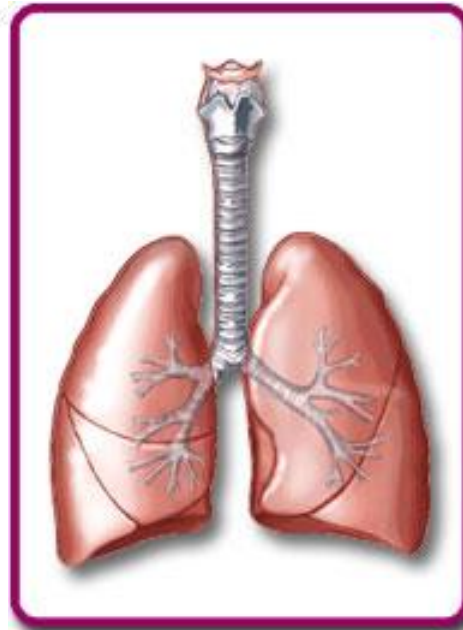
Cushing's Response



Hypertension

Bradycardia

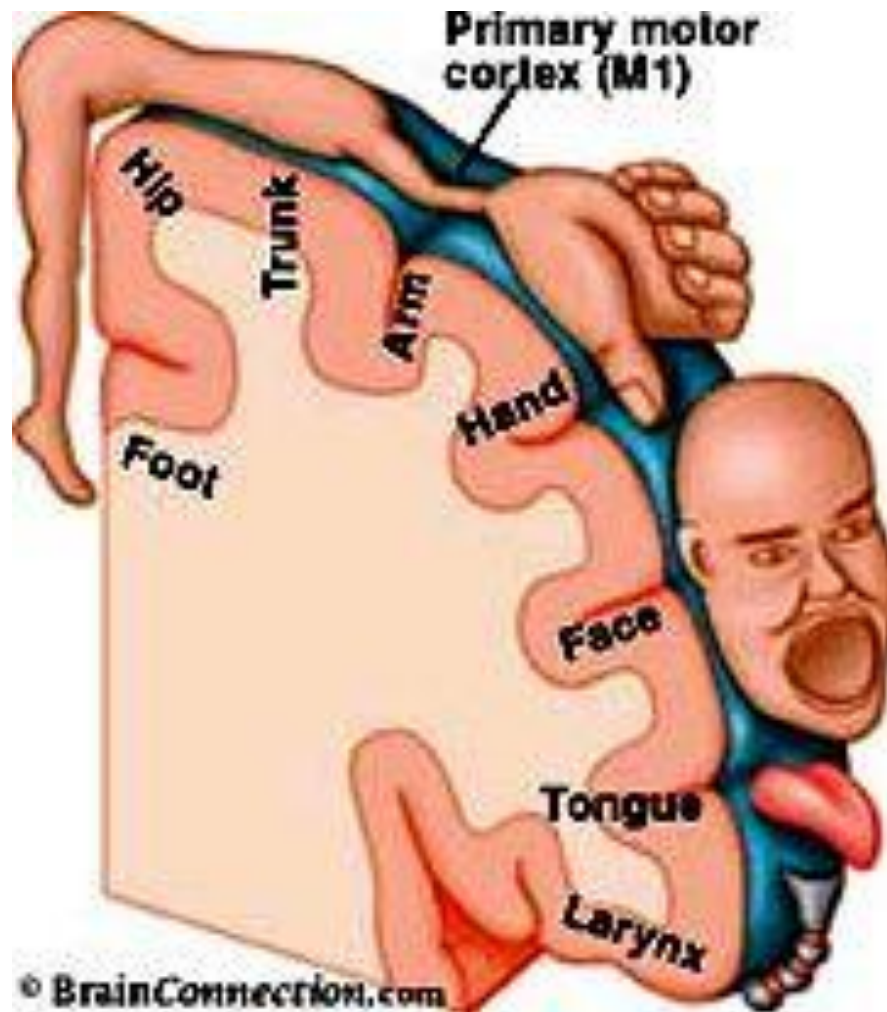
Respiratory Rate

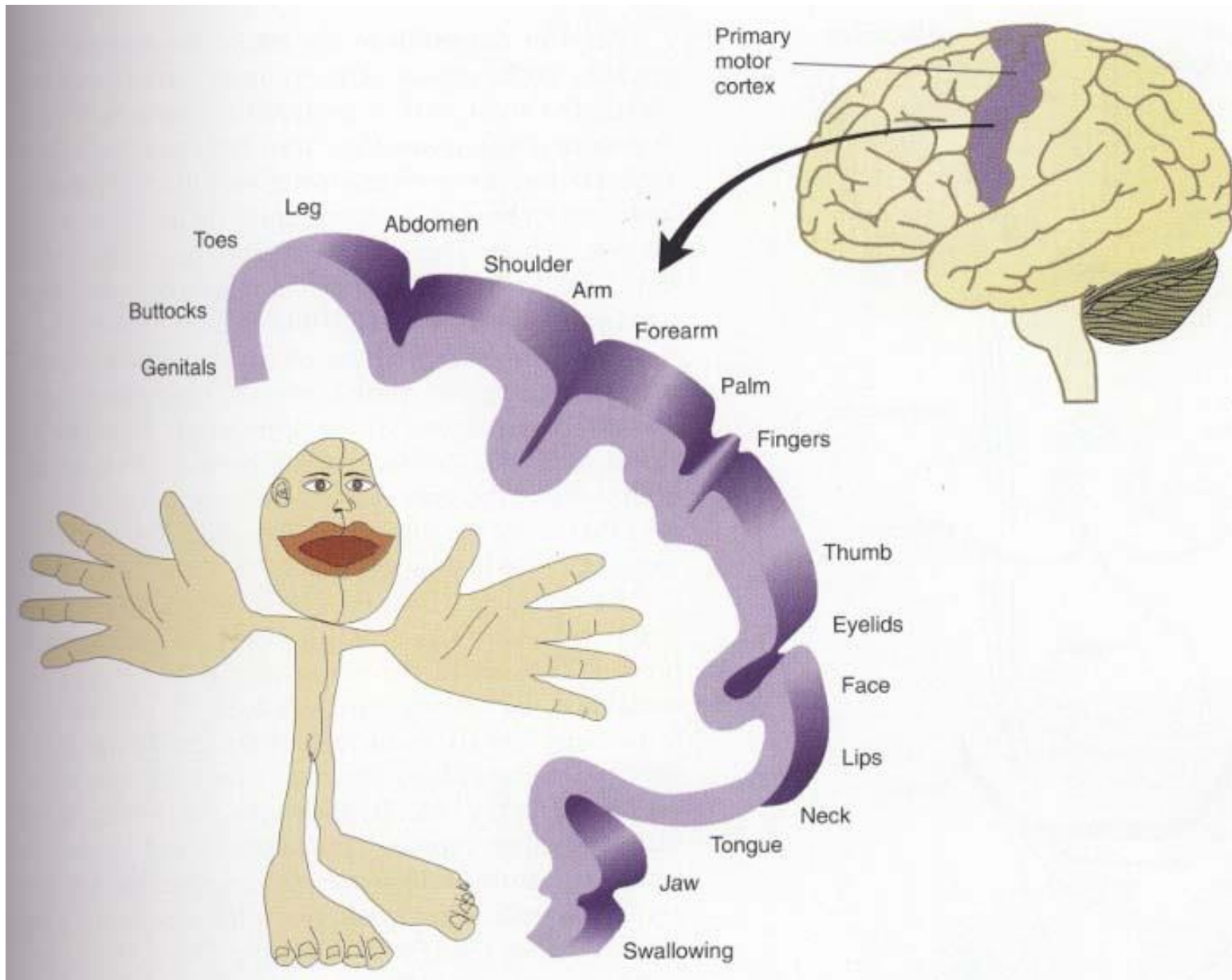


The “Blown” Pupil



The Motor “Homunculus”





Thank you