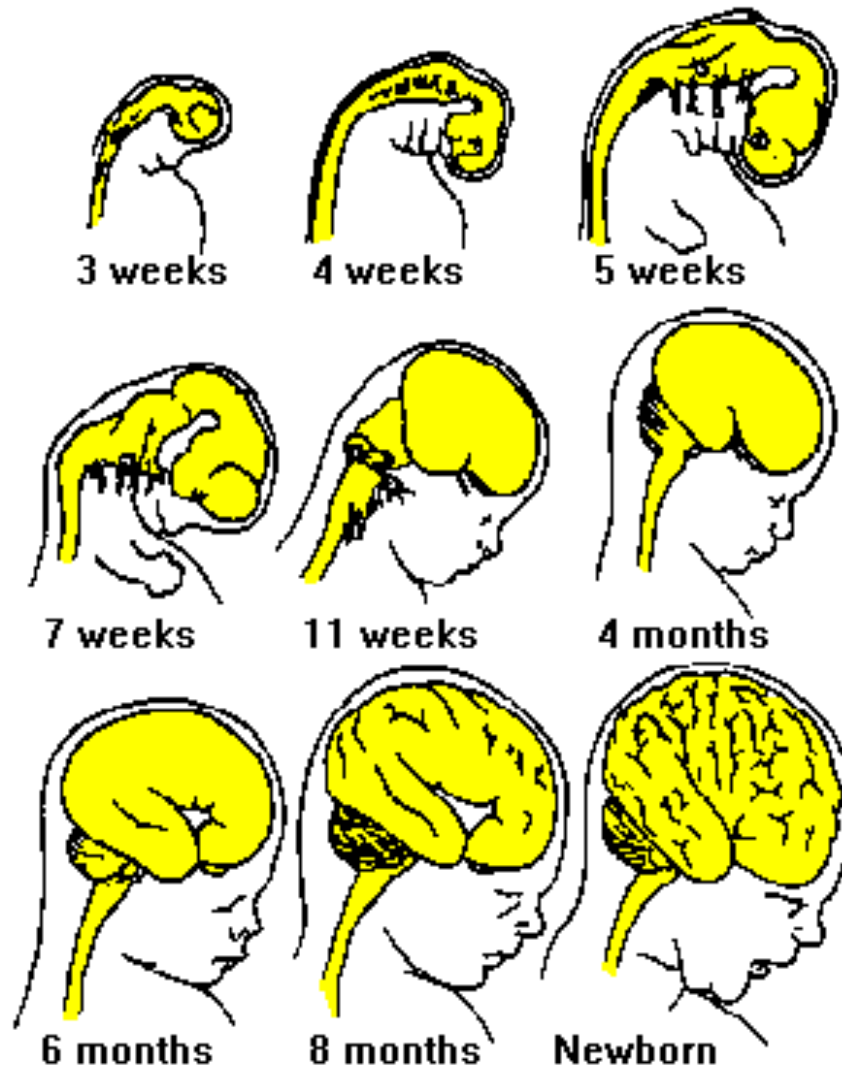
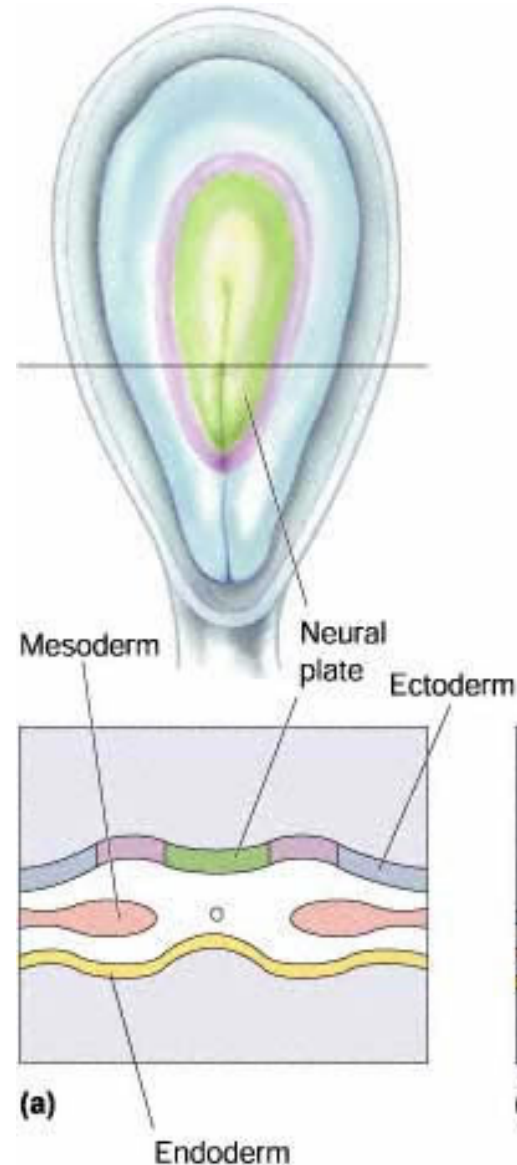


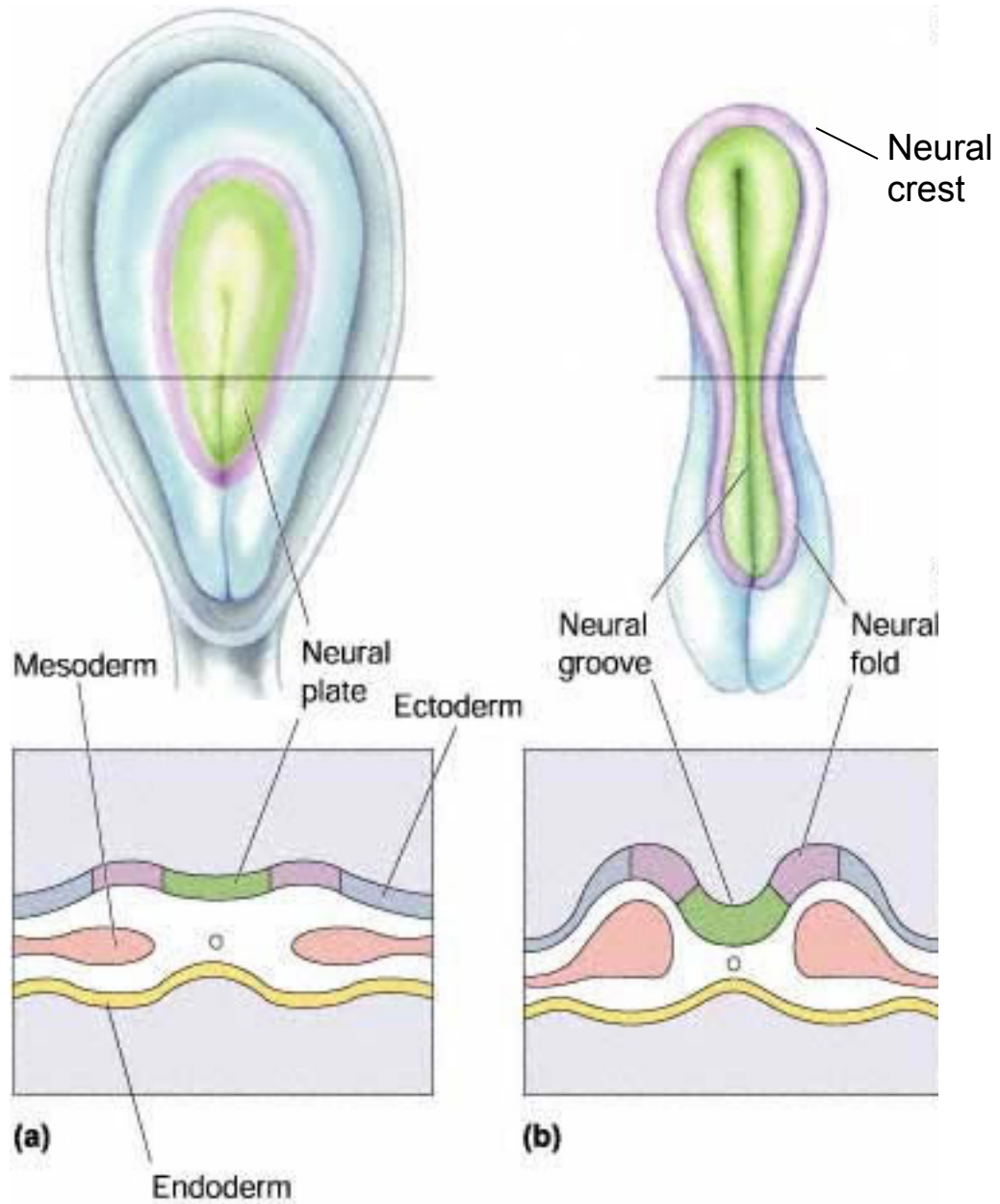
Prenatal Brain Development and Organization



Formation of Neural Tube

- Three primordial tissues
 - endoderm
 - mesoderm
 - ectoderm
- Which tissue does nervous system develop from?
 - ectoderm

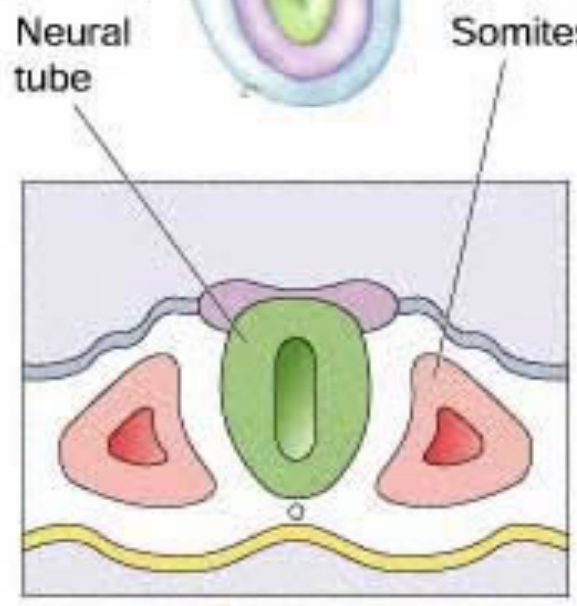
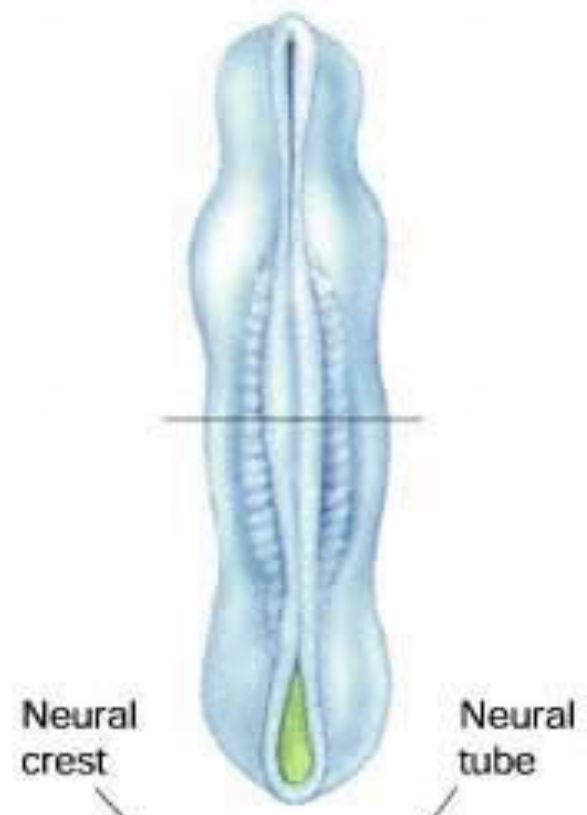
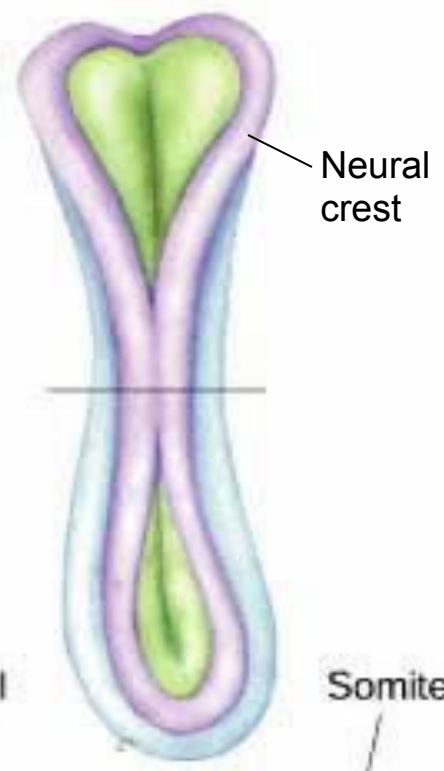




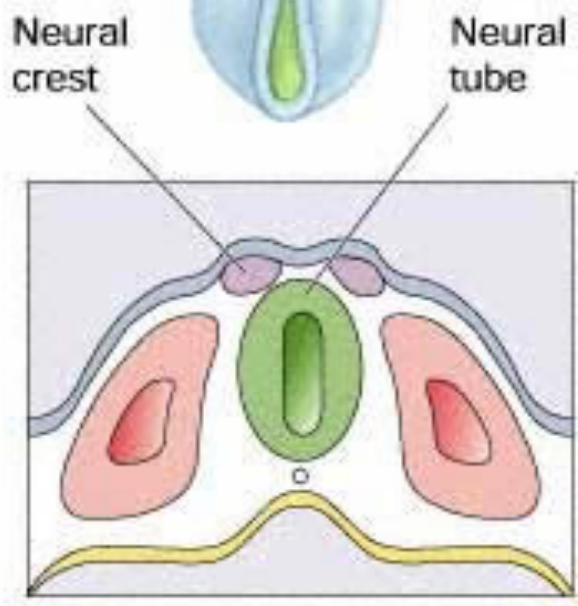
Rostral



Caudal

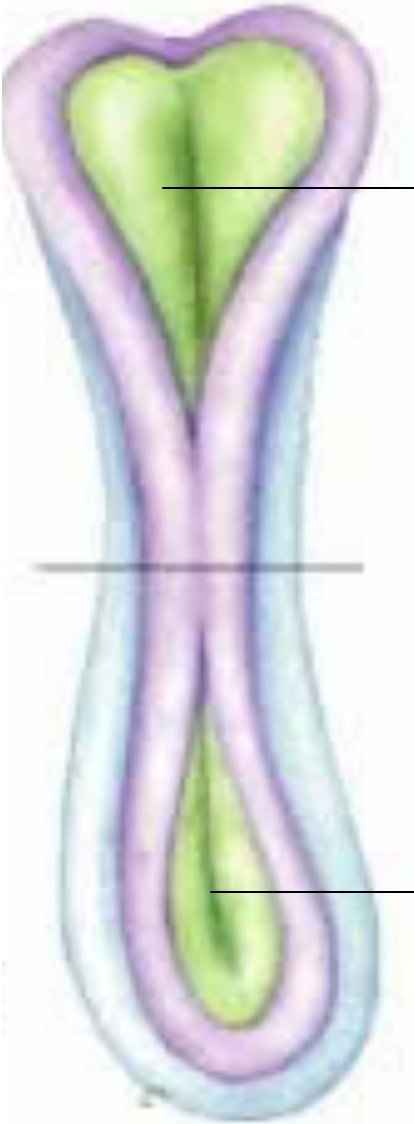


(c)



(d)

Neural Tube Related Birth Defects



Anterior neural pore

failure to close = anencephaly



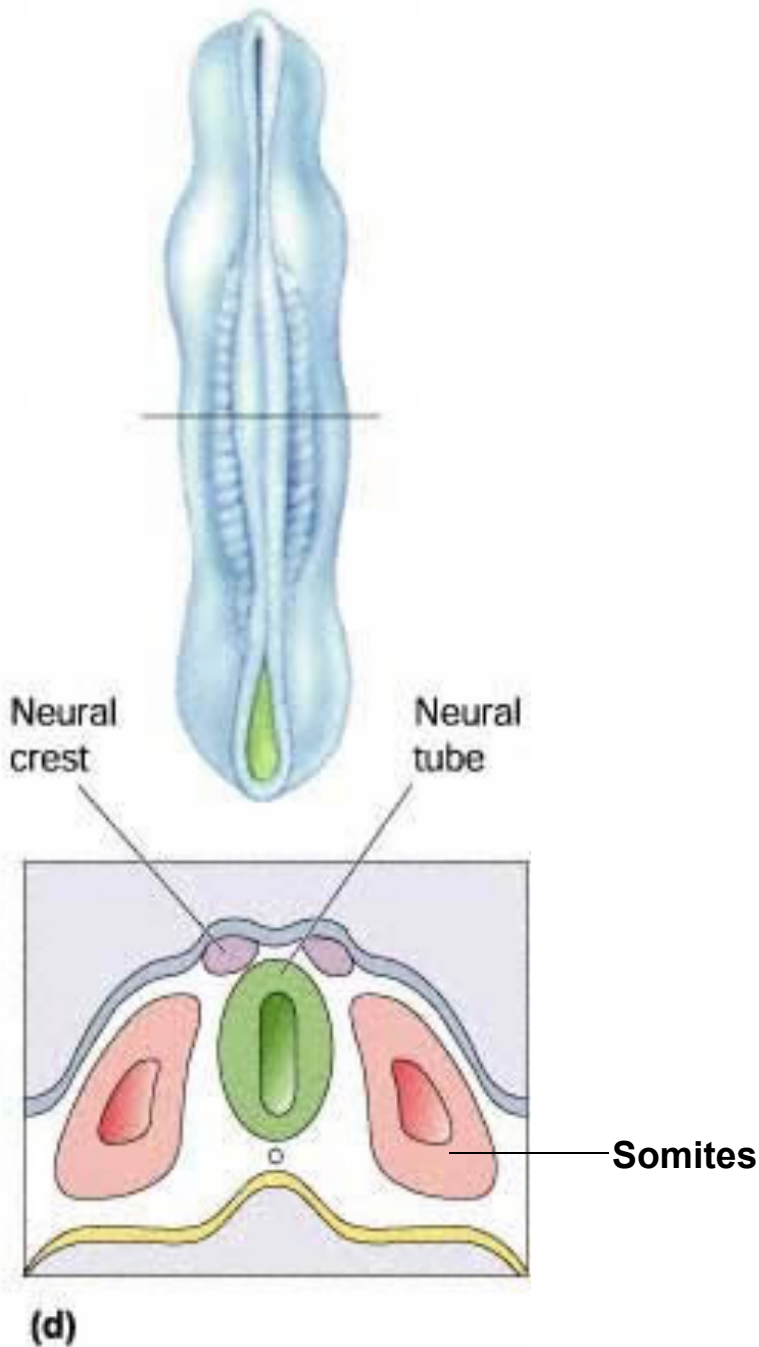
Anencephaly

Posterior neural pore

failure to close = spina bifida

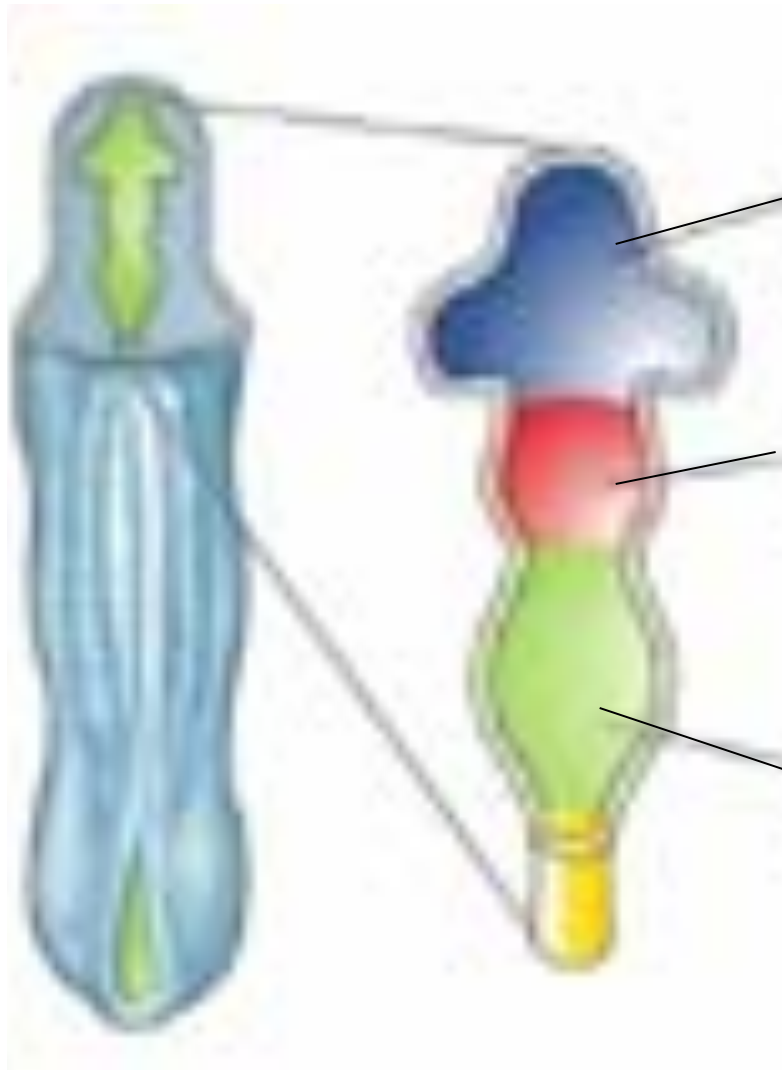
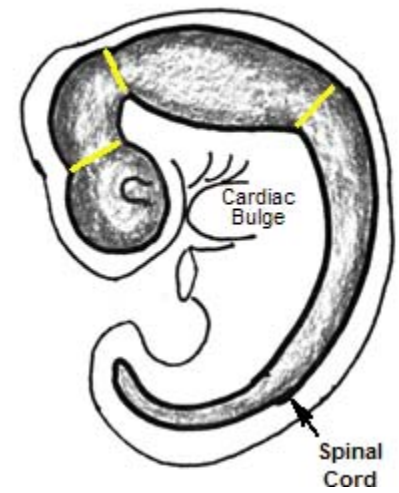


Spina bifida



- Neural crest becomes peripheral nervous system (PNS)
- Neural tube becomes central nervous system (CNS)
- Somites become spinal vertebrae.

Three-vesicle stage (Week 4)

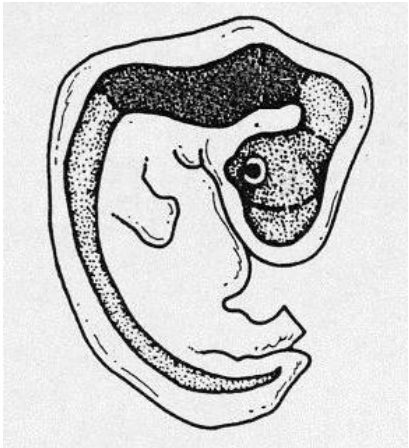


Prosencephalon
or forebrain

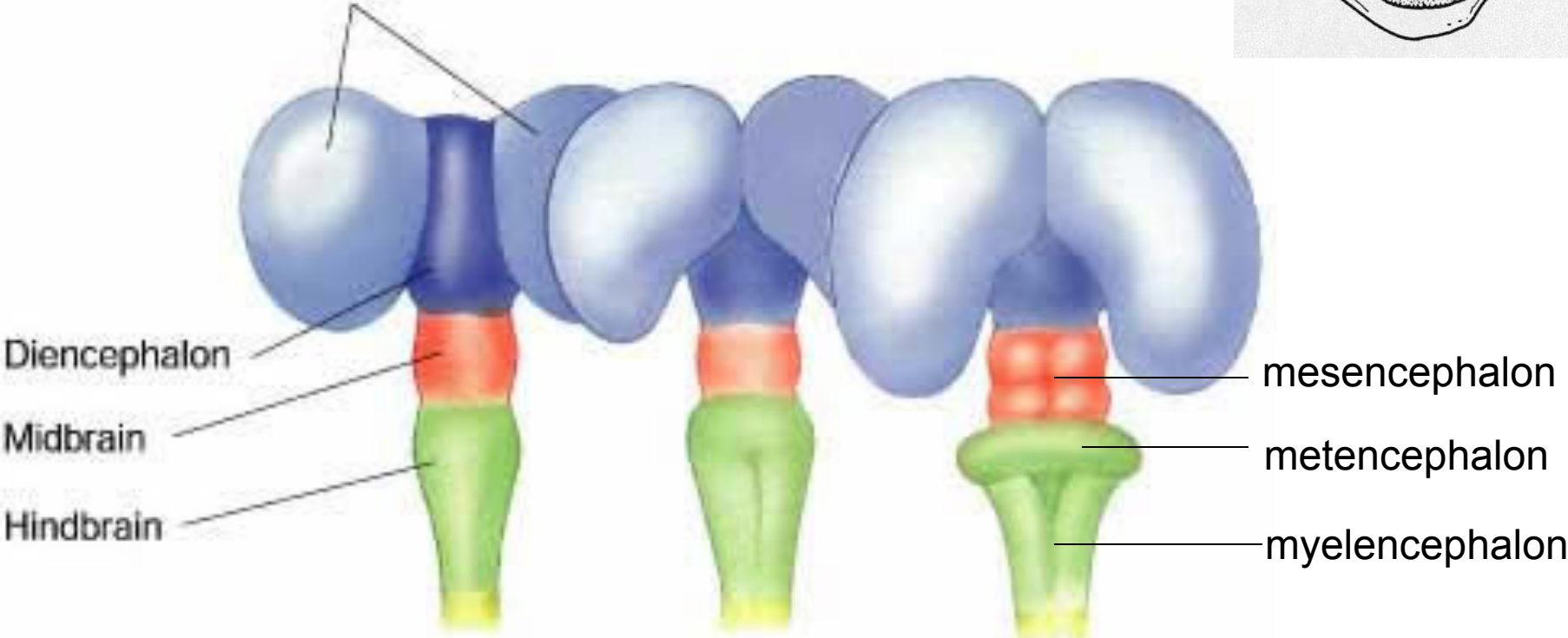
Mesencephalon
or midbrain

Rhombencephalon
or hindbrain

Five-vesicle stage



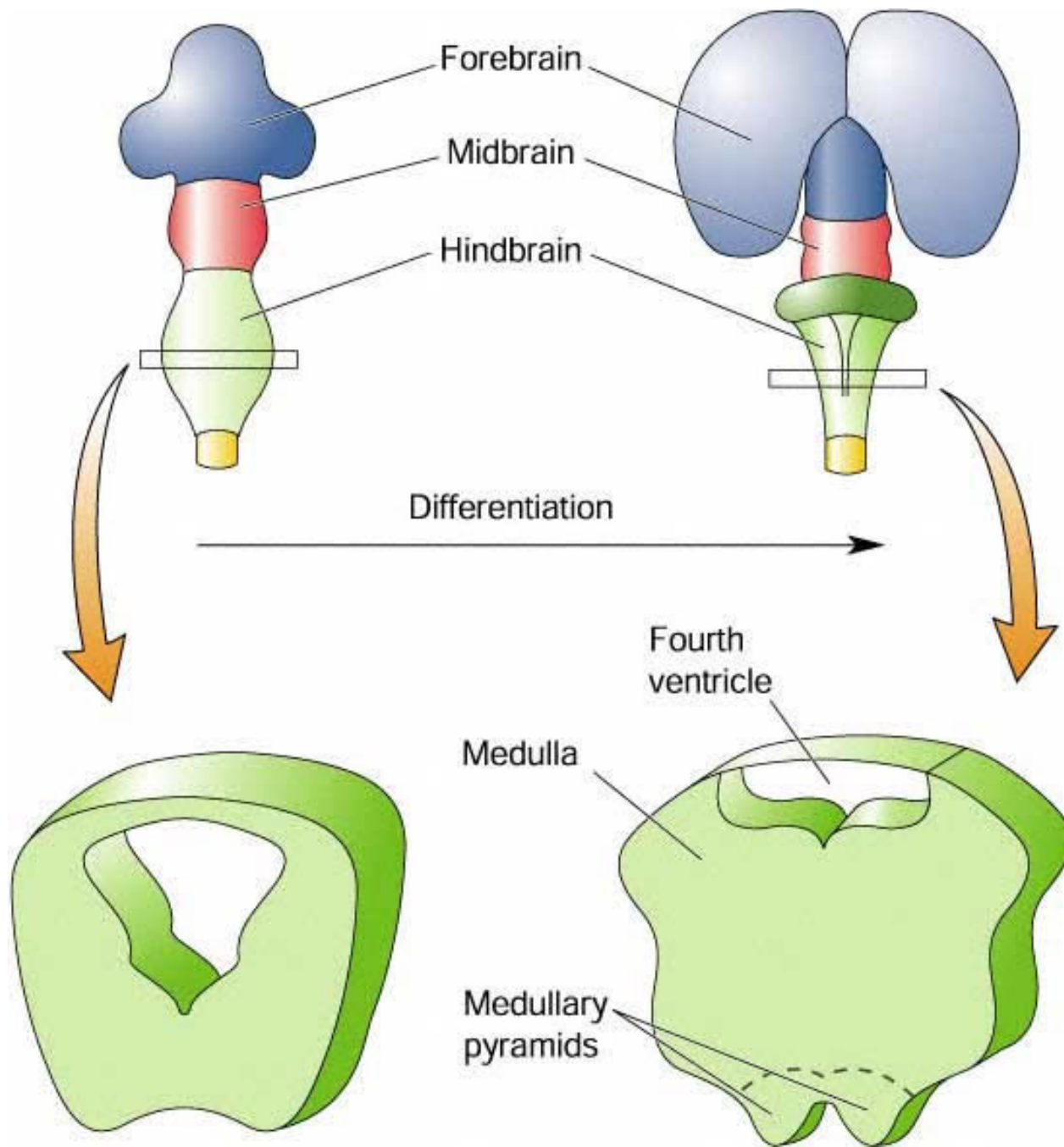
Telencephalon
(2 cerebral hemispheres)

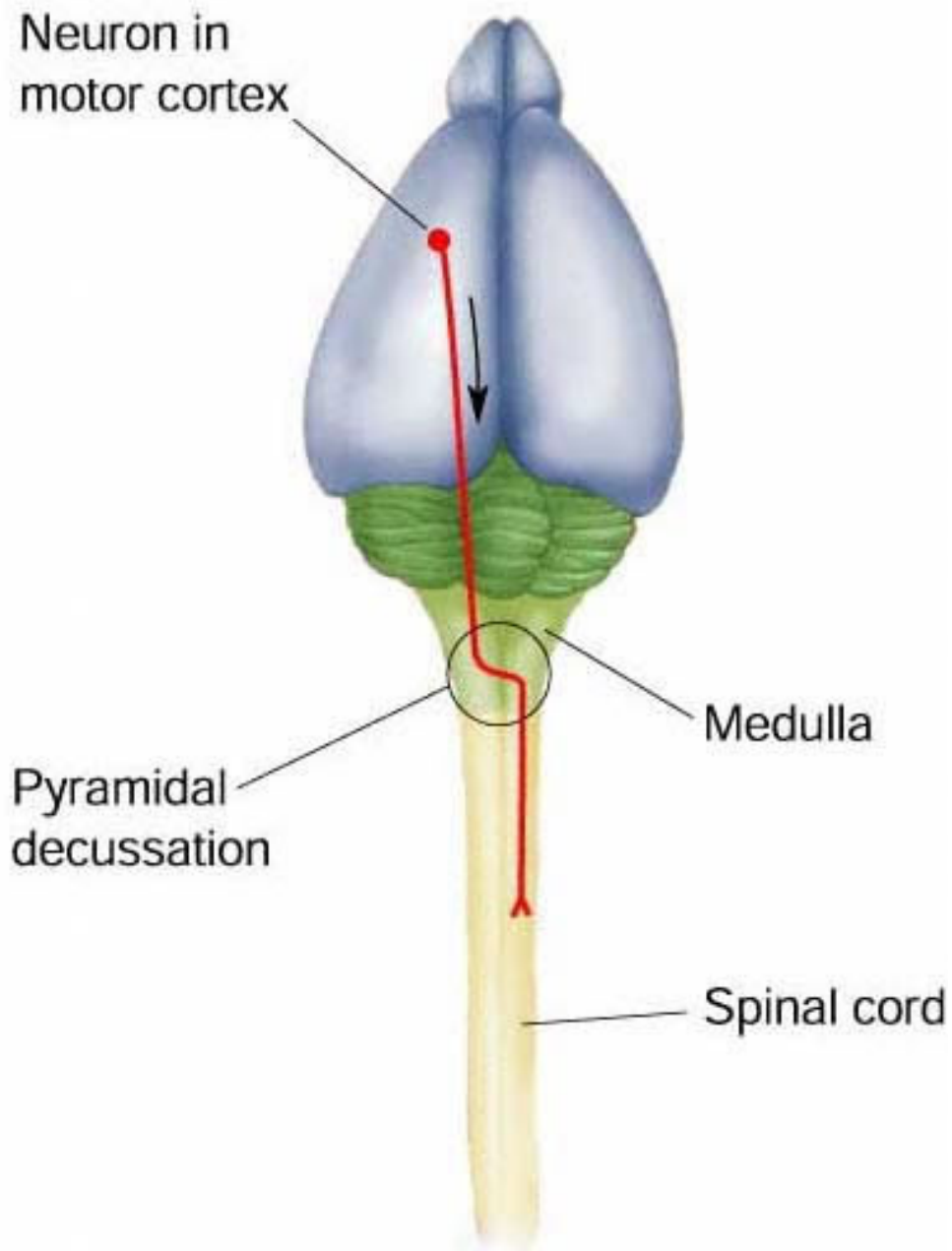


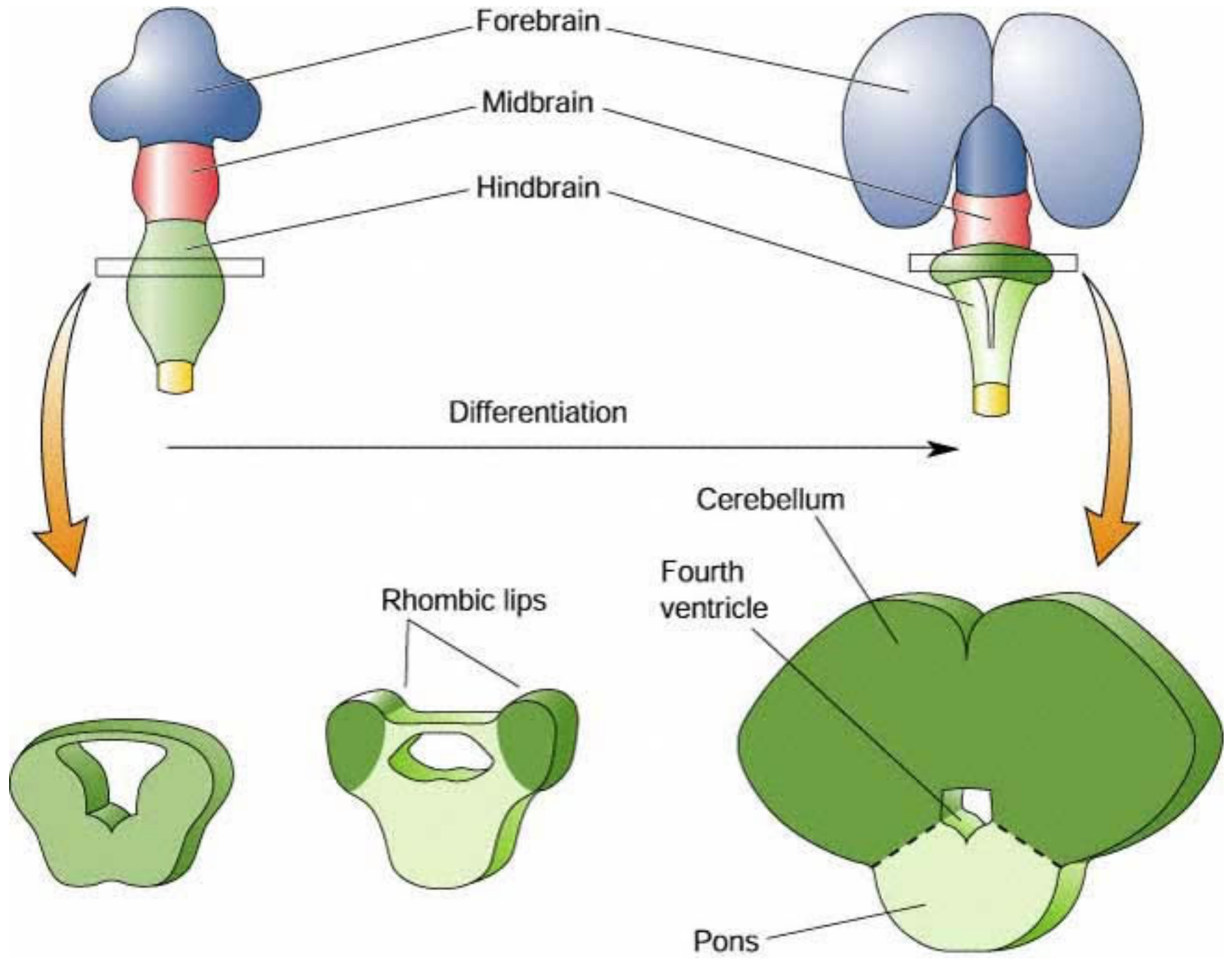
4 weeks

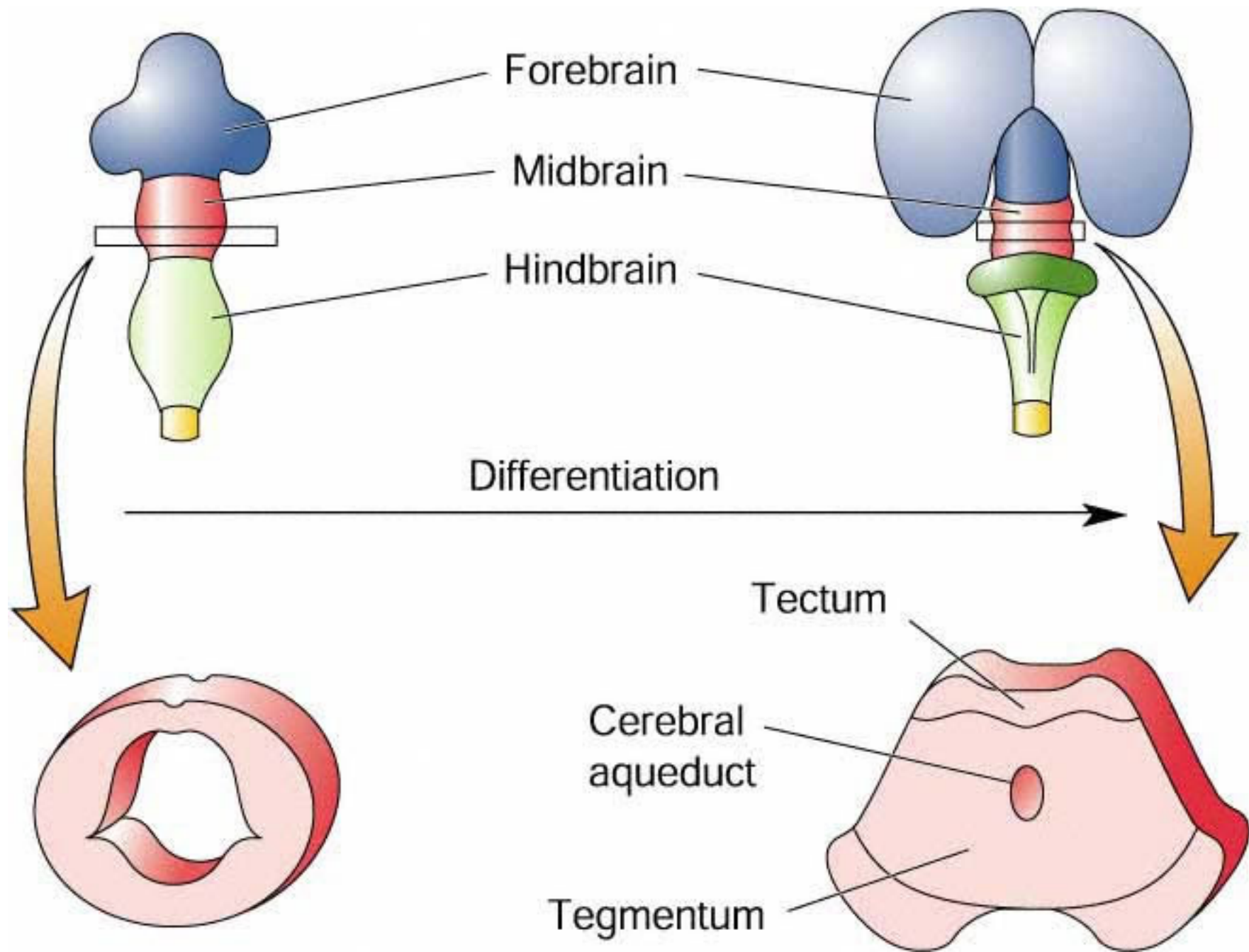
6 weeks

Differentiation

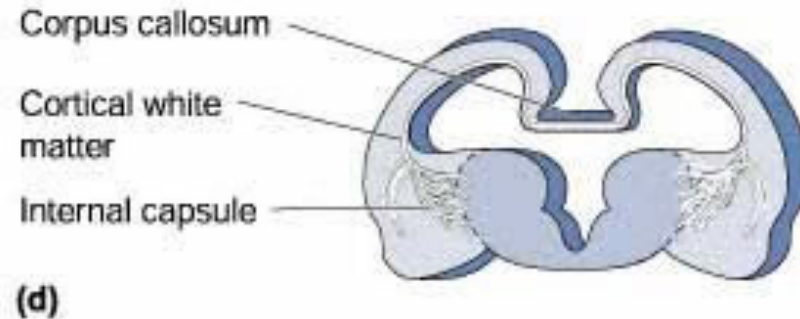
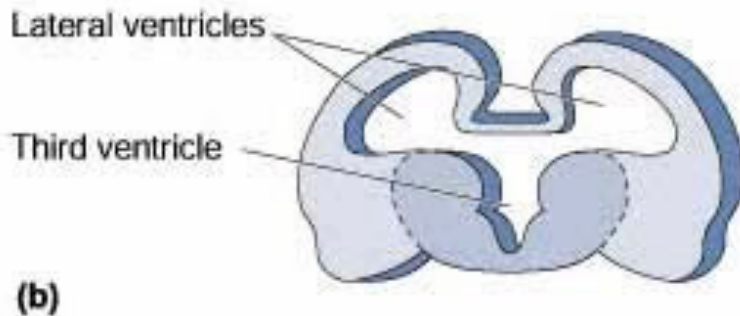
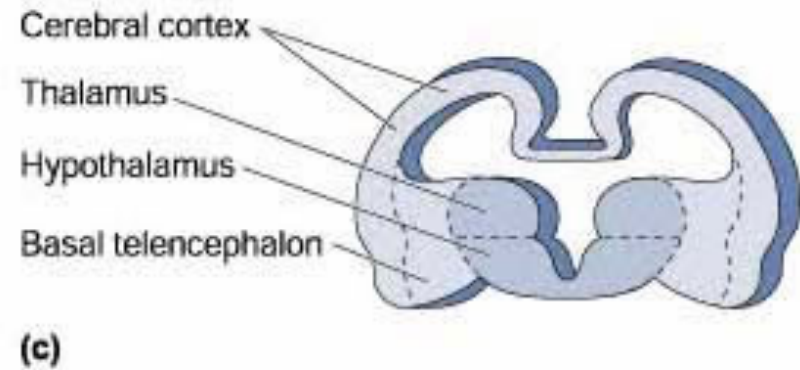
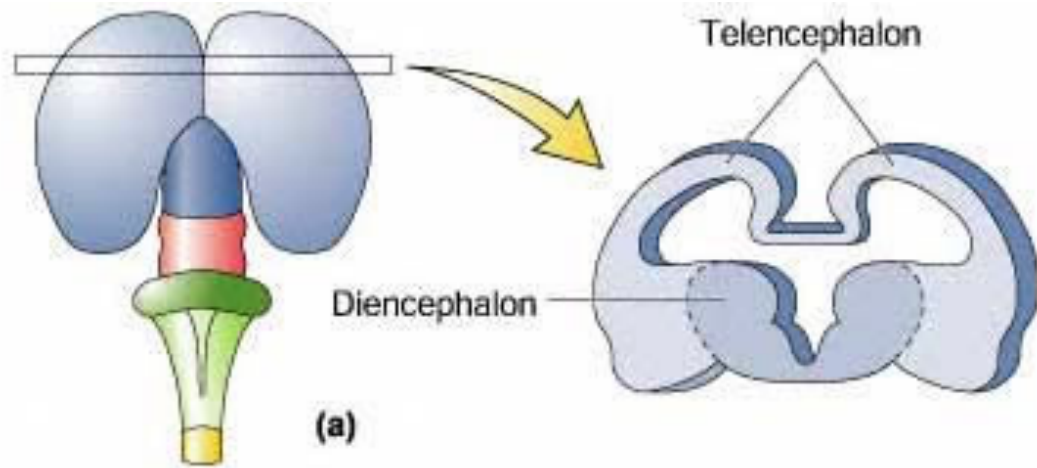


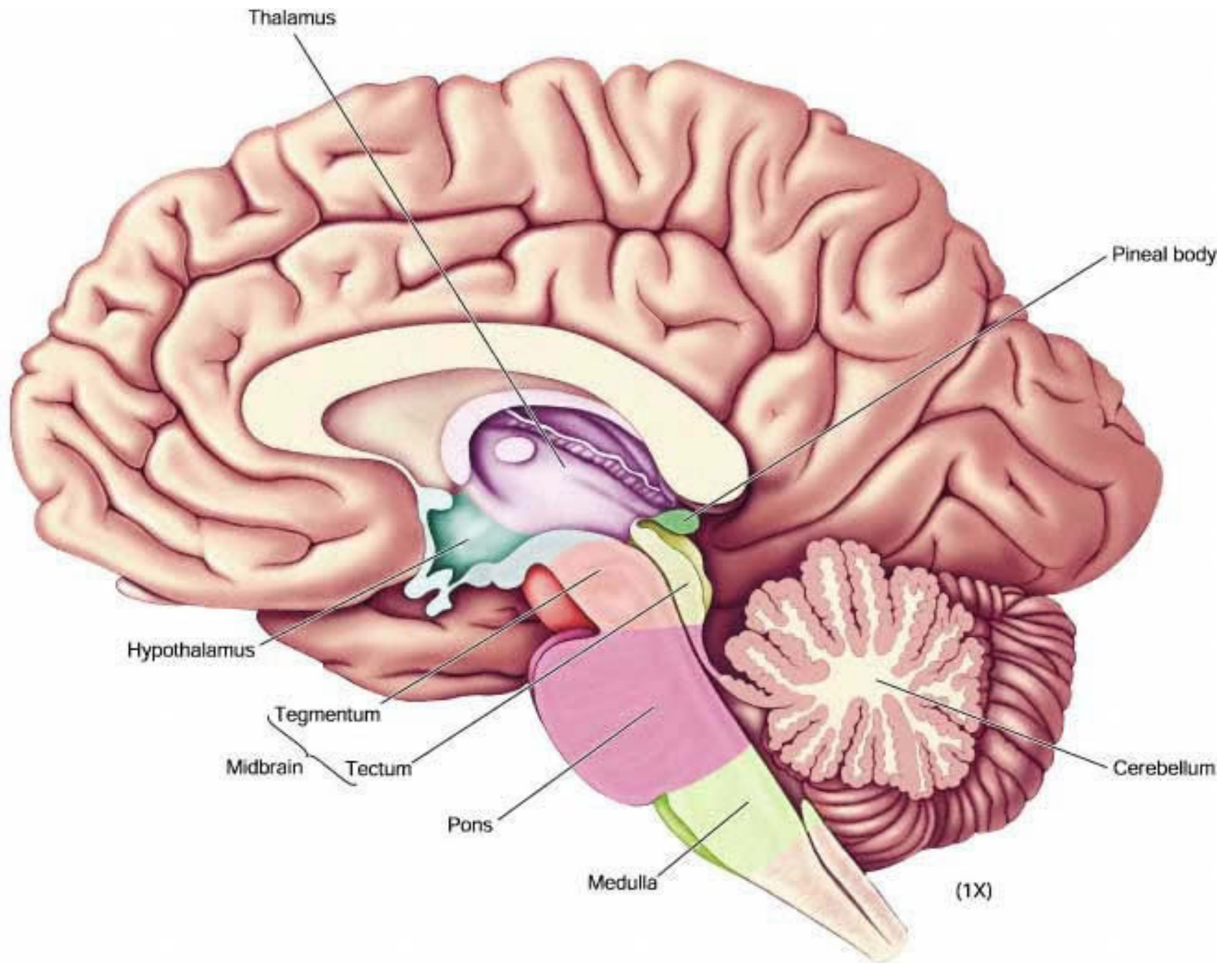






Differentiation of Forebrain

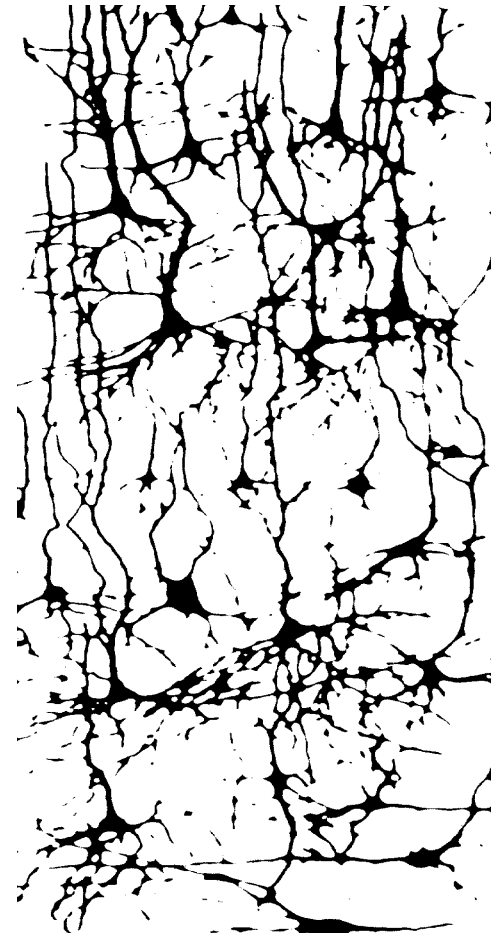
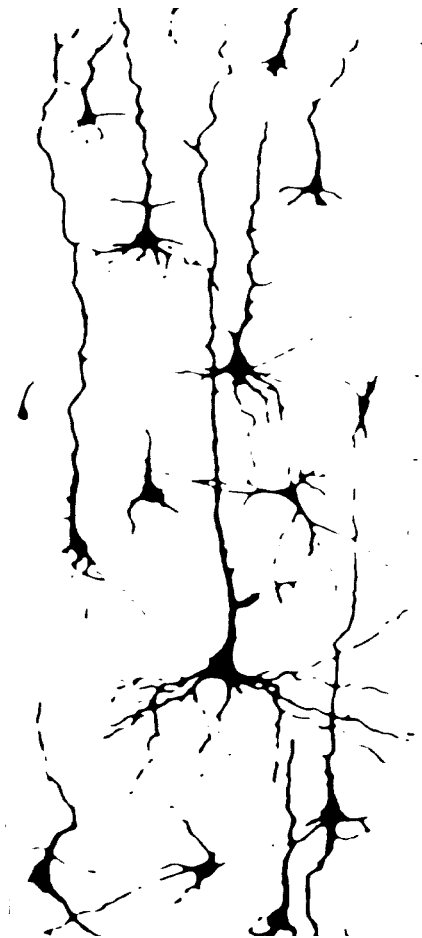




Human
Brain
at Birth

6 Years
Old

14 Years
Old



A lot can go wrong.

- Rate of neurogenesis incredibly rapid.
- Failure to form appropriate connections may be basis of many neurological and psychiatric disorders.