

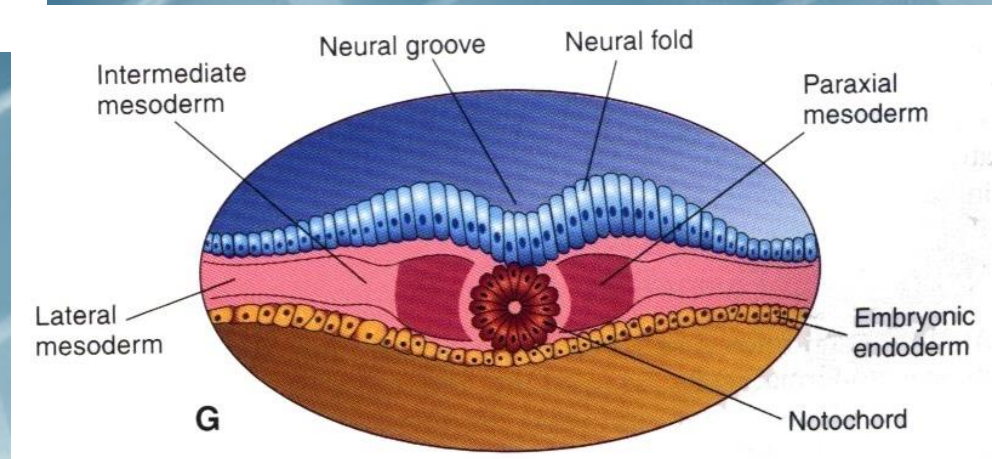
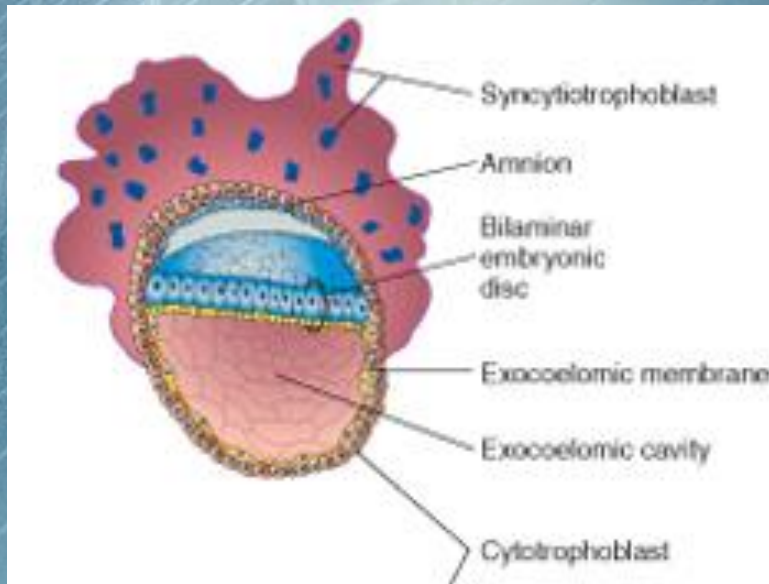
MSS GELİŞİMİ

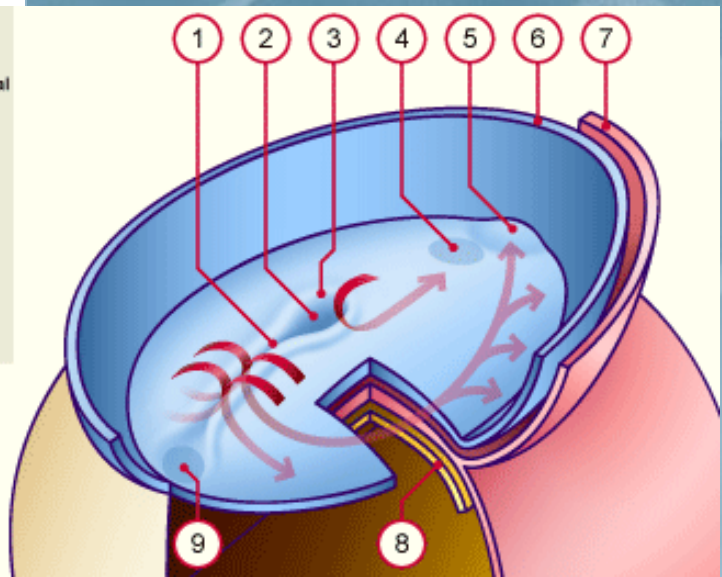
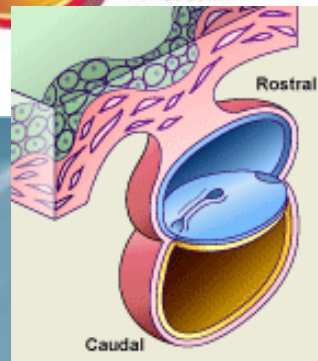
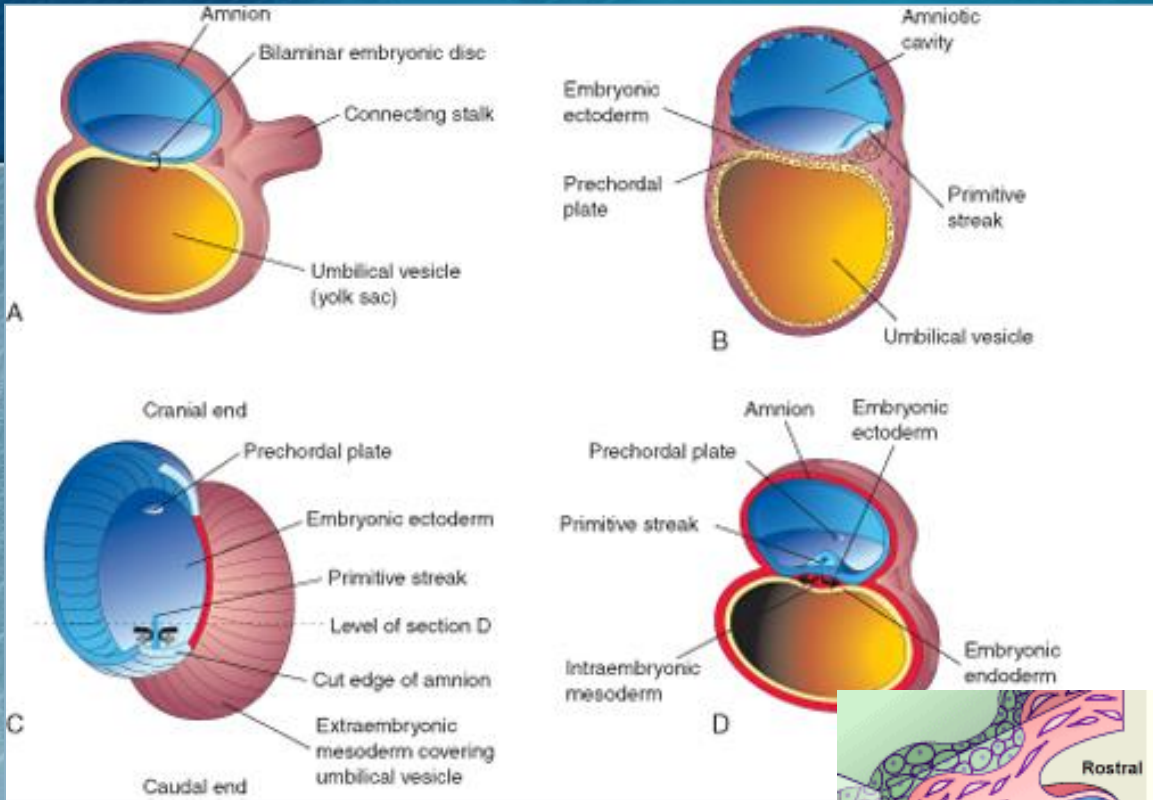
Doç.Dr. Bülent AYAS
Histoloji-Embriyoloji Anabilim Dalı

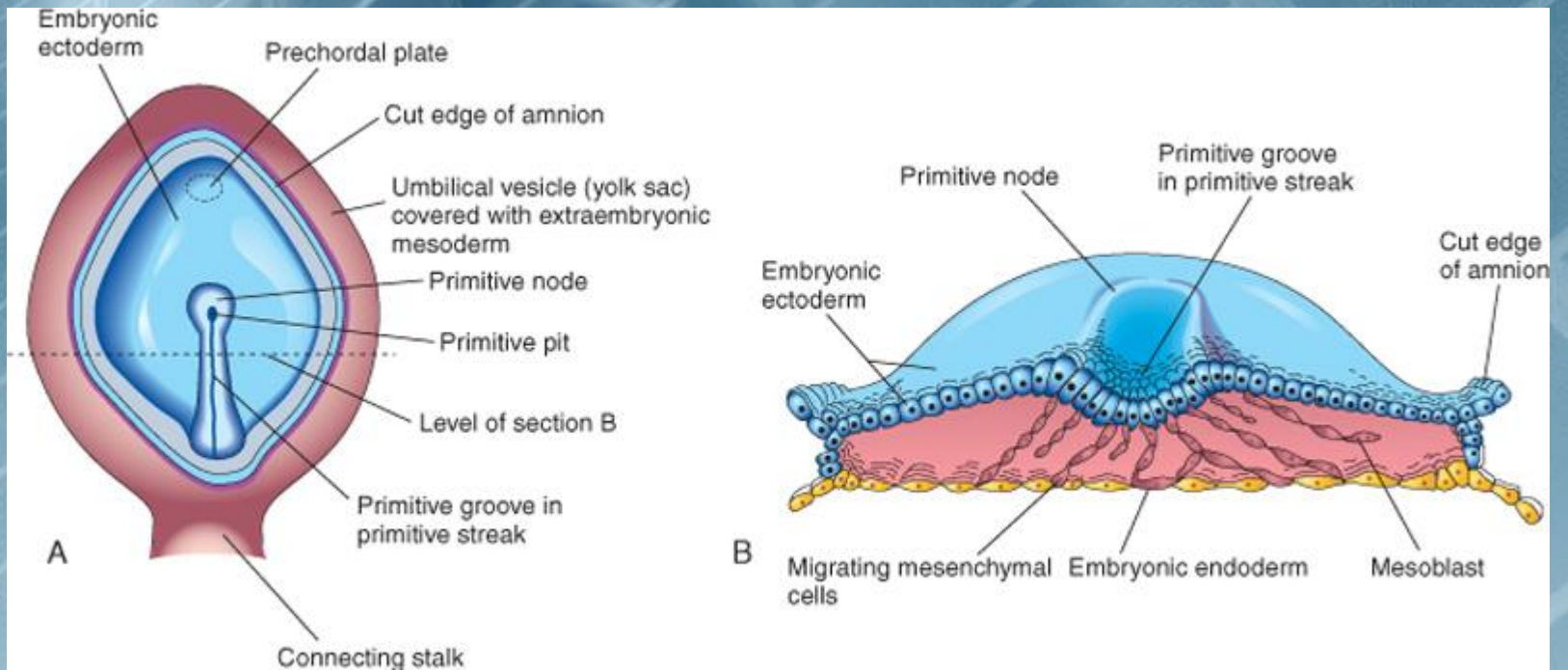
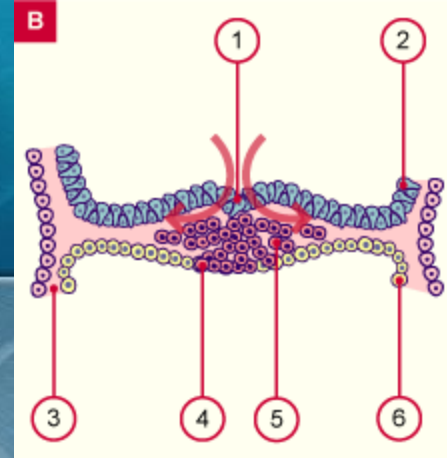
MSS Gelişimi

- Ektodermden köken alır (nöroektoderm)
- Kalınlaşmış, terlik biçimli ektodermal yapı olan **nöral plaktan*** farklanır
- Notokord, ektodermin ileri farklanmasını sağlar

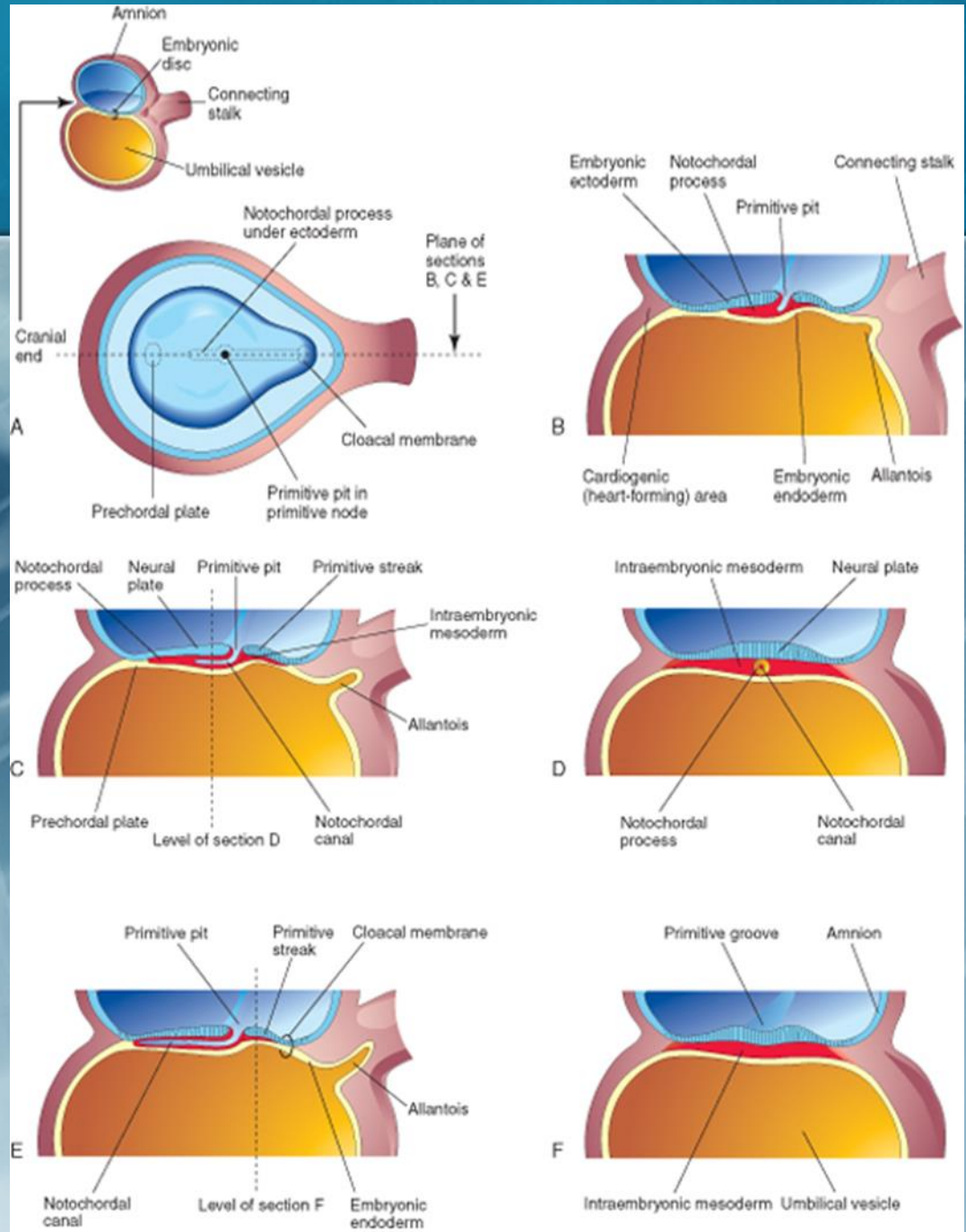
Gastrulasyon – Germ tabakalarının oluşumu



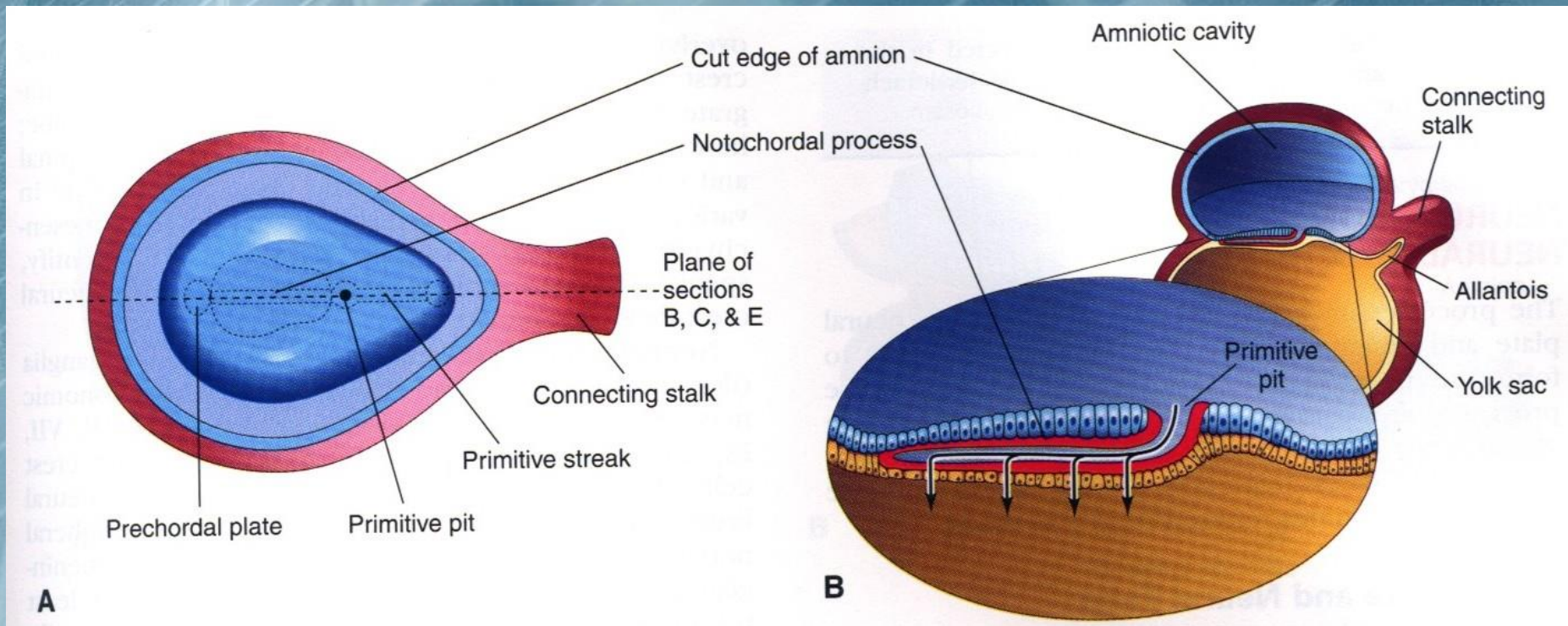




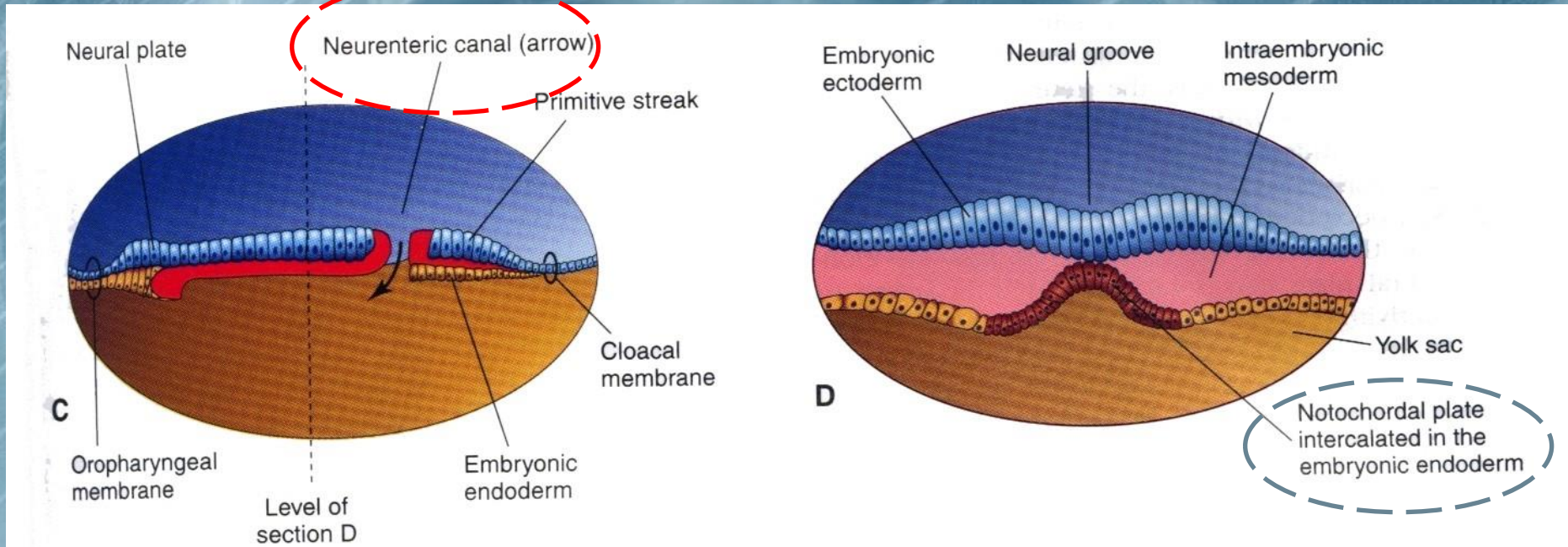
Notokord uzantısı



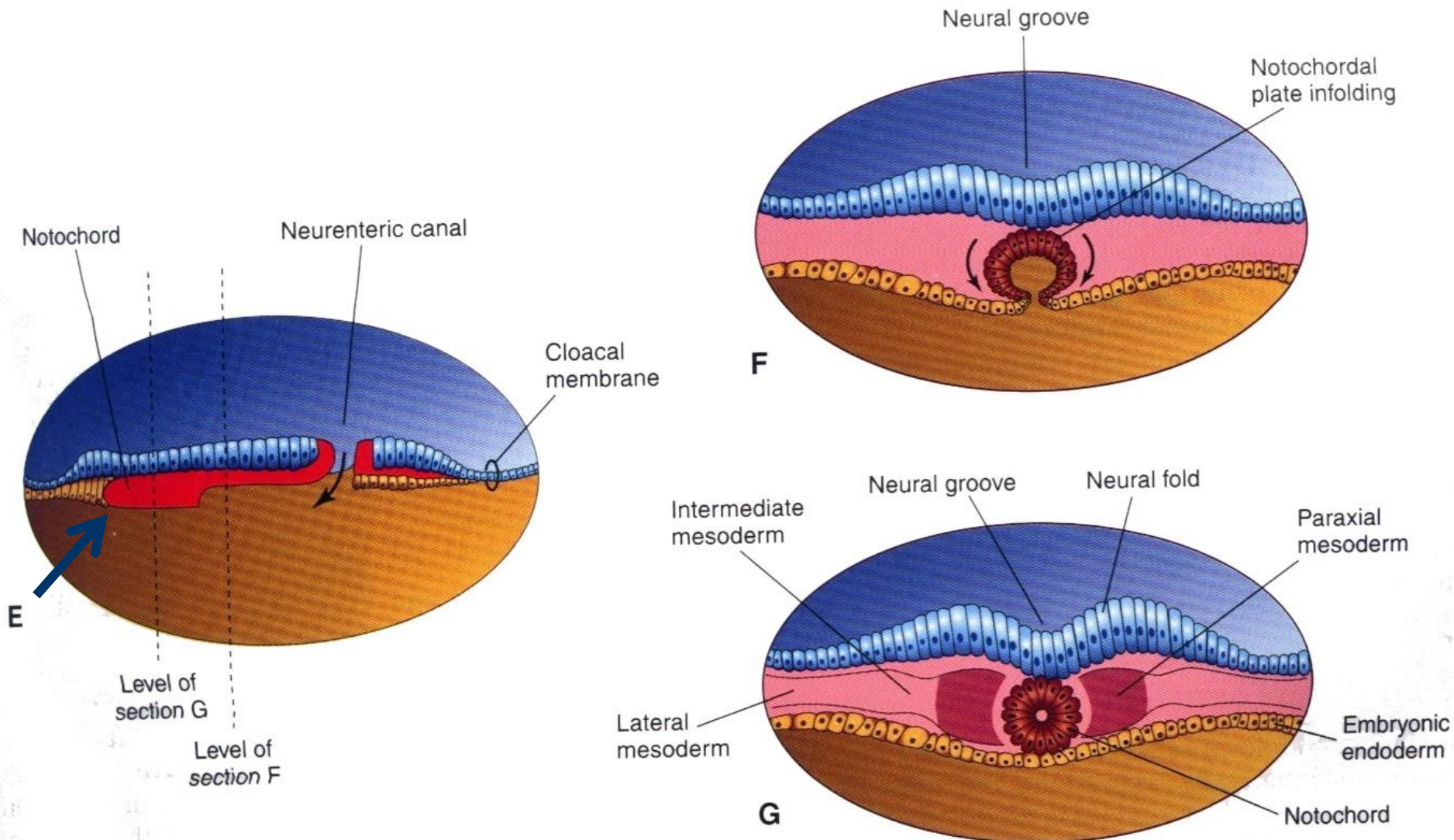
Notokordun oluşumu



Notokordun oluşumu

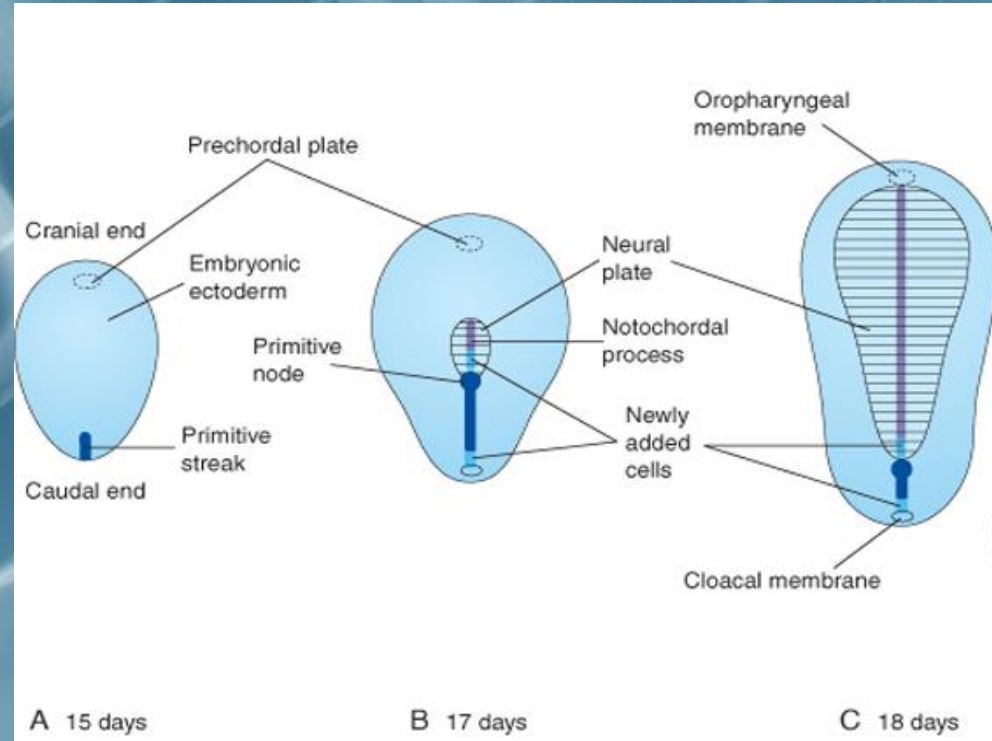


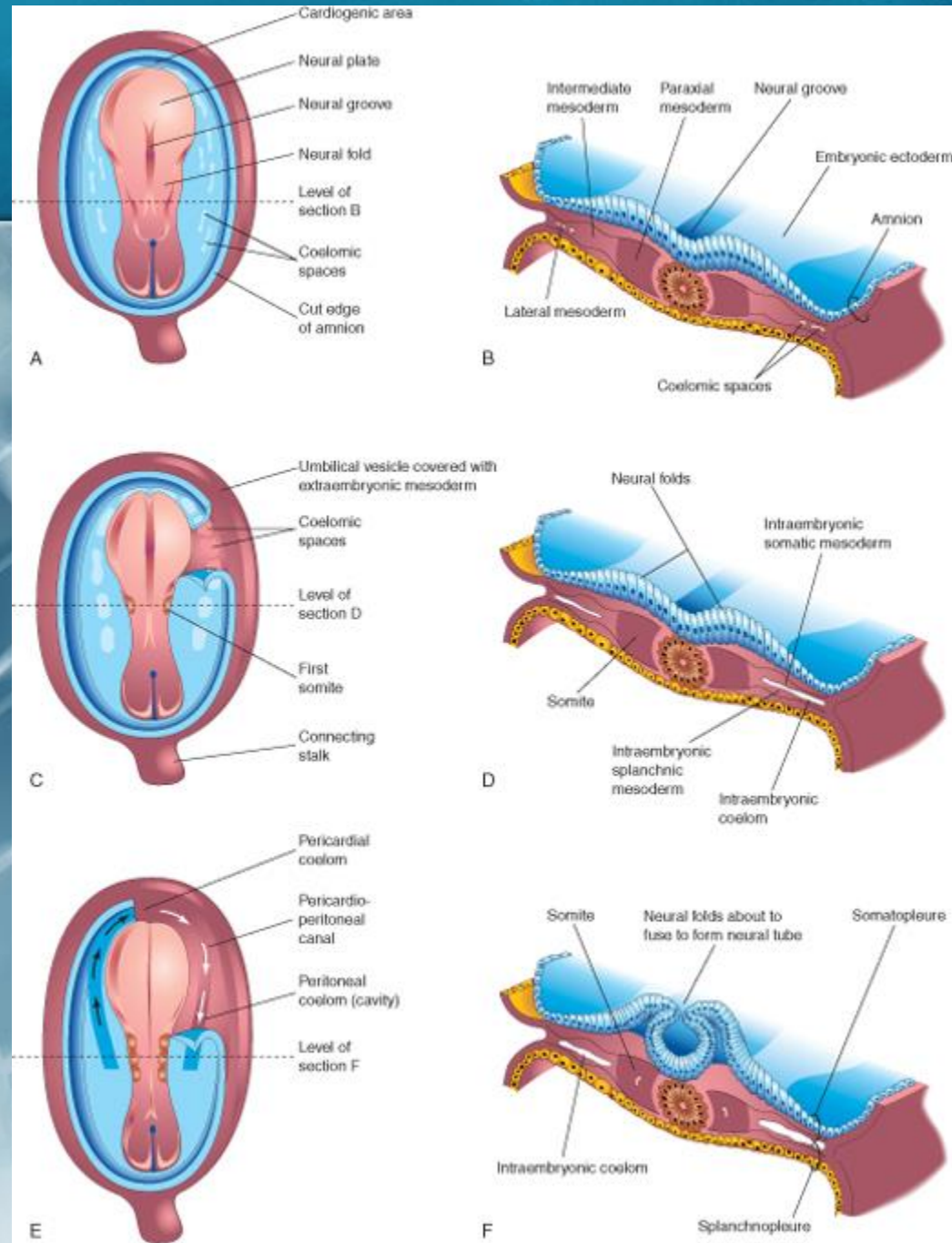
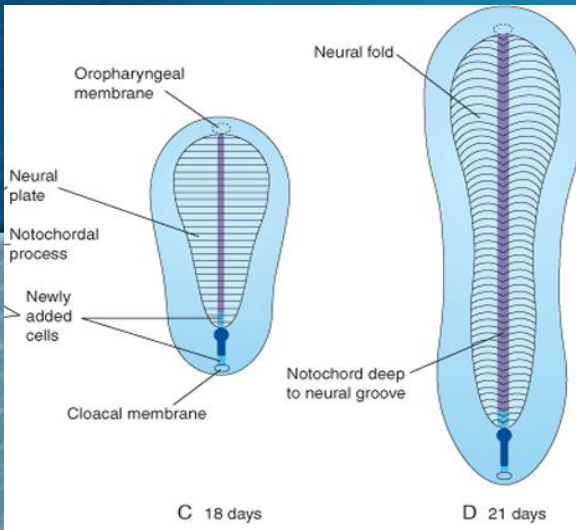
Notokordun oluşumu



Nörolasyon – nöral tüpün oluşumu

- Nöral plak, nöral kıvrımlar ve nöral tüp nörolasyon sırasında gelişen yapılardır.
- 4. haftanın sonunda tamamlanır
- Embriyoya nörala da denir
- Notokord, üzerindeki ektodermi uyararak nöroektoderme (nöral plak) dönüşmesini sağlar (17-19. günler)
- Nöral plaktan MSS gelişir





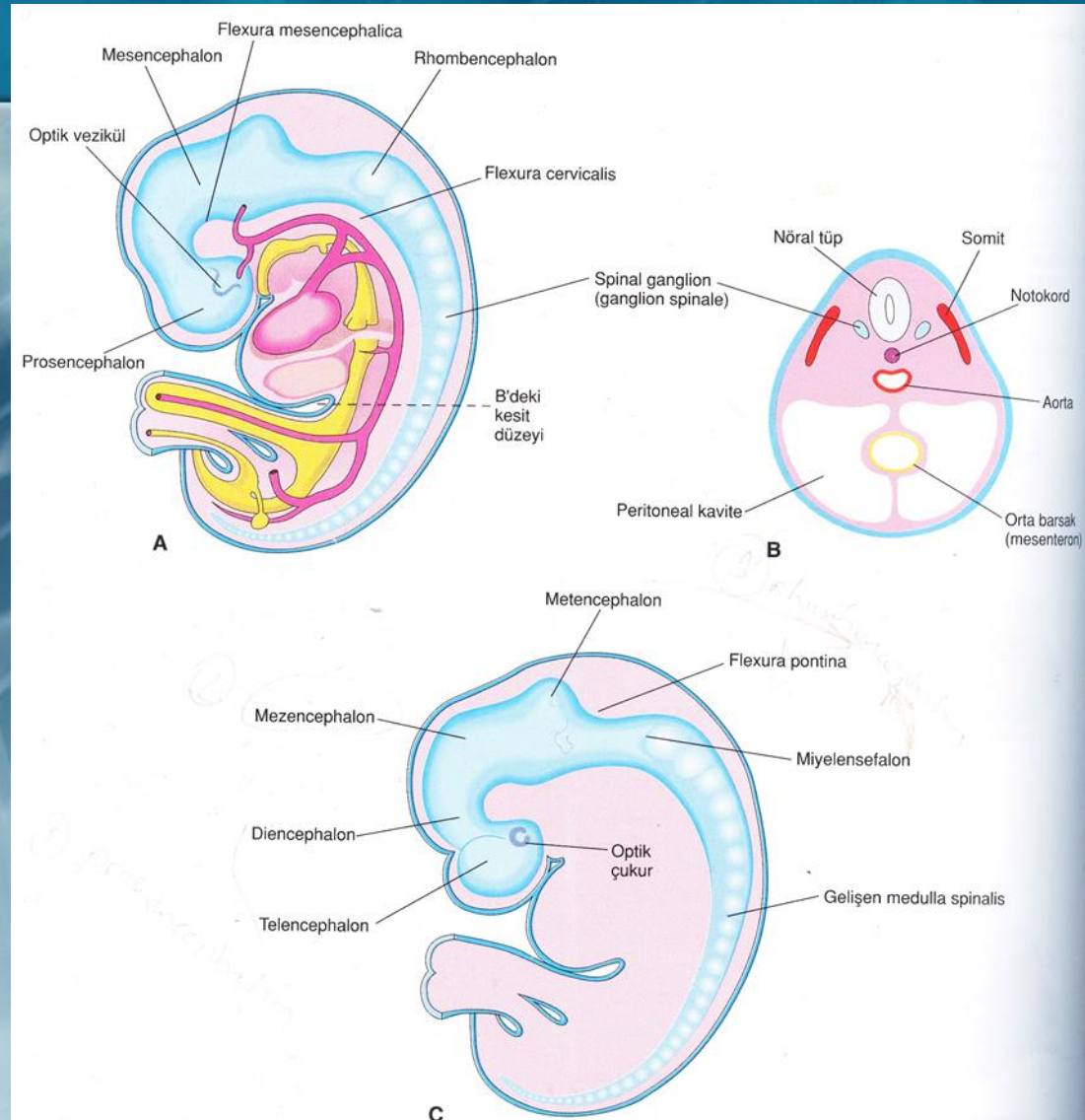
18-19 .günlerde nöral plak üzerinde nöral kıvrımlar ve arasında nöral oluk belirir

3. haftanın sonunda bu kıvrımlar birleşir ve 22-23. günlerde nöral tüp şekillenmeye başlar

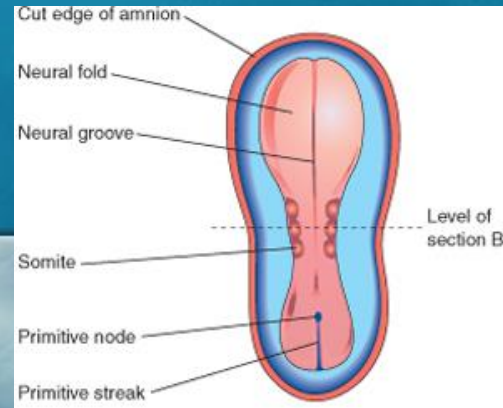
İlk önce anterior nöropor (25.gün) sonra posterior nöropor (26-27.gün) kapanır

Nöral tüp

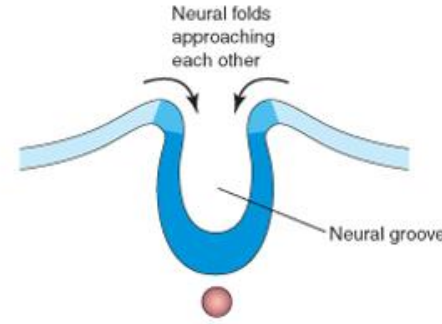
- Nöral tüpün;
 - Kaniyal 2/3 kısmı beyine,
 - 1/3 kaudal kısmı medulla spinalise farklanır
- Nöral kanal ise beynin venriküllerine ve m.spinalisin santral kanalına dönüşür



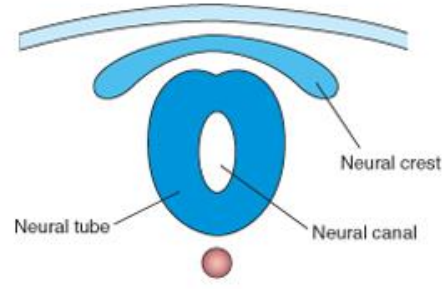
Nöral tüp ve nöral krista



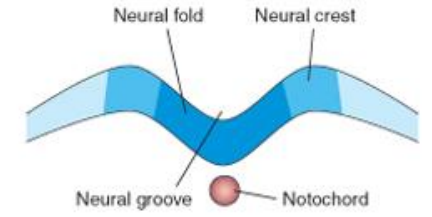
A



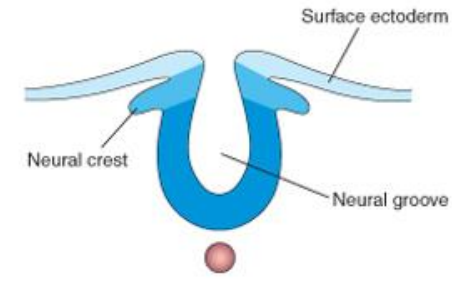
C



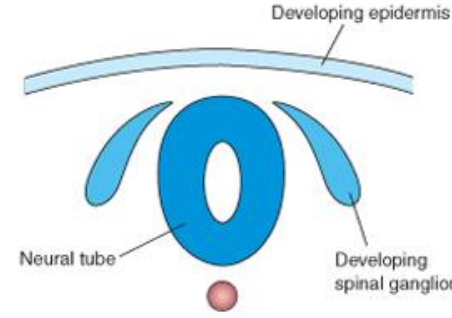
E



B



D



F

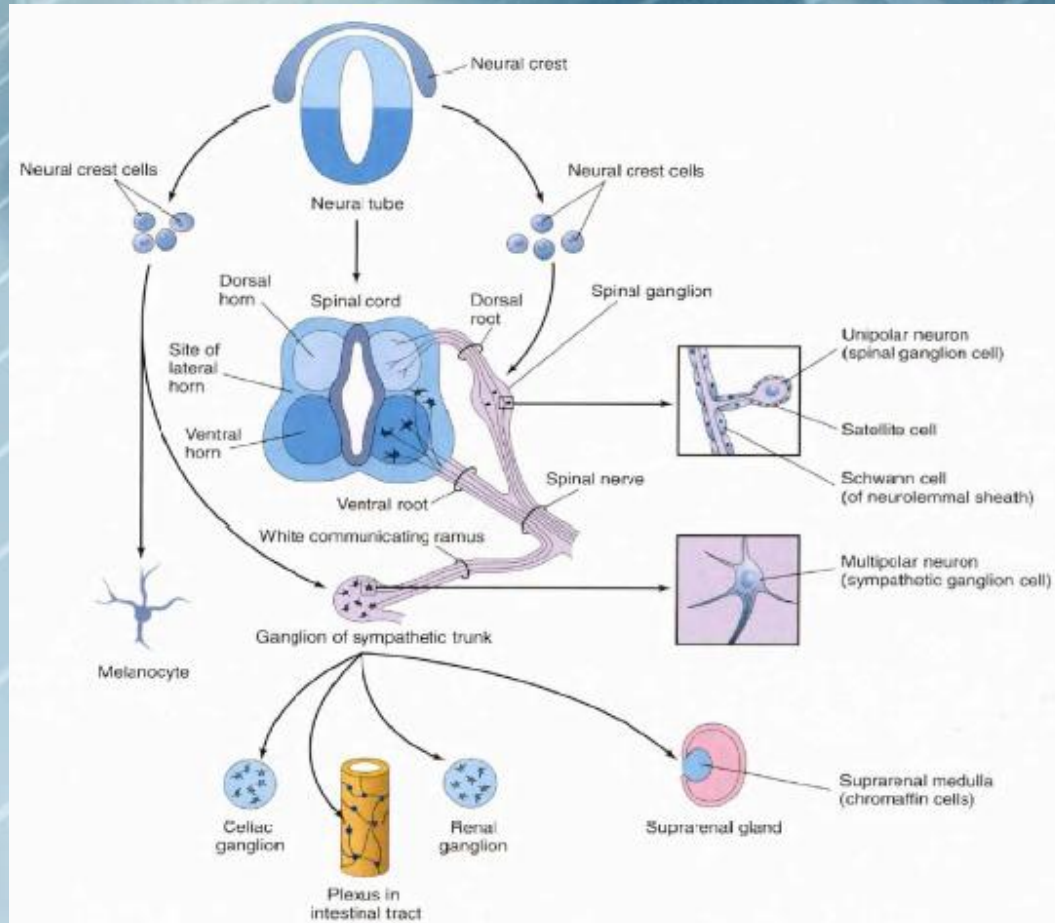
■ Nöral tüp yüzey ektoderminden ayrılır ve ektoderm birleşir

■ Nöral kıvrımların kenarı boyunca uzanan bazı nöroektoderm hücreleri komşu hücrelerle bağlantısı kaybeder (nöral krista)

Nöral kristadan oluşan yapılar

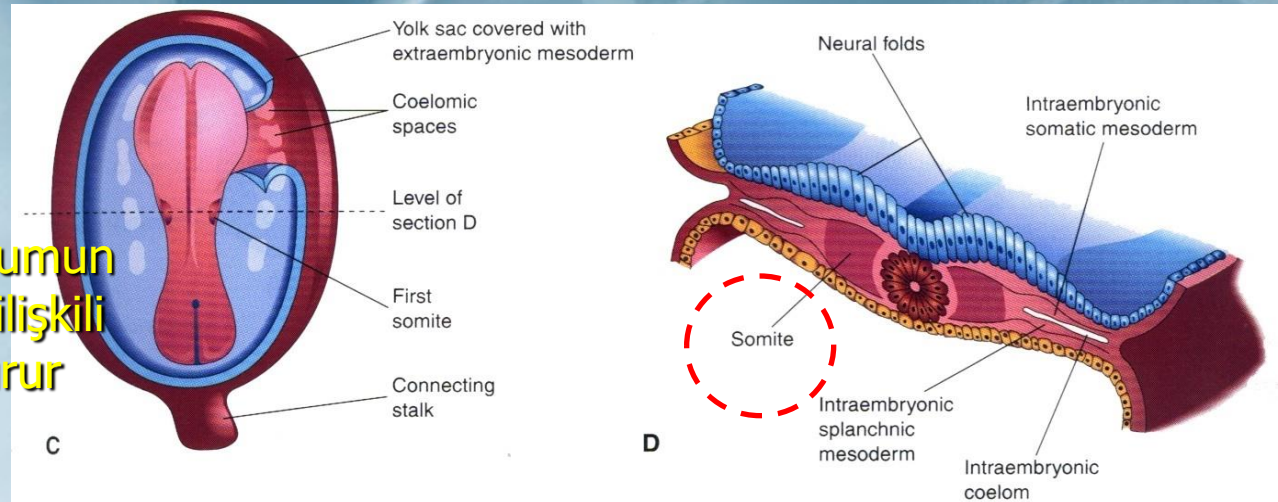
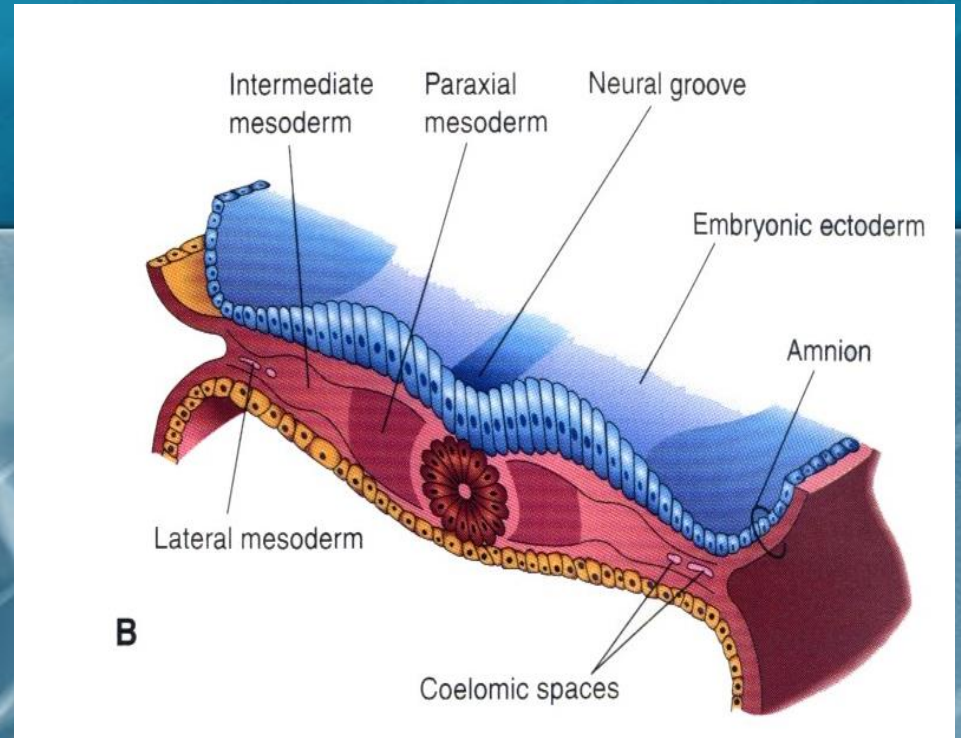
- Spinal (arka kök) ve kranial gangliyonların duyu nöronları
- Otonom sinir sistemi gangliyonları
- Schwann hücresi
- Menings (pia mater ve araknoid)
- Pigment hücreleri (melanosit)
- Odontoblastlar
- Sürrenal medulla hücreleri
- Tiroit bezine ait bazı hücreler
- Kafanın çeşitli kemik, kas ve bağ dokusu yapıları

Nöral kristadan oluşun yapılar



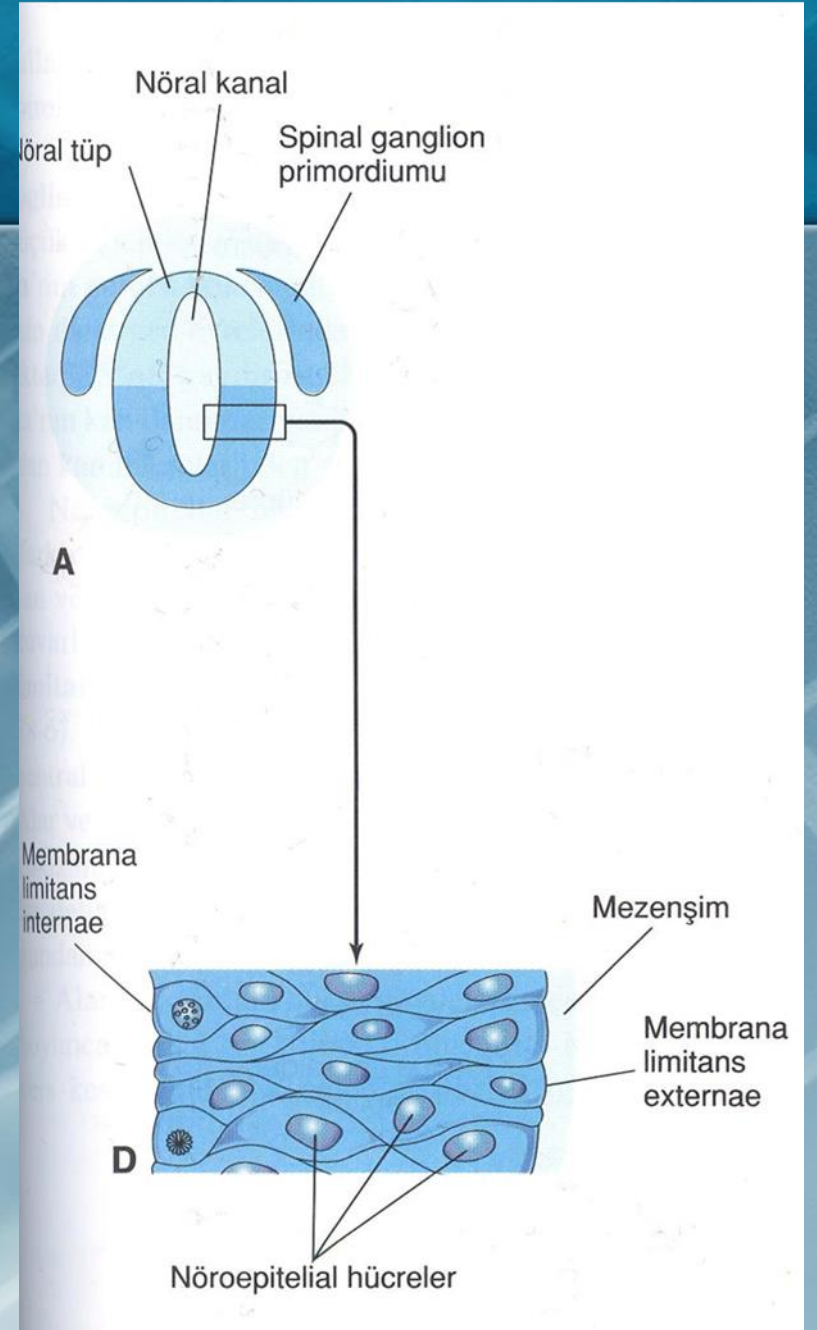
Somitler

- Notokord ve nöral tübün her iki yanında intraembriyonik mezoderm proliferer olur ve paraksiyal mezoderm kolonlarını oluşturur
- 3. haftanın sonunda** paraksiyal mezodermden somitler şekillenir
- 5. hafta sonunda 42-44 somit çifti oluşur
- Omurga, kostalar, sternumun büyük bir bölümünü ve ilişkili kasları ile dermisi oluşturur**

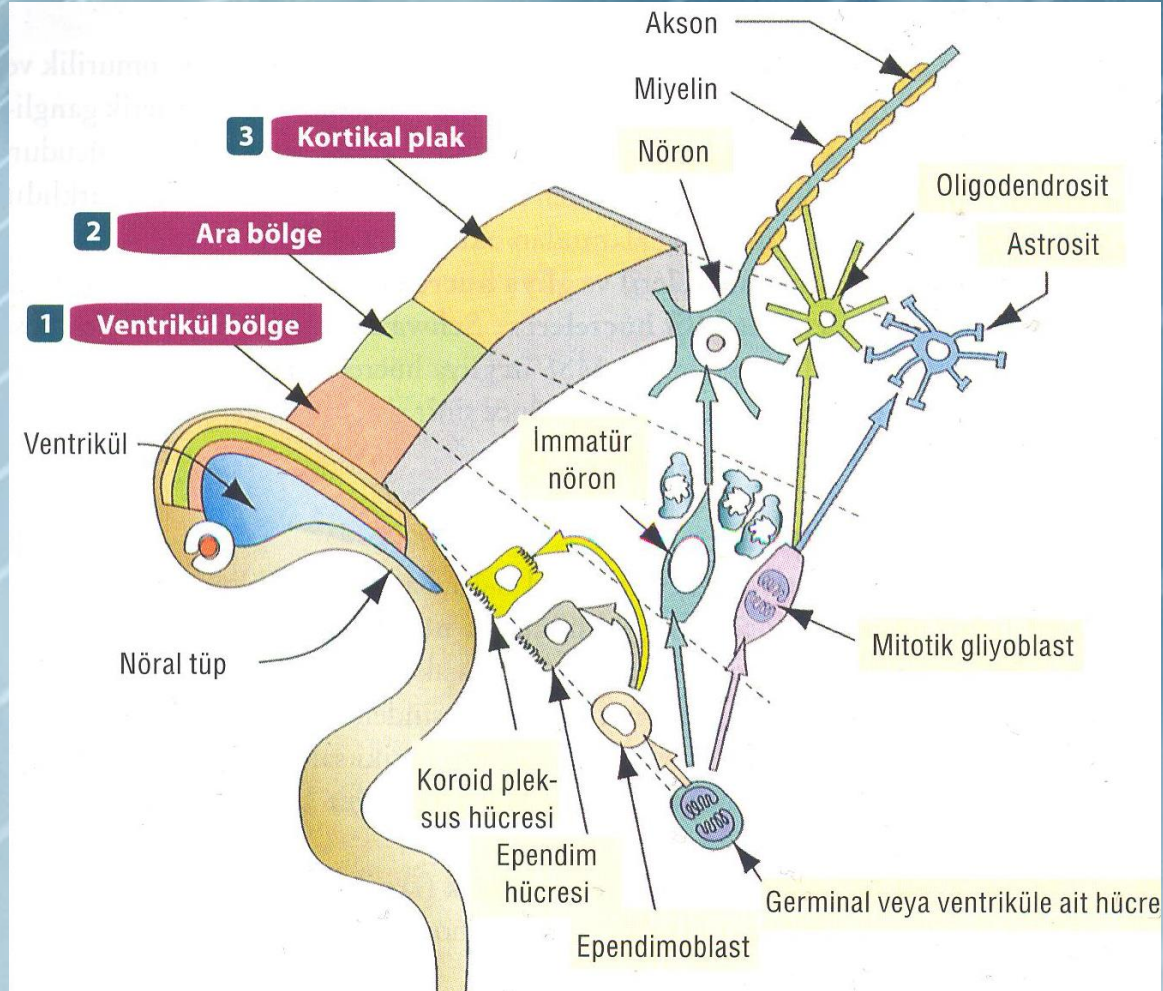


Nöroepitel

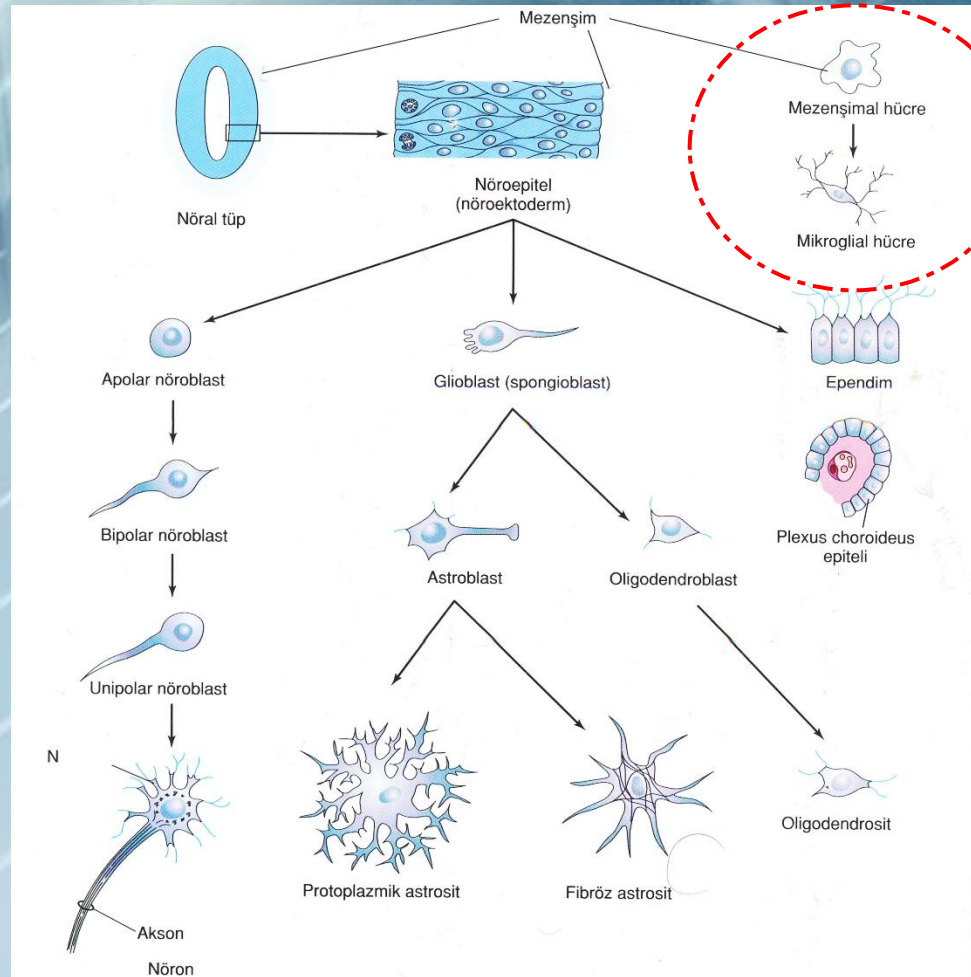
- Psödostratifiye epitel
- Ventriküler tabakayı şekillendirirler
- Bu tabakadan tüm nöronlar ve glia hücreleri şekillenir



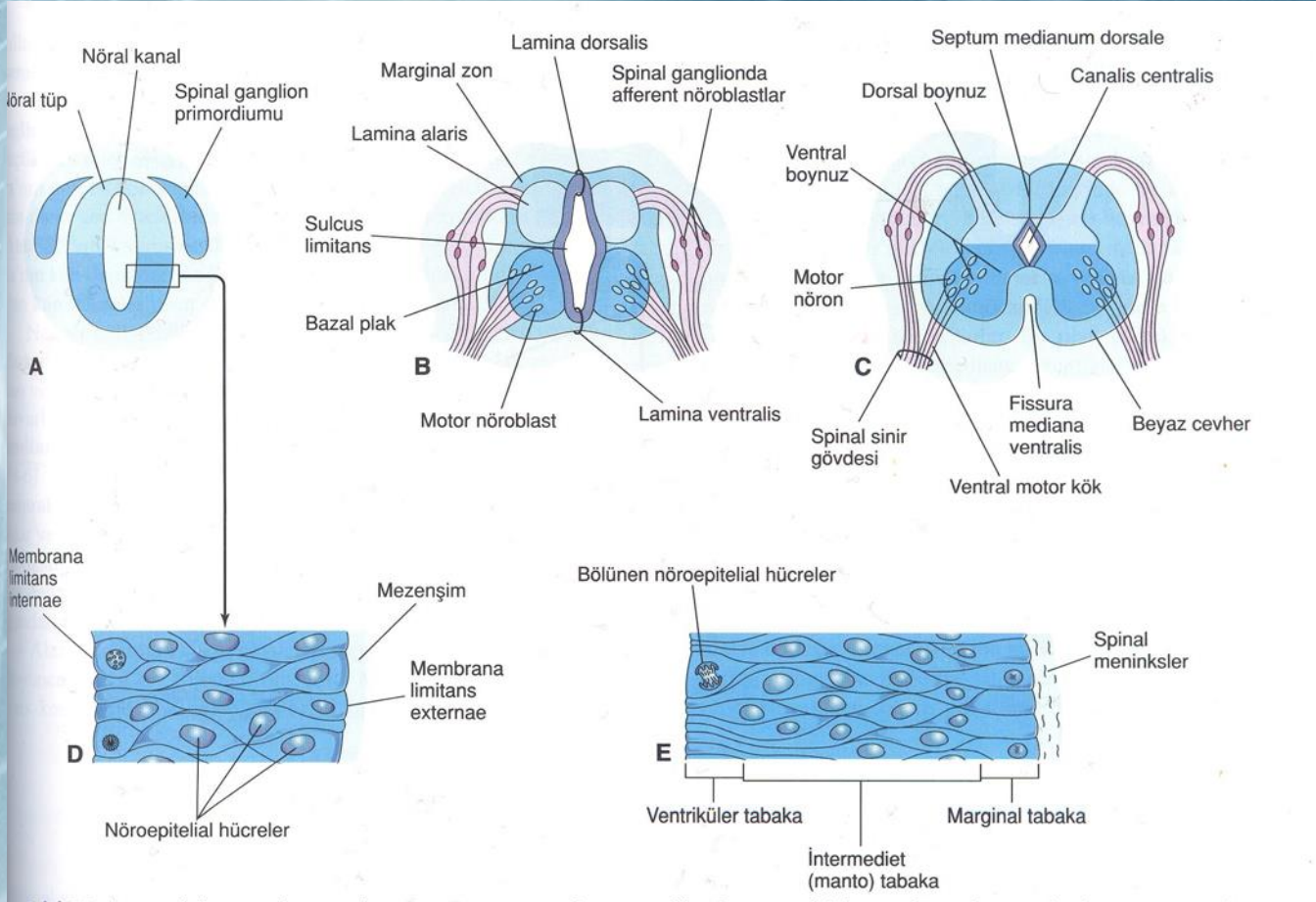
Nöroepitel



Nöroepitel

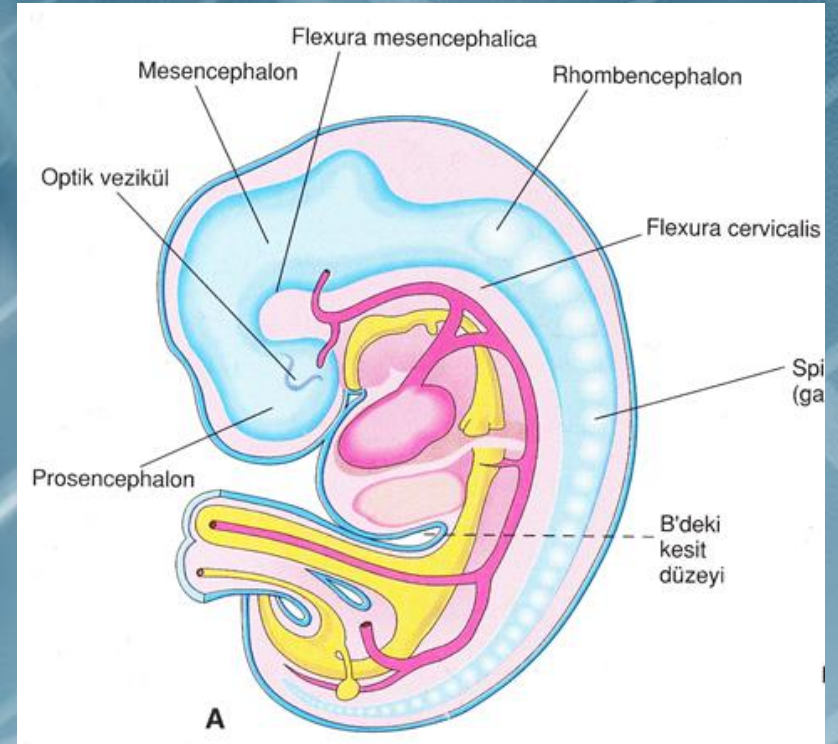


M. spinalis'in farklanması



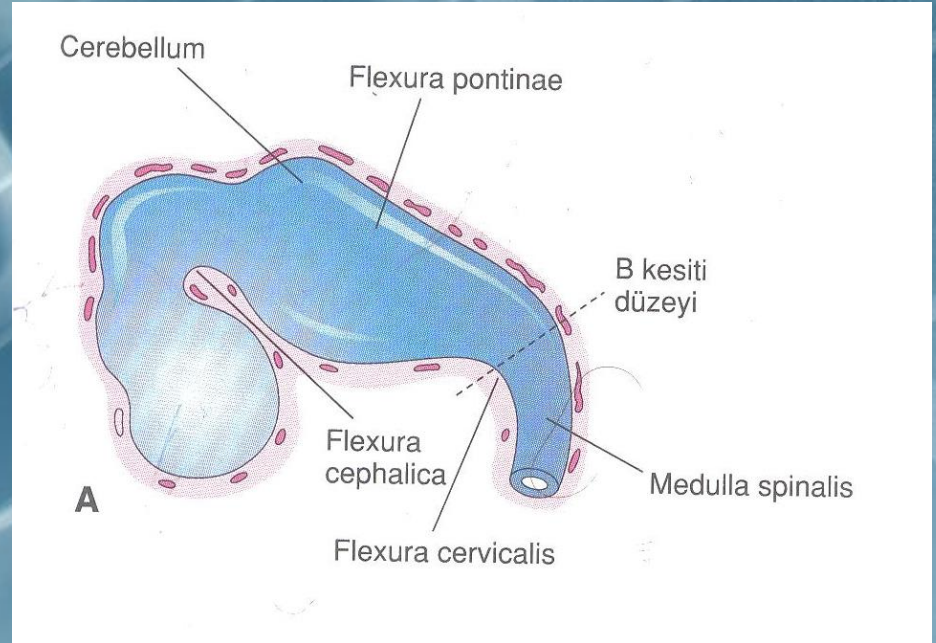
Beynin Gelişimi

- Somitlerin 4. çiftinin kranialindeki nöral tüpten farklanır
- Nöroporus anteriorun kapanmasıyla primer beyin vezikülleri şekillenir:
 - ┌ Prosencephalon (ön beyin)
 - ┌ Mesencephalon (orta beyin)
 - ┌ Rhombencephalon (arka beyin)

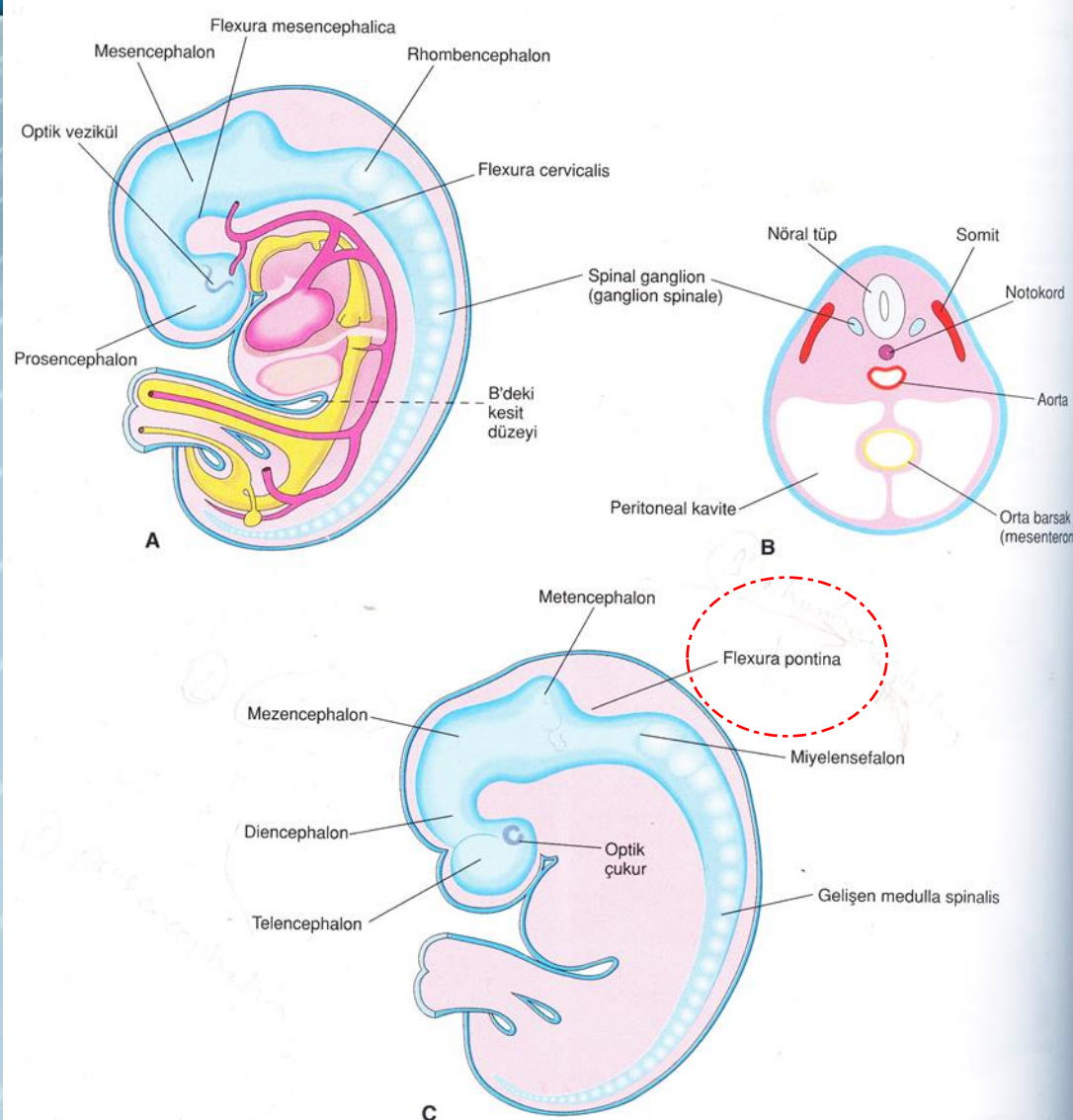


Beynin Gelişimi

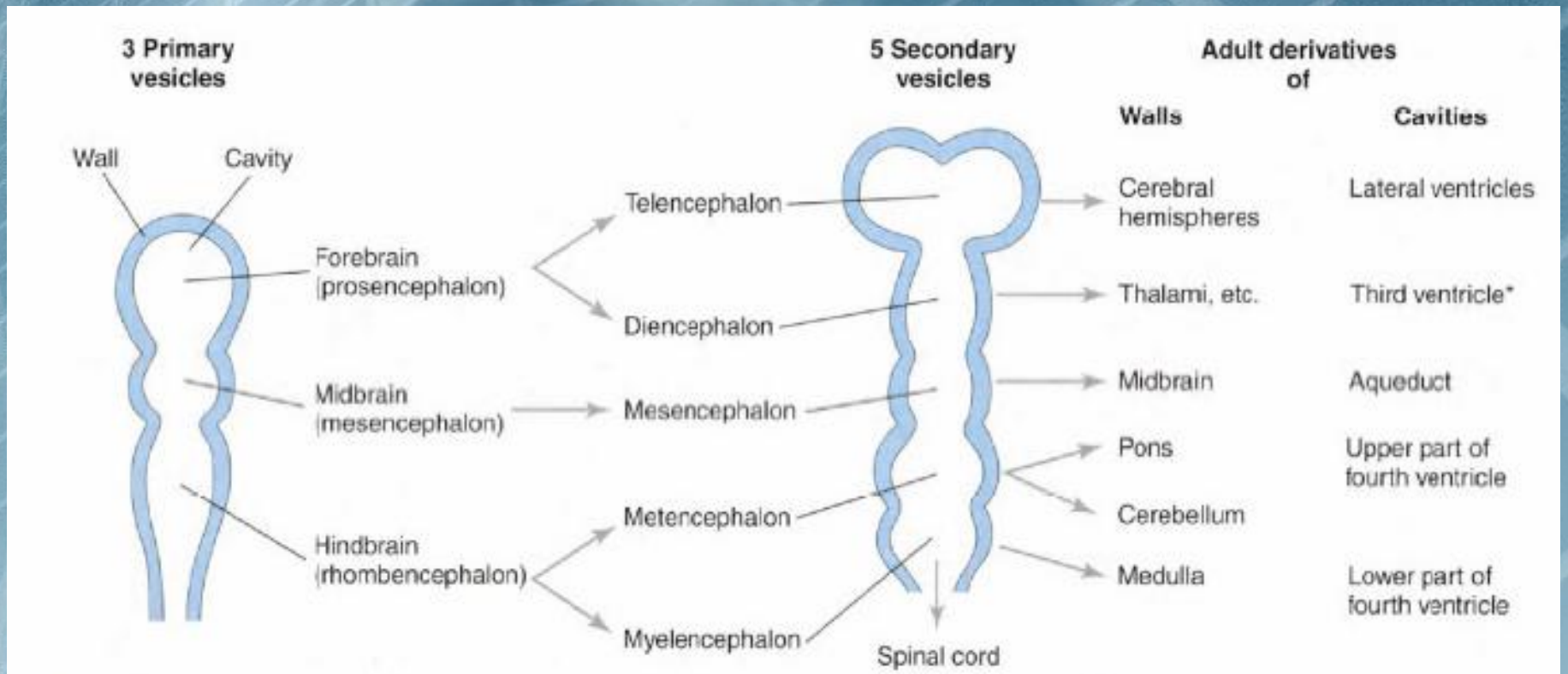
- Mesencephalon ve rhombencephalon arasında **sefalik fleksur**
- Rhombencephalon ve medulla spinalis arasında **servikal fleksur**



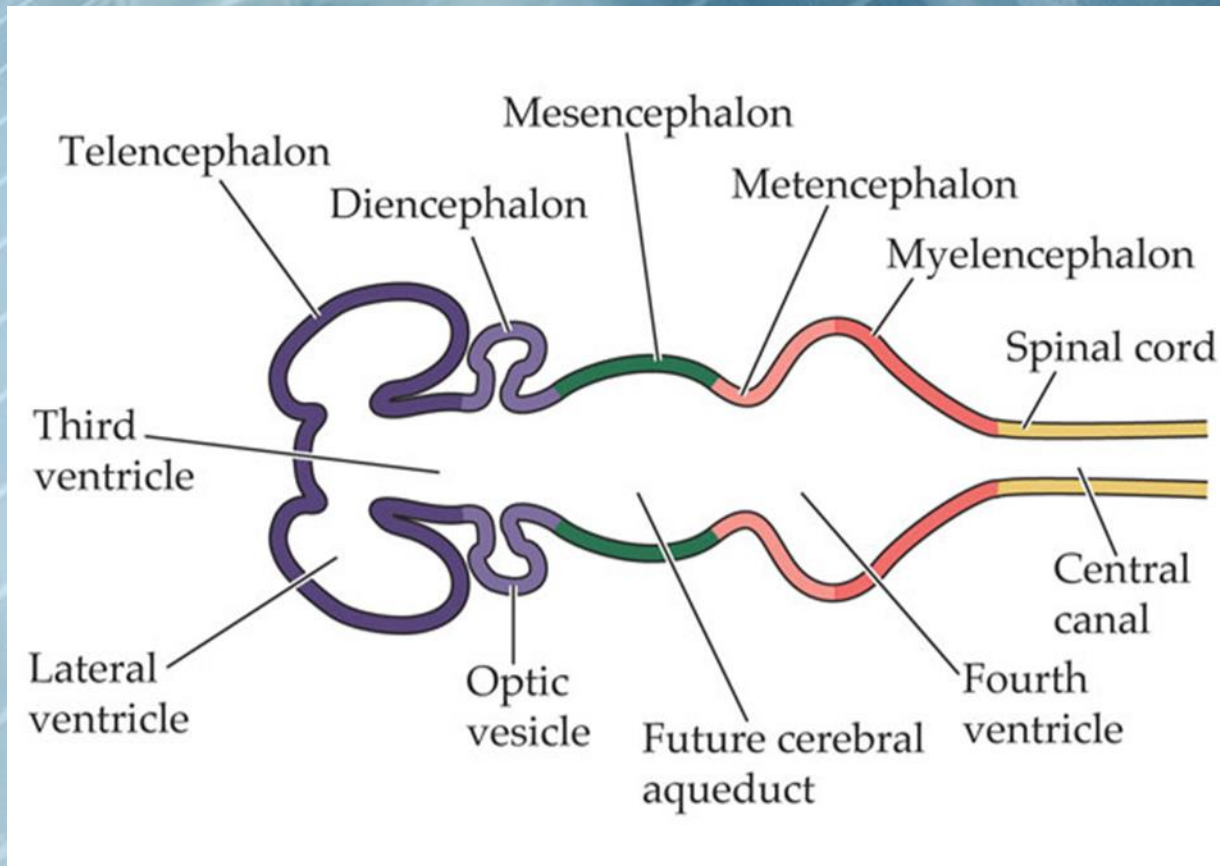
Beynin Gelişimi – 5. hafta



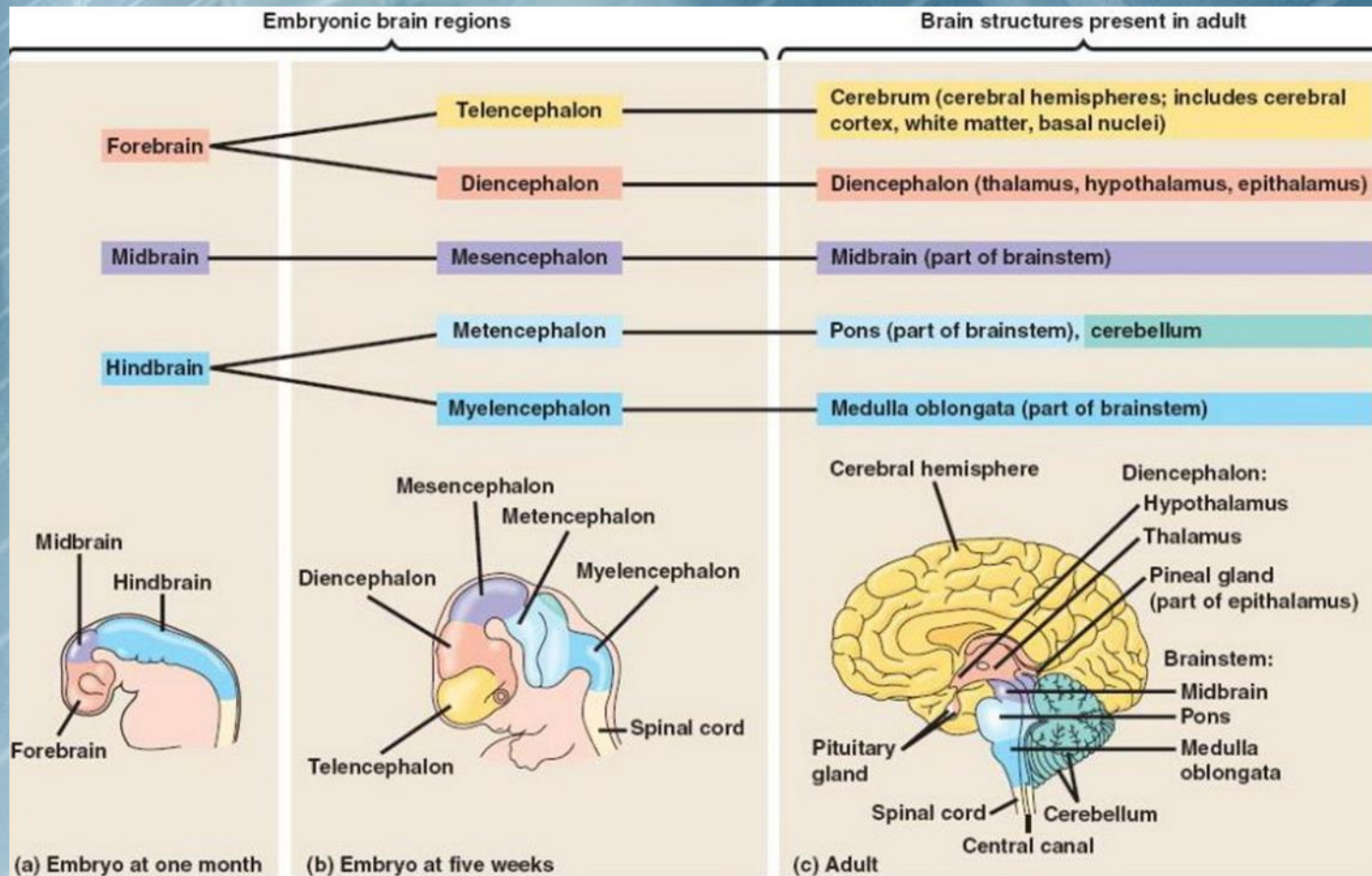
Beynin Gelişimi



Beynin Gelişimi



Beynin Gelişimi





3 weeks



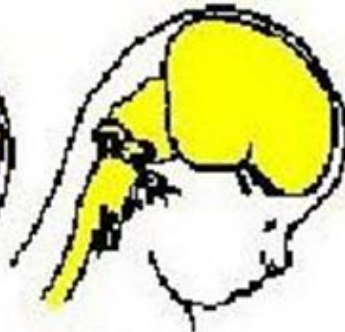
4 weeks



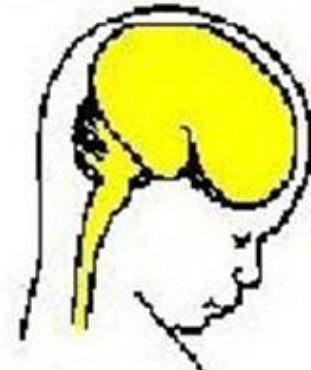
5 weeks



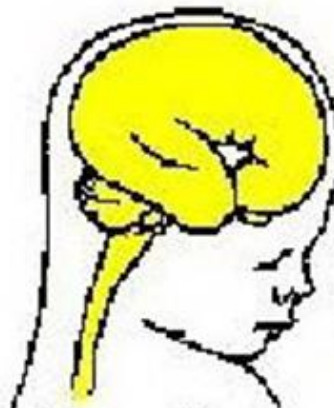
7 weeks



11 weeks



4 months



6 months



8 months



Newborn