

Devolvement of the Head

Embryology

- Develops in two parts
- Neurocranium → associated with the brain
- Viscerocranium → associated with the gut tube

Neurocranium

Parts like Vertebrae

- Develops in relation to the brain
- Brain is the superior end of the neural tube
- Notochord extends as far as the pituitary fossa of the skull
- Part of the skull between foramen magnum and pituitary fossa develops like vertebrae
- Takes stresses of muscle attachments
- Articulates with Atlas and Axis

Parts that grow with Sensory Nerves

1. Nasal Capsule → grows out with olfactory nerve (smell)
2. Optic Capsules → grow out with optic nerves and form orbits (vision)
3. Otic Capsules → grows out with vestibulocochlear nerves and form bony parts of the ear (inner and middle)

Bones that develop as Dermal Bone

- Bones in skin
- Sutures are gaps between bone filled with connective tissue, become ossified when growth is complete
- E.g. Skull

Viscerocranium

- Forms lower part of face and develops along the openings of the gut tube

- Pharyngeal arches
- Closely associated with brain, each arch has a corresponding cranial nerve
 - Arch 1 = Trigeminal (V)
 - Arch 2 = Facial (VII)
 - Arch 3 = Glossopharyngeal (IX)
 - Arch 4/5 = Vagus (X)
 - Arch 6 = Spinal Accessory (XI)
- All arches associated with the head

Evolution

Jawless fish

Neurocranium = braincase with capsules

1. Nasal
2. Optic
3. Otic

Viscerocranium = mouth and gills

- Pharyngeal arches

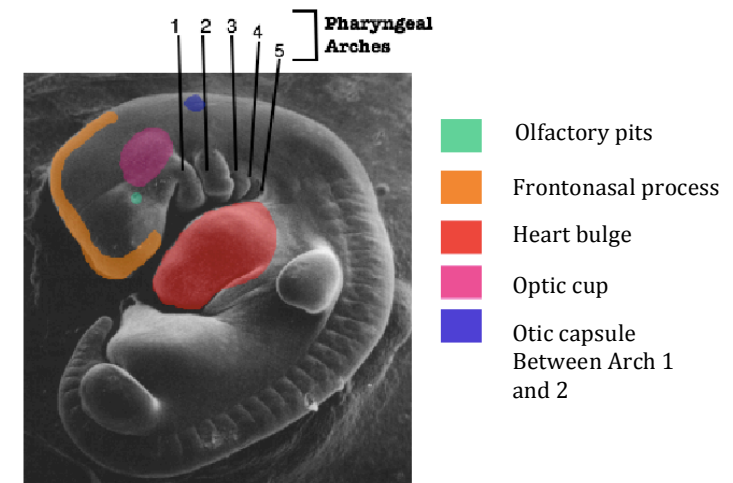
Jawed fish

- 1st pharyngeal arch becomes upper and lower jaws
- In land animals same features present, but no gills, arches near associated with jaws, hyoid bone and laryngeal arches

Four Week Embryo

- Folding important for rearranging of oral membrane, brain and heart
- Segmental somites and developing vertebrae
- Tail
- Umbilical cord
- Large heart bulge
- Limb buds look like paddles
- Head consists of:
 - Rapidly growing frontonasal process

- Pharyngeal arches
 - 1st has maxillary and mandibular swellings (Meckel's Cartilage) Becomes ear, mandible, maxilla, muscles of mastication
 - 2nd is the hyoid, becomes Styloid process, lesser horns of hyoid and muscles of facial expression
 - 3rd arch becomes body and greater hyoid horns, and the stylopharyngeal muscles
 - 4th, 5th and 6th arches become laryngeal cartilages



- Olfactory pits widely separated
- Optic cup sits lateral