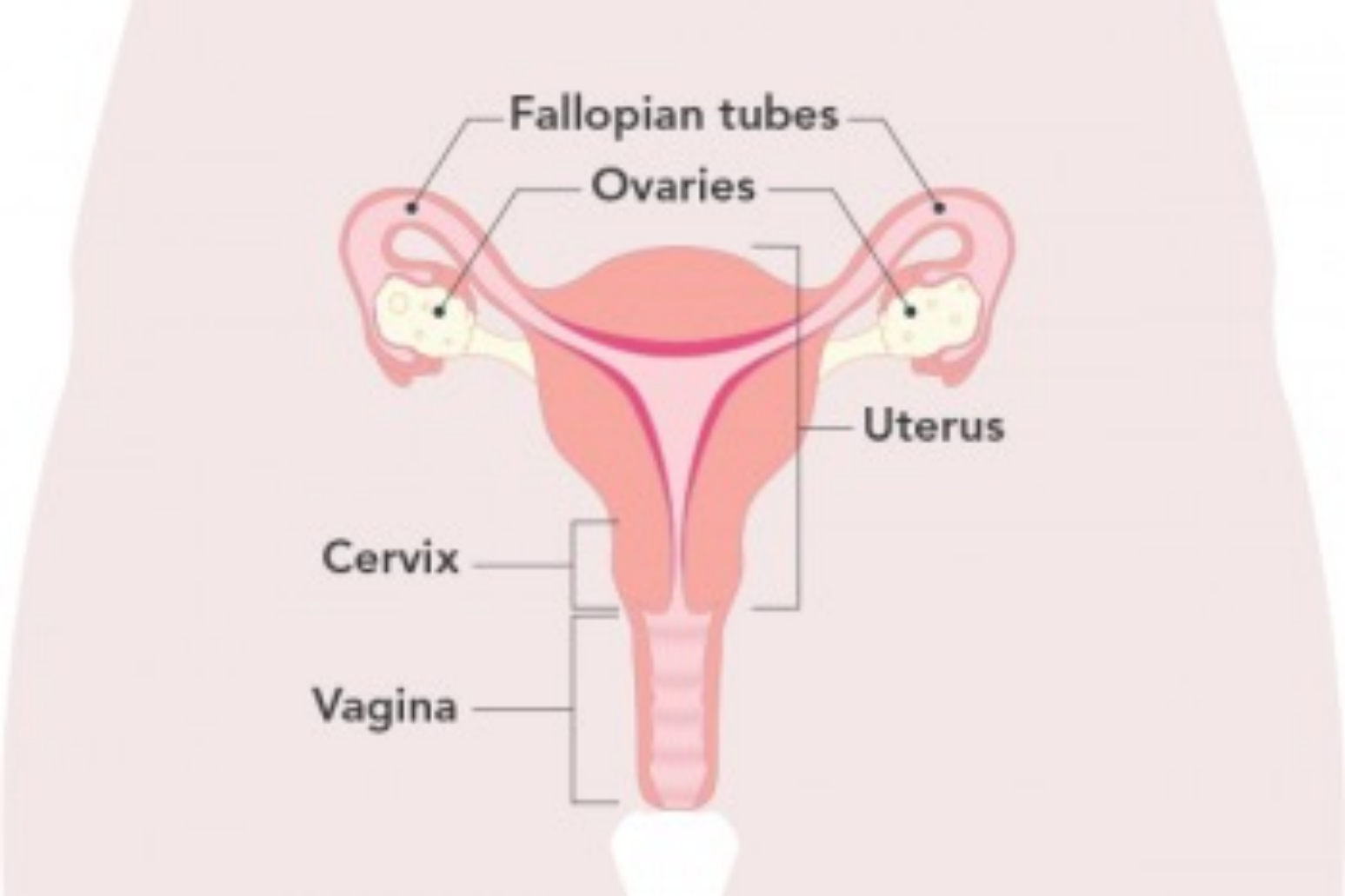


Embryology of the head and neck

By Marte Rydland

PLAN

- 1) Pharyngeal arches
- 2) Pharyngeal pouches
- 3) Pharyngeal clefts
- 4) Development of the face
- 5) Development of the tongue
- 6) Development of the thyroid



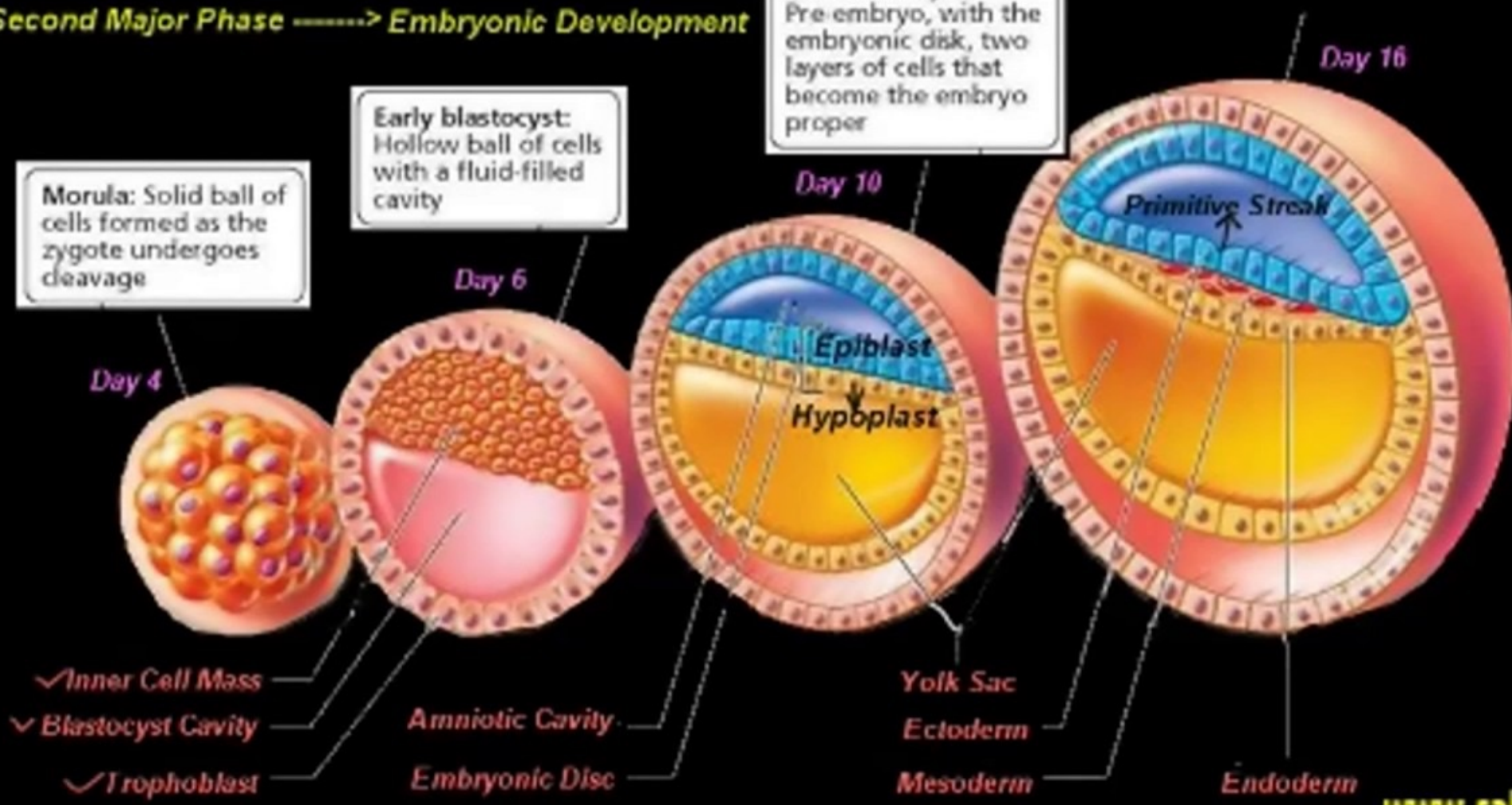
Gastrulation

Second Major Phase -----> Embryonic Development

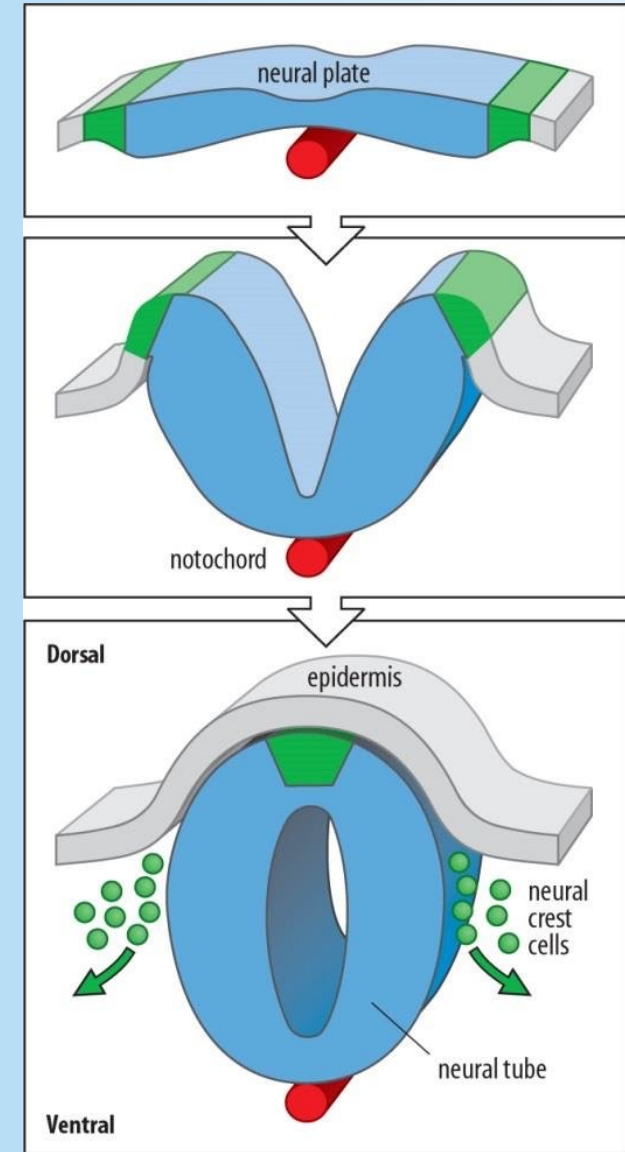
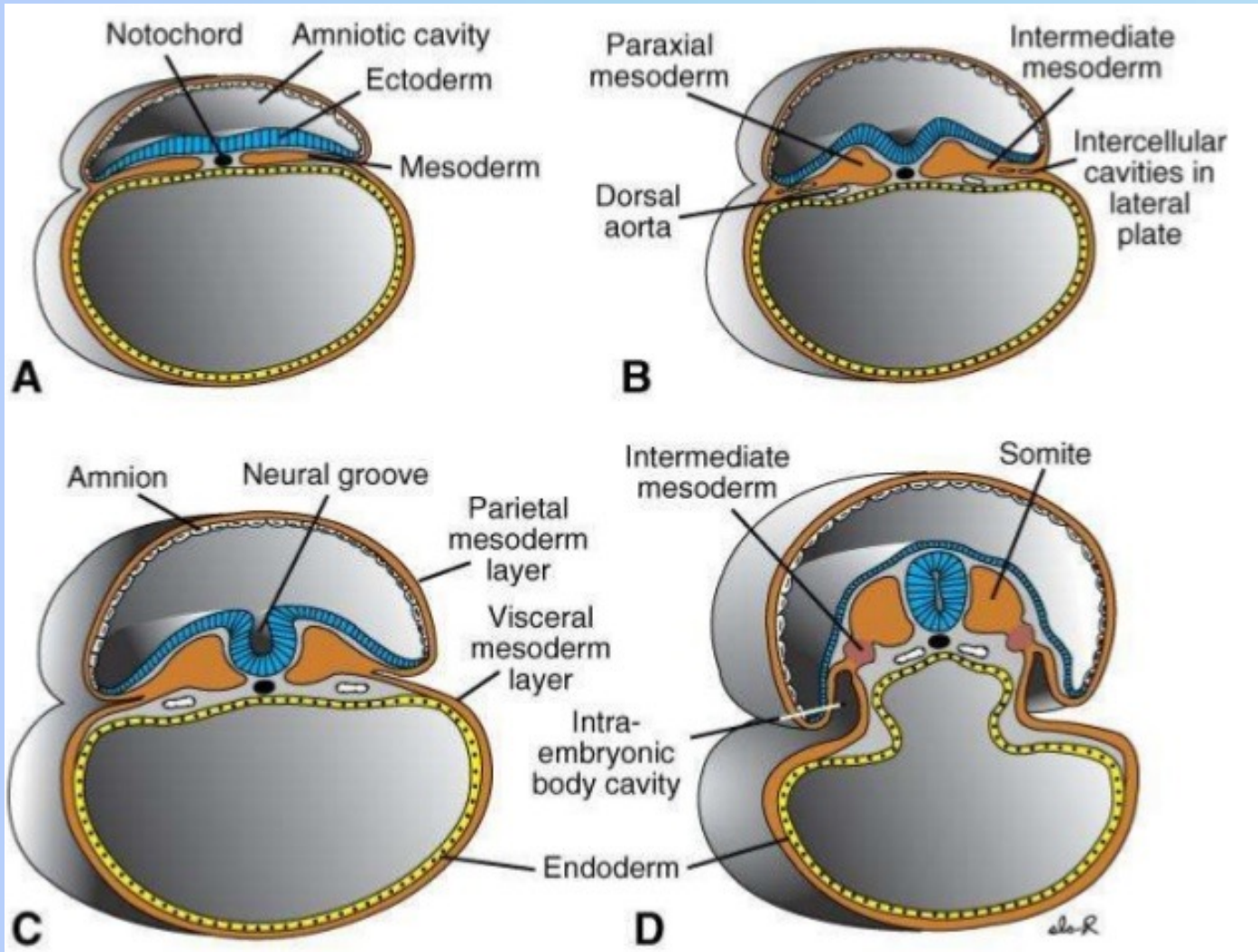
Morula: Solid ball of cells formed as the zygote undergoes cleavage

Early blastocyst: Hollow ball of cells with a fluid-filled cavity

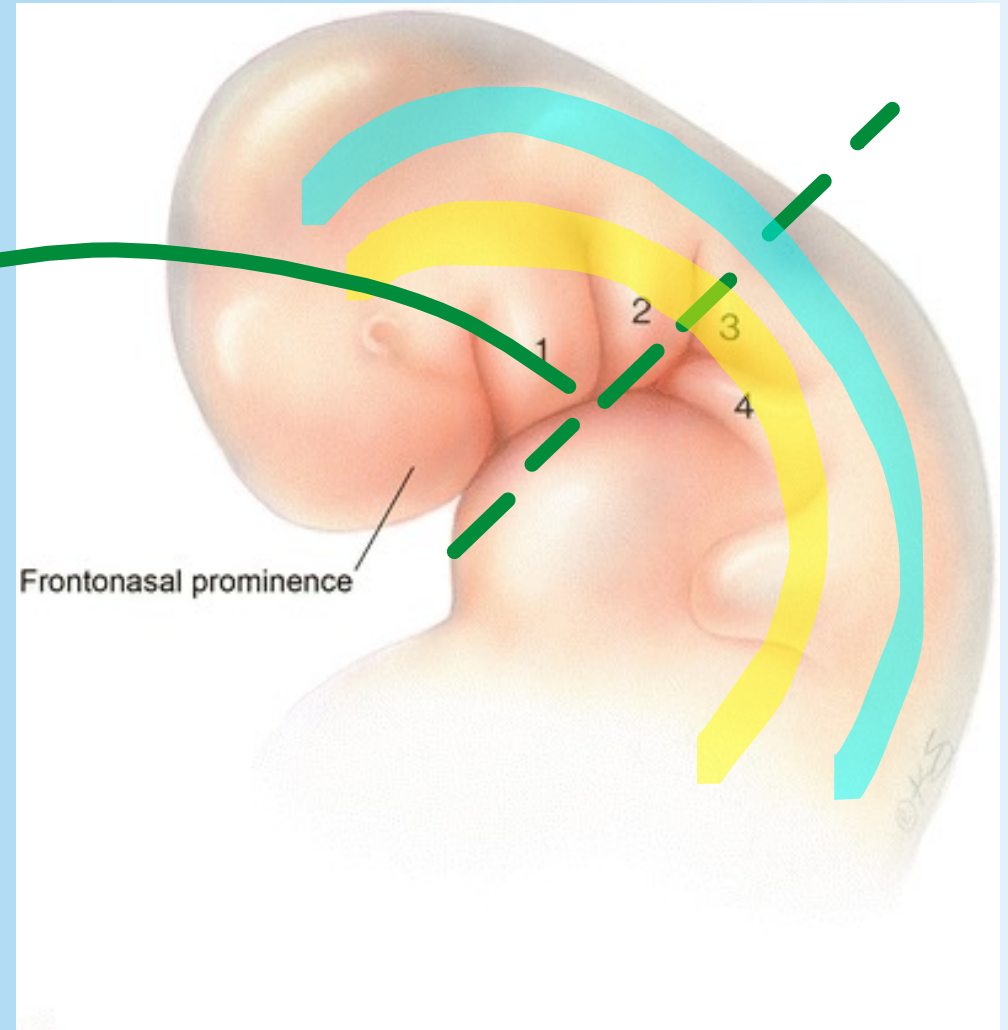
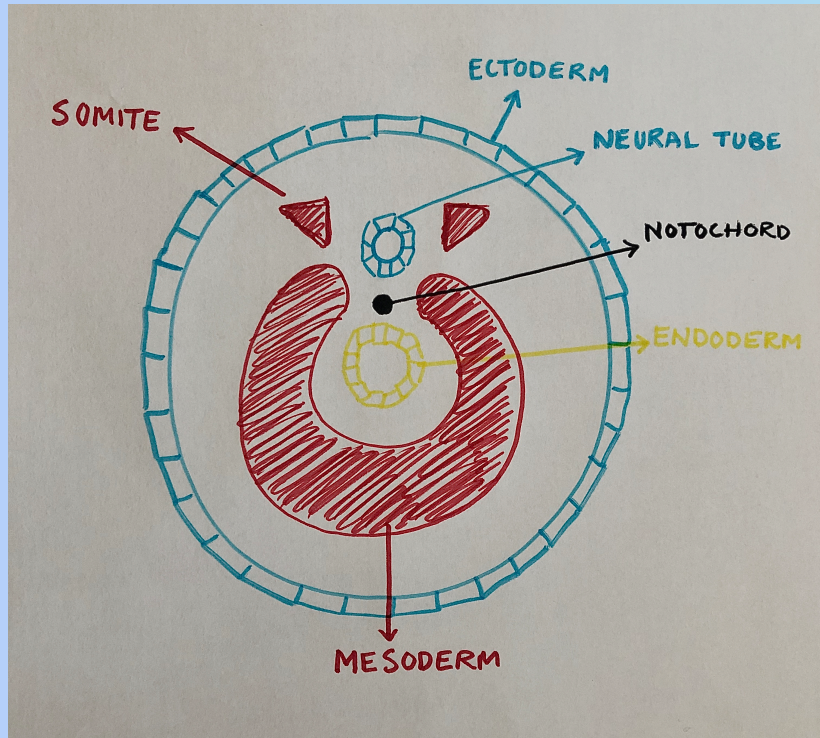
Late blastocyst: Pre-embryo, with the embryonic disk, two layers of cells that become the embryo proper



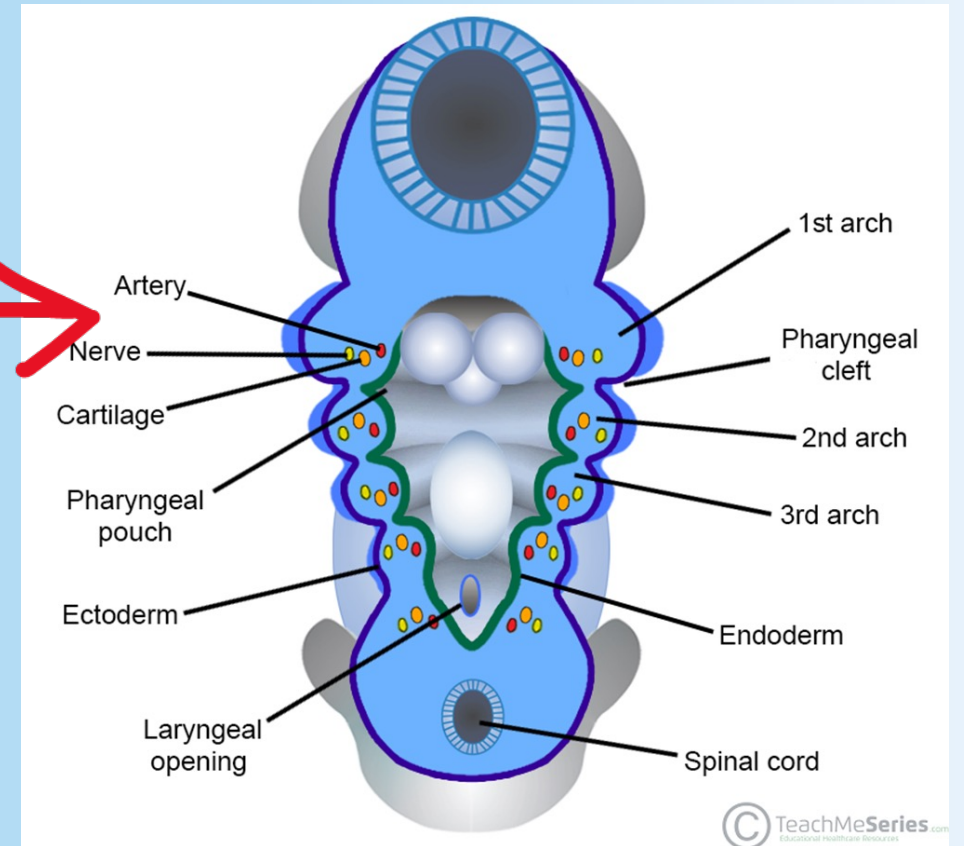
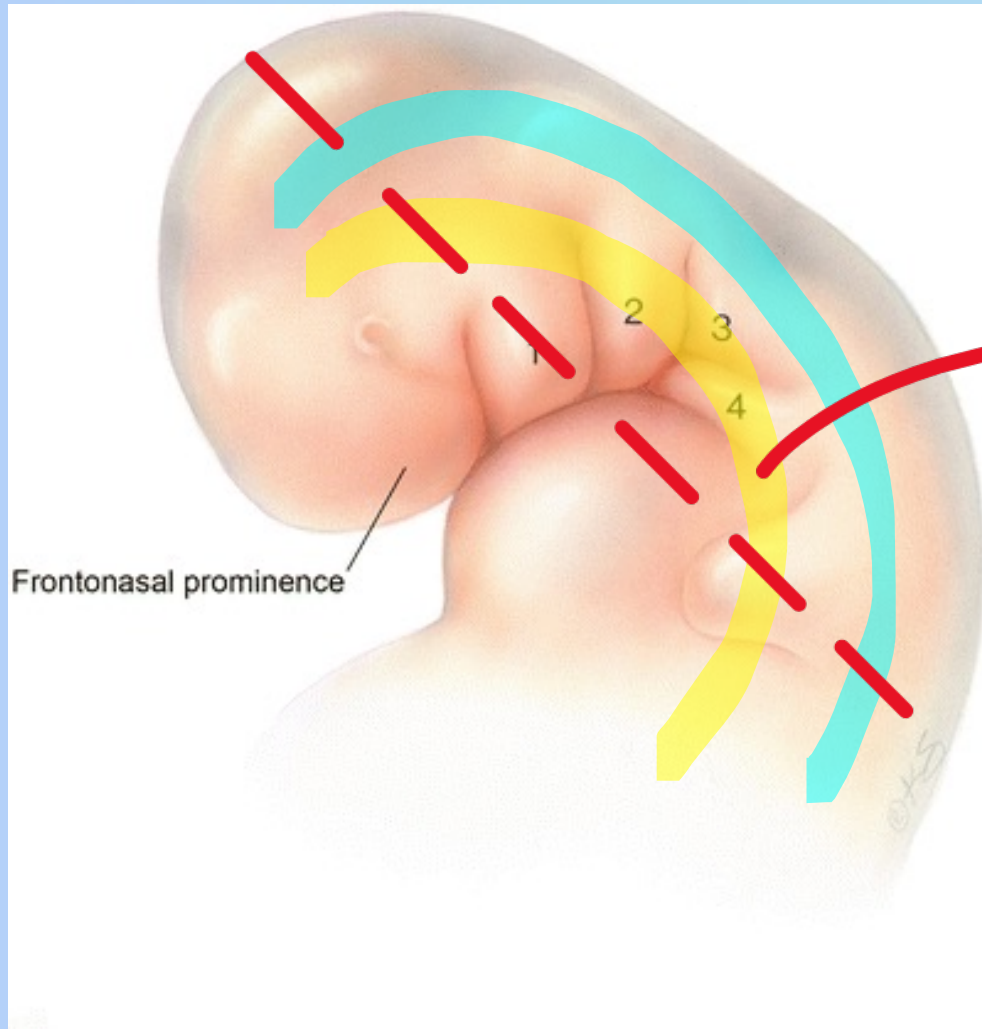
Neurulation:



What are you looking at?

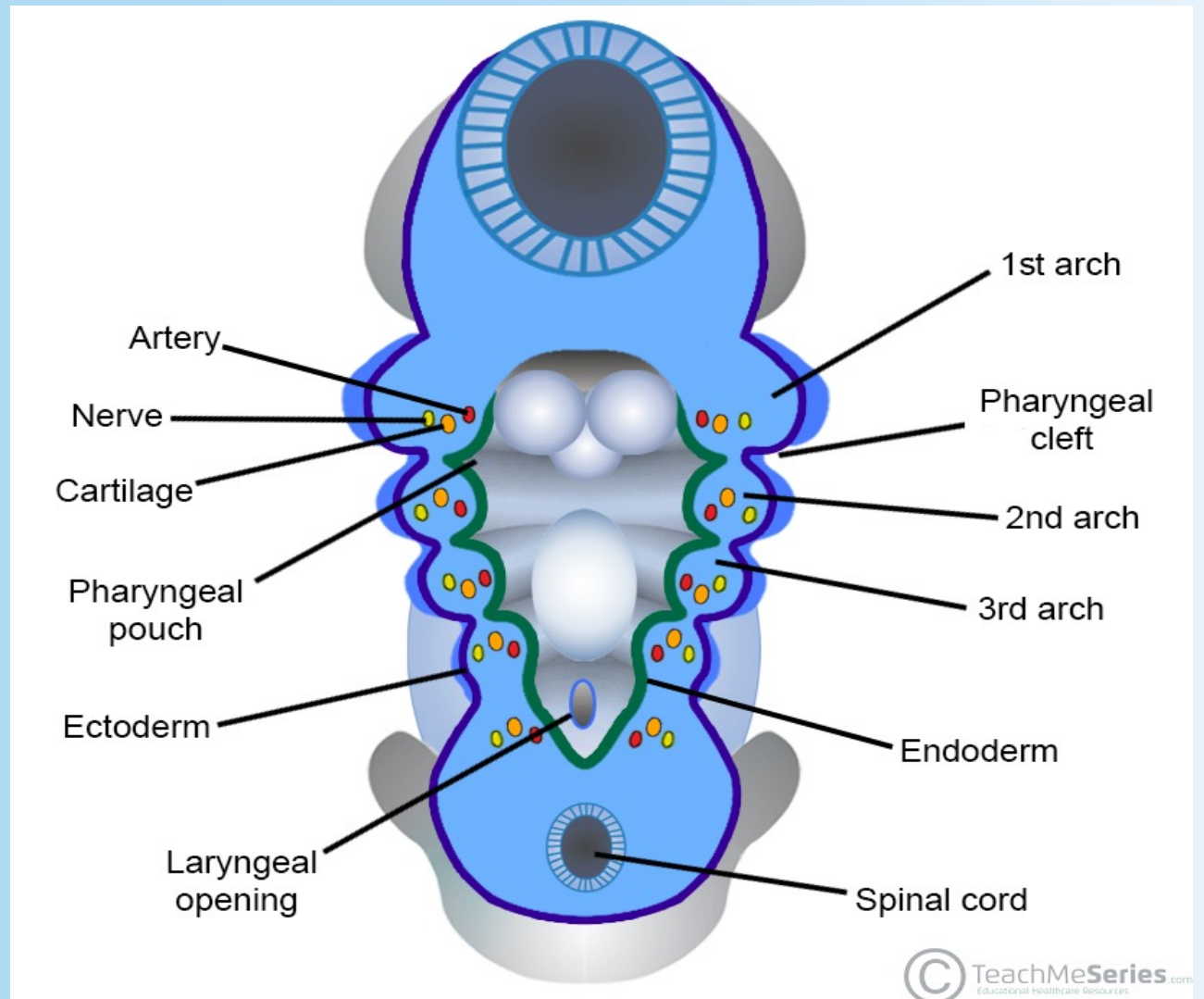


What are the pharyngeal arches?



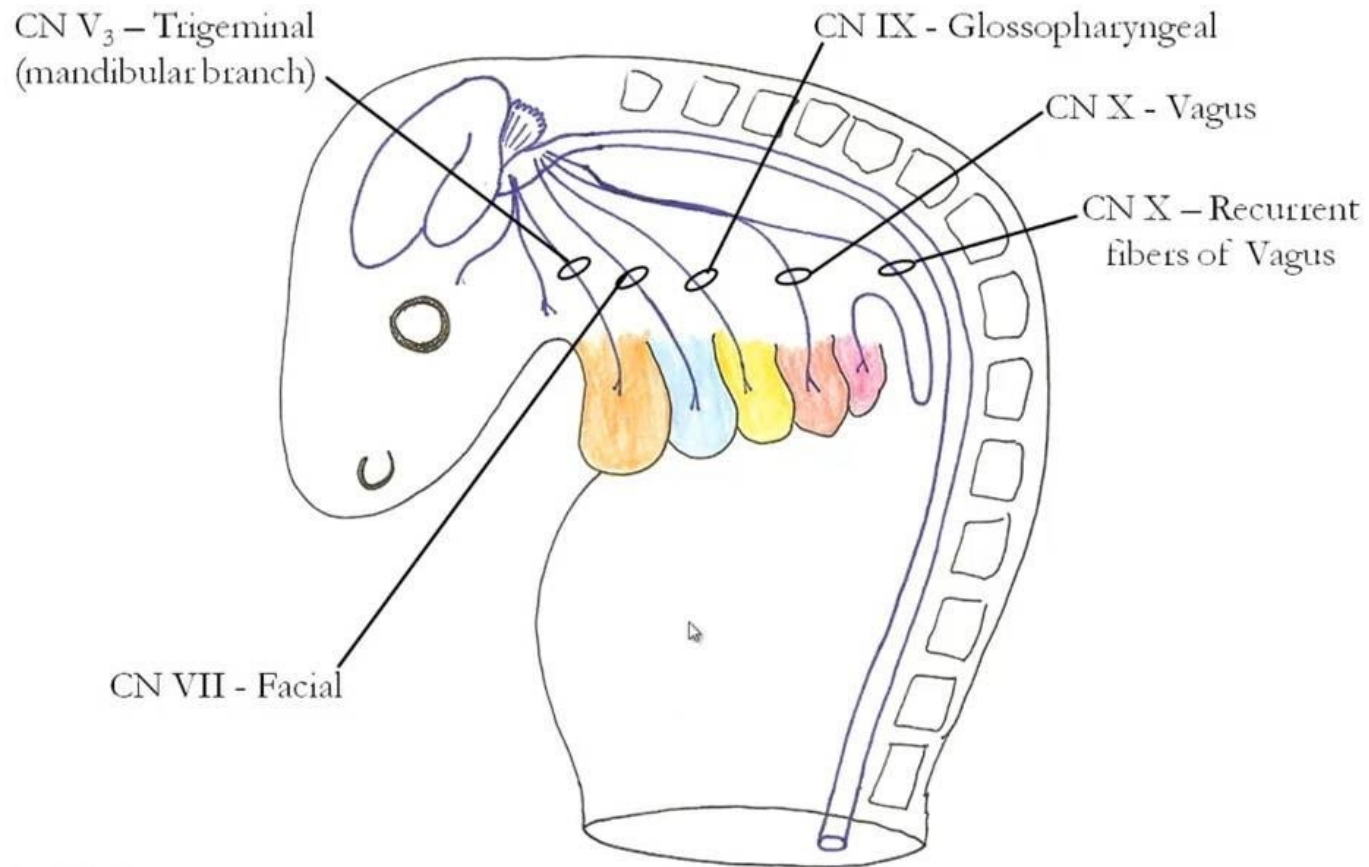
Pharyngeal arches

- Mesoderm
- 5 arches: I-VI
- 4 weeks
- Contains:
 - Artery
 - Nerve = cranial nerve
 - cartilage



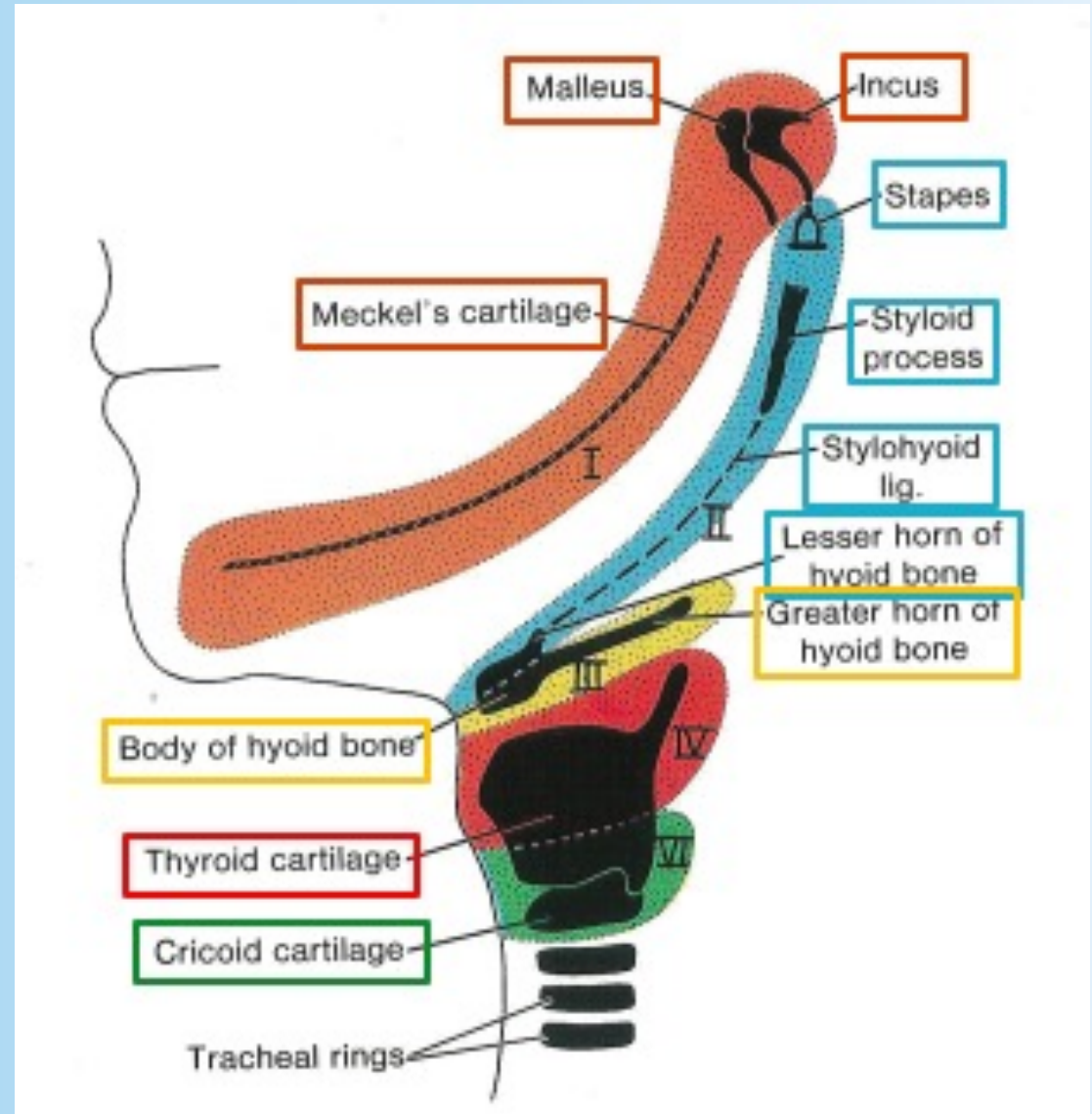
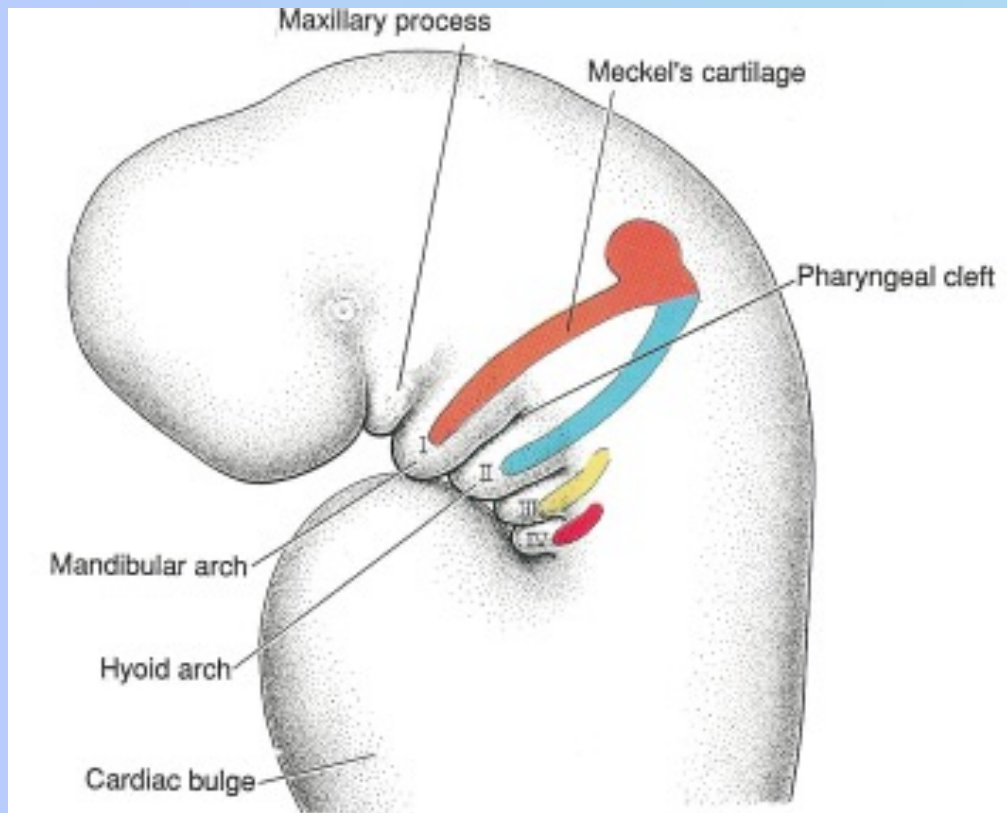
What do they form?

Pharyngeal Arch Muscles and their Innervation

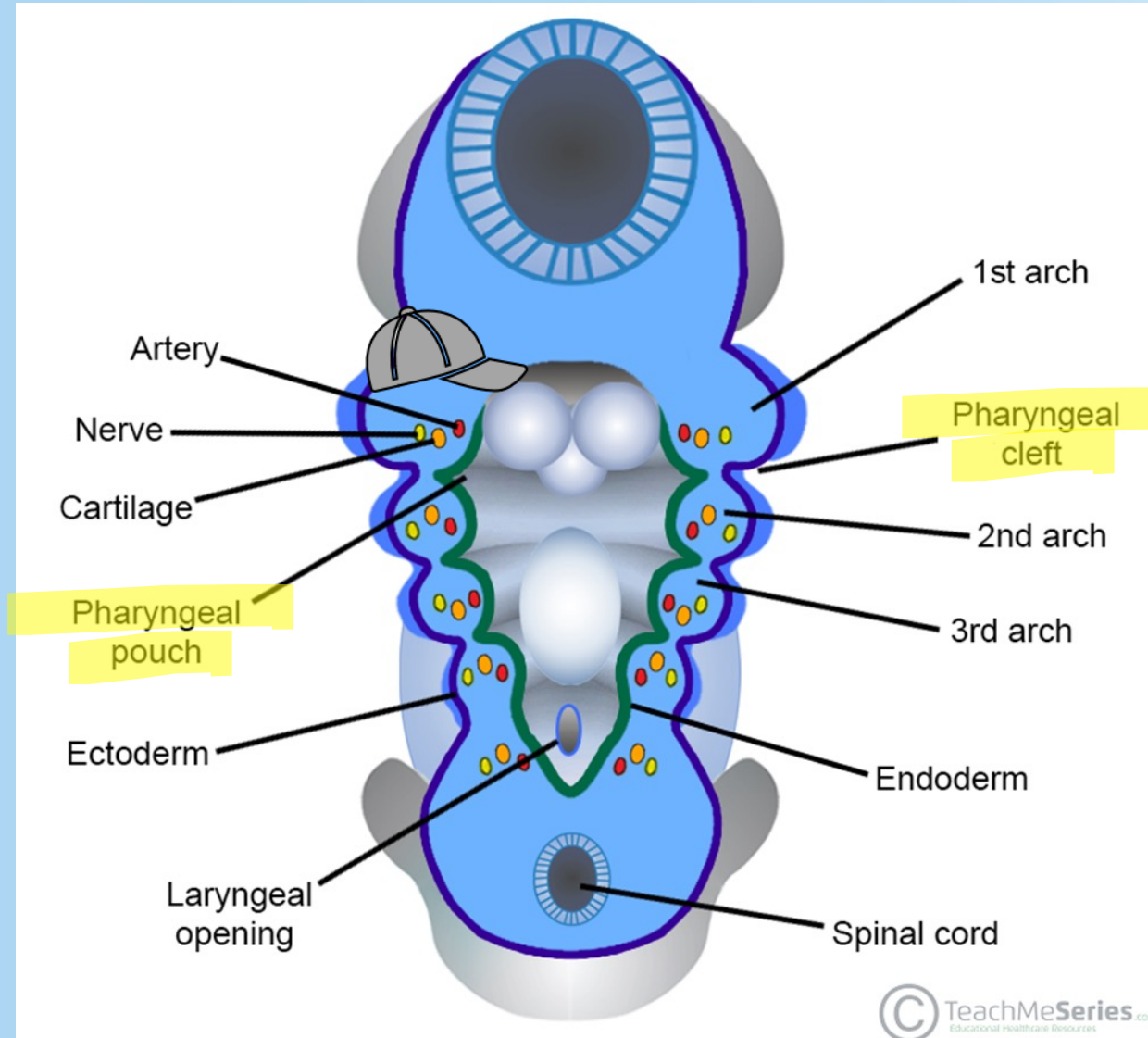


Arch	Cranial nerve	Muscle	Cartilage/bone	Artery
1	V2 + V3	Mastication Ant. belly of digastric Mylohyoid Tensor palatine Tensor tympani	Meckel's cartilage Maxilla Zygomatic Temporal bone (squamous part) Mandible Malleus Incus	Maxillary artery
2	VII	Facial expression Post. belly of digastric Stylohyoid Stapedius	Stapes Styloid process Stylohyoid ligament Hyoid bone – Lesser horn Superior body of Hyoid	Stapedial artery Hyoid artery
3	IX	Stylopharyngeus	Hyoid bone – Greater horn Inferior body of Hyoid bone	Common carotid artery Internal carotid artery
4	X Superior laryngeal branch	Cricothyroid muscle All soft palatal mm (except stylopharyngeus and tensor palatine)	Thyroid cartilage	Arch of aorta Right subclavian artery
6	X Recurrent laryngeal	All intrinsic mm of larynx (except for cricothyroid)	Cricoid cartilage Arytenoid cartilages Corniculate cartilage Cuneiform cartilage	Ductus arteriosus Pulmonary artery

BONES

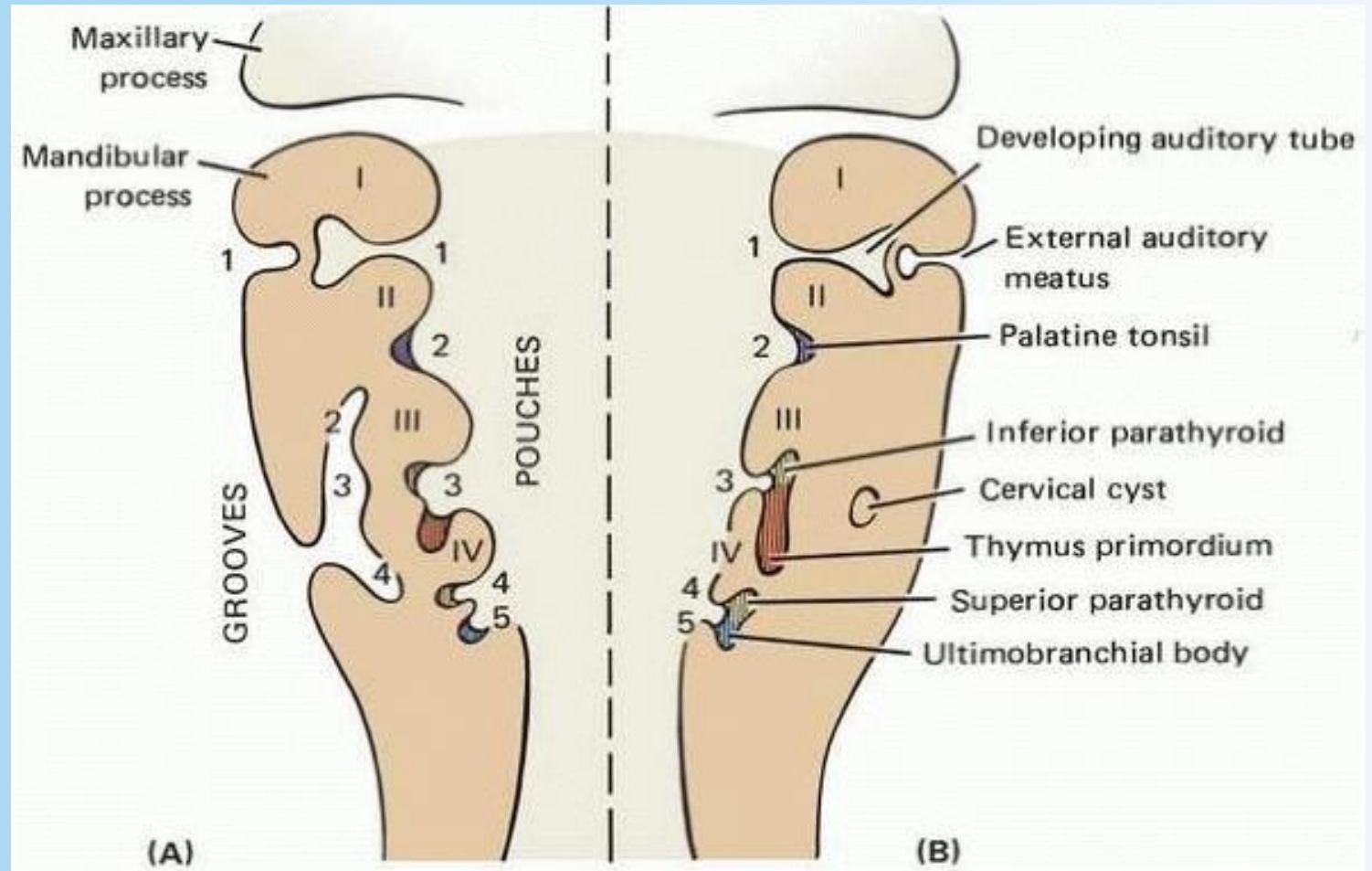


Pharyngeal clefts and pouches



What the pouches and clefts forms:

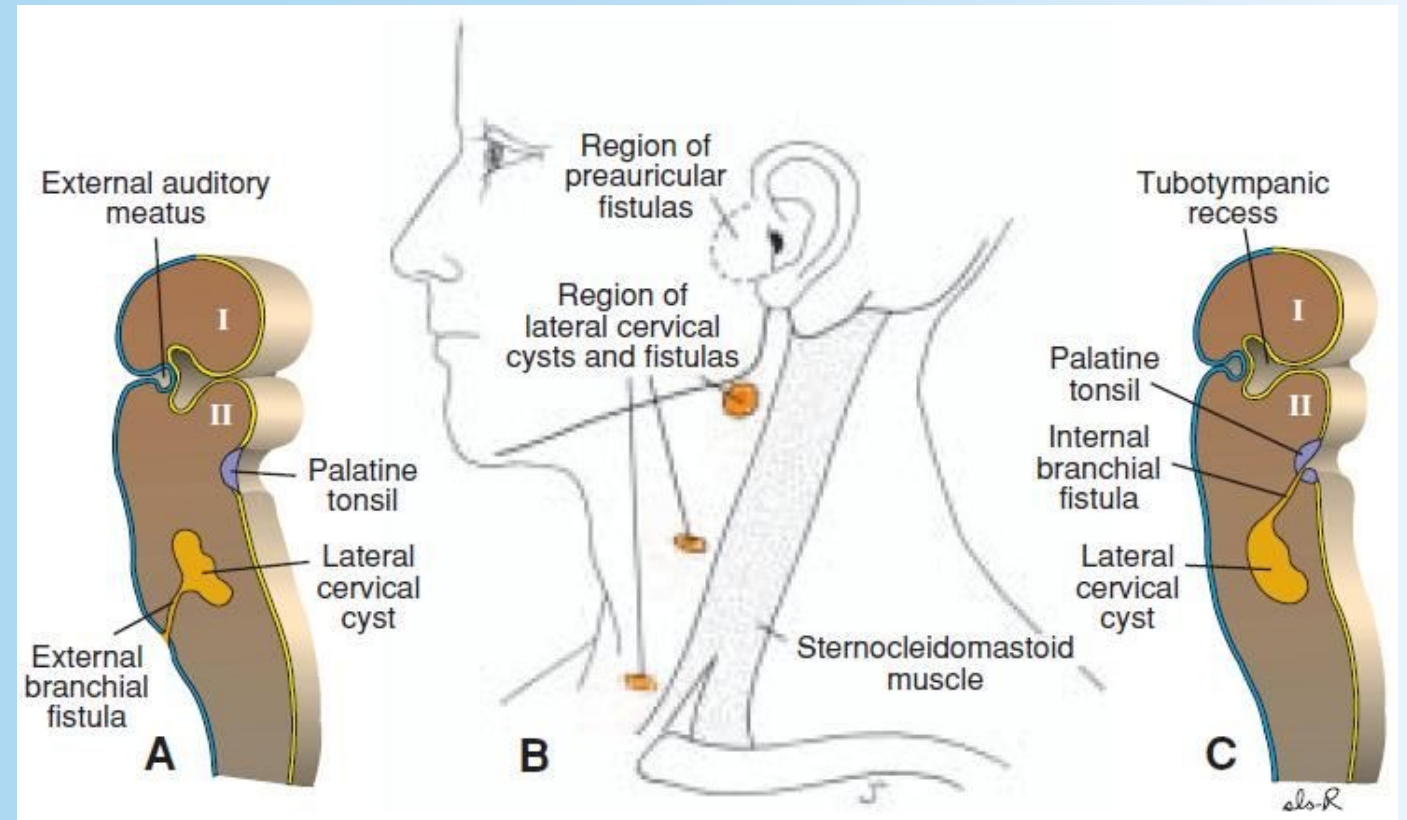
- 4 pouches
 - 5th is rudimentary
- 4 clefts
 - 2nd, 3rd, 4th overgrown by 2nd pharyngeal arch

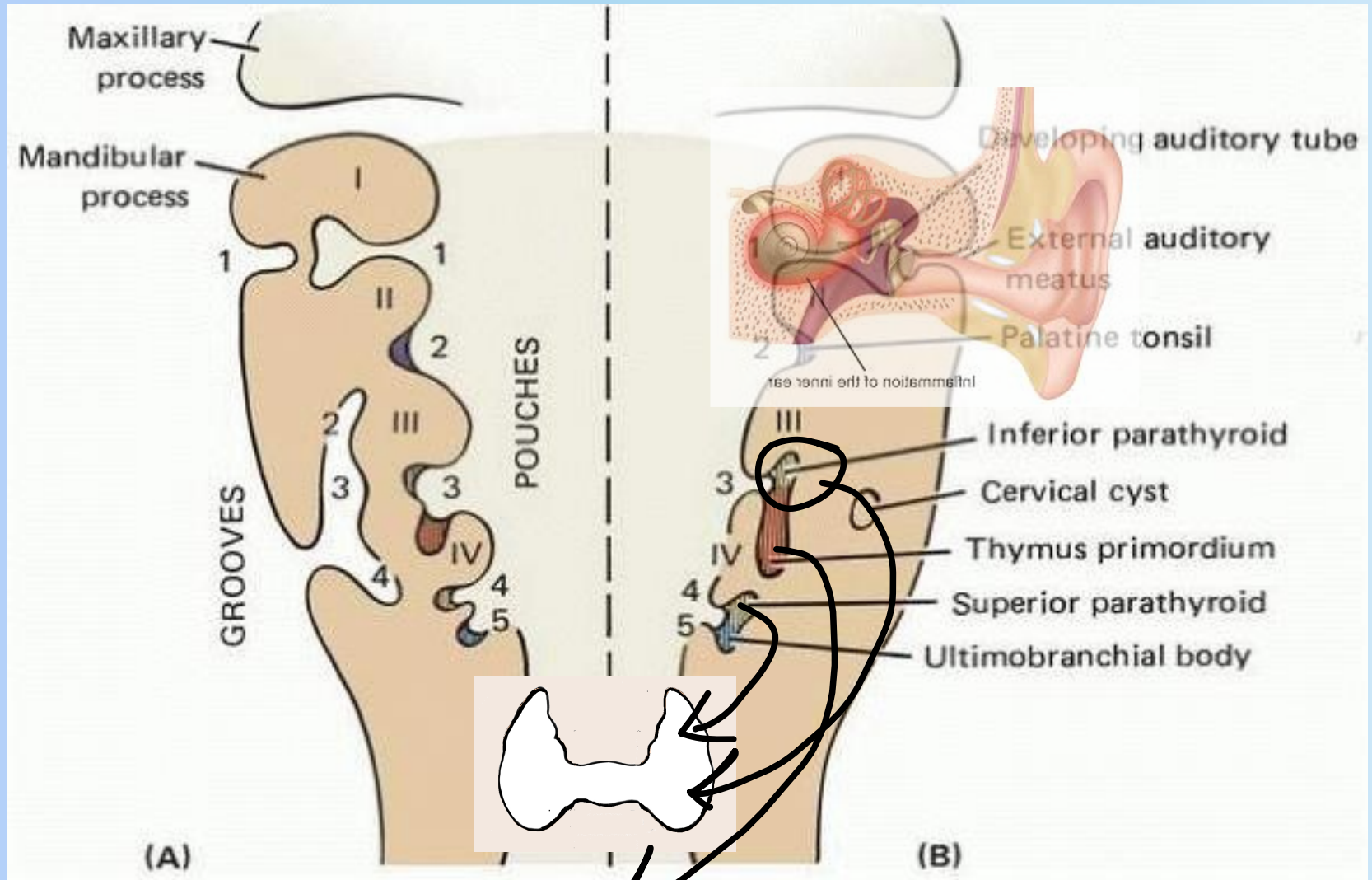


CERVICAL SINUS

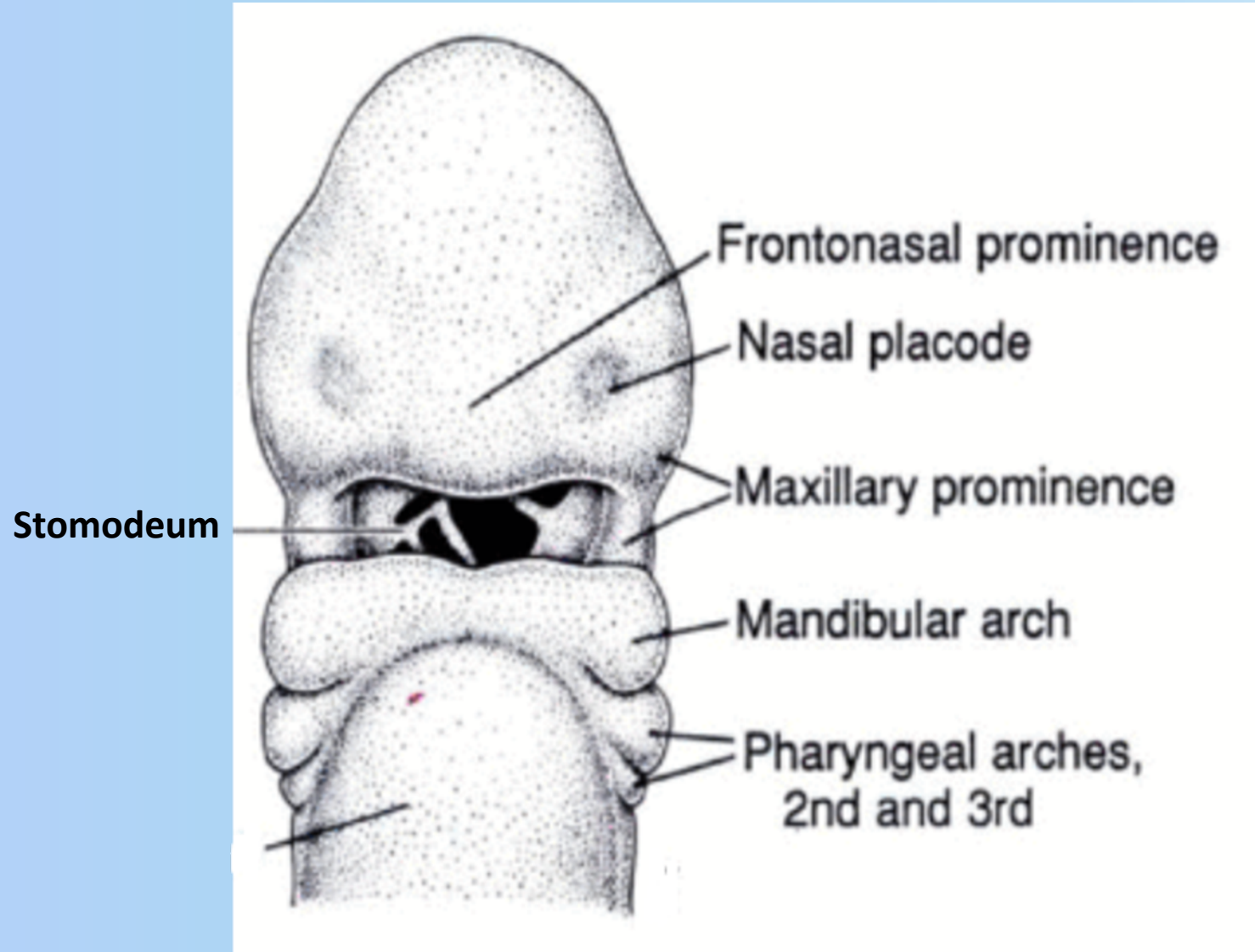
= failure of the cervical sinus to close

- Branchial cysts
- Branchial fistula



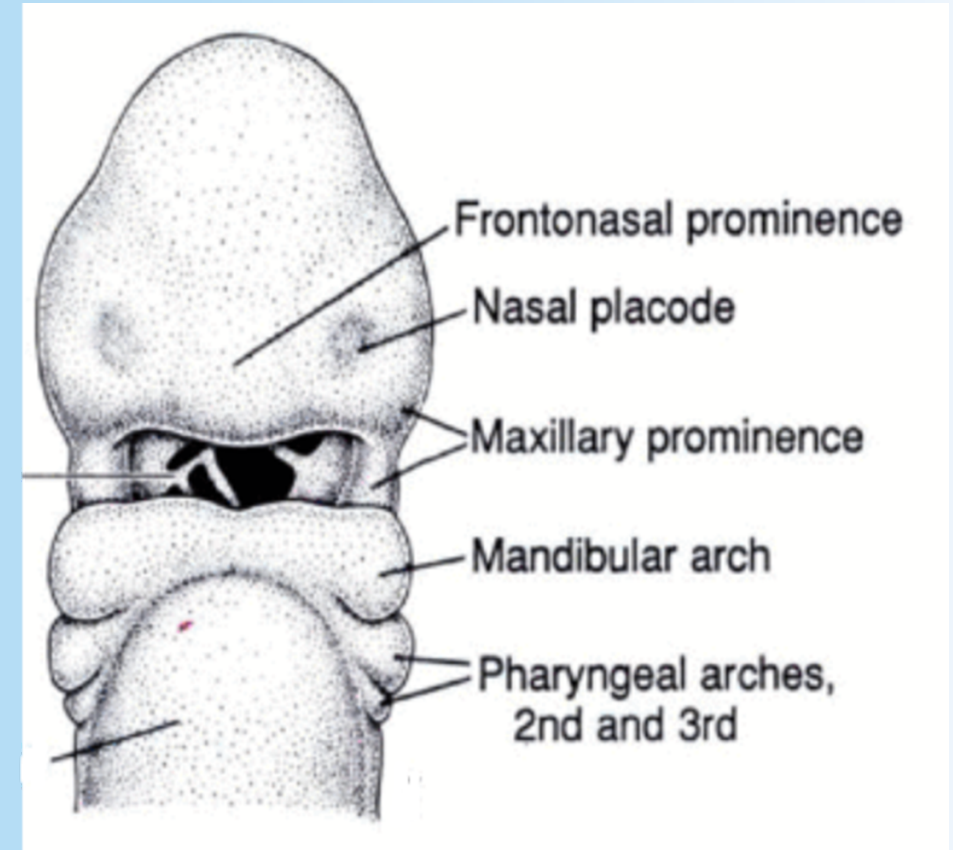


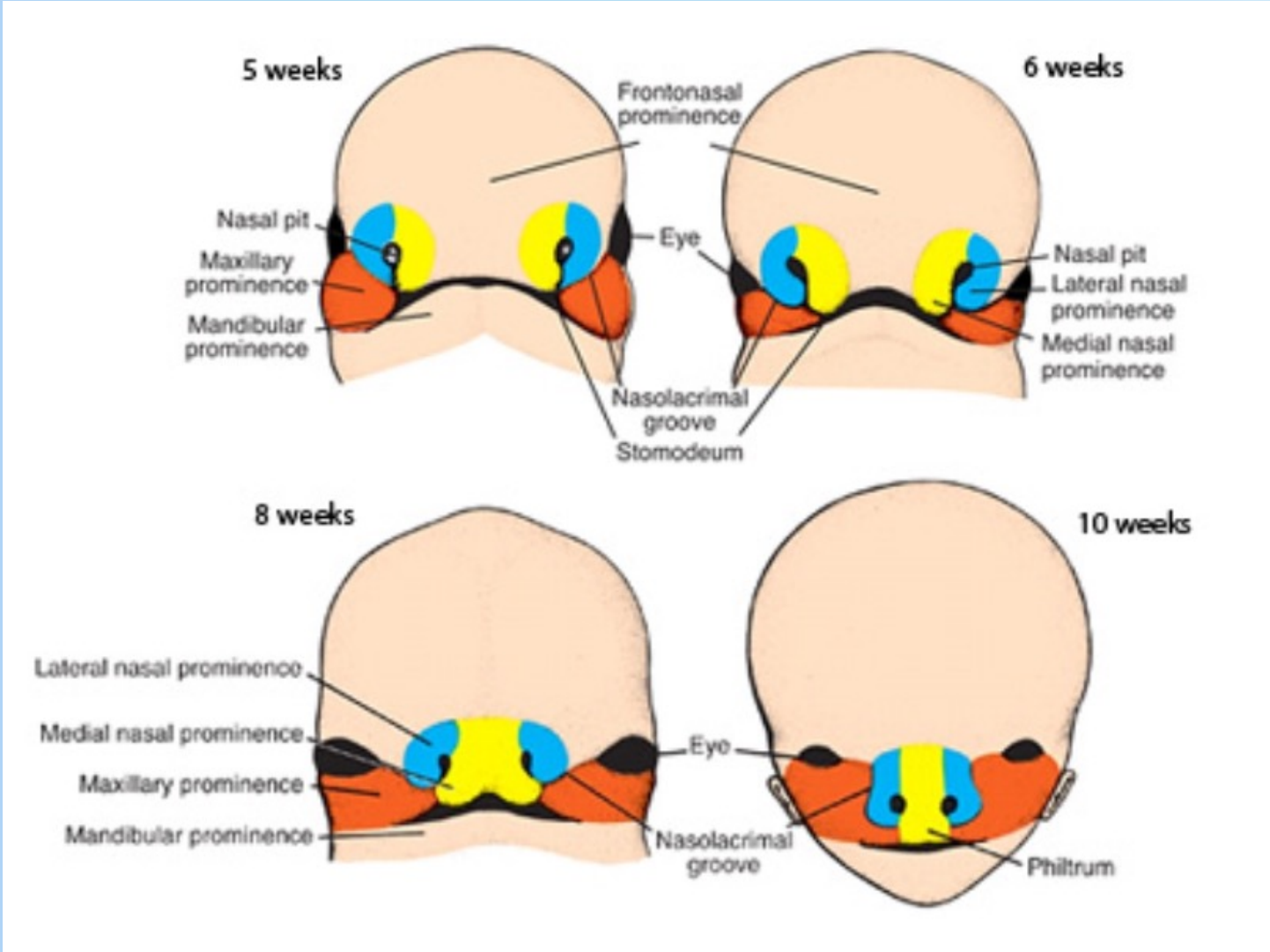
Development of the face

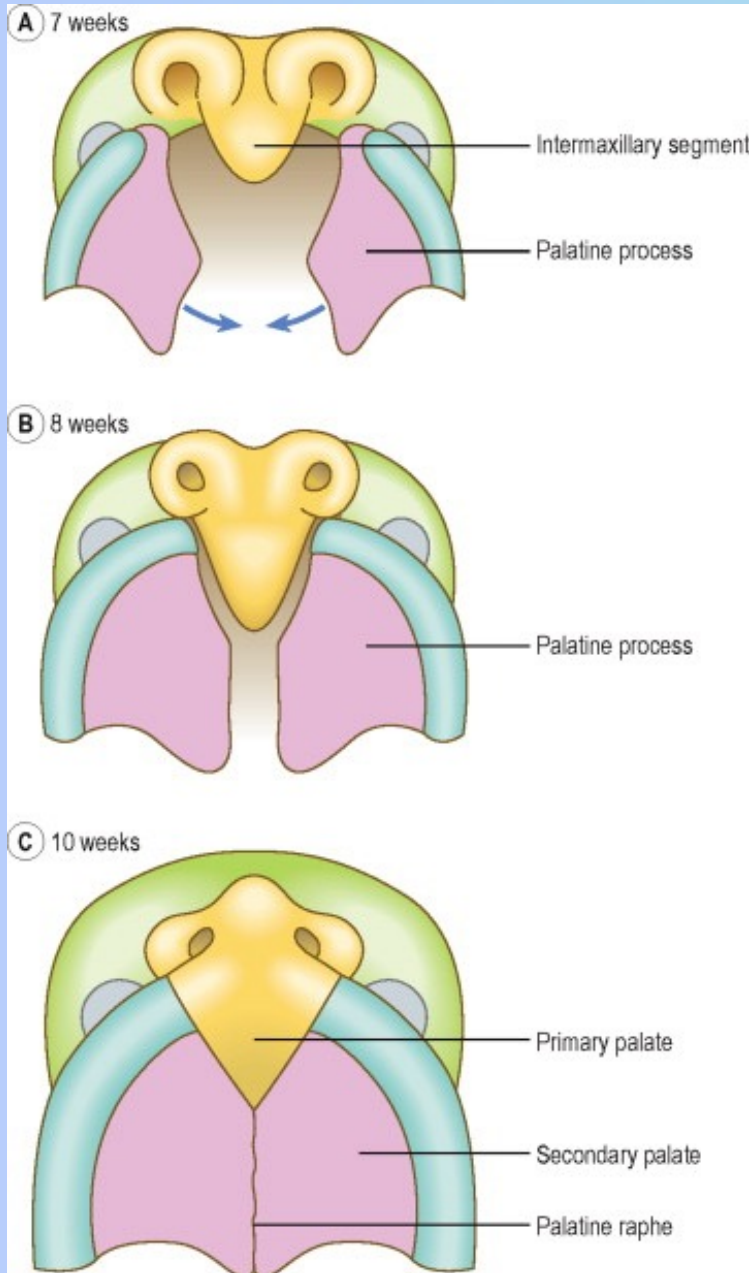


5 prominences:

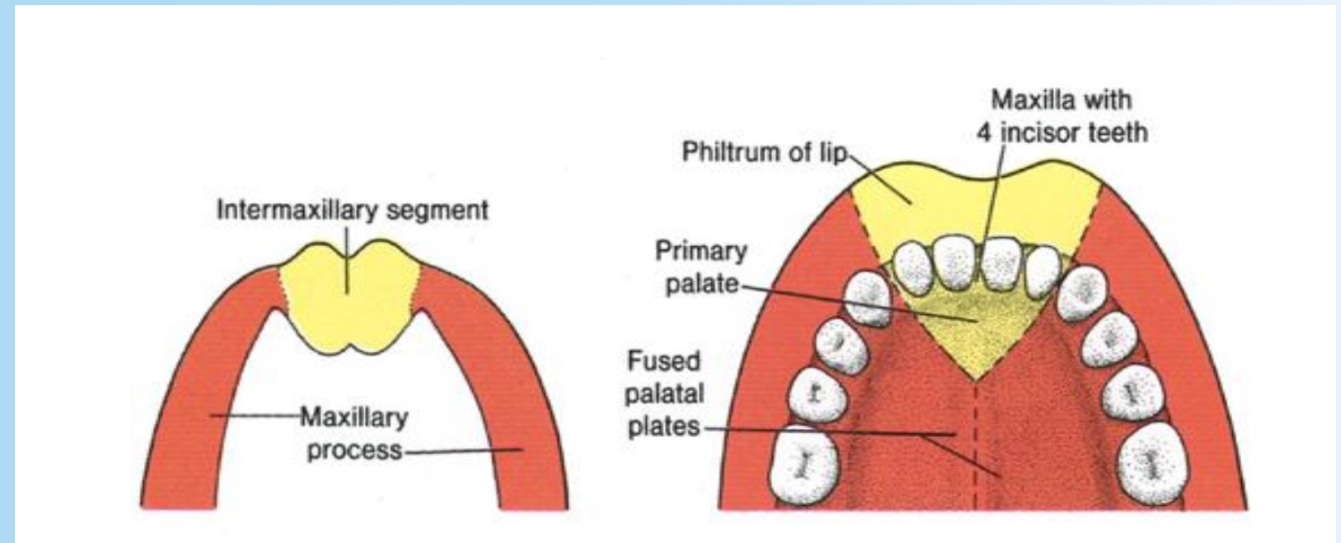
1	FRONTONASAL PROMINENCE	Forehead Nasal septum
2	MEDIAL NASAL PLACODE	Nasal dorsum and apex Philtrum Primary palate
3	LATERAL NASAL PLACODE	Nasal alae
4	MAXILLARY PROMINENCE	Upper cheek Upper lip Secondary palates
5	MANDIBULAR PROMINENCE	Jaw Lower cheek Lower lip





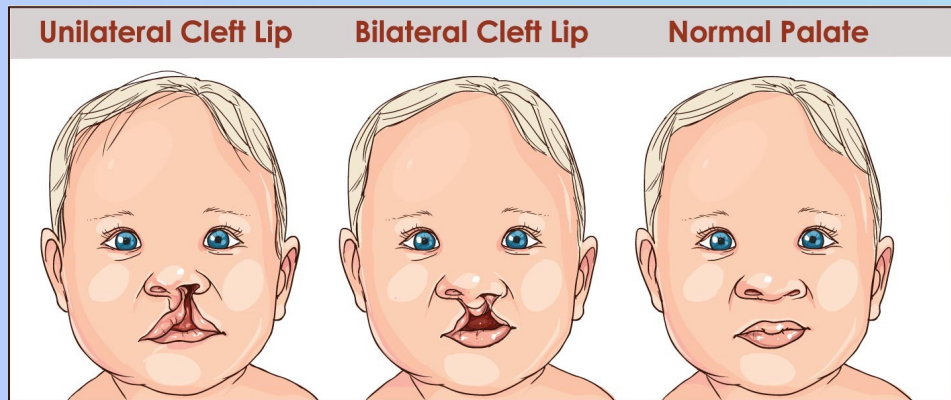


- Primary palate = medial nasal placode
- Secondary palate = maxillary prominence



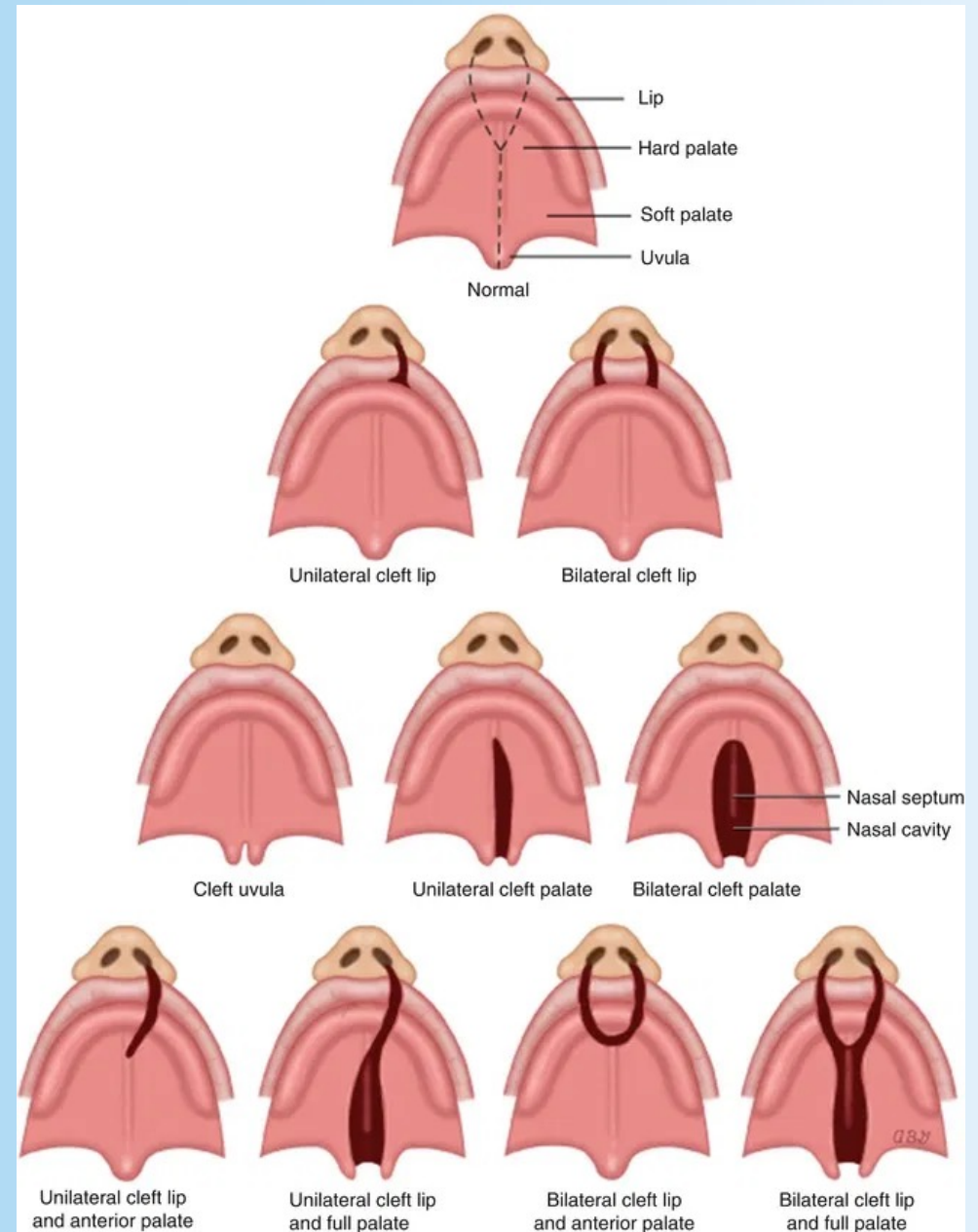
FAILURE TO FUSE

- CLEFT LIP



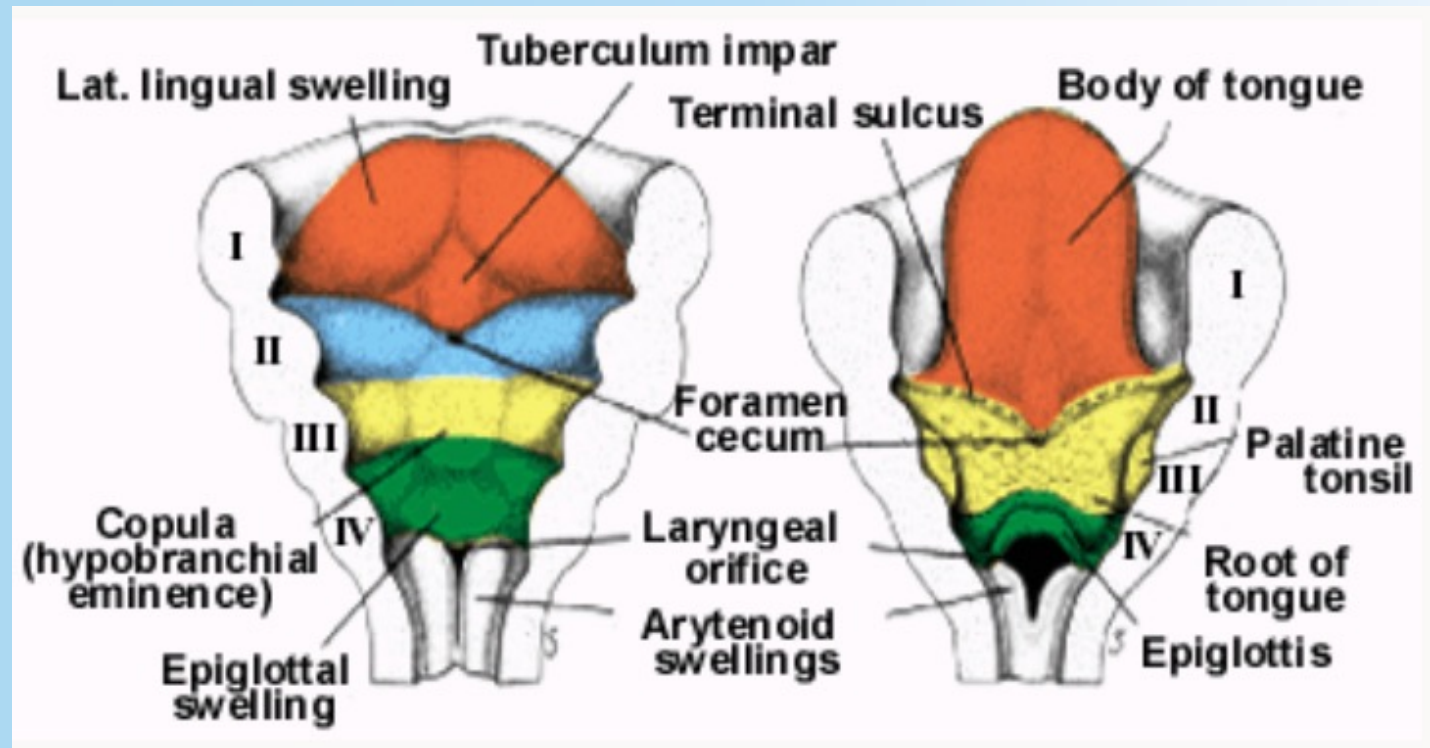
- CLEFT PALATE

- Anterior
- Posterior



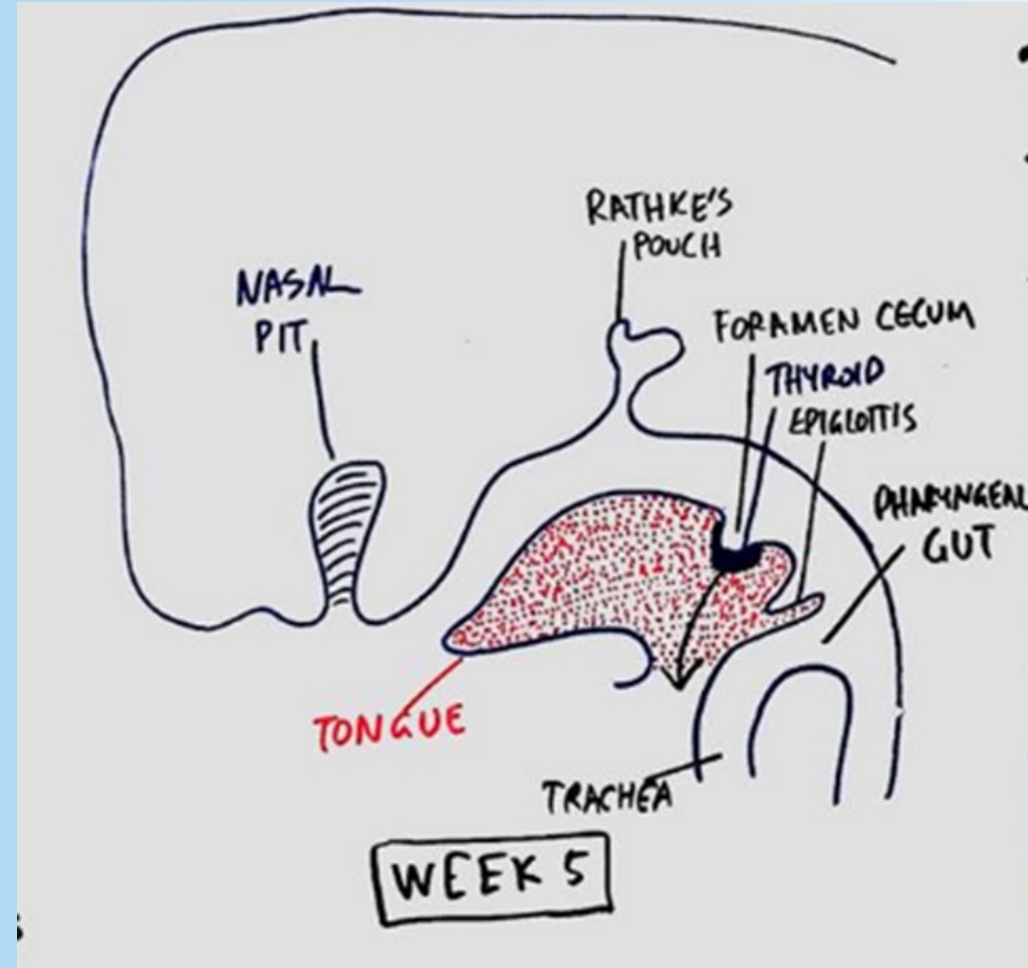
DEVELOPMENT OF THE TONGUE

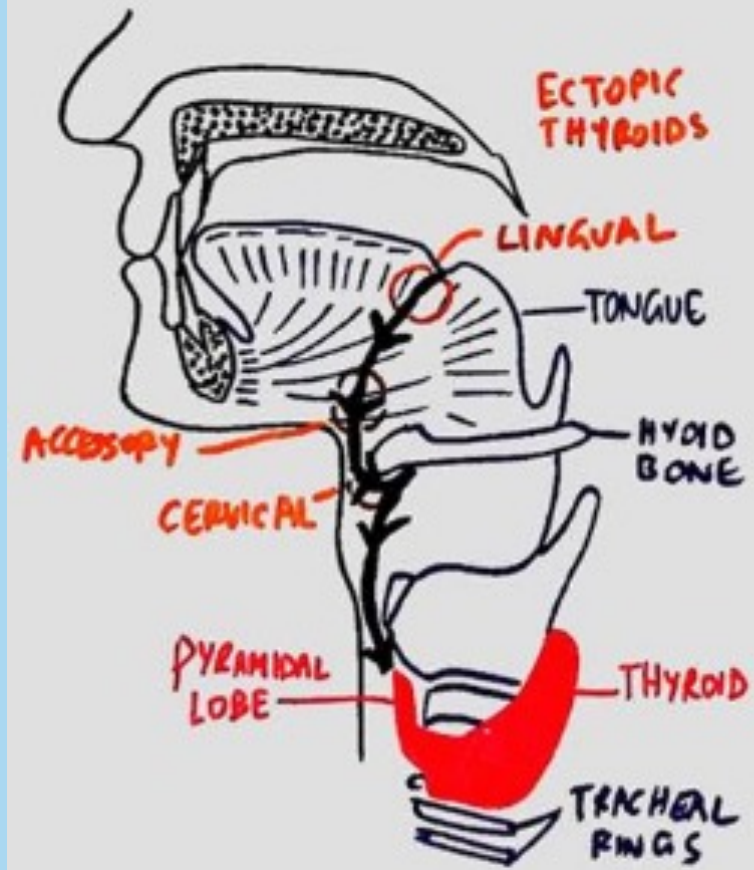
- Week 4
- All pharyngeal arches
- Ant 2/3 = 1st PA
 - CN V3 (sensory)
 - CN VII (taste)
- Pos 1/3 = 2nd, 3rd, 4th PA
 - Mainly 3rd
 - CN IX (sensory and taste)
- Epiglottis = 4th PA
 - CN X (Sup laryngeal br)
- Larynx/voice box = 6th PA
 - CN X (Recurrent laryngeal)
- Muscles = occipital somite
 - CN XII



DEVELOPMENT OF THE THYROID

- From foramen cecum
 - In the tongue between 1st and 2nd pharyngeal arch
- Thyroglossal duct
 - From tongue to trachea
- Anteriorly to 1st and 2nd tracheal rings





Thyroid defects

- Anywhere along the thyroglossal duct
 - Thyroid cysts
 - Thyroid fistulas (open cysts)
 - Remnants of thyroid tissue

