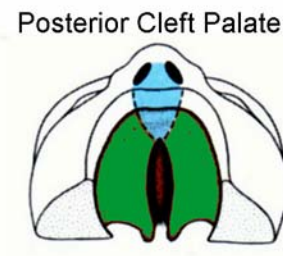
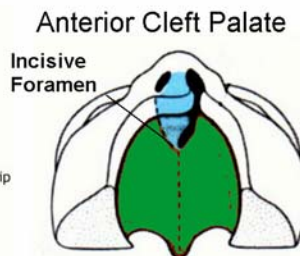
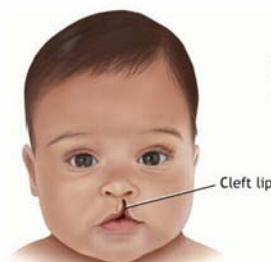
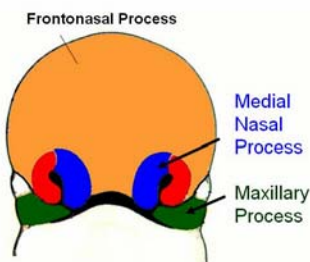


**REVIEW: CLINICAL EMBRYOLOGY OF HEAD AND NECK**

Clinical Condition	Normal development	Abnormal	Signs/ Symptoms	Treatment
<b>Cleft Lip</b> (cheiloschisis)	Fusion of medial nasal and maxillary processes forms upper lip	<b>Failure of fusion of medial nasal and maxillary processes</b>	Cleft at philtrum of upper lip	Surgical repair
<b>Cleft Palate</b> (palatoschisis)	<b>Anterior</b> - Fusion of medial nasal processes (Primary palate) and maxillary processes (Secondary Palate); <b>Posterior</b> - Secondary palate formed by fusion of Maxillary processes of two sides	<b>Failure of fusion</b>	<b>Anterior</b> - Cleft <u>anterior to Incisive foramen</u> ; <b>Posterior</b> - Cleft <u>posterior to Incisive foramen</u>	Surgical repair
<b>Malformation of nasolacrimal duct</b> (dacryostenosis)	Duct forms as cord between maxillary and frontonasal processes! extends from lacrimal sac (at medial canthus of eye) to nasal cavity (inferior meatus)	<b>Cord fails to canalize</b>	Continuous flow of tears over lower lid onto face	Surgical repair
<b>First Arch (Treacher Collins) Syndrome</b>	First brachial arch forms skeletal elements: 1) malleus, incus 2) contributes to mandible (Meckel's cartilage)	<b>Neural crest cells do not migrate into Arch 1</b>	1) Mandibular hypoplasia 2) Conductive hearing loss 4) Facial malformation	Some surgical repair
<b>Thyroglossal duct cysts</b>	Thyroid forms as evagination at foramen cecum of tongue; tissue migrates ant. to Hyoid bone in midline of neck to location below Cricoid cartilage	<b>Glandular tissue or cysts develop anywhere along path of migration</b>	Mass in <b>midline</b> of neck	Surgical removal (remove tract to tongue)
<b>Abnormal location/ Accidental Removal of parathyroid glands</b>	Normally posterior to thyroid gland or embedded in it; develop from branchial pouches 3 and 4 Inferior parathyroid - pouch 3 Superior parathyroid - pouch 4	<b>Can be located within thyroid gland or ectopic</b>	Normally no symptoms; calcium imbalance If accidentally remove ( during thyroid surgery)	Treat calcium imbalance pharmacologically, etc.



## BRANCHIAL ARCHES AND DERIVATIVES

ARCH (NERVE)	SKELETAL	LIGAMENTS	MUSCLES
First (V)	1) Malleus 2) Incus	1) Ant. ligament of malleus 2) Spheno-mandibular ligament	1) Muscles of Mastication 2) Tensor tympani 3) Tensor palati 4) Mylohyoid 5) Ant. belly of Digastric
Second (VII)	1) Stapes 2) Styloid process 3) Hyoid bone - lesser horn, upper half of body	Stylohyoid ligament	1) Muscles of Facial Expression 2) Stapedius 3) Stylohyoid 4) Post. belly of Digastric
Third (IX)	Hyoid bone - greater horn, lower half of body	-----	Stylopharyngeus
Fourth (X)	Cartilages of Larynx	-----	1) All muscles of Larynx 2) All muscles of Pharynx (except Stylopharyngeus) 3) All muscles of Soft Palate (except Tensor palati)
Sixth (XI)	-----	-----	1) Sternocleidomastoid 2) Trapezius

## STRUCTURES DERIVED FROM BRANCHIAL POUCHES, CLEFT AND MEMBRANE: BRANCHIAL 'CLEFT' CYSTS (FISTULI = channels from pharynx to skin)

POUCH	FORMS	CLINICAL
First	1) Auditory tube 2) Tympanic cavity	First Branchial 'Cleft' cyst - tract to external auditory meatus or auditory tube
Second	Lining (crypts) of palatine tonsils	Second Branchial 'Cleft' cyst - tract to tonsillar fossa (palatine tonsils) - <b>MOST COMMON CYST</b>
Third	1) Inferior parathyroid gland 2) Thymus	Third Branchial 'Cleft' cyst - tract to thyrohyoid membrane or piriform recess
Fourth	1) Superior parathyroid gland 2) C-cells of Thyroid	rare

Note: Pouch 3 structures migrate below (caudal) to Pouch 4 structures.

Note: **Location of Cysts and Fistuli - in lateral neck, anterior to Sternocleidomastoid muscle**

Note: **First Branchial Cleft forms Ext. Auditory Meatus; First Branch. Membrane = Tympanic Membrane**

