

# HD 18: FACIAL AND PALATAL DEVELOPMENT

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## READING ASSIGNMENT:

Larsen 3<sup>rd</sup> Edition **Chapter 12**: p.352; pp.365-371; 398-404.

## SUMMARY:

The external human face develops between the 4<sup>th</sup> and 6<sup>th</sup> weeks of embryonic development. Facial swellings arise on the frontonasal process (2 medial nasal and 2 lateral nasal processes) and the first pharyngeal arch (2 mandibular and 2 maxillary processes). By a process of merging and some localized fusion these processes come together to form the continuous contours of the external face. The primary palate is formed in this period by fusion/merging of the medial nasal and maxillary processes. Subsequently, between 6<sup>th</sup> and 12<sup>th</sup> embryonic/fetal weeks the secondary palate is formed as the result of fusion between palatal processes growing from the oral surfaces of the maxillary processes. Each merging and fusion site is also the site of a potential facial or palatal cleft.

## LEARNING OBJECTIVES:

You should be able to

- a. Indicate on a frontal image of a human face those parts of the face that are formed by contributions from the frontonasal process and those that are formed by contributions from the first pharyngeal arch.
- b. Define the following as to site, composition, time of appearance, and fate: oropharyngeal membrane, oronasal membrane.
- c. Describe the derivatives of the four pairs of facial processes and the pair of palatal processes.
- d. Describe the development of the nose and primary palate.
- e. Discuss the differences between the processes of merging and fusion.
- f. Name all possible sites where facial or palatal clefts may develop, and for each indicate what facial or palatal processes are involved.
- g. Define the following and specify what facial/palatal processes participate in their development: primary palate, secondary palate, and definitive palate.
- h. Discuss the extrinsic and intrinsic factors that may affect the normal development of the secondary palate.

## **GLOSSARY:**

**Buccopharyngeal membrane.** See oropharyngeal membrane.

**Choana.** Communication between oral and nasal cavities. When posterior to the primary palate: primitive (primary) choana. When posterior to definitive palate: definitive (secondary) choana.

**Definitive palate.** The structure that is composed of primary and secondary palate and that separates the fully developed oral and nasal cavities.

**Frontonasal process.** Embryonic facial swelling of tissues that cover the surface of the forebrain.

**Fusion.** The process by which two facial processes, that were initially separated by a space, grow together.

**Globular process.** The lower extension of the merged medial nasal processes which will become the philtrum of the upper lip.

**Intermaxillary process.** See globular process

**Lateral nasal process.** An embryonic facial swelling on the frontonasal process, developing lateral to the nasal placode.

**Mandibular process.** Embryonic facial swelling formed directly by tissues of the first pharyngeal arch.

**Maxillary processes.** Embryonic facial swelling which is formed as an outgrowth of the proximal part of the first pharyngeal arch.

**Medial nasal process.** An embryonic facial swelling on the frontonasal process, developing medial to the nasal placode.

**Merging.** The process by which the groove between two facial processes is eliminated.

**Nasal placodes.** Two ectodermal thickenings that appear on the frontonasal process. They are the precursors of the olfactory epithelium.

**Oral membrane.** See oropharyngeal membrane.

**Oronasal membrane.** Located posterior to the primary palate, composed of ectodermal layers from fused oral and nasal epithelium.

**Oropharyngeal membrane.** A membrane composed of ectoderm and endoderm only which closes off the cephalic end of the developing digestive tract.

**Primary palate.** The structure that is formed by the two maxillary and two medial nasal processes, and that initially separates the developing oral and nasal cavities.

**Secondary palate.** The structure that is formed by two palatal processes (outgrowths of the maxillary processes).