

# Facial development

## Stomodeum = primitive oral cavity

Around the centenary beginning **5. week** under the influence of the prosencephalic and rhombencephalic organizational center begins to form a face. The stomodeum is first a transverse fold lined with ectoderm. By the proliferation of mesenchyme from the 1st gill arch, two paired mounds - **maxillary and mandibular**' - are formed and grow around the stomodeum.

The mandibular ridges come together in the midline to form the base for the **lower jaw and lip**.

The maxillary ridges do not grow towards the midline, because an unpaired "frontal ridge" is inserted between them, on the sides of which the "olfactory plates" are formed by thickening the ectoderm. These mounds are derivatives of the pharyngeal arches, they are formed mainly by the proliferation of **neural bars** cells, which enter the arches during the 4th week. Neural crest cells are the main source of connective tissue components in the facial landscape.

## Nasal banks

In the fifth week, two pairs of protrusions grow from the frontal ridge - **nasal ridges' (medial and lateral). Between them, the olfactory plates deepen into olfactory pits.**

The nasal wings are formed from the lateral nasal folds.

The medial part of the frontal fold forms the *area triangularis* - the basis for the middle part of the nose (*dorsum et 'apex nasi*). The medial nasal cusps insert between the maxillary cusps for the upper jaw. They fuse with the maxillary ridges and thus form the basis of the *upper jaw and lip*. Cranially, the **septum nasi** is formed from the mesenchyme of the frontal wall.

By creating the upper and lower jaw and lips, the oral cleft will be definitively defined.

The lateral nasal folds are separated from the maxillary folds by the nasolacrimal groove. The ectoderm from the bottom of the groove is released during development, giving rise to an epithelial strip, which subsequently sinks into the surrounding mesenchyme - the basis for the **ductus nasolacrimalis**'. The upper end of the ductus nasolacrimalis dilates into the saccus lacrimalis. During the fetal period, the ductus nasolacrimalis opens into the meatus nasi inferior in the lateral wall of the *cavitas nasi*. Full opening is not completed until **after birth**. If patency does not occur, we speak of "atresia of the ductus nasolacrimalis".

## Intermaxillary segment

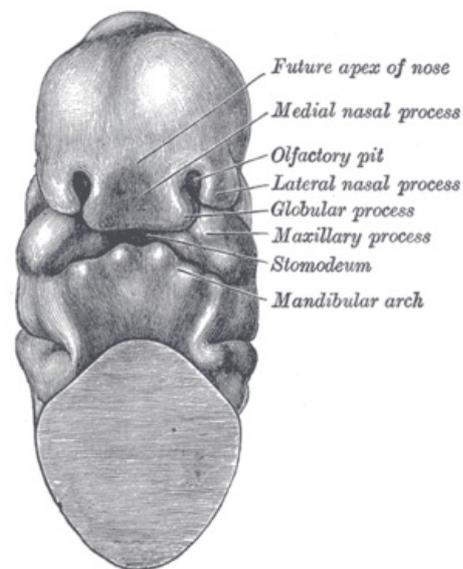
The fusion of the medial nasal processes gives rise to the *'intermaxillary segment*. On the upper lip, the intermaxillary segment forms the philtrum, on the floor of the nasal cavity the primary palate and the premaxillary part maxilla with the corresponding section of the gum. The secondary palate, the lateral part of the upper lip and the remaining larger part of the maxilla arise from the maxillary ridge, which laterally connects to the mandibular ridge. The lips and gums develop only after the formation of the ectodermal *labiogingival ridge* in the mesenchymal mass of the primitive jaws. The bar for the most part disappears, persisting only as the frenulum labii superioris connecting the lip to the gingiva of the upper jaw.

## Facial muscle

The Mimic muscles of the face have their basis in the mesenchyme of the second pair of pharyngeal arches, so they are innervated from the nervus facialis. Muscles of mastication, musculus tensor veli palatini, musculus tensor tympani, musculus mylohyoideus and anterior belly musculus digastricus arise from the first pair of pharyngeal arches and are therefore innervated from the nervus trigeminus.

## Further development of the face

During late facial development, the nose, which is initially flat, takes shape, the earlobes move up to the level of the nose, the development of the lower jaw is completed, and due to *'enlargement of the cerebral hemispheres* the forehead and eyes of the fetus become prominent shift medially.



Maxillary, mandibular cusps, frontal cusps, medial and lateral nasal cusps, stomodeum

## Links

## Related Articles

- Development of the nasal cavity

## References

- VACEK, Zdeněk. *Embryology for paediatricians*. 2. edition. JP Publishing House, 1992. 313 pp. ISBN 80-7066-562-9.
- MOORE, Keith L. – PERSAUD, T.V.N.. *Human birth: embryology with a clinical focus*. 1. edition. ISV, 2002. 564 pp. ISBN 80-85866-94-3.