




THE FACE and ORAL REGION

Introduction

1. Face development is intimately connected to development of entire head and neck region.
 - a. It is highly integrated, starts in the early embryo, and isn't completed until postnatal development ceases.
 - b. Much of the face is derived from cranial neural crest (pattern formation?)
 - c. As neural crest cells migrate they become closely associated with overlying ectoderm, giving rise to the inductions that form the facial skeleton.
 - d. A second migration of myogenic cells from the somitomeres provides the branchial arches with mesodermal cells for the musculature.
 2. Early expansion of the forebrain and optic cups displaces head mesoderm caudally.
 - a. Neural crest cells surround the oral area, pharynx, and diencephalon.
 - b. Mesoderm surrounds the mesencephalon, myelencephalon, and otic capsule.
 - c. The temporal bone is made up of both types of cells.
- 

THE FACE and ORAL REGION

Introduction

3. In keeping with its phylogeny, the mammalian face develops relatively late.
- 4 weeks – face consists of a few primordial tissue masses partially surrounding the future oral region.
 - The oral cavity (stomodeum) is an ectodermal depression separated from the foregut by the oral plate formed of ectoderm on one side and endoderm on the other.
 - Rostrally, the face is dominated by the frontal prominence of the overhanging forebrain.
 - Laterally, the maxillary processes of the 1st branchial arch are visible
 - Caudally, the stomodeum is bordered by the mandibular arches and other branchial structures just starting to emerge.
 - Between the forebrain and the maxillary processes the nasal placodes are becoming visible.

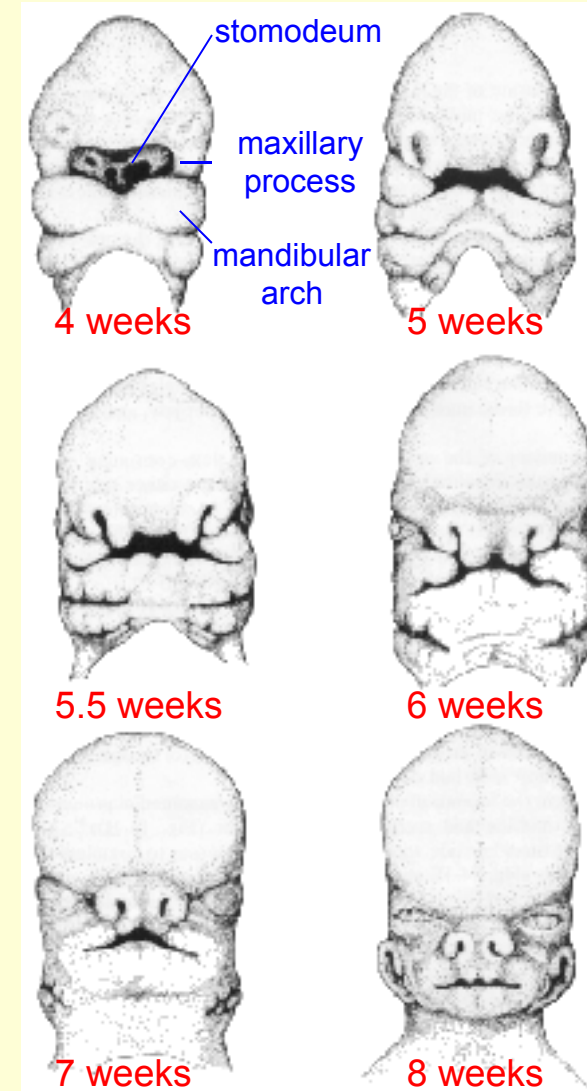


FIG. 16-5

THE FACE and ORAL REGION

Introduction

3. Later face development is characterized by growth of the primordia around the stomodeum and their rearrangements.
- Stomodeum remains shallow, even when the oral plate ruptures to establish the connection between mouth and foregut.
 - The adult oral cavity is formed as structures around the stomodeum grow forward, forming the superficial face parts, the jaws, and walls of the oral cavity.
 - Midface formation occurs by displacement of the forebrain away from the mouth and the filling in of the area by:
 - Mesenchymal growth around the nasal placodes (nasomedial and nasolateral processes)
 - Medial migration of the eyes.
 - Ingrowth of the maxillary processes

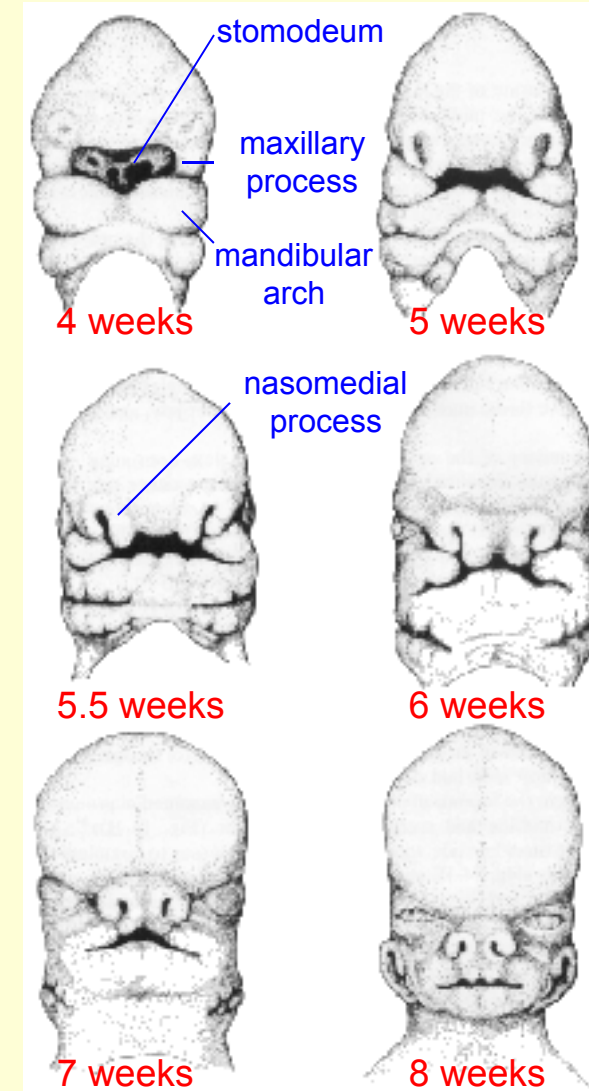


FIG. 16-5

THE FACE and ORAL REGION

Upper jaw and nose

1. On either side of the frontal prominence are horseshoe-shaped elevations around the nasal placodes.
 - a. Medial limbs are nasomedial processes
 - b. Lateral limbs are nasolateral processes
2. Growing toward midline from cephalolateral are the maxillary processes, approaching mandibular arches and merging with them at the angle of the mouth.
 - a. Maxillary processes grow to crowd the nasal processes closer together.
 - b. Nasomedial processes grow quickly, pushing frontal prominence cephalad, then fuse with the maxillary processes to complete the arch of the upper jaw.
 - c. Nasomedial tissues give rise to philtrum of lip on the surface and the medial palatine process inside.

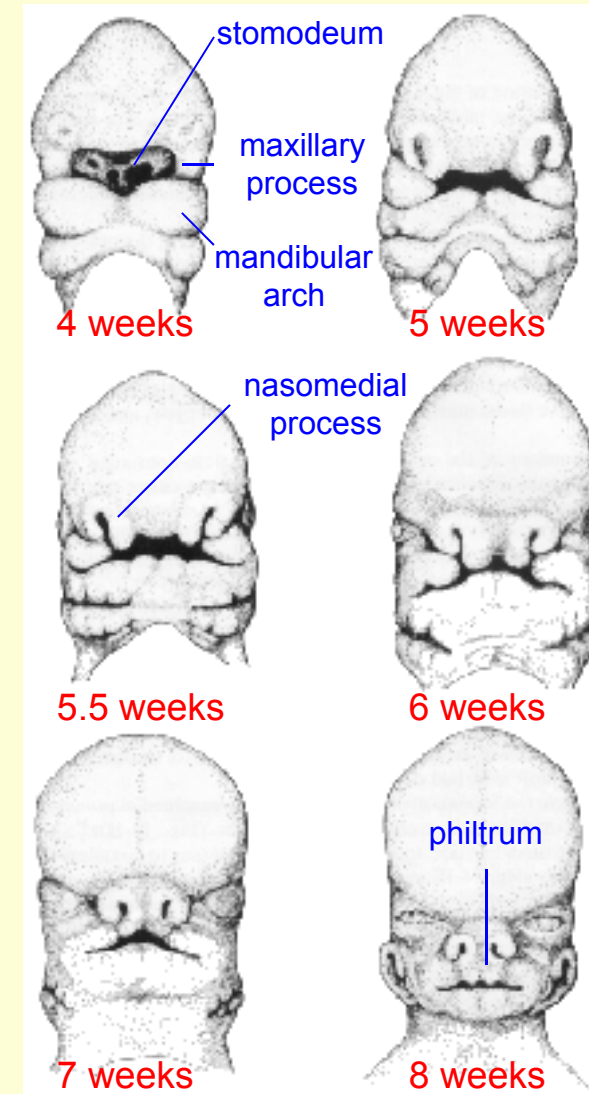


FIG. 16-5

THE FACE and ORAL REGION

Lower jaw

1. The caudal boundary of the mouth is much less complex.
 - a. Arising from either side of the mandibular arch and localized thickenings of mesenchyme that give rise to the mandible.
 - b. Until the thickenings merge in the midline, there is a conspicuous notch between the two.
2. Once merged in the midline, the arch of the lower jaw is completed.

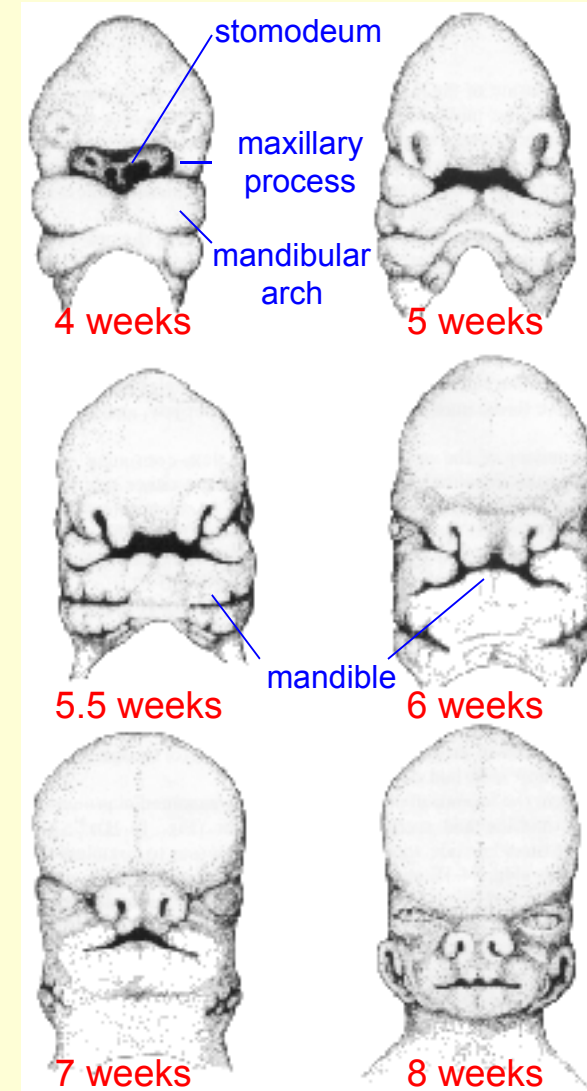


FIG. 16-5

THE FACE and ORAL REGION

Palate

1. After the upper jaws are established, the palatal shelves begin to appear.
 - a. Paired structures that subdivide the most rostral part of stomodeum
 - b. Nasal pits arise above the level of the shelves.
 - c. Development of the shelves elongates the nasal chambers backwards so that they open into the region where the mouth opens into the pharynx.

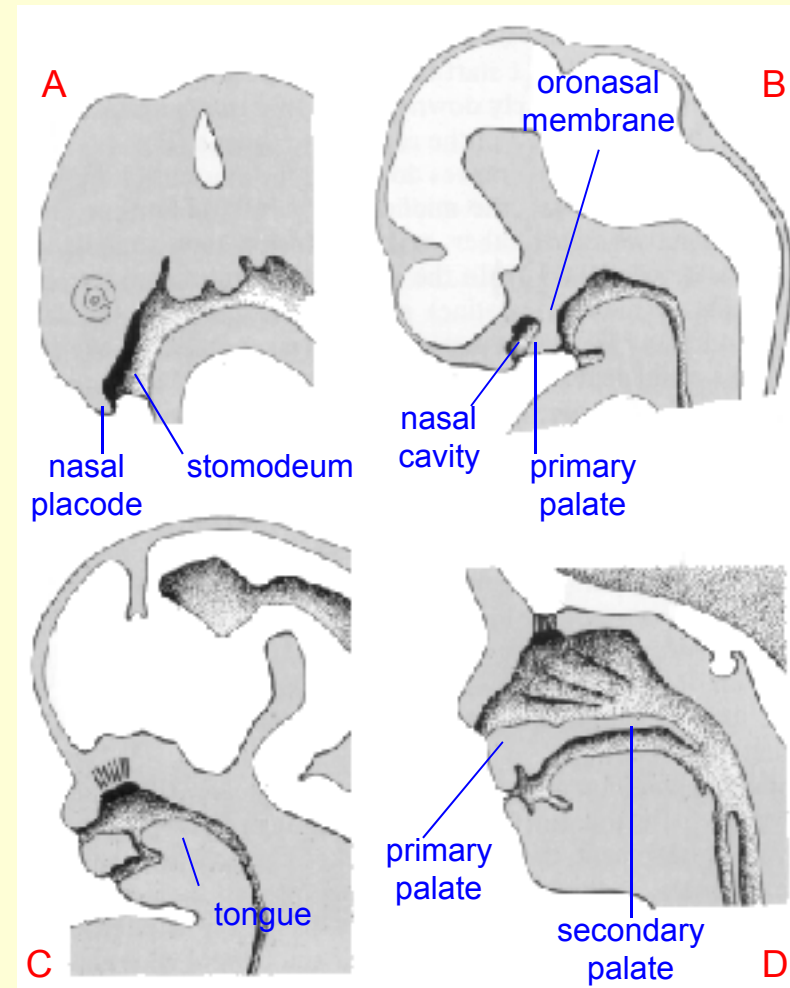


FIG. 16-9

THE FACE and ORAL REGION

Palate

2. Both nasomedial processes and both maxillary processes contribute to palate
 - a. The primary palate is also called the median palatine process, formed by fusion of deep portions of the two nasomedial processes.
 - b. The secondary palate is derived from shelf-like outgrowths of the maxillary processes.
 - (1) Initially the tongue lies between the shelves and the shelves hang oblique and down.
 - (2) As tongue moves down, the shelves swing up toward the midline.
 - (3) When they meet, fusion begins with each other, then lastly with the median palatine process.
3. At the same time the nasal septum is forming so that the nasal chambers are separated into right and left and from the mouth.

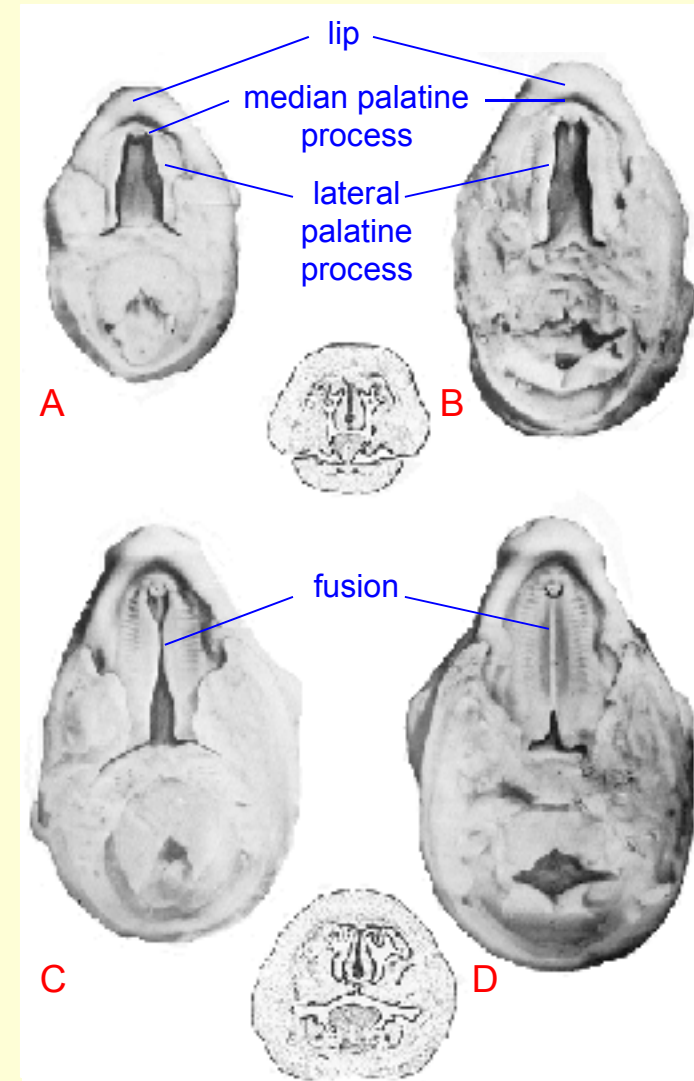


FIG. 16-7

THE FACE and ORAL REGION

Nasal chambers (review)

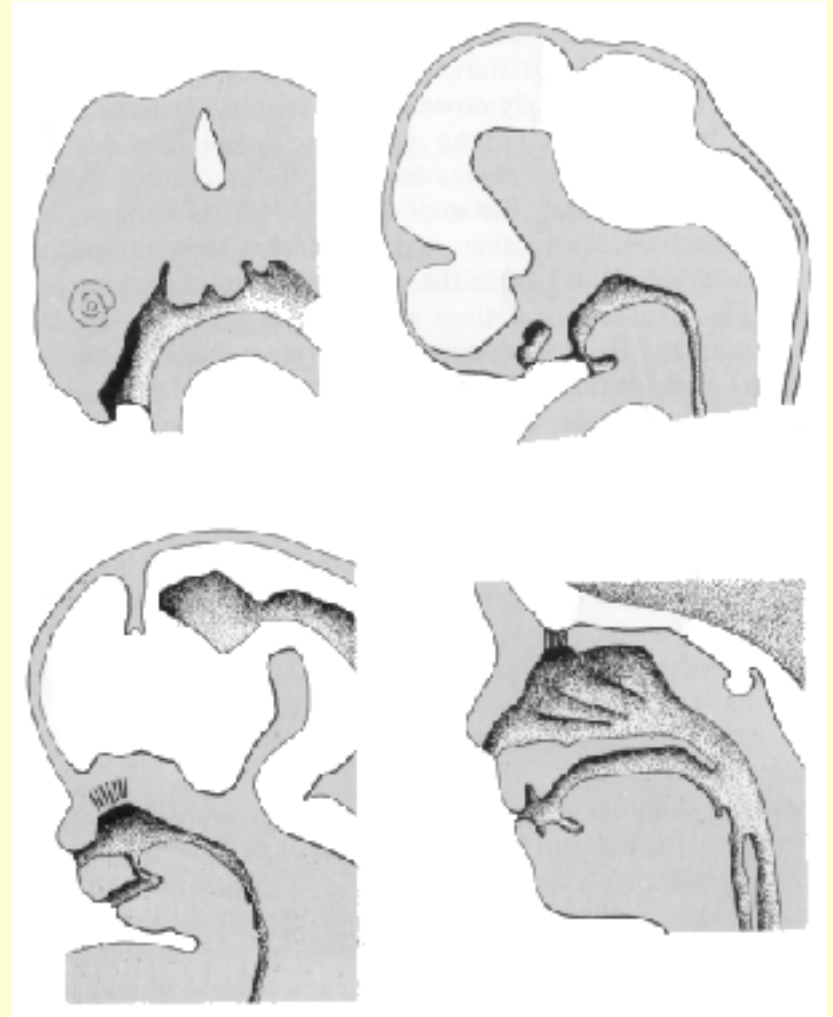
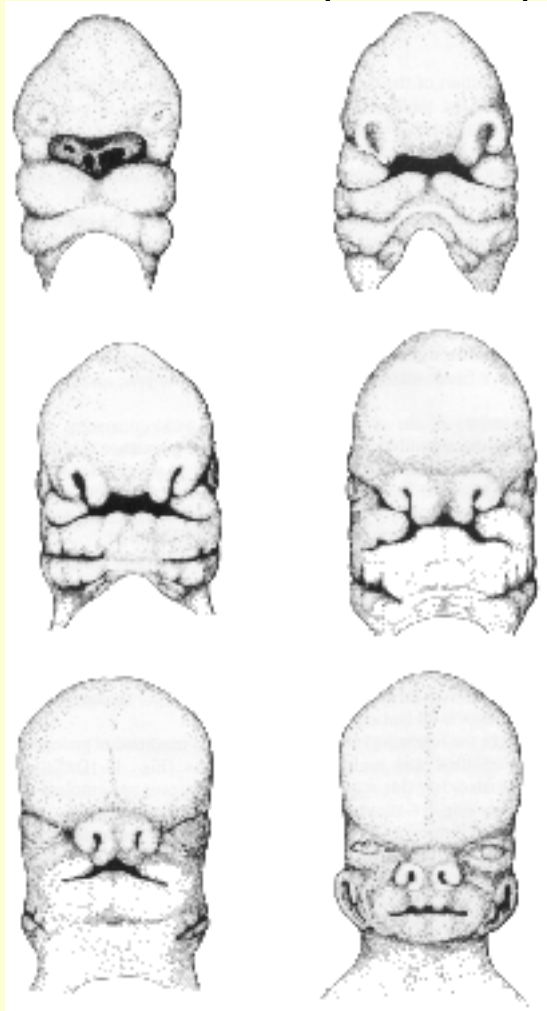


FIG. 16-6 and 16-9

THE FACE and ORAL REGION

Congenital anomalies

