

## Development of Face

At the **end of the fourth week**, **facial prominences** consisting primarily of neural crest-derived mesenchyme and formed mainly by the first pair of pharyngeal arches appear (**Maxillary prominences** and **mandibular prominences**). On both sides of the **frontonasal prominence**, local thickenings of the surface ectoderm, the **nasal (olfactory) placodes**, formed.

During the fifth week, the nasal placodes invaginate to form **nasal pits**. In so doing, they create a ridge of tissue that surrounds each pit and forms the **nasal prominences**. The prominences on the outer edge of the pits are the **lateral nasal prominences which form ala of nose** ; those on the inner edge are the **medial nasal prominences** that fused and form **Intermaxillary Segment** that form the followings:

- (a) **labial component**, which forms the philtrum of the upper lip;
- (b) **upper jaw component**, which carries the four incisor teeth;
- (c) **palatal component**, which forms the **triangular primary palate** .

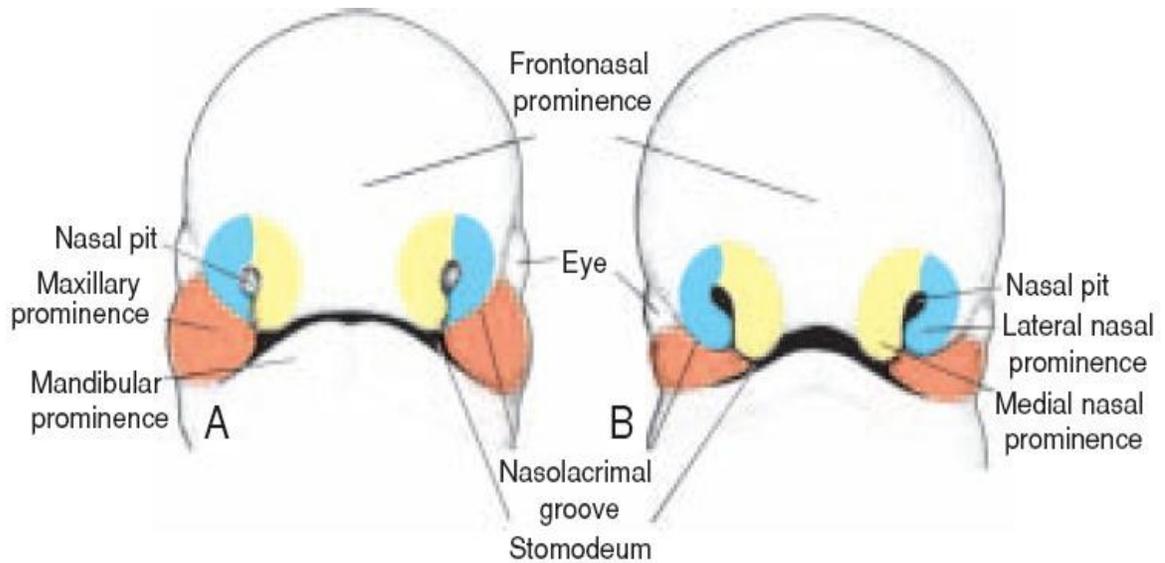
The **nose** is formed from **five facial prominences** .

1. **the frontal prominence gives rise to the bridge**
2. **the merged medial nasal prominences provide the crest and tip**
3. **the lateral nasal prominences form the sides (alae)** .

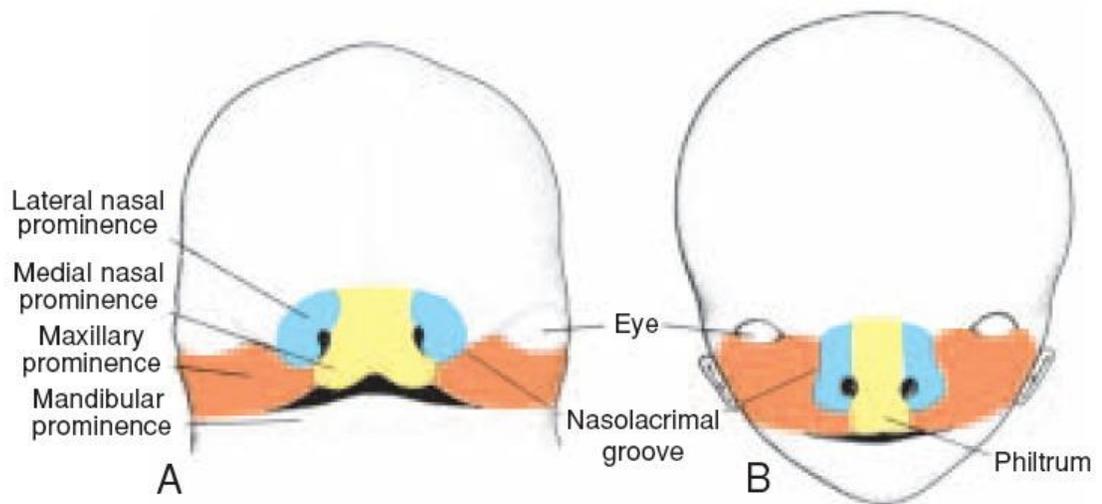
During the following 2 weeks, the **maxillary prominences** continue to increase in size. Simultaneously, they grow medially, **compressing the medial nasal prominences toward the midline** and the two fuse .

Initially, the maxillary and lateral nasal prominences are separated by a deep furrow, the **nasolacrimal groove** . After canalization, the cord forms the **nasolacrimal duct**;

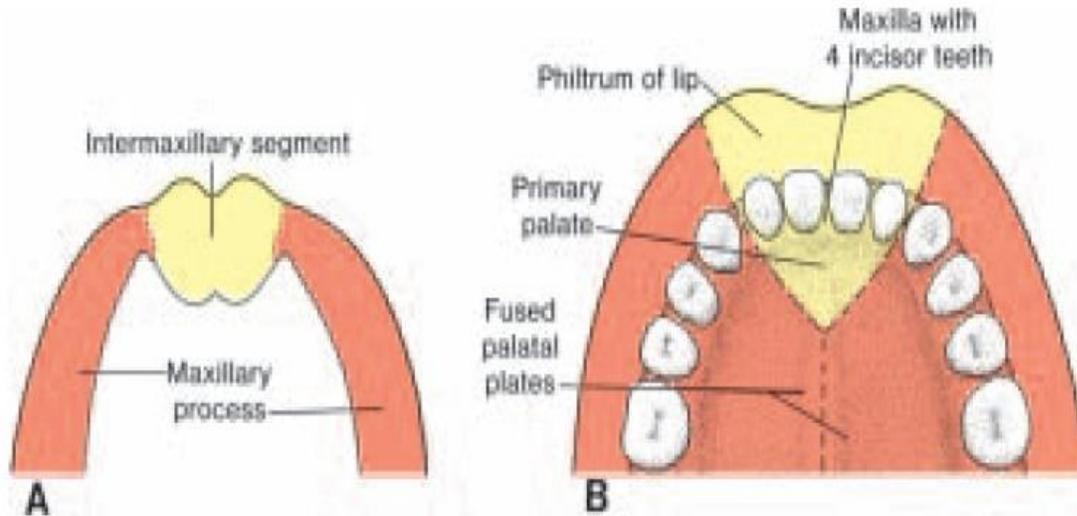
its upper end widens to form the **lacrimal sac**. the maxillary prominences enlarge to form the **cheeks** and **maxillae**.



Figure(1) show development of face



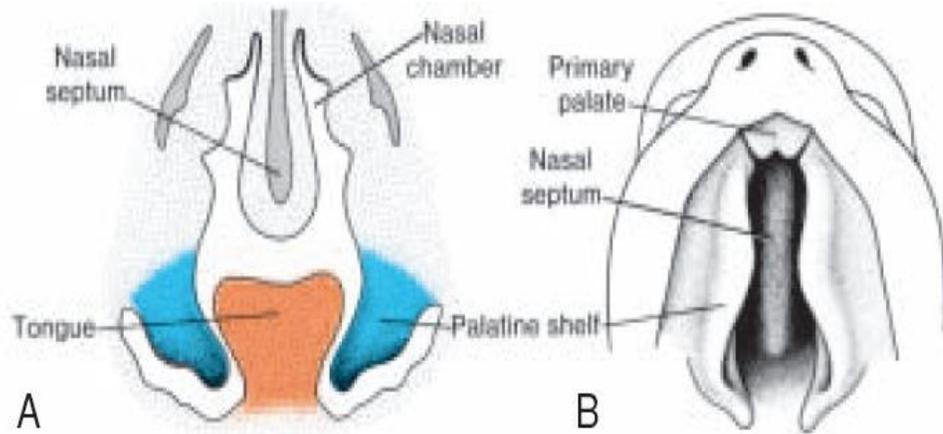
Figure(2) maxillary process fused with medial nasal process



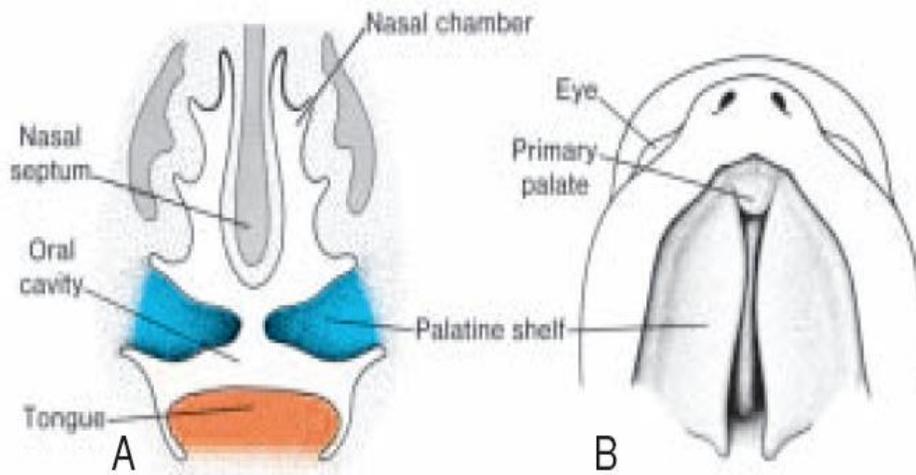
**Figure(3) intermaxillary segment**

## **Secondary Palate**

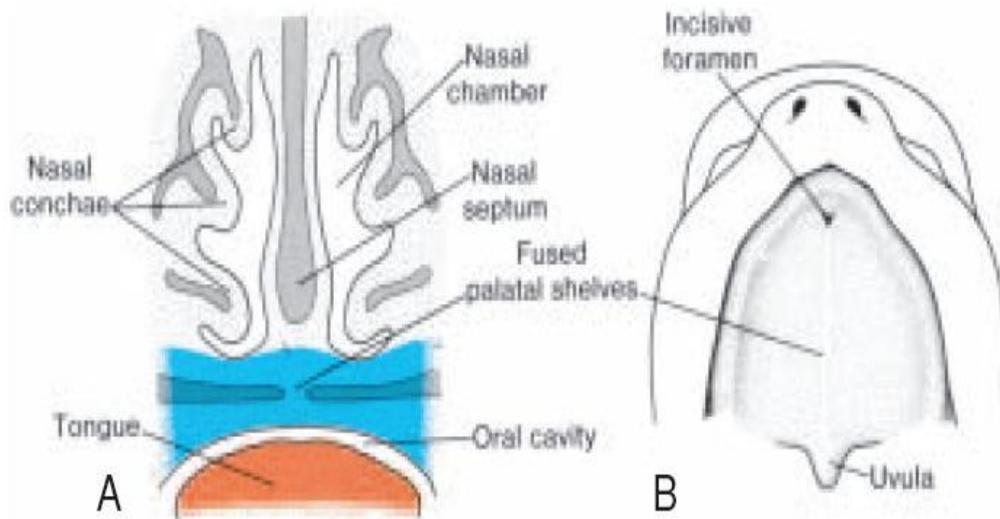
Although the primary palate is derived from the intermaxillary segment, the main part of the definitive palate is formed by two shelf like outgrowths from the maxillary prominences. These outgrowths, the **palatine shelves, appear in the sixth week** of development and are directed obliquely downward on each side of the tongue. In **the seventh week**, the palatine shelves ascend to attain a horizontal position above the tongue and fuse, forming the **secondary palate**. Anteriorly, the shelves fuse with the triangular primary palate, and the **incisive foramen** is the midline landmark between the primary and secondary palates. At the same time as the palatine shelves fuse, **the nasal septum grows down and joins** the newly formed palate.



**Figure (4) palatine shelves**



**Figure(5) Tongue move down ward and palatine shelves reach a horizontal position.**



**Figure(6) Two palatine shelves fuse with each other and with nasal septum**

### **Structures Contributing to Formation of the Face**

#### **Prominence**

#### **Structures Formed**

- |                                       |  |
|---------------------------------------|--|
| <b>1. Frontonasal prominences</b>     | <b>Forehead, bridge of nose, medial &amp; lateral nasal</b>      |
| <b>2. Maxillary</b>                   | <b>Cheeks, lateral portion of upper lip, secondary palate</b>    |
| <b>3. Medial nasal primary palate</b> | <b>Philtrum of upper lip, crest and tip of nose, premaxilla,</b> |
| <b>4. Lateral nasal</b>               | <b>Alae of nose</b>  |
| <b>5. Mandibular</b>                  | <b>Lower lip, chin</b>   |

**Note :**The frontonasal prominence is a single unpaired structure; the other prominences are paired.

## **Facial Clefts:**

**Incidence of cleft lip is common among male, unilateral cleft (80%) while bilateral cleft (20%).The cleft palate is more common in female .**

### **1.Cleft of upper lip**

**Median cleft lip(median hare lip) = medial nasal prominences fail to merge together = often baby mentally retarded .**

**Lateral cleft lip = failure of fusion between medial nasal and maxillary prominences**

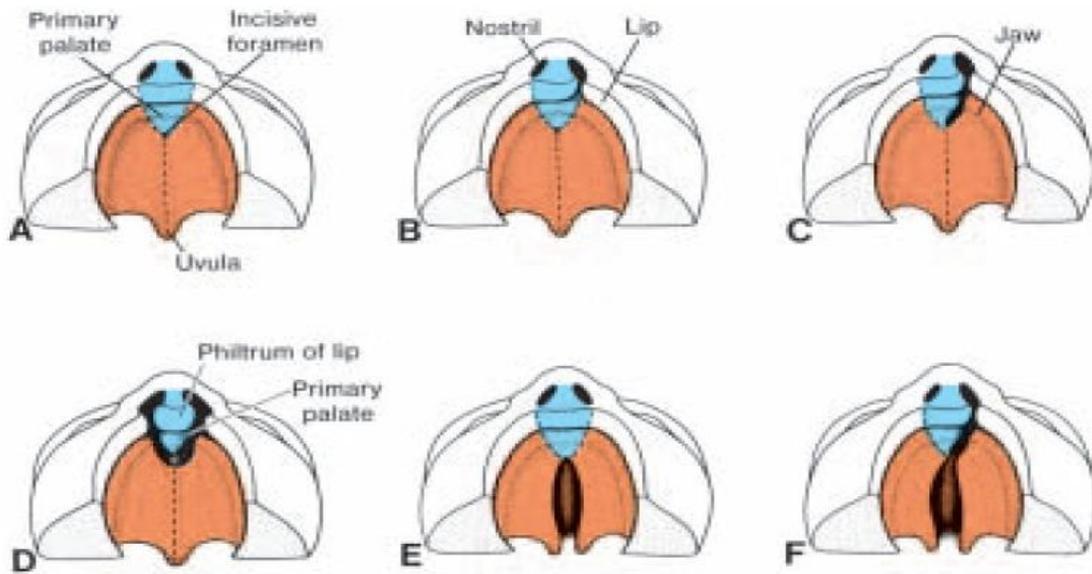
**2.Median cleft lower lip = failure of fusion between the 2 mandibular process.**

**3.Oblique facial clefts = failure of fusion between maxillary and lateral nasal prominences**

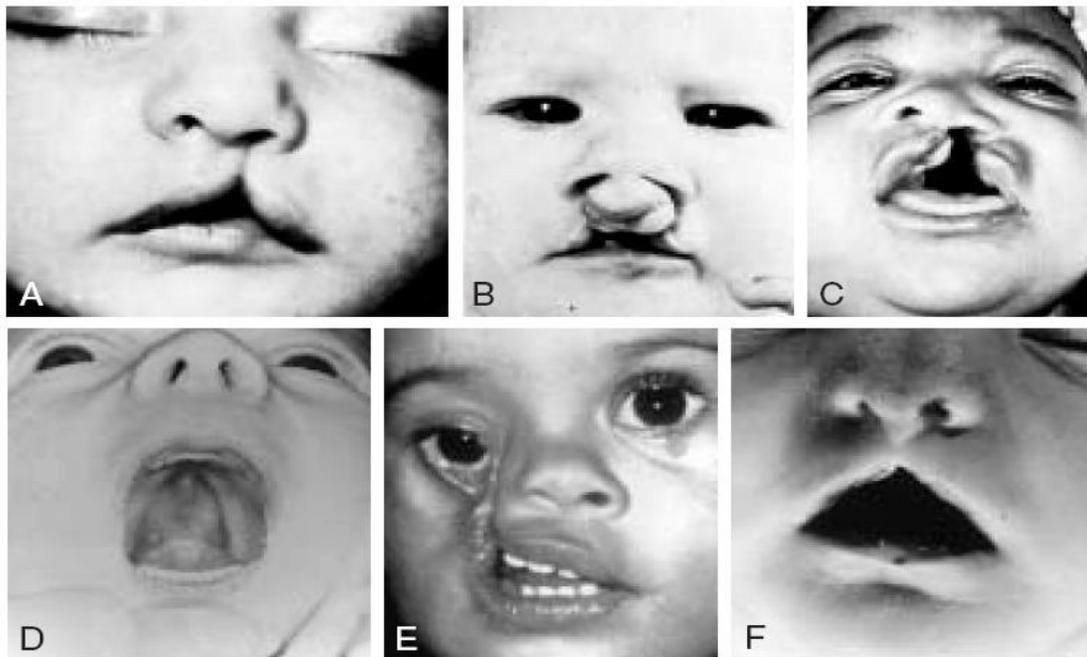
**4.Cleft palate = failure of fusion maxillary prominences (palatal shelves)**

**5. Macrostomia(larg mouth)= due to arrest of fusion between the maxillary and mandibular.**

**6. Microstomia= due to excessive fusion between the maxillary and mandibular.**



**Figure 15.28** Ventral view of the palate, gum, lip, and nose. **A.** Normal. **B.** Unilateral cleft lip extending into the nose. **C.** Unilateral cleft involving the lip and jaw and extending to the incisive foramen. **D.** Bilateral cleft involving the lip and jaw. **E.** Isolated cleft palate. **F.** Cleft palate combined with unilateral anterior cleft lip.



**Figure 15.29** **A.** Incomplete cleft lip. **B.** Bilateral cleft lip. **C.** Cleft lip, cleft jaw, and cleft palate. **D.** Isolated cleft palate. **E.** Oblique facial cleft. **F.** Midline cleft lip.