

Anatomy and Physiology of the Velopharyngeal Mechanism

Anatomy: The anatomy of the velopharyngeal mechanism includes: the nasal cavity, the lips, the oral cavity, the pharynx, and the muscles of the palate.

Nasal Cavity:

Nasal Bridge

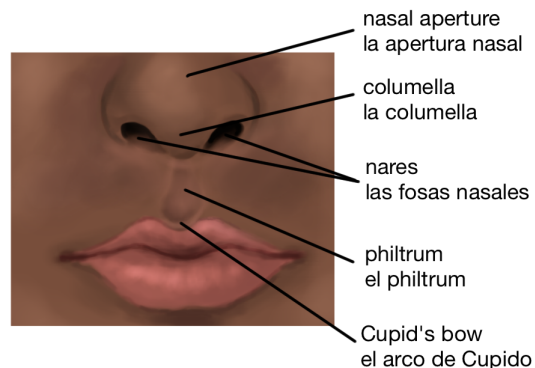
Columella

Nares

Nasal Aperture

Nasal Septum: vomer, perpendicular plate of the ethmoid, quadrangular cartilage

Choana: opening in the back of the nasal cavity to the nasopharynx

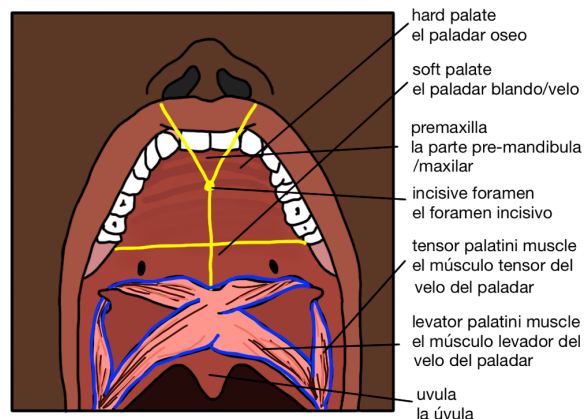
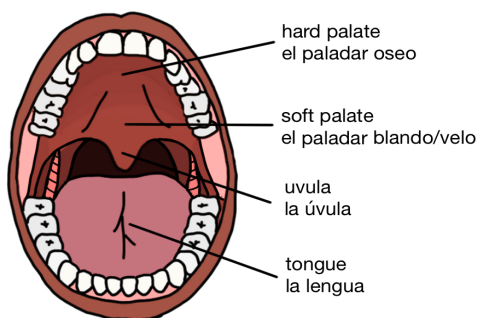


Lips:

Philtrum: extends from the columella to the lip

Cupid's bow: dip in the superior lip

Vermillion: red color of the lips



Oral Cavity:

Faucial Pillars: structures that help with the movement of the Velopharynx and the tongue

Alveolar Ridge: the ridge between the superior teeth and the hard palate

Hard Palate

Incisive Foramen: located above the pre-mandible/maxilla

Soft Palate/Velum

Tongue

Uvula

The Pharynx:

Oral pharynx

Nasal pharynx

Hypopharynx

Posterior wall of the pharynx

Lateral walls of the pharynx

Physiology: The velopharyngeal mechanism acts as a valve separating the oral cavity and the nasal cavity during speech and swallowing.

Velopharyngeal Closure:

- The physiology includes velopharyngeal closure
- This process occurs with 3 movements:
 - The velum (soft palate) moves posteriorly towards the posterior wall of the pharynx
 - The posterior wall of the pharynx moves anteriorly towards the velum
 - The lateral walls of the pharynx move medially to the velum
- At rest, the velum is in its lowest position
- During the production of oral sounds, the velum moves posteriorly and superiorly
- The phonetic context influences the elevation and displacement of the velum
 - *map* vs. *man*
 - *cat* vs. *can*
- Patients with cleft palate cannot close the “door” between the nose and the mouth with their velum, posterior pharyngeal wall, and lateral pharyngeal walls

Primary Muscles of Velopharyngeal Closure:

Muscles that attach to the velum

1. Levator veli palatini: the principle muscle of elevation of the velum
2. Superior pharyngeus constrictor: displaces the lateral pharyngeal walls medially during contraction
3. Musculus uvulae: contraction causes rigidity and a slight increase in size in the uvula
4. Palatoglossus: lowers the velum

Other muscles of the velum:

1. Tensor veli palatini: opens the Eustachian tube but does not contribute to velopharyngeal closure

