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 form 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

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**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

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