

## Oral cavity content, inner aspects

The **oral region** includes:

- the lips
- the oral cavity
- teeth
- gingivae
- tongue
- palate
- the region of the palatine tonsils. (1)

**Oral cavity/mouth-** has two parts: the *oral vestibule* and the *oral cavity proper*

- ◎ It is in the oral cavity that food and drinks are tasted and where mastication (chewing) and lingual manipulation of food occur.
- 1. The **oral vestibule** is the slit-like space between the teeth and gingivae and the lips and cheeks which communicates with the exterior through the **oral fissure** (opening). The **size of the fissure** is controlled by the peri-oral muscles: the **orbicularis oris**, the buccinator, risorius, and depressors and elevators of the lips (acting like sphincter and dilators of the fissure). (1)
- 2. The **oral cavity proper** is the space between the upper and the lower **dental arches** or arcades (maxillary and mandibular alveolar arches and the teeth they bear). The oral cavity is limited laterally and anteriorly by the dental arches. The *roof of the oral cavity* is formed by the palate. Posteriorly, the oral cavity communicates with the oropharynx (oral part of the pharynx). When the mouth is closed and at rest, the oral cavity is fully occupied by the tongue. (1)
- ◎ The **lips** are mobile, musculo-fibrous folds surrounding the mouth, extending from the nasolabial sulci and nares laterally, and superiorly to the mentolabial sulcus inferiorly covered by skin externally and internally by mucous membrane. The lips contain the orbicularis oris and superior and inferior labial muscles, vessels, and nerves. The *transitional zone of the lips* (commonly considered by itself to be the lip), with colours ranging from brown to red, continues into the oral cavity where it is continuous with the mucous membrane of the mouth. The labial mucosa covers the intra-oral, vestibular part of the lips. This mucosa has frenula. The labial frenula are free-edged folds of mucous membrane in the midline, extending from the vestibular gingiva to the mucosa of the upper and lower lips; the one extending to the upper lip is larger. Other smaller frenula sometimes appear laterally in the premolar vestibular regions (1)
  - ◎ Arteries: On one side and the other the lips have an arterial supply from the facial artery: the superior and inferior labial arteries, branches that anastomose with each other in the lips to form an arterial ring. The upper lip is supplied by superior labial branches of the *facial* and *infra-orbital arteries*. The lower lip is supplied by inferior labial branches of the *facial* and *mental arteries*. (1)
  - ◎ Nerves: The upper lip is supplied by the superior labial branches of the infra-orbital nerves (of CN V2), and the lower lip is supplied by the inferior labial branches of the mental nerves (of CN V3). (1)
- ◎ The **cheeks** are the movable walls of the oral cavity with essentially the same structure as the lips with which they are continuous. Anatomically, the external aspect of the cheeks constitutes the *buccal region*, bounded **anteriorly** by the

*oral* and *mental regions* (lips and chin), **superiorly** by the *zygomatic region*, **posteriorly** by the *parotid region*, and **inferiorly** by the inferior border of the *mandible*. (1)

- ◎ Cheeks contents: the buccinators muscles, buccal glands (between the mucous membrane and the buccinators) and buccal fat-pads covered by the overlying skin.
- ◎ Arteries and nerves-the cheeks are supplied by buccal branches of the maxillary artery and innervated by buccal branches of the mandibular nerve.(1)
- ◎ The gingivae /gums are mainly fibrous tissue covered with mucous membrane. There are two parts of gingiva: the gingiva proper and the buccal gingiva. The gingiva proper or the attached gingiva is firmly attached to the alveolar processes of the mandible and maxilla and the necks of the teeth. The gingiva proper adjacent to the tongue is the superior and inferior lingual gingivae, and that adjacent to the lips and cheeks is the maxillary and mandibular labial or buccal gingiva, respectively. (1)
- ◎ Teeth. They are -deciduous (primary) or permanent (secondary) type -of -tooth, and they are described in relation to its proximity to the midline or front of the mouth (e.g., medial and lateral incisors; the 1st molar is anterior to the 2nd). Children have 20 deciduous teeth; adults normally have 32 permanent teeth. The types of teeth are identified by their characteristics: incisors, thin cutting edges; canines, single prominent cones; premolars (bicuspid), two cusps; and molars, three or more cusps. The vestibular surface (labial or buccal) of each tooth is directed outwardly, and the lingual surface is directed inwardly. As used in dental practice, the mesial surface of a tooth is directed toward the median plane of the facial part of the cranium. The distal surface is directed away from this plane; both mesial and distal surfaces are *contact surfaces*—that is, surfaces that contact adjacent teeth. The masticatory surface is the occlusal surface. A tooth has a crown, neck, and root. The **crown** projects from the gingiva. The neck is between the crown and root. The root is fixed in the tooth socket by the *periodontium* (connective tissue surrounding roots); the number of roots varies. Most of the tooth is composed of dentine (L. *dentinum*), which is covered by enamel over the crown and cement (L. *cementum*) over the root. The pulp cavity contains connective tissue, blood vessels, and nerves. The root canal (pulp canal) transmits the nerves and vessels to and from the pulp cavity through the apical foramen. The tooth sockets are in the *alveolar processes* of the maxillae and mandible.
  - ◎ VASCULATURE AND INNERVATION OF TEETH-The superior and inferior alveolar arteries, branches of the maxillary artery, supply the maxillary and mandibular teeth, respectively. The alveolar veins have the same names and distribution accompany the arteries. Lymphatic vessels from the teeth and gingivae pass mainly to the submandibular lymph nodes. The named branches of the superior (CN V2) and inferior (CN V3) alveolar nerves give rise to dental plexuses that supply the maxillary and mandibular teeth. (1).
- ◎ Palate. The palate forms the arched roof of the mouth and the floor of the nasal cavities and separates the oral cavity from the nasal cavities and the nasopharynx, the part of the pharynx superior to the soft palate.
  - ◎ The palate consists of two regions: the hard palate anteriorly and the soft palate posteriorly. (1)

- ◎ The hard palate is vaulted and the anterior two thirds of the palate has a bony skeleton formed by the palatine processes of the maxillae and the horizontal plates of the palatine bones. The incisive fossa is a depression in the midline of the bony palate posterior to the central incisor teeth into which the incisive canals open. The naso palatine nerves pass from the nose through a variable number of incisive canals and foramina that open into the incisive fossa. Medial to the 3rd molar tooth, the *greater palatine foramen* pierces the lateral border of the bony palate. The *greater palatine vessels and nerve* emerge from this foramen and run anteriorly on the palate. The *lesser palatine foramina* posterior to the greater palatine foramen pierce the pyramidal process of the palatine bone. These foramina transmit the *lesser palatine nerves and vessels* to the soft palate and adjacent structures.
- ◎ The soft palate is the movable posterior third of the palate and is suspended from the posterior border of the hard palate. The soft palate has no bony skeleton; however, its anterior *aponeurotic part* is strengthened by the palatine aponeurosis, which attaches to the posterior edge of the hard palate. The aponeurosis is thick anteriorly and thin posteriorly, where it blends with a posterior *muscular part*. Postero-inferiorly, the soft palate has a curved free margin from which hangs a conical process, the uvula. (1). Laterally, the soft palate is continuous with the wall of the pharynx and is joined to the tongue and pharynx by the palatoglossal and palatopharyngeal arches, respectively. The fauces is the space between the oral cavity and the pharynx. The fauces is bounded superiorly by the soft palate, inferiorly by the root of the tongue, and laterally by the pillars of the fauces, the palatoglossal and palatopharyngeal arches. (1).
- ◎ Soft palate ms:
  - tensor veli palatini
  - levator veli palatini
  - palatoglossus
  - palatopharyngeus
  - musculus uvulae (1)
- ◎ Vasculature and innervation of the palate:
  - the greater palatine artery on each side, a branch of the descending palatine artery.
  - the lesser palatine artery, a smaller branch of the descending palatine artery, enters the palate through the lesser palatine foramen and anastomoses with the ascending palatine artery, a branch of the facial artery.
  - the veins of the palate are tributaries of the *pterygoid venous plexus* (1).
  - the *sensory nerves of the palate* are branches of the maxillary nerve (CNV2), which branch from the *pterygopalatine ganglion*. The greater palatine nerve and the nasopalatine nerves supplies the hard palate and the lesser palatine nerves supply the soft palate. All the muscles of the soft palate are supplied through the *pharyngeal plexus of nerves*. Exception- the tensor veli palatini is supplied by CN V3. (1).
- ◎ The tongue is a mass of skeletal muscle separated into right and left halves by a midline fibrous septum. The tongue is separated from teeth by a deep alveololingual sulcus, which is filled in by palatoglossal fold/arch posterior to the last molar tooth. (1).
- ◎ The tongue exhibits the following external features:
  1. A root.
  2. A tip.
  3. A body.
 And 2 surfaces: dorsal and ventral.

The dorsal surface is convex and it is divided by a V-shaped sulcus named the sulcus terminalis into two parts:

1. Anterior two-third or oral part. and 2. Posterior one-third or pharyngeal part.(2)

- ⊙ The **oral part** presents the following features: a median furrow, representing the bilateral origin of the tongue and a large number of papillae.
- ⊙ The **pharyngeal part** presents the following features: a large number of lymphoid follicles (constituting the **lingual tonsil**) and a large number of mucus and serous glands.

The ventral/inferior surface of tongue presents the following features: 1. Frenulum linguae, a median-fold of mucous membrane connecting the tongue to the floor of the mouth. 2. Deep lingual veins, may be seen through mucous membrane on either side of frenulum linguae (the lingual nerve and lingual artery are medial to the vein but not visible). 3. Plica fimbriata, a fringed fimbriated fold of mucous membrane lateral to the lingual vein directed forwards and medially towards the tip of the tongue.(2)

The musculature of tongue consists of extrinsic and intrinsic muscles.

- ⊙ Each half of the tongue contains four intrinsic and four extrinsic muscles. These are as follows:
- ⊙ Intrinsic muscles
  1. Superior longitudinal.
  2. Inferior longitudinal.
  3. Transverse.
  4. Vertical.
- ⊙ Extrinsic muscles
  1. Genioglossus.
  2. Hyoglossus.
  3. Styloglossus.
  4. Palatoglossus.

The tongue is supplied by the following arteries: a. branches of lingual artery (chief artery of tongue); the deep lingual arteries to the anterior part and dorsal lingual arteries to the posterior part; b. tonsillar branch of the facial artery and c. ascending pharyngeal artery.(2)

It is by the following veins: a. deep lingual vein is the *principal vein of the tongue* and is visible on the inferior surface of the tongue near the median plane through thin mucous membrane in life; b. venae comitantes accompanying the lingual artery. They are joined by *dorsal lingual veins*. c. venae comitantes accompanying the hypoglossal nerve (2)

The nerves supplying the tongue are as follows:

- ⊙ Motor supply: All the muscles of tongue (intrinsic and extrinsic) are supplied by the hypoglossal nerve except palatoglossus which is supplied by cranial root of accessory via pharyngeal plexus.
- ⊙ Sensory supply:
  - ⊙ Anterior two-third of the tongue is supplied by: (a) lingual nerve carrying general sensations, and (b) chorda tympani nerve carrying special sensations of taste.
  - ⊙ Posterior one-third of the tongue is supplied by: (a) glossopharyngeal nerve, carrying both general and special sensations of taste, and (b) posteriormost part (base of the tongue), supplied by the internal laryngeal branch of the superior laryngeal carrying special sensations of taste.(2)

**References:** Text are exclusive for educational and demonstrative purposes to best illustrate the syllabus in the current conditions, the written text is cited from the books listed below:

1. Moore K.L. Clinically Oriented Anatomy. Seventh Ed. Lippincott Williams & Wilkins. 2014
2. Singh V. Textbook of Anatomy. Head, Neck and Brain-second edition, 2014

**For practicals mandatory texts from**  
**Richard L. Drake, A. Wayne Vogl, Adam W.M. Mitchell, *Gray's for students* ,**  
**Churchill Livingstone Elsevier, 2010**

**And additional completing the essential reading of the lecture texts from:**

1. **Gray H, *Gray's Anatomy – Anatomy descriptive and surgery*, Produced by Magpie Books, London, 1995.**
2. **Frank Netter - *Atlas of Human Anatomy* - Published by Icon Learning Systems, 2003**

### **English section-additional references that can be useful for practicals**

#### **Second year**

Carmine D. Clemente - *Anatomy: A Regional Atlas of the Human Body* - Published by Lippincott Williams & Wilkins, 2007.

Frank Netter - *Atlas of Human Anatomy* - Published by Icon Learning Systems, 2003.

Gray's Anatomy – *The anatomical basis of medicine and surgery*, Ed. XXXVIII.

Johannes Sobotta - *Sobotta Atlas of Human Anatomy* - Published by Lippincott Williams & Wilkins, 1996.

Keith L. Moore, A. M. R. Agur - *Essential Clinical Anatomy*, Published by Lippincott Williams & Wilkins, 2007.

Keith L. Moore, Arthur F. Dalley, A. M. R. Agur - *Clinically Oriented Anatomy* - Published by Lippincott Williams & Wilkins, 2006.

Mike T. Timmons, Michael J. Timmons, Ralph T. Hutchings, William C. Ober, Claire W. Garrison, Frederic Martini - *Human Anatomy: Laboratory Guide and Dissection Manual* - Published by Prentice Hall, 2002.

[www.bartleby.com/sv/pr060700.html](http://www.bartleby.com/sv/pr060700.html) -pentru Gray anatomy

<https://anatomiaartistica.files.wordpress.com/.../color-atlas-of-anatomy-a-photog-study-o> -cuvinte cheie pe google color anatomy atlas