

Physiology of teeth

FUNCTION OF TEETH

- The primary function of teeth is **mastication**, which involves
 1. the cutting
 2. mixing
 3. grinding of food to allow the tongue and oropharynx to shape it into a **bolus** that can be swallowed.
- There are **eight incisors** in normal adult dentition; two central and two lateral incisors on each arch. The incisors have a maximal biting force value of approximately **43.3 kg**.
- Moving posteriorly, the next tooth is **the canine, or the cuspid**, which is known as **the cornerstone** of the dental arch. The canine is considered one of the most important teeth due to its crucial role in jaw dynamics, helping to control how the teeth slide on and off each other. The **canine often has the longest root and is fastened tightly to the bone**. Canine teeth function to **tear and puncture holes**.
- Posterior to the canines are the **eight premolars (bicuspid)**, four in each arch, which assist in crushing, grinding, and mixing food. The bicuspid have a maximal biting force value of approximately **99.11 kg**.
- The most posterior functioning teeth are the **first and second molars**. Adults have **eight molars**, four per arch, with many adults also having more posterior third molars (known as wisdom teeth). Third molars are often extracted; however, it should be understood that wisdom teeth rarely contribute to mastication. The first molars have a maximal biting force value of approximately **120.66 kg**.

TOOTH FORM

Each tooth has three sections, (1) the crown, (2) the neck, and (3) the root.

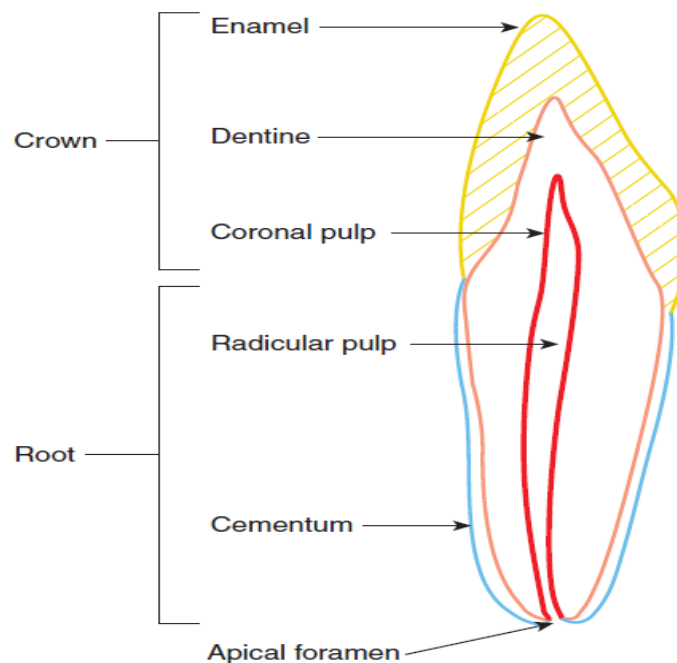
-**The crown** is the section of the tooth visible in the oral cavity, following its eruption from the underlying alveolar bone.

-**The neck** is the section where the tooth and the gingival tissues are in contact with each other.

- **The root** is the (usually) non-visible section that holds the tooth in its bony socket.

All teeth are composed of the same four tissues:

- **Enamel** – covering the whole crown of the tooth
- **Dentine** – forming the inner bulk of the crown and root
- **Cementum** – a thin covering of the root dentine only
- **Pulp** – the inner neurovascular tissue of the tooth, within the central pulp chamber



Crown

Two types of crown terminologies are used:

- 1. Anatomical crown:** It refers to the crown (entire) which is covered by enamel, regardless of whether it completely erupts or not. **The size of the anatomical crown remains constant throughout the lifetime of the tooth.**
- 2. Clinical crown:** It refers to the crown that is visible clinically, and it is what one sees when looking into the mouth. **The height of the clinical crown is determined by the position of the gingival margin.**

Root

The portion of the tooth covered by cementum is known as the root. The tooth may have either a single root or multiple roots.

Single roots are seen in - anterior teeth

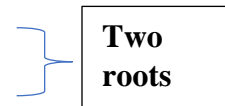
mandibular premolars

maxillary second premolars.

Multiple roots have been seen in – maxillary first premolars

mandibular molars

maxillary molars } three roots



Bifurcation or trifurcation: is the term used for the division of the root into two or three segments, i.e., bifurcation is seen in- maxillary first premolars

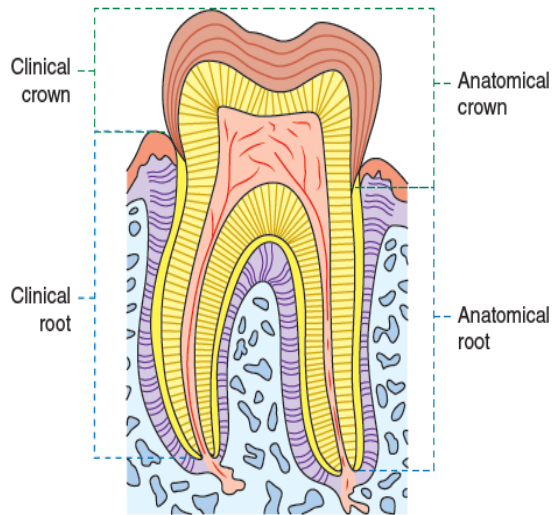
mandibular molars

trifurcation is seen in- maxillary molars.

Based on whether the root is visible in the oral cavity, two types of root terminologies are used:

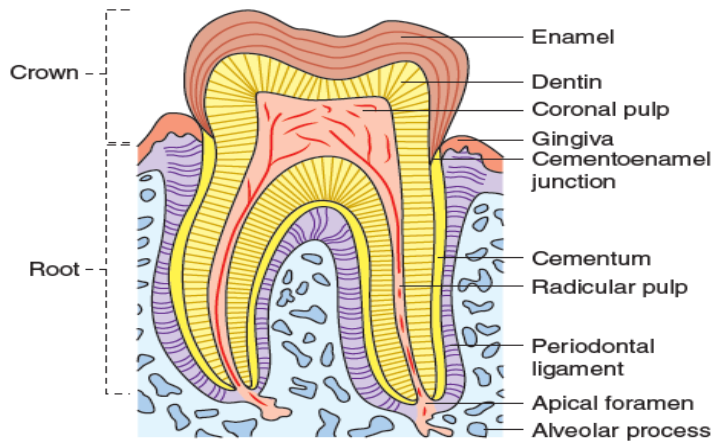
- 1. Anatomical root:** It refers to the root that is below the CEJ and is covered with cementum, a material that looks like bone and holds the tooth in its socket (the alveolus). **The size of the anatomical root remains constant throughout the lifetime of the tooth.**

2. Clinical root: It refers to the part of the tooth that is under the gingiva and not exposed to the oral cavity. The height of the clinical root is determined by the position of the gingival margin.



Cervical Line(neck)

The cervical line separates *the anatomical crown from the anatomical root*. It is the junction between two tissues of the tooth, **enamel, and cementum, and** hence is known as the **cementoenamel junction** or simply the CEJ. This region of the tooth is also called the cervix of the tooth because it appears constricted between the crown and the root portions.



SURFACES OF THE TEETH

The surfaces are named according to their **position** in the oral cavity and also their **uses**.

-Anterior teeth have 4 surfaces—labial, palatal/lingual, mesial, and distal—and one incisal ridge. **Anterior teeth positioned closer to the midline**

-Posterior teeth have 5 surfaces: buccal, palatal/lingual, mesial, distal, and occlusal. **Posterior teeth positioned away from the midline**

Facial Surface:

The facial surface can be subdivided into two parts:

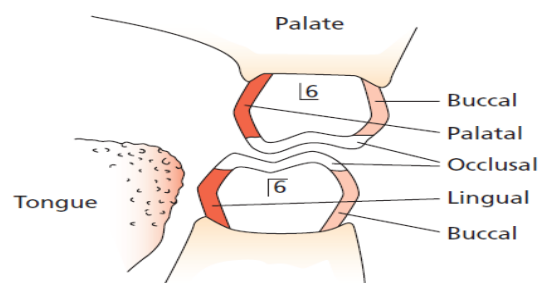
1. Labial surface: → lips → anterior teeth
2. Buccal surface: → cheek → posterior teeth

Palatal Surface

In the maxillary arch, the surface of the tooth closest to the palate is termed the palatal surface.

Lingual Surface

In the mandibular arch, the surface of the tooth closest to the tongue is termed the lingual surface.



Proximal Surface

The surface of a tooth that is towards another tooth in the dental arch is termed the proximal surface.

The proximal surface can be subdivided into two surfaces based on a position about the median line of the face.

1. **Mesial surface:** The surface → closer to the median line of the face.

2. **Distal surface:** The surface → away from the median line of the face.

The mesial surfaces of all teeth contact the distal surface of the adjacent teeth, except between the central incisors where the mesial surface contacts the adjacent mesial surface. In the permanent third molars and deciduous second molars, the distal surface has no contact with any other tooth.

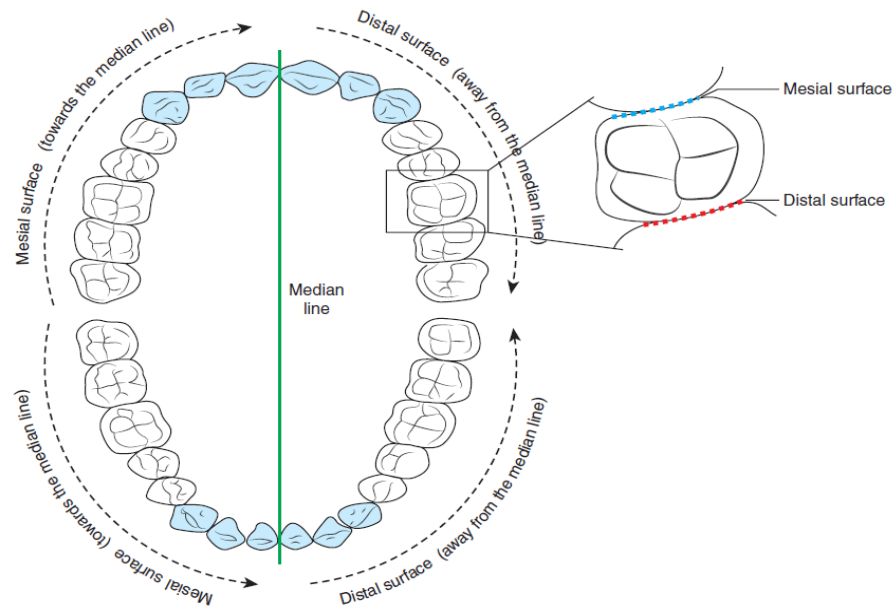


Figure 9.4 Proximal (mesial and distal) surface of the teeth.

Masticatory Surface

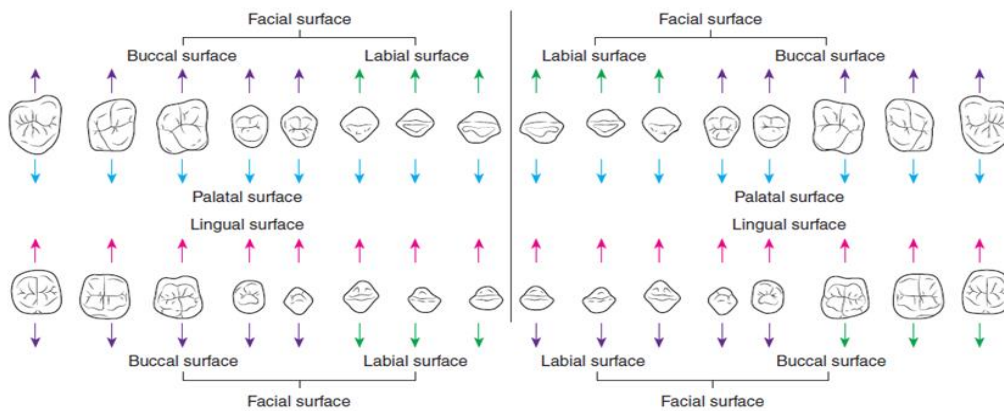
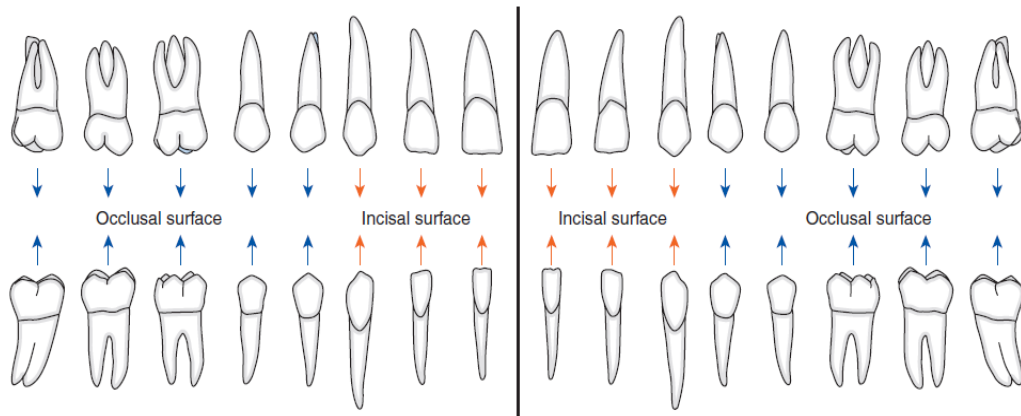
The surface that aids in chewing is known as the masticatory surface and is divided into two parts.

1. **Occlusal surface:** The chewing surface of the posterior teeth articulates with an antagonist's tooth in the opposing arch.

2. **Incisal surface:** It is the cutting surface of the anterior teeth.

incisal ridge- In newly erupted teeth, the incisal surface appears rounded and narrow.

incisal edge- When the incisal ridge becomes flat due to wear and tear.



DIVISION OF THE SURFACES OF THE TEETH

the crowns and roots are arbitrarily divided into thirds and are named according to their location.

Division of the Crown into Thirds

The crown can be divided into thirds in three ways:

1. Cervico-occlusal/cervico-incisally: By equally spaced horizontal lines.

They are divided into the following:

(a) Occlusal/incisal third

(b) Middle third

(c) Cervical third

2. Facio-lingually: by equally spaced vertical lines.

The divisions are as follows:

(a) Facial (labial/buccal) third

(b) Middle third

(c) Palatal/lingual third

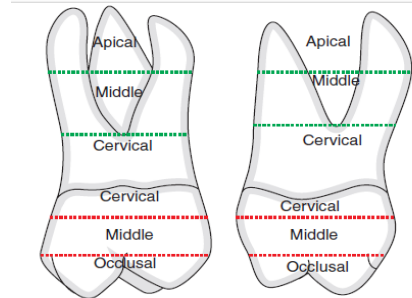


Figure 9.6 Division of the crown cervico-occlusally and root cervicoapically.

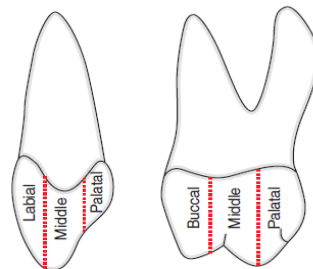


Figure 9.7 Division of the crown faciolingually.

THANK YOU