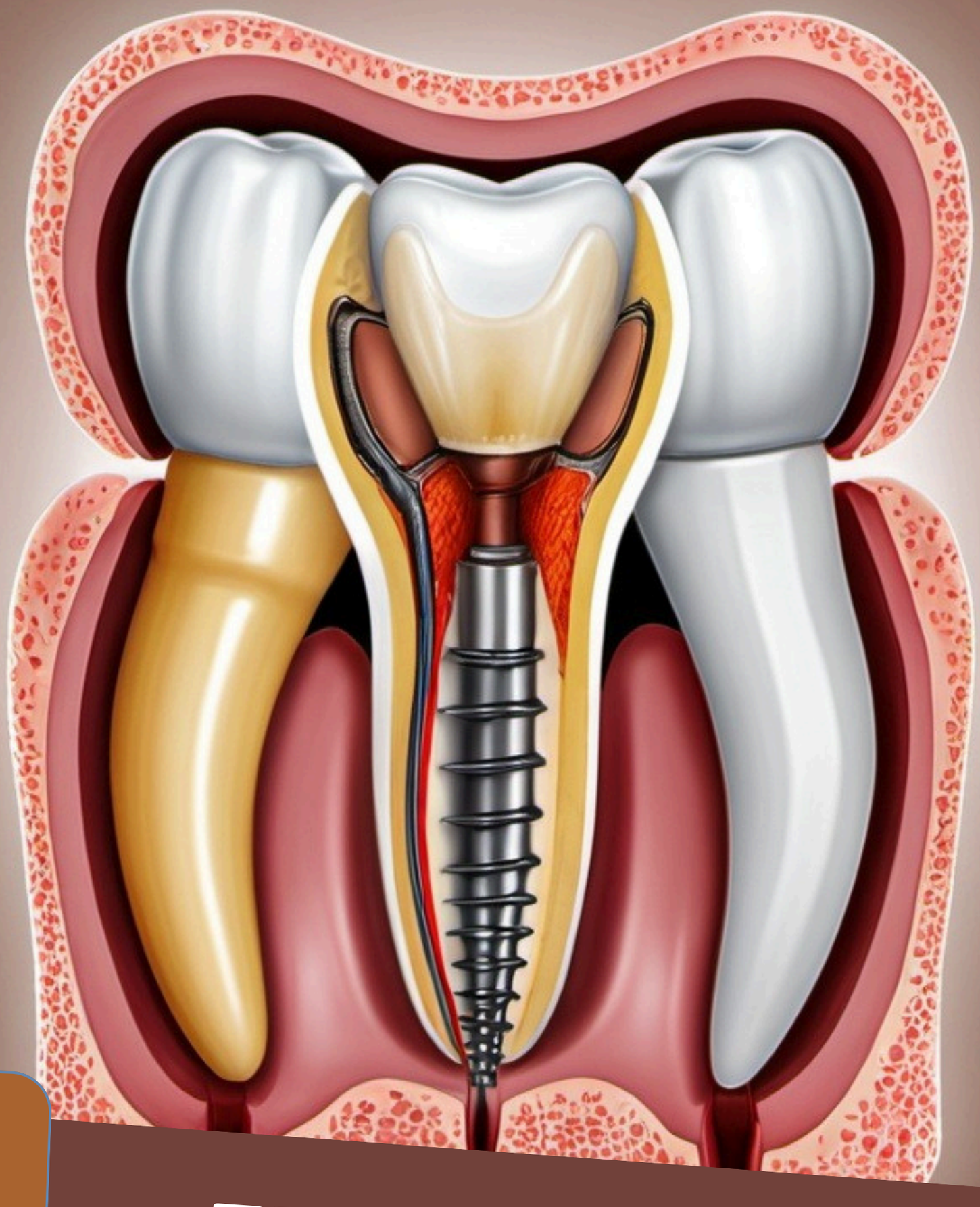


01

CHAPTER

ENDODONTICS LEC 1

طِبُّ لُبِّ الأَسْنان المحاضرة الاولي

TOPICS

Anatomical considerations

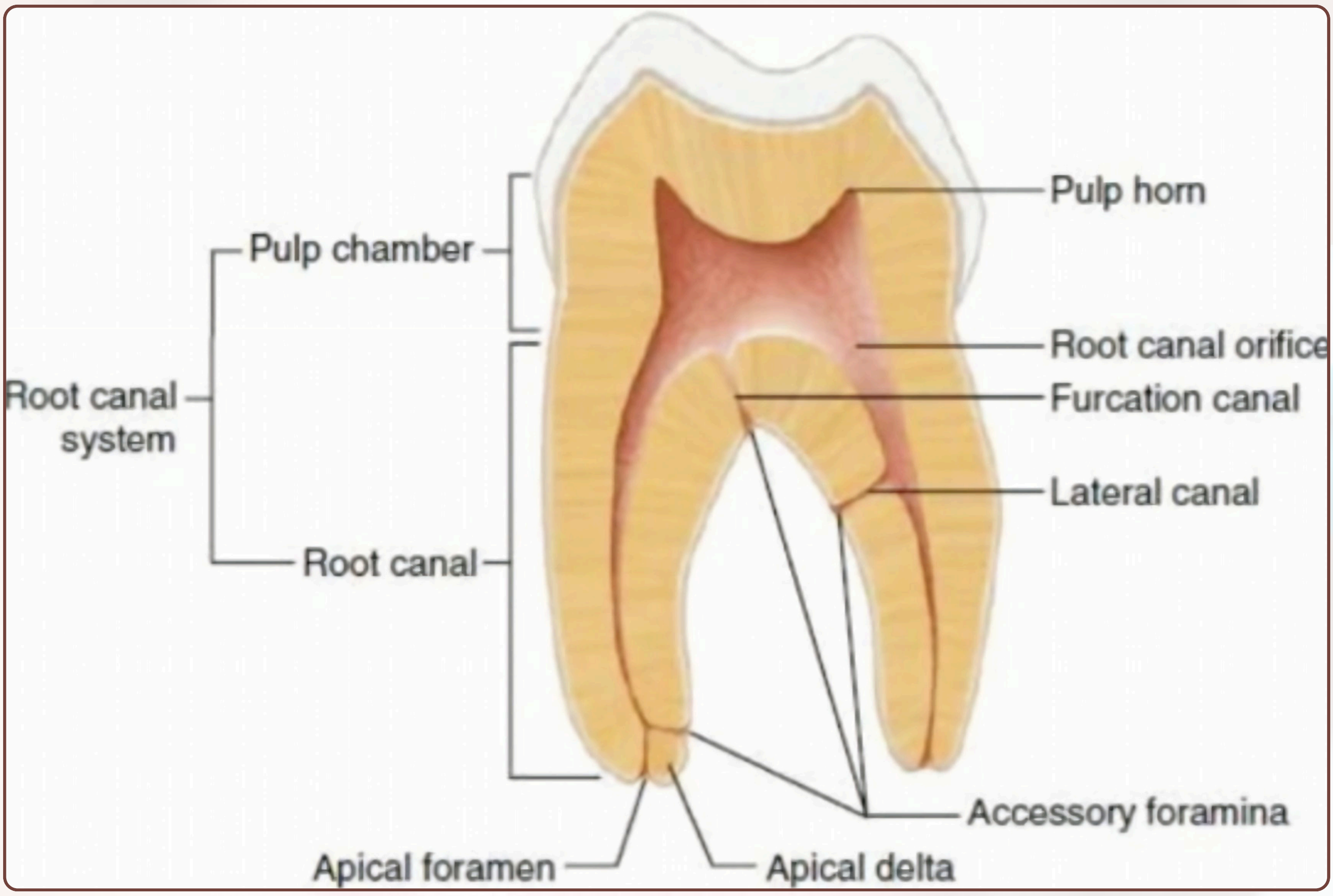
Scientific content prepared by

Booknerd Team

Anatomical considerations

- The complete removal of pulpal tissue from the root canal system is considered necessary for successful endodontics.
- Proper understanding of the variations in the anatomy of the root canal system is required for approaching the root canal space
- The entire space in dentin where the pulp is housed is called the root canal system.
- The root canal system is divided into two portions:

1. The pulp chamber (located in the anatomic crown of the tooth).
2. The root canals found in the anatomic roots.



Other anatomic features of the root canal system:

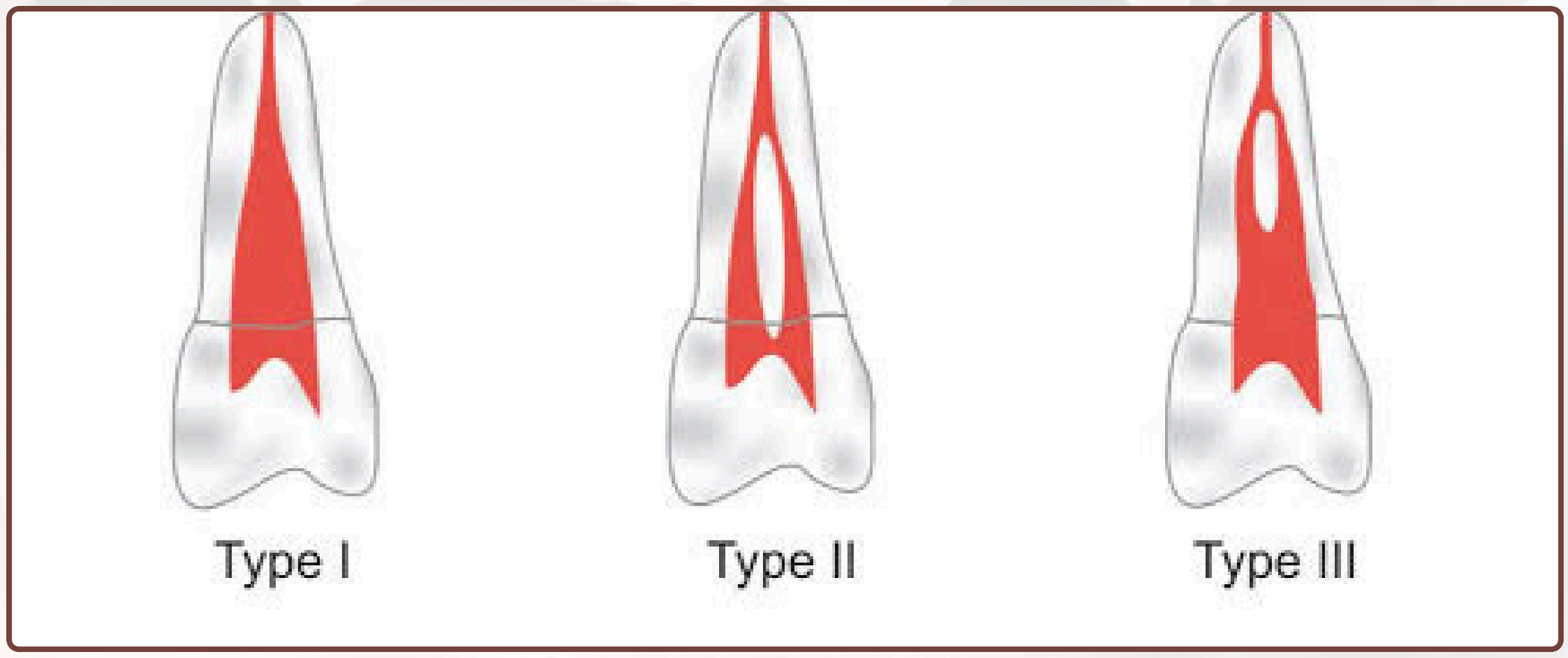
1) Pulp horns
2) Canal orifces.
3) Acessory canals.
4) Furcation canals.
5) Apical constriction.
6) Apical foramen.

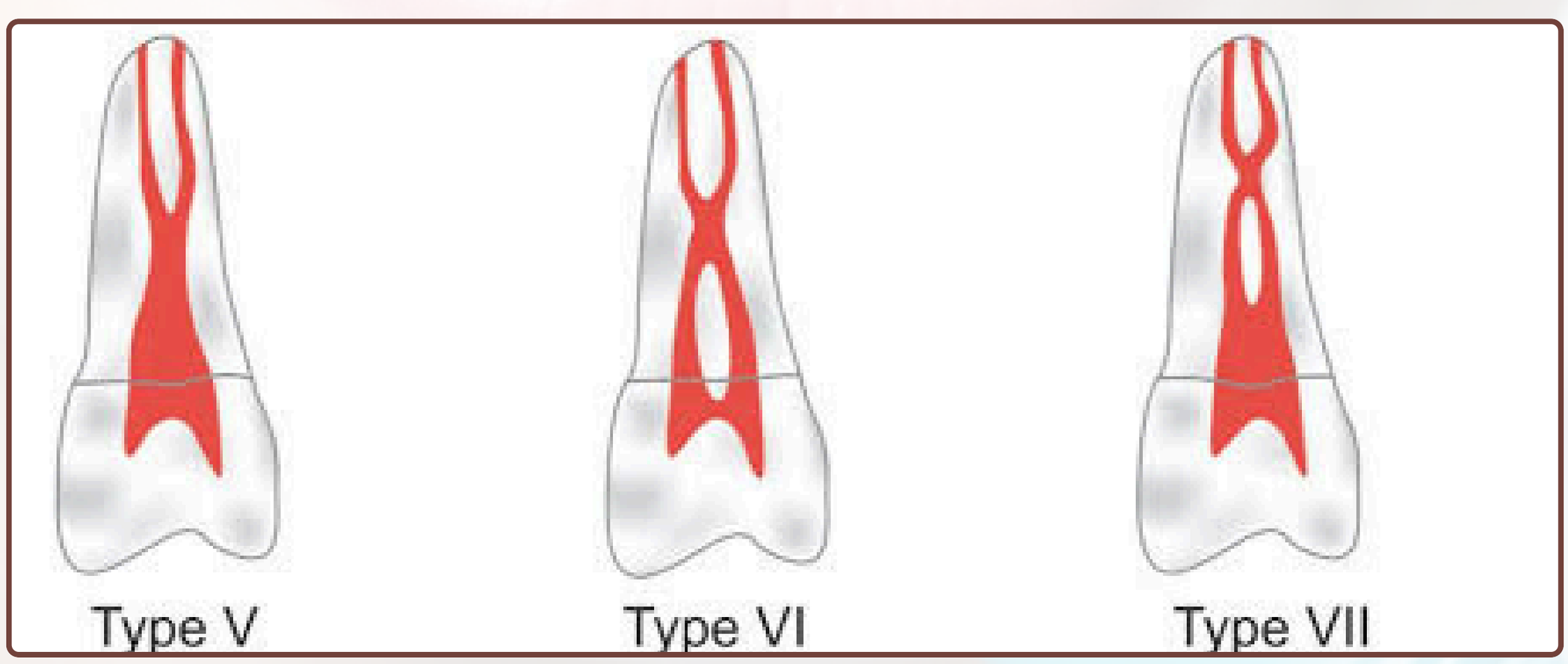
Root canal anatomy

- Typically, root canals take variable pathways throughout, coursing from the orifice to the apex. The pulp canal system is complex, and canals may branch, divide, and rejoin.
- Weine et al (1969) categorized the root canal systems in any root into four basic types. Later on, two more types were added to become six types.

Weine's classification of root canal configurations :

- Type I: A single canal extends from the pulp chamber to the apex.
- Type II: Two separate canals leave the pulp chamber and join short of the apex to form one canal.
- Type III: Two separate, distinct canals extend from the pulp chamber to the apex.
- Type IV: One canal leaves the pulp chamber and divides short of the apex into two separate, distinct canals with separate apical foramina.
- Type V: One canal leaves the pulp chamber and divides into two in the root; the two then merge to exit as one canal.
- Type VI: Two separate canals leave the pulp chamber, merge in the body of the root, and separate short of the apex to exit as two distinct canals.



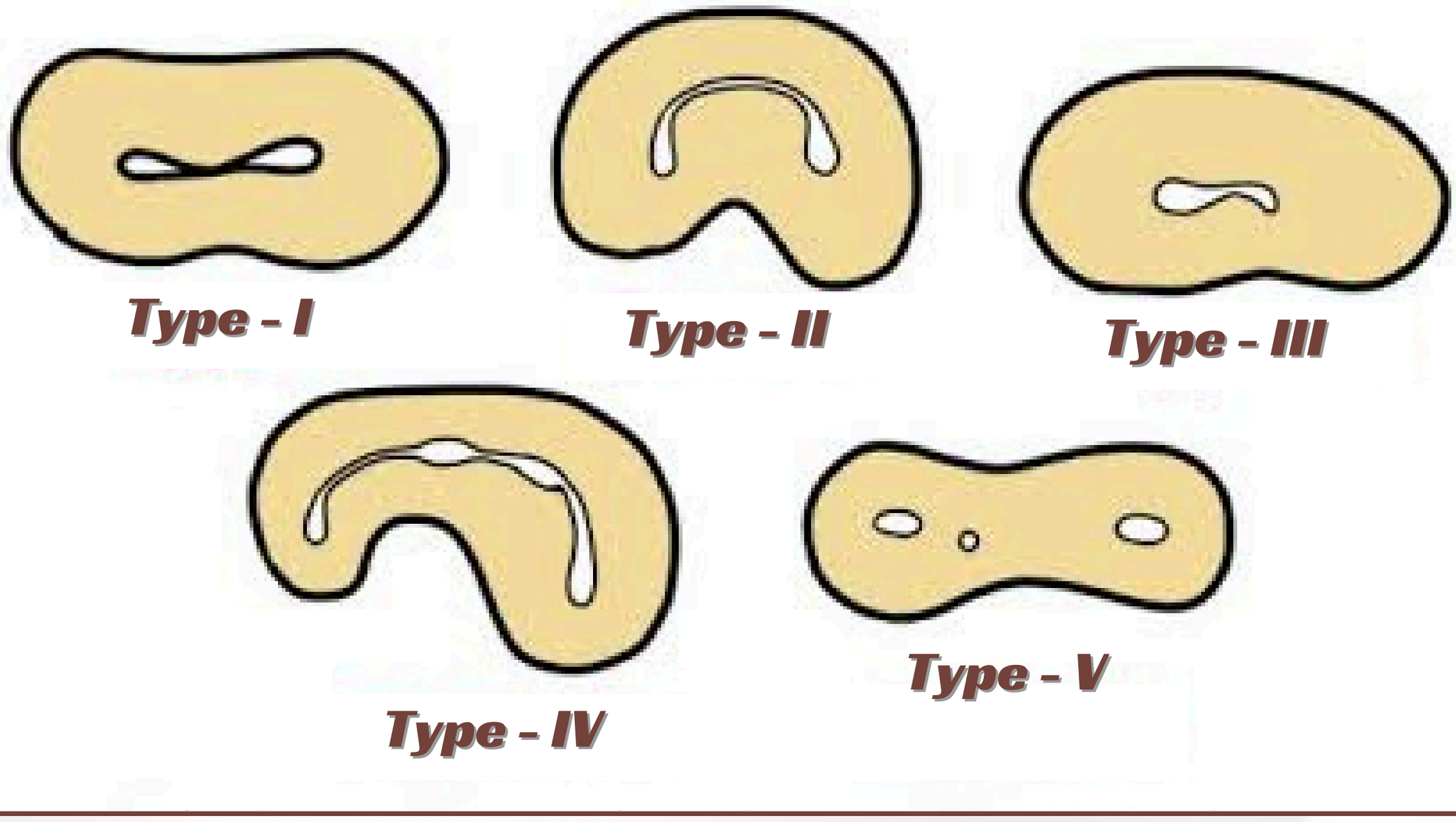


Isthmus

- It is a narrow, ribbon-shaped communication between two root canals that contains pulp or pulpally derived tissue. It contains variable amounts of tissue, and when the pulp is infected, it often contains bacteria and their byproducts.

Isthmus classifications by Kim and Colleagues:

- Type I is an incomplete isthmus; it is a faint communication between two canals.
- Type II is characterized by two canals with a definite connection between them (complete isthmus).
- Type III is a very short, complete isthmus between two canals.
- Type IV is a complete or incomplete isthmus between three or more canals.
- Type V is marked by two or three canal openings without visible connections.



Morphology of the root apex

- The classic concept of apical root anatomy is based on three anatomic and histologic landmarks in the apical region of a root: the apical constriction (AC), the cementodentinal junction (CDJ), and the apical foramen (AF).

The apical constriction (AC) :

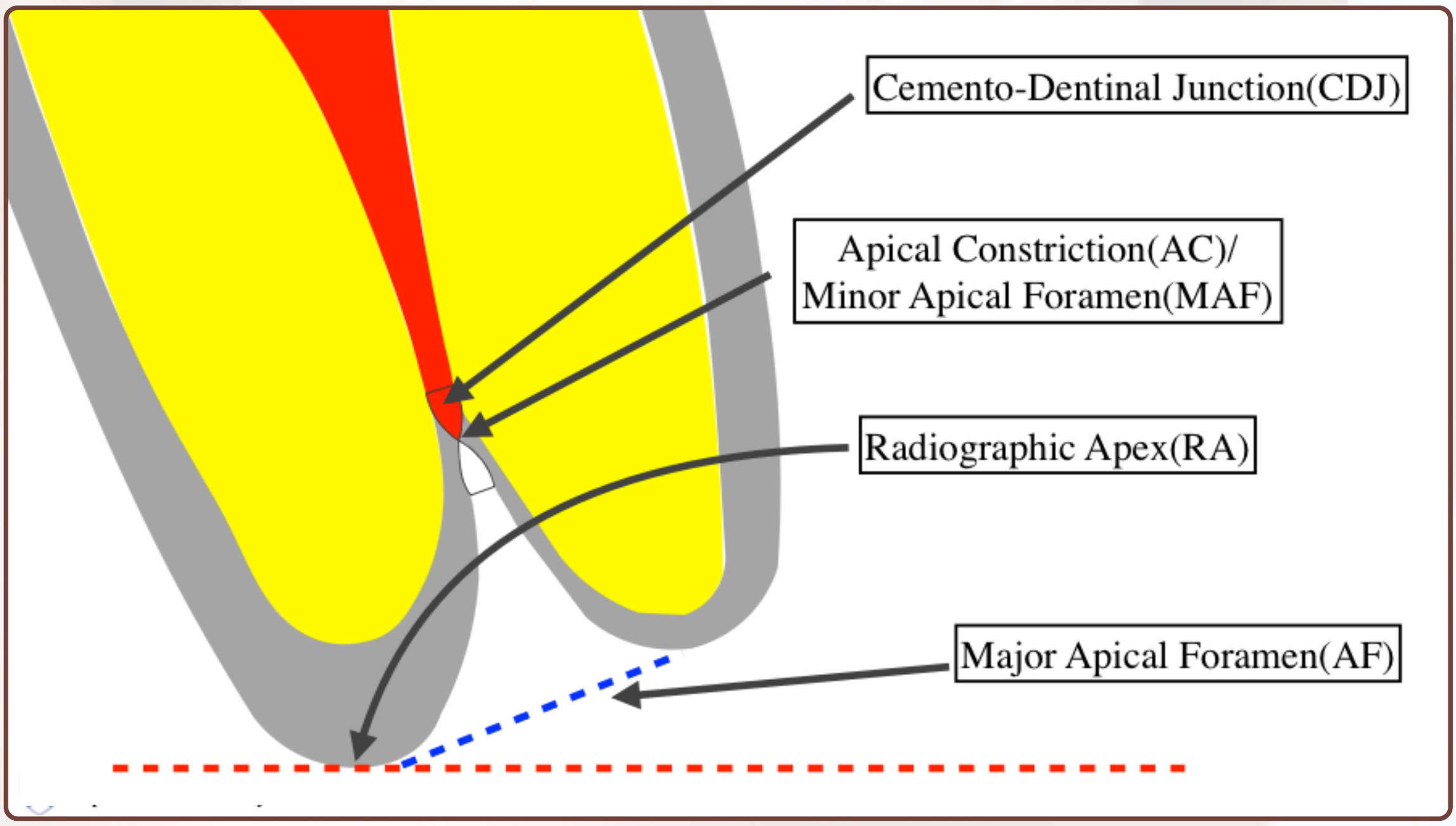
- The AC generally is considered the part of the root canal with the smallest diameter and it is generally 0.5 to 1.5 mm coronal to the AF. It is also the reference point which clinicians use most often as the apical termination for enlarging, shaping, cleaning, disinfecting, and filling.

The cementodentinal junction (CDJ):

- The CDJ is the point in the canal where cementum meets dentin; it is also the point where pulp tissue ends and periodontal tissues begin.

Apical Foramen (AF)

- From the AC, or minor apical diameter, the canal widens as it approaches the AF, or major apical diameter. The space between the major and minor diameters has been described as funnel shaped. The mean distance between the major and minor apical diameters is 0.5 mm.



Teeth with C-shaped root canal systems

- The main cause for C-shaped roots and canals is the failure of Hertwig's epithelial root sheath to fuse on either the buccal or lingual root surface. The C-shaped root canal system can occur in maxillary and mandibular molars, but it mostly occurs in mandibular second molars.

Classification of C-shaped canal configuration:

- Category I (C1): The shape is an uninterrupted “C” with no separation or division.
- Category II (C2): The canal shape resembles a semicolon resulting from a discontinuation of the “C” outline.
- Category III (C3): Two or three separate canals.
- Category IV (C4): Only one round or oval canal is in the cross-section.
- Category V (C5): No canal lumen can be observed (is usually seen near the apex only)