

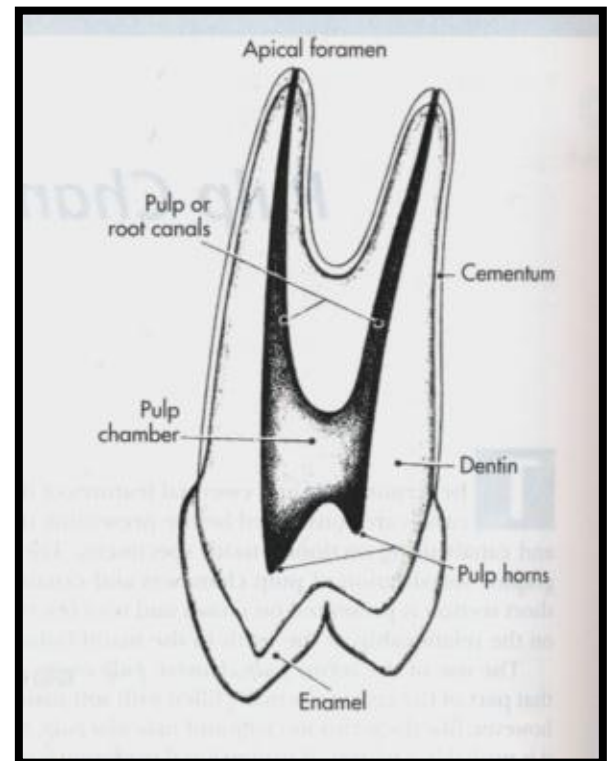
## The pulp cavities of the permanent teeth:

The dental pulp is the soft tissue component of the tooth that occupies the internal cavity of the tooth (the pulp cavity which is divided into pulp chamber and pulp canal or root canal). The pulp tissue furnishes the blood and nerve supply to the tooth.

## Functions of the pulp:

1. Formative: formation of dentin (secondary dentin).
2. Sensory: mediation of pain sensation.
3. Nutritive: transportation of nutrition into dentin.
4. Defensive: response to irritation by forming reparative dentin.

**Pulpal cavity:** It is the central space in the dentin of the tooth which contain the dental pulp in a living tooth. In general, the outline of the pulp cavity corresponding to the external outline form of the tooth.

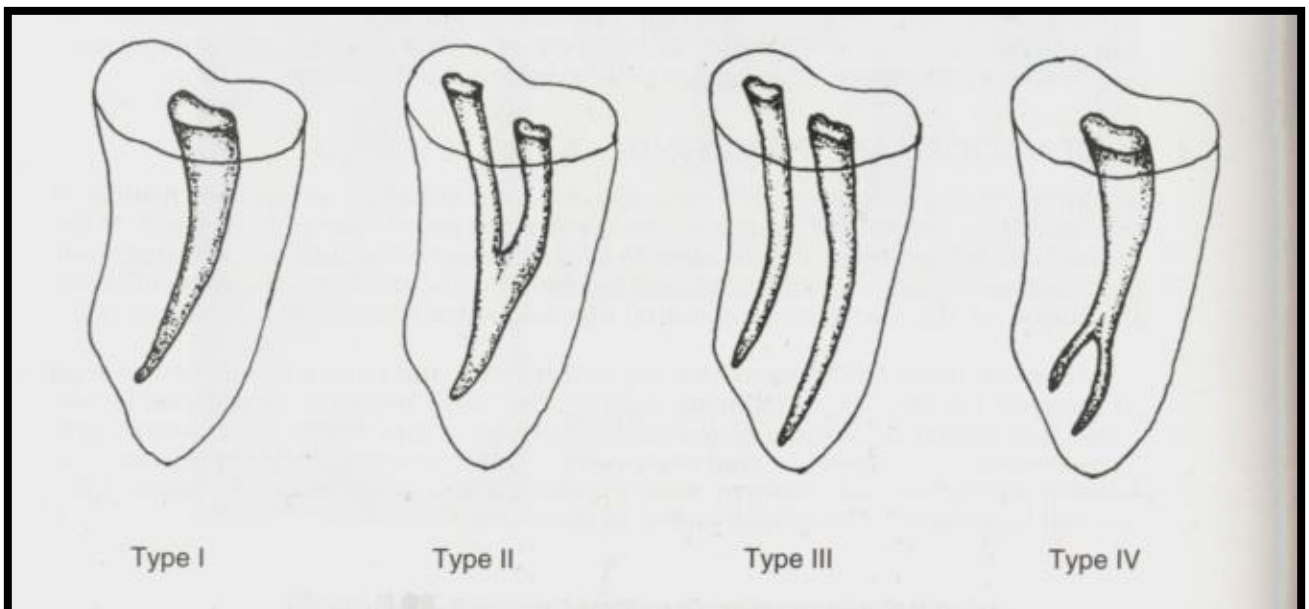


**Pulp chamber:** Is that portion of the pulp cavity which is located mainly in the anatomical crown of the tooth.

**Pulp canal:** Is that portion of the pulp cavity which is located in the anatomical root of the tooth, it is a continuation of the pulp chamber.

The shape and number of root canals in any one root have been divided into four major classifications:

- \* **Type I** - one canal from the pulp chamber to the apex.
- \* **Type II** - two separate canals leaving the pulp chamber and joining short of the apex to form one canal apically.
- \* **Type III** - two separate canals leaving the pulp chamber and remaining separate to exit the root apically as separate foramina.
- \* **Type IV** - one canal leaving the pulp chamber and dividing in the apical third of the root into two separate canals with separate apical formation.

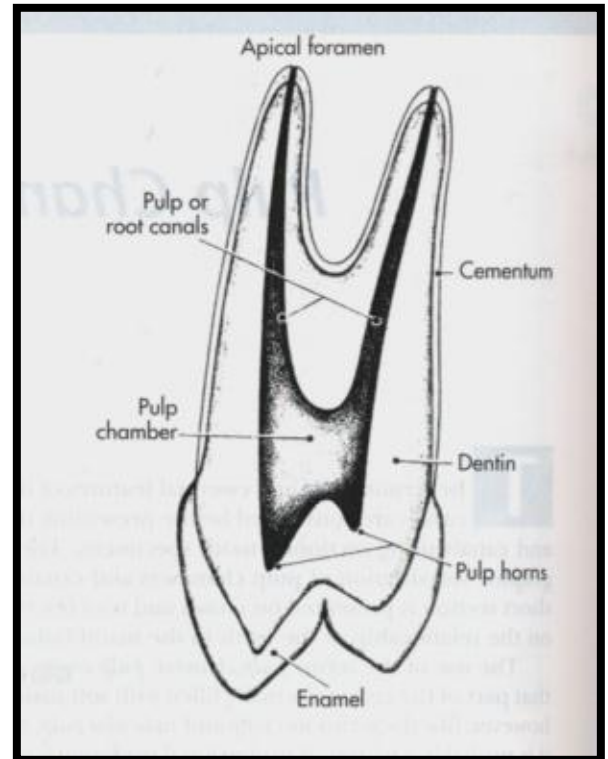


\* **Apical foramen:** It is the constricted opening near the apex of the root through which the blood supply and nerves pass.

\* **Lateral or supplementary canal:** Is a lateral branch of the root canal.

\* **Delta system:** the complex system formed by breaking up of the root canal into multiple tiny canals.

\* **Pulp horn:** Is the pulpal tissue that occupy the projections or prolongations in the roof of the pulp chamber that correspond to the various major cusps or lobes of the crown.



## **Pulp cavities of individual teeth:**

### **Maxillary incisors:**

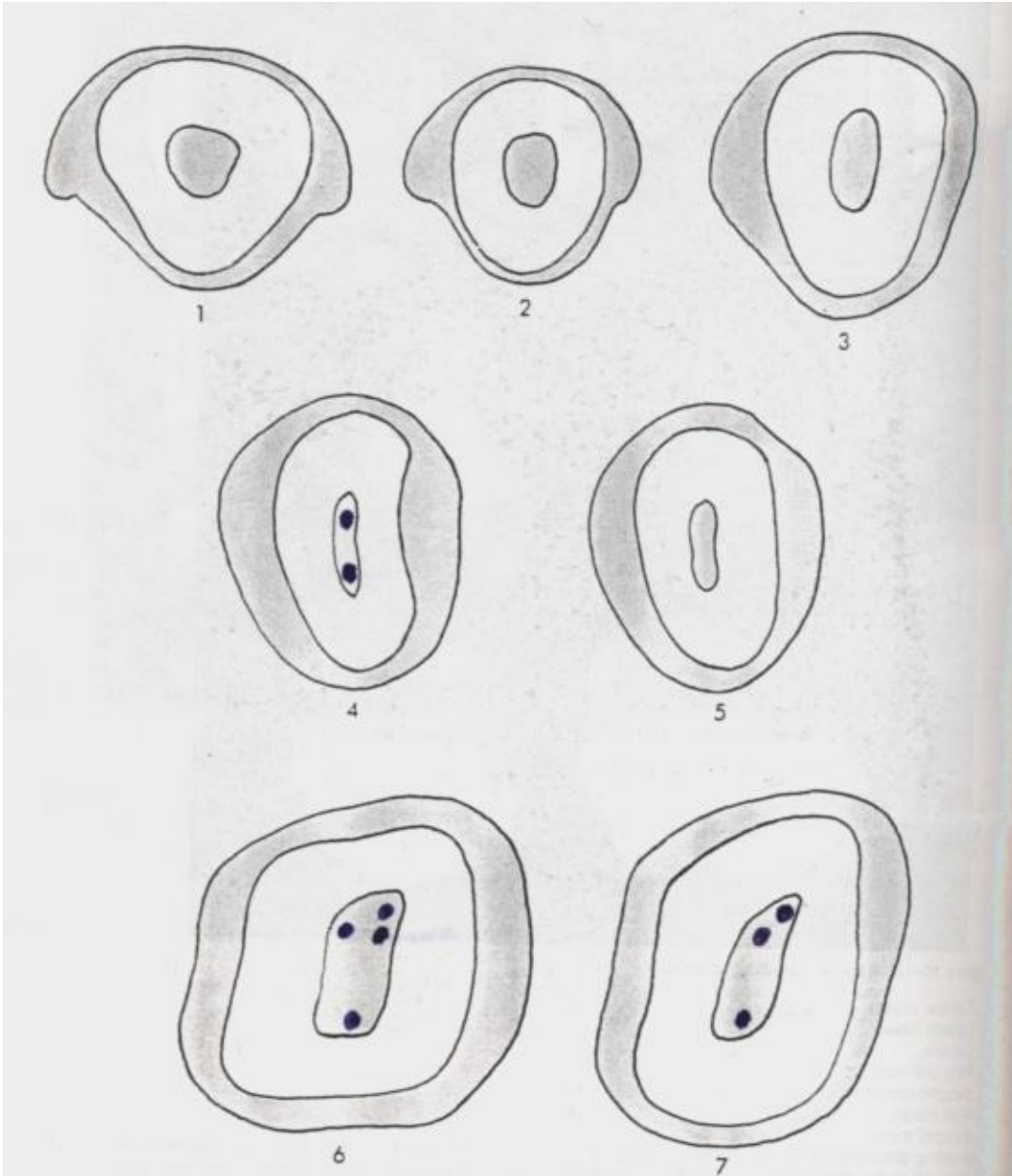
Each incisor has a pulp cavity that is wider mesiodistally than buccolingually. The central incisor has a wider pulp cavity than the lateral incisor. The central incisor in young age has three pulp horns. The cross section of the pulp chamber is triangular in shape with rounded angles.

### **Mandibular incisors:**

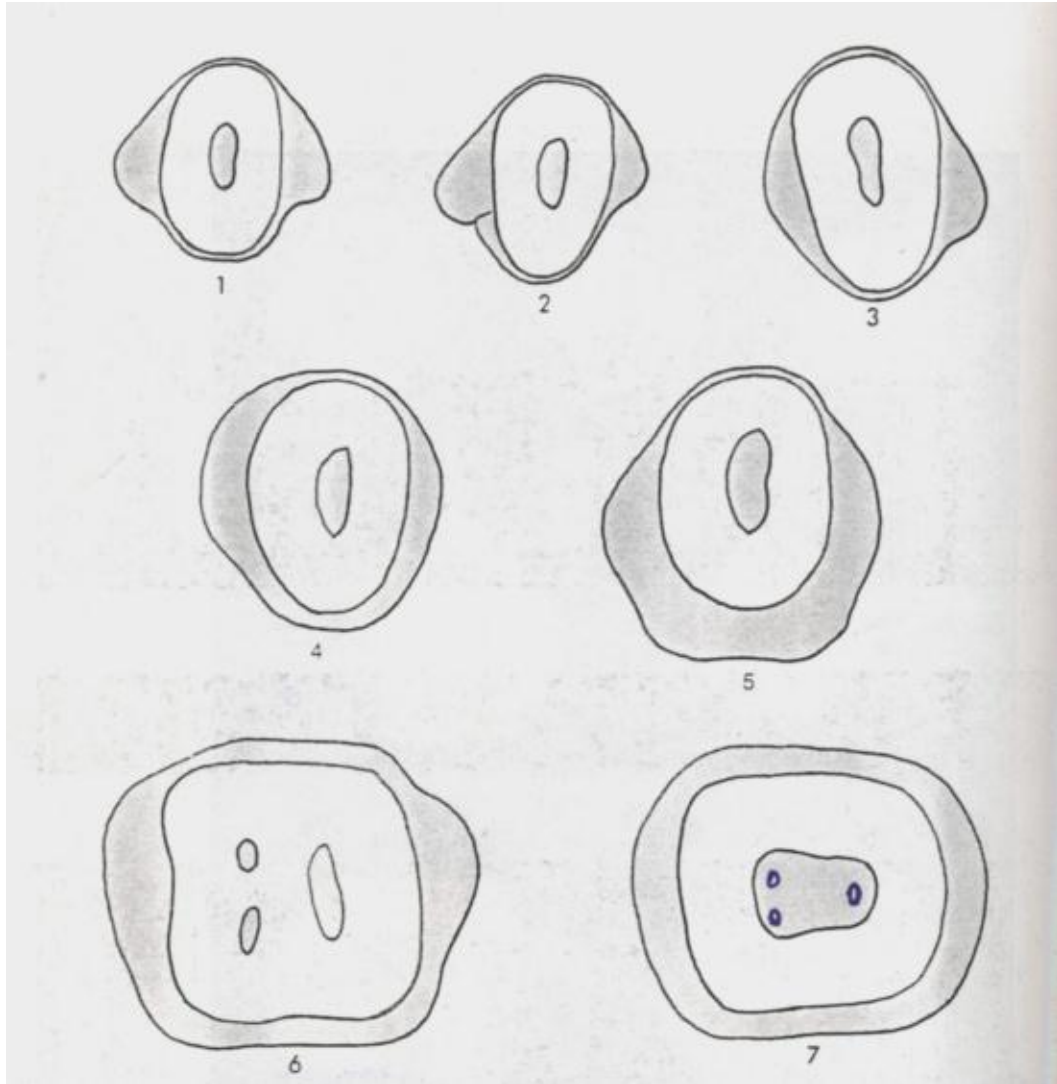
The cross section of the pulp chamber is more oval in shape. The pulp cavity of the lateral incisor tend to be little larger than that of central incisor in all dimensions and the pulp chamber is also larger. Usually they have one canal but two canals may be found.

### **Maxillary canine:**

It is the widest pulp chamber in the mouth labiolingually. There is one pulp canal and one pulp horn. The cross section of the pulp chamber is oval or triangular in shape. The size of the pulp chamber also may be the largest in the mouth.



Cervical cross sections of Maxillary teeth



Cervical cross sections of Mandibular teeth

**Mandibular canine:**

It is similar to the maxillary canine but with less dimension.

### **Maxillary first premolar:**

The cross section of the cervical level shows the characteristic of kidney-shaped outline form of the maxillary first premolar. It usually has 2 root canals, a small percentage has three canals. There is two pulp horns, one under each cusp, the buccal horn is higher. usually it has 2 separated foramina.

### **Maxillary second premolar:**

Most maxillary second premolar have only one root and canal. Two roots are possible, although 2 canals within a single root may also be found. It has 2 pulp horns. When there is 2 root canals, they may have:

1. two separated foramina.
2. one apical foramen, join at the apical third.
3. one apical foramen, join at the apex.

The cervical cross section is usually oval.

### **Mandibular first premolar**

The pulp cavity of this tooth look similar to that of mandibular canine, with 2 pulp horns, the buccal one is higher. The majority of these teeth have one canal, but two canals are possible. The cross section varies considerably, it may be oval, rectangular, round or triangular.

### **Mandibular second premolar:**

It is similar to the first premolar with increased dimension, and more prominent 2-3 pulp horns depending on the number of the cusps. It has one root with one root canal.

### **Maxillary first molars:**

The cervical cross section of the pulp chamber is rhomboidal in shape. It has 4 pulp horns, the mesiolingual one is the highest. This tooth has 3 roots, each root has one root canal, but the mesiobuccal root may have 2 canals. In cross section the orifices of the canals form a triangular pattern.

### **Maxillary second molar:**

It is similar to that of first molar, but the orifices of the root canals are much closer together than in the maxillary first molar, and the presence of 2 canals in the mesiobuccal root is not common in the maxillary second molar.

### **Mandibular first molar:**

The cervical cross section of the pulp chamber is rectangular or quadrilateral in form. The pulp chamber is wider mesially than distally at its buccolingual dimension. There are 5 pulp horns. The mesial root has 2 canals, one buccal and one lingual. The distal root usually has one large canal, but 2 canals are often present.

### **Mandibular second molar:**

It is similar to that of the first molar, but there is 4 pulp horns. The outline form of the cervical cross section is more triangular because of the smaller dimensions that are usually seen in the distal aspect of this tooth.

**END**