

DIFFERENCE BETWEEN PRIMARY AND PERMANENT TEETH

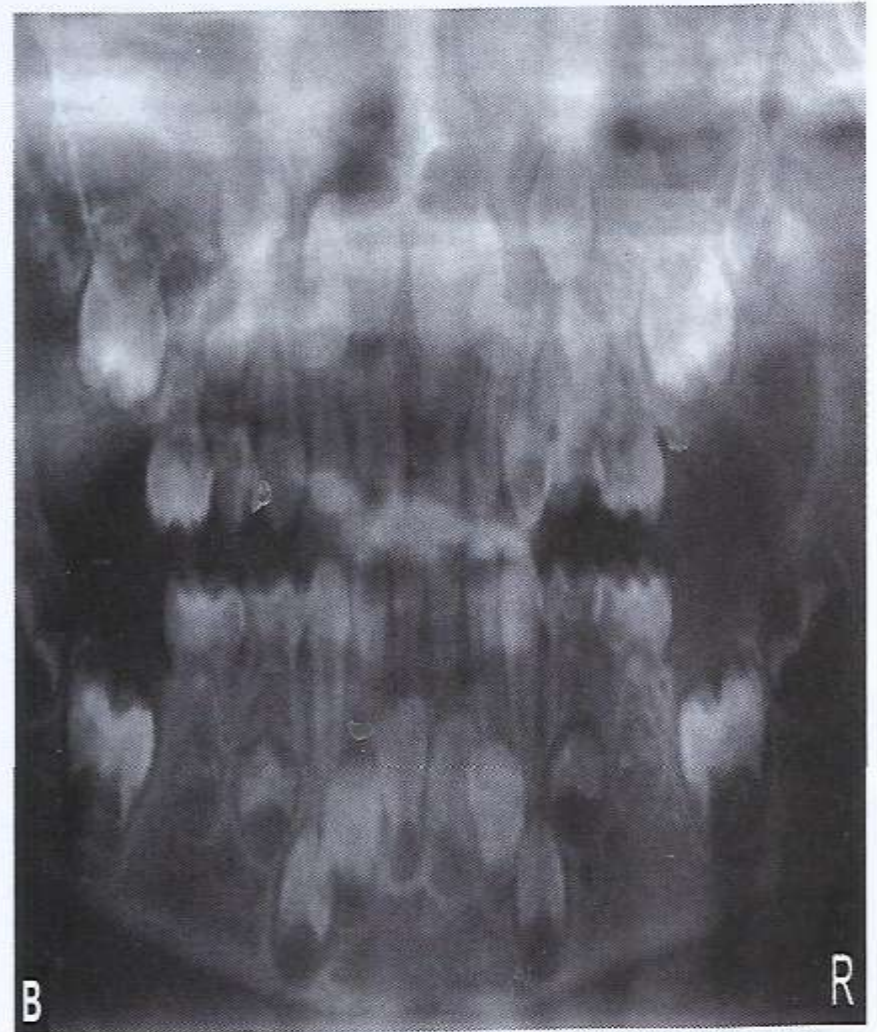
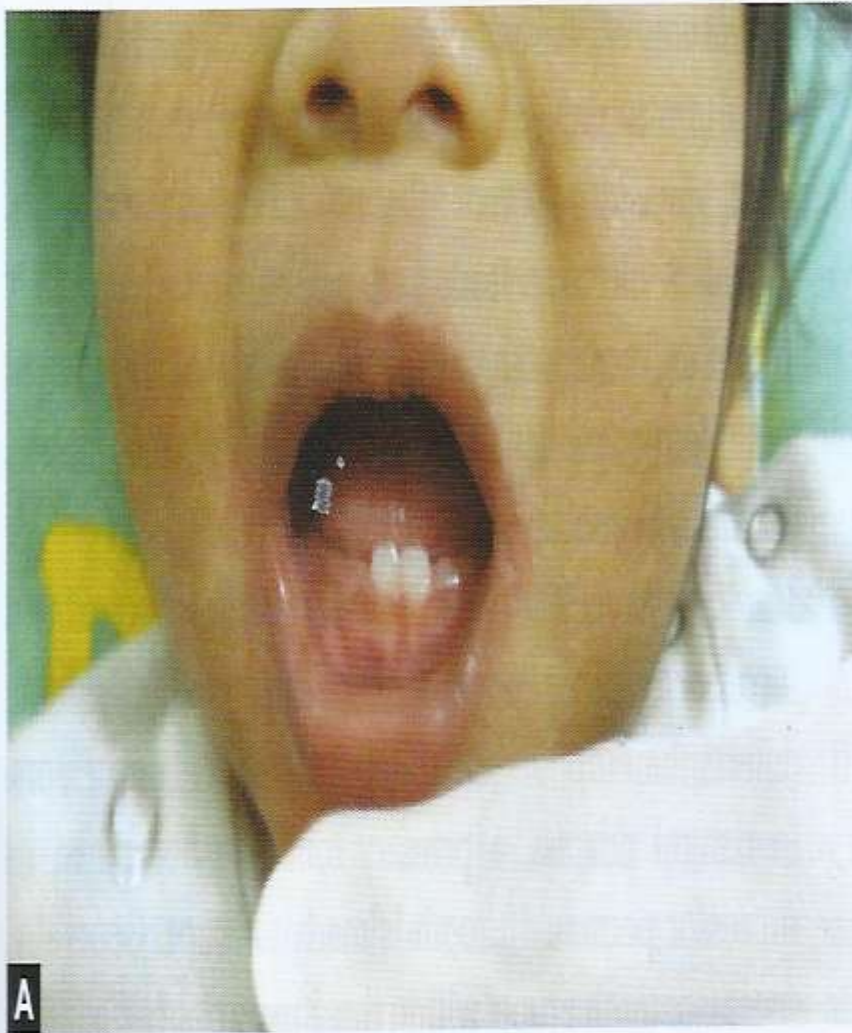
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Reader

Oral & Maxillofacial Pathology

SDC

- **Humans exhibit two sets of teeth, condition called **Diphyodonty**.**
 - 1. Primary Teeth**
 - 2. Permanent Teeth**



Figures 5.4A and B (A) Eruption of primary teeth usually begins with emergence of mandibular central incisors at around 6 months of age; (B) OPG of a 3-year-old boy showing root completion of all the primary teeth

SIGNIFICANCE OF DECIDUOUS DENTITION

- **Efficient mastication of food:** With the establishment of primary occlusion, child learns to masticate the food efficiently. Neuromuscular coordination required for masticatory process is established at primary dentition stage itself.

- **Maintenance of a proper diet and good nutrition:** A child with missing/grossly decayed primary teeth may reject food that is difficult to chew.
- **Maintenance of normal facial appearance:** It contributes to normal psychological and cognitive development of the child. Prematurely lost or rampantly carious front teeth may hamper a child's self confidence due to mocking from their peers.

- **Development of clear speech:** Teeth, especially the anteriors are essential for normal pronunciation of consonants. Congenital absence or premature loss of anterior primary teeth can hamper the development of clear speech.

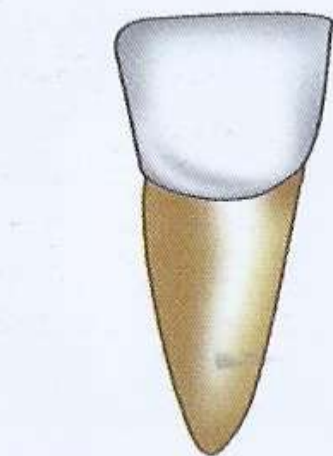
- **Avoidance of infection and possible sequelae:** It is important to prevent and treat dental caries of primary teeth so as to prevent abscess formation & pain. Spread of infection from periapical abscess (especially in primary molars) may reach the underlying permanent tooth germs & can cause brown spots of their crowns (Turner's hypoplasia).

- **Maintenance of normal eruption schedule of permanent successors:** Generally, successor tooth erupts within three months of exfoliation of its predecessor tooth. However, this normal eruption schedule of permanent teeth is disturbed when primary teeth are lost prematurely due to caries or trauma. Thus, malocclusion may develop.

- Maintenance of space for eruption of permanent successor teeth: Presence of adequate physiologic spacing in primary dentition is conducive to the development of normal occlusal relations in permanent dentition. A lack of space associated with premature loss of primary teeth is a common cause of malocclusion development.



Figure 5.8 Adequate physiologic spacing between the primary teeth in a 5-year-old child



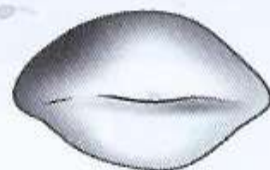
A Labial



B Lingual



C Mesial



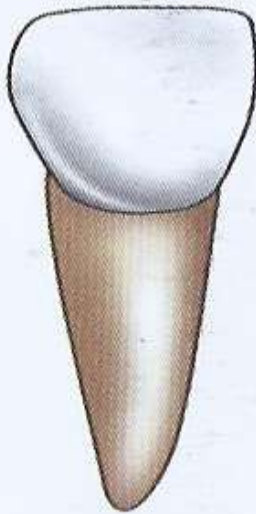
Incisal

E



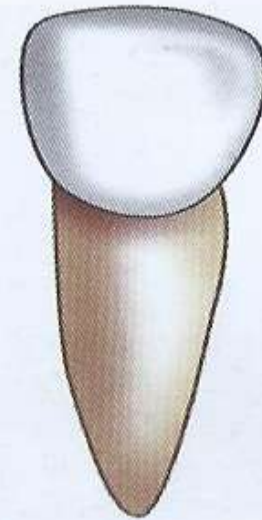
D Distal

Figures 5.14A to E Primary right mandibular central incisor



A

Labial



B

Lingual



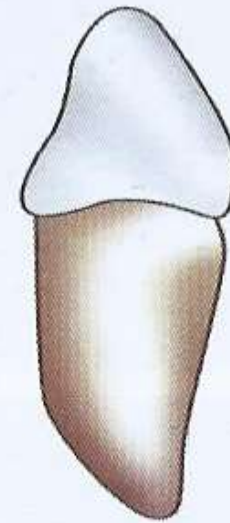
Incisal

E



C

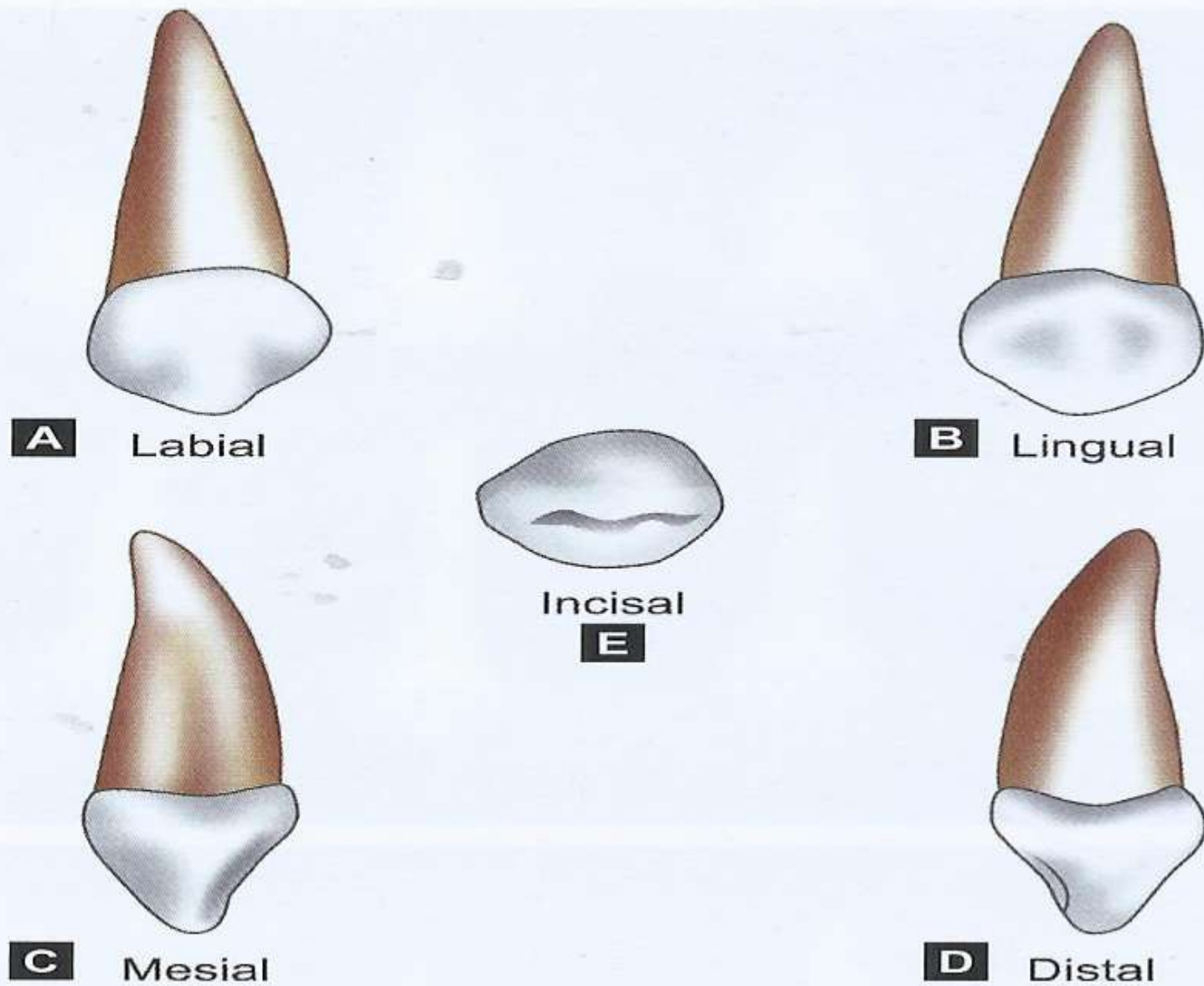
Mesial



D

Distal

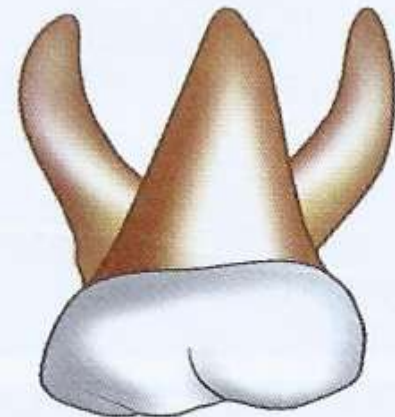
Figures 5.16A to E Primary right mandibular lateral incisor



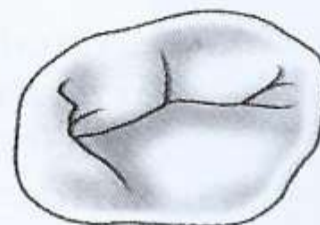
Figures 5.18A to E Primary right maxillary canine



A Buccal

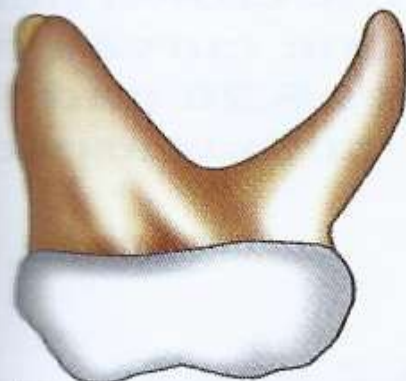


B Lingual

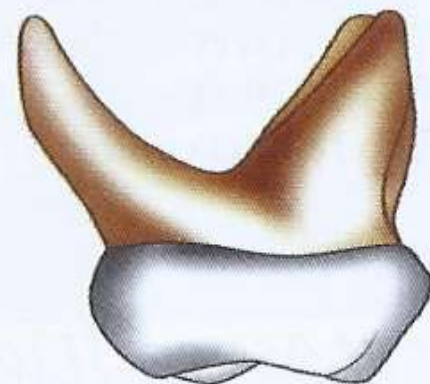


Occlusal

E



C Mesial



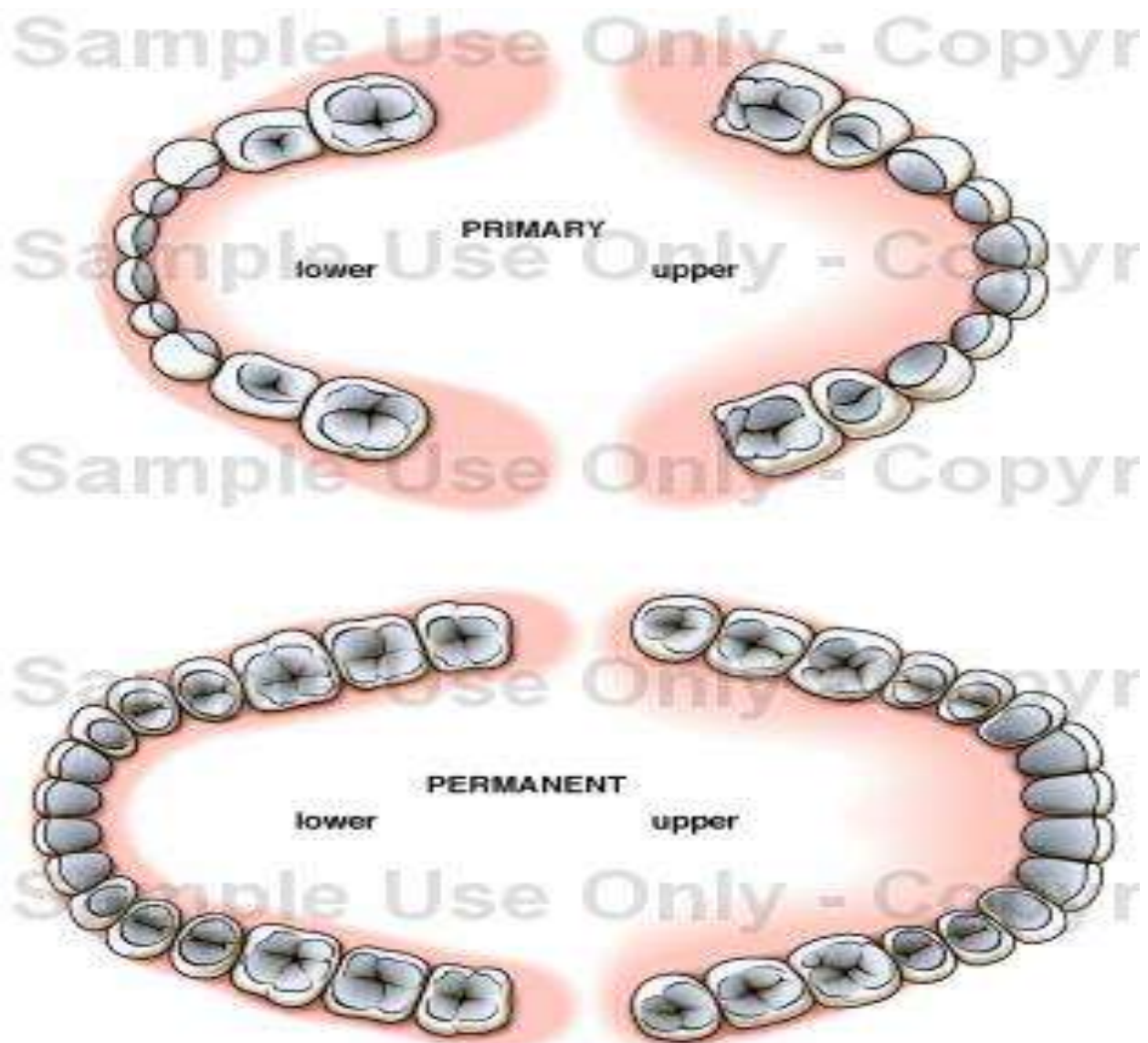
D Distal

Figures 5.24A to E Primary right maxillary 2nd molar

Primary and Permanent Teeth

Teeth vary in size, shape and their location in the jaws. These differences enable the teeth to work together to help you chew, speak and smile. They also help give your face its shape and form.

At birth people usually have 20 primary (baby) teeth, which often erupt as early as six months of age. They are then shed at various times throughout childhood. By age 21, all 32 of the permanent teeth have usually erupted. Listed below, for your quick reference, are charts that identify primary and permanent teeth.



Primary dentition

- Number: A total of 20 teeth. 10 in each jaw, 5 in each quadrant. There are 2 incisors, 1 canine, 2 molars in each quadrant. Premolars & 3rd molars are not there in deciduous dentition.

Permanent dentition

- A total of 32 teeth. 16 in each jaw, 8 in each quadrant. There are 2 incisors, 1 canine, 2 premolars and 3 molars in each quadrant.

Primary dentition

- **Duration of dentition:**
lasts from 6 months to 6 years. Primary teeth begin to erupt at 6 months. By 2½ to 3 years of age, a child would have his/her complete set of deciduous teeth.

Permanent dentition

- 12 years and beyond.
Eruption of permanent teeth begins at 6 years and completes at 12-13 years except for 3rd molars.

Macroscopic features

Primary dentition

- **Size:** Primary teeth are smaller in overall size and crown dimensions when compared to their permanent counterparts.
- **Color:** Lighter in color. They appear bluish-white (milky white) & are also called as milk teeth. Their refractive index is comparable to that of milk.

Permanent dentition

- Larger in overall dimension.
- Permanent teeth are darker in color. They appear yellowish, white or greyish white.
- Thus for primary resin restorations, lighter shades should be selected.

Primary dentition

- **Shape:** Crowns of primary teeth are wider mesiodistally in comparison to their crown height.
- **Cervical constriction:** more constricted at the cervical portion of the crown, i.e. narrower at their necks.

Permanent dentition

- Crowns of permanent anterior teeth appear longer as their cervicoincisal height is greater than mesiodistal width.
- Crowns not so constricted at their necks.

Primary dentition

- **Cervical ridge**: on buccal aspect of deciduous crown are more prominent (especially on 1st molars).
- **Incisors**- primary incisors do not exhibit mamelons.
- Primary incisors wider mesiodistally than they are long cervicoincisally.

Permanent dentition

- Cervical ridges on permanent crowns are flatter.
- Newly erupted permanent incisors exhibit mamelons.
- Permanent incisors longer cervicoincisally than they are wider mesiodistally.

Primary dentition

- **Canines**- tend to be more conical in shape & cusp tip is more pointed & sharp.
- No premolars in deciduous dentition.
- Only 2 molars in each quadrant. No 3rd molars in deciduous dentition.

Permanent dentition

- Permanent canines are less conical; their cusp tips are less pointed.
- There are two premolars in each quadrant.
- 3 molars in each quadrant.

Primary dentition

- Size- crown of 2nd molar is larger than the crown of 1st molar.
- Deciduous molars are more bulbous & with marked cervical constriction.

Permanent dentition

- 1st permanent molar is larger than 2nd & 3rd molars. Size of crown gradually decreases from 1st to 3rd molars.
- Permanent molars have less constriction of neck.

Primary dentition

- Occlusal table: buccal & lingual surfaces of primary molars, especially that of 1st molars converge sharply occlusally, thus forming narrow occlusal table in buccolingual dimension.

Permanent dentition

- There is less convergence of buccal & lingual surfaces of molars towards occlusal surface. Thus, have broader occlusal table.

Primary dentition

- Supplementary grooves are more. Primary molars are more caries prone due to easy food lodgement.
- Upper 1st molar has 3 cusps (resembles a premolar). Upper 2nd molar resembles permanent upper 1st molar. Lower 1st molar does not resemble any tooth.

Permanent dentition

- Supplementary grooves are less.
- Upper 1st molar has 4 cusps & 1 accessory cusp. Upper 2nd molar has 4 cusps. Lower 1st molar has 5 cusps & lower 2nd molar has 4 cusps.

ROOT

Primary dentition

- Primary molars are more delicate. Roots of primary teeth are proportionately longer & more slender in comparison to crown size.
- Roots are narrower mesiodistally.

Permanent dentition

- Permanent roots are stronger & provide good anchorage in jaw bone. They are shorter & bulkier in comparison to their crown.
- Roots are broader mesiodistally.

ROOT

Primary dentition

- Furcation of molar roots is placed more cervically so that the root trunk is much smaller.
- Roots of primary molars flare out markedly from cervical area to their tips(to accommodate permanent tooth buds between their roots).

Permanent dentition

- Furcation in permanent molars is placed more apically & thus root trunk is larger.
- Marked flaring of roots is absent.

ROOT

Primary dentition

- Primary roots undergo physiologic resorption & the primary teeth are shed naturally.

Permanent dentition

- Physiologic resorption is absent.

PULP

Primary dentition

- Pulp chambers of deciduous teeth are proportionately larger when compared to crown size.
- Pulpal outline of primary tooth follows DEJ more closely than that of permanent teeth.

Permanent dentition

- Pulp chamber is smaller in relation to crown size.
- Pulp outline follows DEJ less closely.

PULP

Primary dentition

- Pulp horns of deciduous molars (especially mesial horns) are higher & closer to outer surface than that of permanent molars.

Depth of cavity preparation in primary teeth should be kept shallow. Care should be taken not to expose the pulp.

Permanent dentition

- Pulp horns are comparatively lower & away from outer surface.

ROOT

Primary Dentition

- Root canals are more ribbon-like, follows a thin, tortuous & branching path. Multiple ramifications of primary pulp make complete debridement impossible.

Permanent dentition

- Root canals of permanent teeth are well-defined & less branching.

ROOT

Primary dentition

- Accessory canals in pulp chambers of primary molars directly lead to inter-radicular furcation areas.

Inflammation/infection from pulp can easily reach periodontium & vice versa in case of primary molars.

Permanent dentition

- Floor of the pulp chamber do not have many accessory canals.

ROOT

Primary dentition

- Apical portion of the canal is much less constricted than that of permanent tooth & apical foramen is wider.

Permanent dentition

- Apical portion of the canal is constricted & apical foramen is narrower.

HISTOLOGIC FEATURES

Primary dentition

- Enamel is thinner. About 1mm thick but of uniform thickness. Less pressure is required during cavity preparation of primary teeth. Depth of the cavity preparation is less. Enamel rods at the cervical third are directed horizontally instead of gingivally.

Permanent dentition

- Enamel is 2-3 mm thick & is not uniform in thickness.
- Enamel rods at the cervix are directed apically.

HISTOLOGIC FEATURES

Primary dentition

- Dentin thickness is half that of permanent teeth.
- Dentinal tubules are less regular.

Permanent dentition

- Greater thickness of dentin over pulpal roof.
- Dentinal tubules are more regular.

HISTOLOGIC FEATURES

Primary dentition

- Have wide enlarged apical foramen. Thus, have abundant blood supply & exhibit a poor localization of infection & inflammation.
- Less densely innervated. Thus, primary teeth are less sensitive to operating procedure compared to permanent teeth.

Permanent dentition

- Apical foramen is constricted. Reduced blood supply. Thus, infection & inflammation comparatively well-localized.
- Permanent pulp is densely innervated. Nerve fibers terminate among odontoblasts & even pass beyond pre dentin.

HISTOLOGIC FEATURES

Primary dentition

- Cementum is thin & made up of only primary cementum. This shows that permanent teeth are firmly anchored in alveolar bone.
- Anchorage of primary teeth is comparatively less firm and easily resorbed, and can be easily extracted.

Permanent dentition

- Cementum is thick. Both primary & secondary cementum present.
- Permanent teeth are firmly anchored in alveolar bone & are not easily resorbed.

Primary dentition

- Mineral content- both enamel and dentin are less mineralized and less dense.
- Neonatal lines are present in all primary teeth both in enamel and dentin.

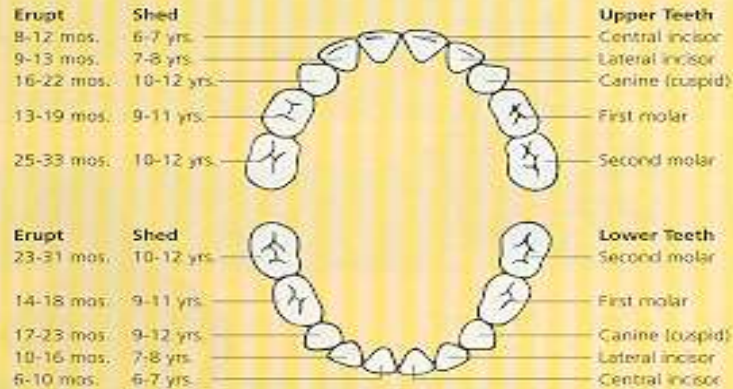
Permanent dentition

- Enamel and dentin are more mineralized.
- Neonatal lines are seen only in 1st molar (since mineralization begins at birth).

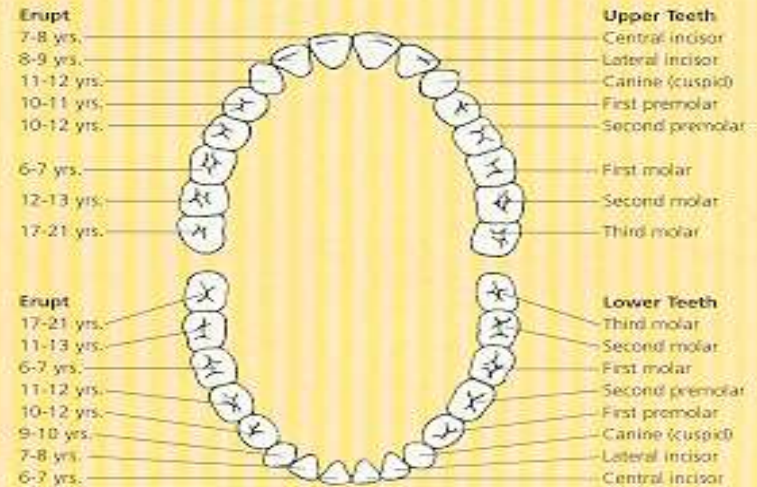
BASED ON CHRONOLOGY PRIMARY AND PERMANENT TEETH ARE DIFFERENTIATED AS FOLLOWS :

Tooth Eruption Charts

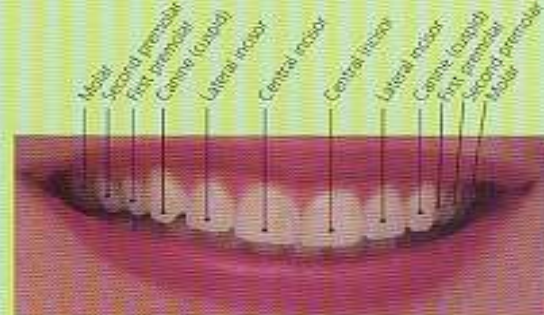
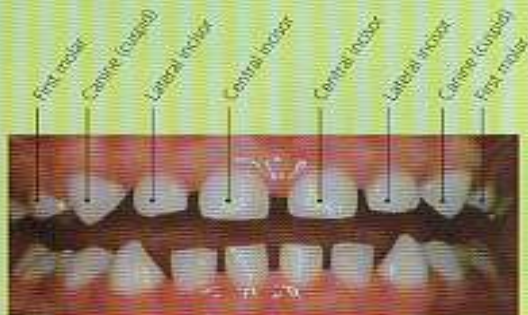
Tooth Development: Primary Teeth



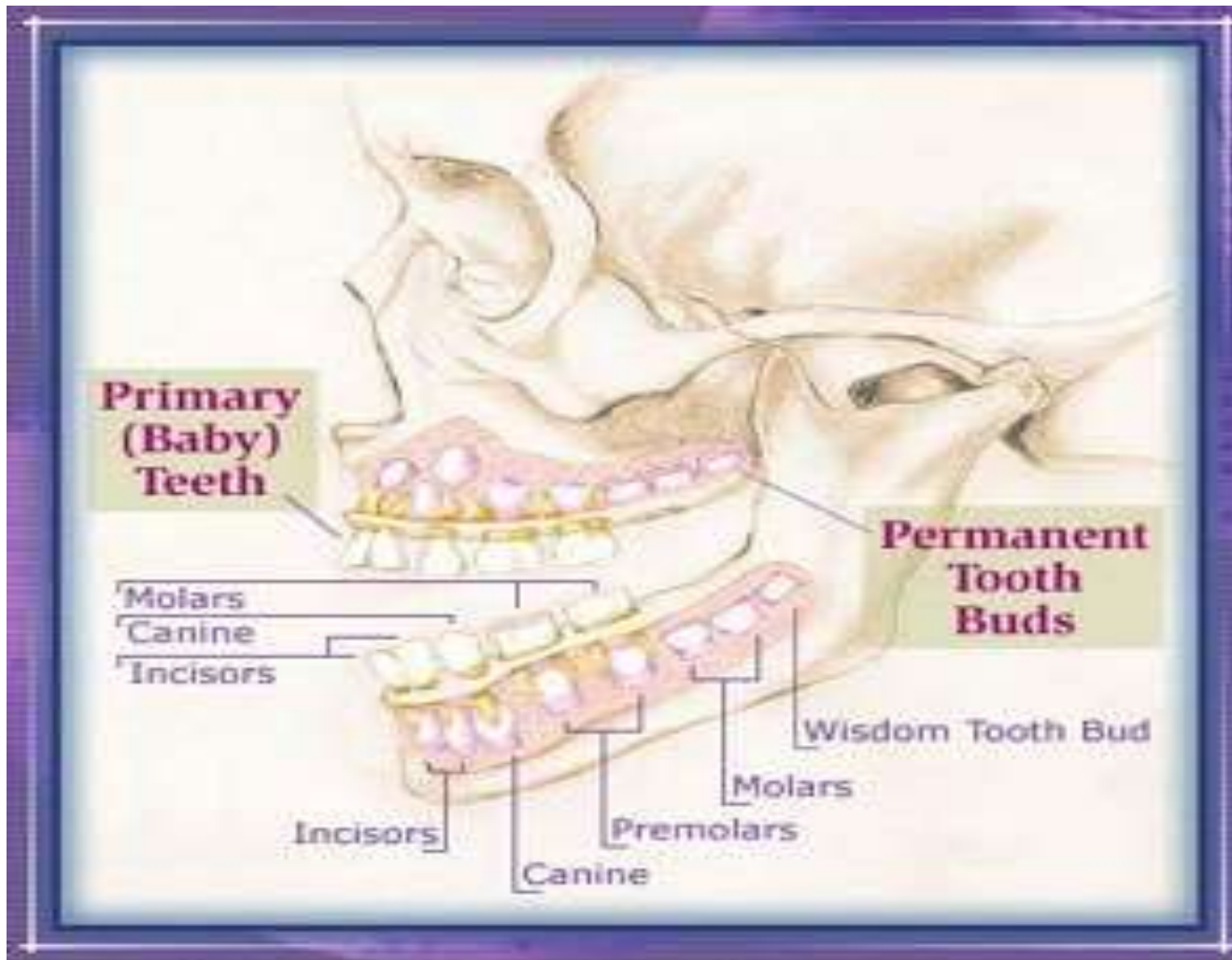
Tooth Development: Permanent Teeth



Tooth Identification Charts



DEVELOPING DENTITION



Spacing of permanent teeth is not to scale.

REFERENCES

- Wheeler's. Text book of Dental Anatomy, Physiology and occlusion. Ninth Edition.