Maintenance of a Clean Field

The maintenance of a clean operating field during cavity preparation and placement of the restorative material helps ensure efficient operation and development of a serviceable restoration that will maintain the tooth and the integrity of the developing occlusion. The rubber dam aids in the maintenance of a clean field. It is generally agreed that the use of the rubber dam offers the following advantages:

1. Aids management. It has been found through experience that apprehensive children can often be controlled more easily with a rubber dam in place. Because the rubber dam efficiently controls the patient's tongue and lips, the dentist has greater freedom to complete the operative procedures.

2. Controls saliva. Control of saliva is an extremely important consideration when one is completing an ideal cavity preparation for primary teeth.

3. Provides protection. The use of the rubber dam prevents foreign objects from coming into contact with oral structures. When filling material, debris, or medicaments are dropped into the mouth, salivary flow is stimulated and interferes with the operative or restorative procedure. A rubber dam also prevents the small child in a reclining position from swallowing or aspirating foreign objects and materials.

4. Helps the dentist educate parents. Parents are always interested in the treatment that has been accomplished for their child. While the rubber dam is in place, the dentist can conveniently show parents the completed work after an operative procedure.

Basic Principles In Cavity Preparation In Primary

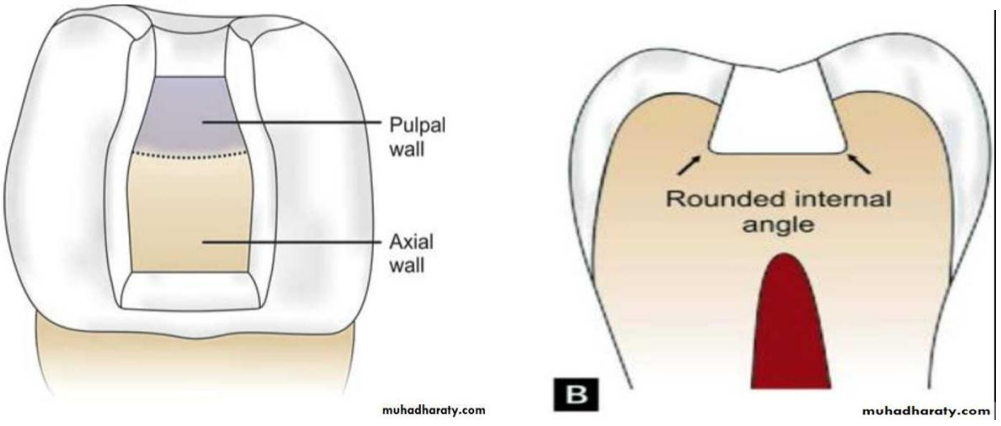
- A flat pulpal floor is generally advocated. However, a sharp angle between the pulpal floor and the axial wall of a two-surface preparation should be avoided.

- Rounded angles throughout the preparation will result in less concentration of stresses and will permit better adaptation of the restorative material into the extremities of the preparation.

- In the traditional class II cavity preparation for amalgam, the cavity Design should have greater buccal and lingual extension at the cervical area of the preparation to clear contact with the adjacent tooth.
- The axio-pulpal line angle should be beveled or grooved to reduce the concentration of stresses and to provide greater bulk of material in this area, which is vulnerable to fracture.

- The first step in the traditional preparation of a class II cavity in a primary tooth involves opening the marginal ridge area. Extreme care must be taken to prevent damage to the adjacent proximal surface.

- Primary incisors with small proximal carious lesions may not require conventional restorations at all. Enameloplasty of the affected proximal surface (usually described as "disking") to open the proximal contact and remove most, if not all, of the cavitation, followed by topical fluoride varnish, will often suffice until the teeth exfoliate naturally



Restorative Materials Used In Pediatric Dentistry

Composite

Composite is the universally used tooth-colored restorative material developed in 1962 by combining dimethacrylates (epoxy resin and methacrylic acid) with silanized quartz powder.

Factors that influence the composite resin polymerization process

- **Curing time**: It depends on: resin shade, light intensity, box depth, resin thickness, curing through tooth structure.
- **Shade of resin**: Darker composite shades cure more slowly and less deeply than lighter shades (60 seconds at a maximum depth of 0.5 mm).
- **Thickness of resin**: Optimum thickness is 1 to 2 mm
- **Distance between light and resin**: Optimum distance < 1 mm, with the light positioned 90 degrees from the composite surface.
- **Light source quality**: Wavelength between 400 to 500 nm.

Types of Composite:

- ***Hybrid composite resins:***

  – These composites are so called because they are made up of polymer groups (organic phase) reinforced by an inorganic phase.

  – The characteristic properties of these materials are: availability of a wide range of colors and ability to mimic the dental structure, less curing shrinkage, low water absorption, excellent polishing and texturing properties

- ***Flowable composites:***

  – These are low-viscosity composite resins, making them more fluid than conventional composite resins. Their main advantages are: High wettability of the tooth surface, ensuring penetration into every irregularity; ability to form layers of minimum thickness, so

improving or eliminating air inclusion or entrapment and availability in different colors.

– The drawbacks are: High curing shrinkage, due to lower filler load, and weaker mechanical properties.

– These are indicated in Class V restorations.

- ***Condensable composites:***

  – Condensable composites are composite resins with a high percentage of filler.

  – The advantages are: Condensability (like silver amalgam) and better reproduction of occlusal anatomy.

  Their disadvantages are poor esthetics in anterior teeth.

  – Indication is Class II cavity restoration

- ***Compomer*:**

  – The word ―Compomer comes from composite and glass ionomer in an attempt to take advantage of the desirable qualities of both materials; the fluoride release and ease of use of the glass ionomers and esthetics of the composites.

  – They are most suitable for restorations in the deciduous dentition due to their low abrasion resistance.

Indications of composite (in general):

- Classes I, II, III, IV, V and VI restorations
- Sealants
- Esthetic enhancement procedures integrity such as:veneers, Tooth contour modifications, Diasthema closures

Contraindications:

- If the operating site cannot be isolated from contamination by oral fluids
- If all of the occlusal load will be on the restorative material
- Economics

Advantages

- Esthetic
- Conservative of tooth structure removal
- Tooth preparation is simple
- Used almost universally
- Bonded to tooth structure
- Repairable

Disadvantages

- May have a gap formation and marginal leakage
- Time-consuming
- Costly
- Technique sensitive

Silver Amalgam

Silver amalgam remains one of the most durable and cost-effective restorative materials. Success in the use of this filling material depends on adherence to certain principles of cavity preparation.

Indications of Amalgam

- Moderate-to-large restorations
- Restorations that are not in highly esthetic areas of the mouth
- Restorations that have heavy occlusal contacts
- Restorations that cannot be well isolated
- Abutment teeth for a removable partial denture

Contraindications of Amalgam

- Esthetically prominent areas of posterior teeth
- Small-to-moderate classes I and II restorations that can be well
- isolated
- Class VI restorations.

Advantages of amalgam

• Ease of use

• High tensile strength
• Excellent wear resistance
• Lower cost than for composite restorations

Disadvantages of amalgam

- Non-insulating
- Non-esthetic
- Less conservative and weakens tooth structure
- More difficult tooth preparation

GLASS IONOMER Cements

Glass ionomer cements (GICs) were developed in an attempt to capitalize on the favorable properties of both silicate and polycarboxylate cements

Properties of Glass Ionomer Cement

o Fluoride release and fluoride recharge
o Dimensional change (shrinks on setting, expands with water sorption)
o Brittle
o Lacks translucency
o Rough surface texture
o Biocompatible to tissues.

Indications

- Non-stress bearing areas
- Teeth that are not expected to be long lasting
- Class III and V restorations in adults
- Class I and small cl II restorations in primary dentition
- Core build-ups when at least 3 walls of tooth are remaining after crown preparation.

Contraindications

- High stress applications
- Class IV and class II restorations
- Cusp replacement
- Core build-ups with less than 3 sound walls remaining.
-

Advantages

- Bonds to enamel and dentin
- Significant fluoride release
- Coefficient of thermal expansion similar to tooth structure
- Tooth colored

Disadvantages

- Less polishability than resin
- Poor wear resistance
- Brittle, poor tensile strength
- Poor longevity in xerostomic patients.

Recent Developments of Glass Ionomer Cement

• Modified powder — liquid system

– This system has improved wetting of the powder by the liquid rendering the mixing process much easier and faster.

• Capsules

– The glass ionomer cement in the form of capsule system is a modern application method, which simplifies and allows procedures to be performed with greater ease and efficiency. These capsules contain premeasured glass ionomer powder and liquid, which ensures correct ratio, consistency of mix and a predictable result.

– These capsules have angled nozzles that act as a syringe for accurate placement of the material into a cavity or a crown for cementation.

• Paste-paste dispensing system

– This is the latest development in the glass ionomer cement technology. This dispensing system was designed with the objectives of providing optimum ratio, easy mixing, easy placement, total reliability, using a specially designed cartridge and an easy-to-use material dispenser.

Modifications of Glass Ionomer Cement

• Metal modified glass ionomer

- Silver alloy admix (silver amalgam alloy particles mixed with glass particles). The addition of metal powders or fibers to glass ionomer cements can improve strength; however, their esthetics are poor and they do not burnish.

• Resin modified glass ionomer

Resin modification of glass ionomer cement was designed to produce favorable physical properties similar to those of resin composites while maintaining the basic features of the conventional glass ionomer cement.

• "High strength," "packable," or "high viscosity" glass Ionomers

– These glass ionomers are particularly useful for atraumatic restorative treatment technique (ART). They were designed as an alternative to amalgam for posterior preventive restorations. These cements set only by a conventional neutralization reaction but have properties that exceed those of the resin modified systems. Setting is rapid, early moisture sensitivity is considerably reduced and solubility in oral fluids is very low.

Calcium Hydroxide

Calcium hydroxide was introduced in United States in 1938, and is since then being used as a pulpal medicament.

Uses of Calcium Hydroxide

• Calcium hydroxide as an intracanal medicament:/

It plays a major role as an intervisit dressing in the disinfection of the root canal system.

• Calcium hydroxide as an endodontic sealer

– In the root canal obturation, sealer plays an important role, as it fills the gap between the walls of the prepared dentine and the gutta-percha. Examples of calcium hydroxide sealers: Sealapex (Kerr)

• Calcium hydroxide as a pulp capping agent.

– When calcium hydroxide is applied directly to pulp tissue, dentinal bridge formation occurs. The main calcium hydroxide products for pulp capping are Pulpadent, Dycal

• Calcium hydroxide in apexification

– Apexification technique is recommended in nonvital young permanent tooth with incomplete apices; it is cleaned and disinfected, then if tooth is free of signs and symptoms of infection, the canal is dried and filled with stiff mix of calcium hydroxide.

– Commercial paste of calcium hydroxide like, Pulpdent, Metapex may be used to fill the canals.

- **Calcium hydroxide in weeping canals**

– Sometimes a tooth undergoing root canal treatment shows constant clear or reddish exudate associated with periapical radiolucency. Tooth can be asymptomatic or tender on percussion, exudates stops but when opened in next appointment, it again reappears, this is known as "weeping canal".

– In these cases tooth with exudates is not ready for obturation. Since culture reports normally show negative bacterial growth, so antibiotics are of no help. For such teeth, dry the canals with sterile absorbent paper points and place calcium hydroxide in canal which helps in controlling the exudates because pH of periapical tissues is acidic in

weeping stage which gets converted into basic pH by calcium hydroxide.

Advantages of calcium hydroxide

- Initially bactericidal then bacteriostatic
- Promotes healing and repair
- High pH stimulates fibroblasts
- Neutralizes low pH of acids
- Stops internal resorption
- Inexpensive and easy to use

Disadvantages of calcium Hydroxide

- Associated with primary tooth resorption
- Dissolve after one year
- May degrade during acid etching
- Degrades upon tooth flexure
- Marginal failure with amalgam condensation
- Does not adhere to dentin or resin restoration

MATRICES

Matricing is a procedure where by a temporary wall is created in the areas of tooth structure lost during preparation. The appliance used for building these walls is called matrix.

Rationale for Using Matrix

- Accurate reproduction of contour of teeth
- To prevent interproximal excess
- To establish tight contact areas
- To maintain integrity of normal gingival papillae

Ideal Requirements of Matrix

- Rigid to allow condensation
- Promote desired contour
- Should be of minimal thickness
- Compatible with restorative material

- Ease of application
- Economic.

Classification of Matrix

 According to place of application

• Posterior – T-band, Toffelmire

• Anterior – Celluloid matrix

 According to presence or absence of retainer

• With retainer - Ivory No. 1, Ivory No. 8

• Without retainer – S-band

 According to form

• Anatomical – Celluloid crown form

• Non-anatomical – Ivory No. 1

 According to use

• Universal – Ivory No. 8, Toffelmire

• Unilateral – Ivory No. 1

Recent Modifications in Matrix

• **Sectional matrix**: This system is easy to place, gives a large preparation area thus reducing the working time.

• **Smart view matrix system**: The Smart View Matrix System also comes with Smart Bands Sectional Matrices and titanium instruments. The Smart Bands have a nonstick surface, are anatomically contoured, and integrate a reinforced placement tab while the instruments are made of high-grade, blue titanium. The specially designed titanium instruments are strong, durable, and lightweight. These are mostly used for composite restorations.

Sectional

Smart view

Tooth numbering system

1. Zsigmondy- palmer system

The Hungarian dentist Adolf Zsigmondy discovered this system in 1861, using a Zsigmondy cross to record quadrants of tooth positions. Adult teeth were numbered 1 to 8, and the child primary dentition (also called deciduous, milk or baby teeth) were depicted with a quadrant grid using Roman numerals I, II, III, IV, V to number the teeth from the midline. Palmer changed this to A, B, C, D, E. This makes it less confusing and less prone to errors in interpretation. The Palmer notation consists of a symbol (┘└┐┌) designating in which quadrant the tooth is found and a number indicating the position from the midline. Adult teeth are numbered 1 to 8, with deciduous (baby) teeth indicated by a letter A to E. Hence the left and right maxillary central incisor would have the same number, "1", but the right one would have the symbol, "┘", underneath it, while the left one would have, "└".

87654321	12345678
87654321	12345678

EDCBA	ABCDE
EDCBA	ABCDE

Advantages:

1) Easy to implement.
2) Easy of writing and communication.
3) Less mistakes in identifying the designated tooth.

Disadvantages:

1) Cannot be written by the computer.
2) Non-numeric symbolization.

2. Universal numbering system

This tooth numbering system was proposed by German dentist Julius Parrediдt in 1882. Although it is named the "universal numbering system", it is also called the "American system" as it is commonly used in the United States. The uppercase letters A through T are used for primary teeth and the numbers 1 - 32 are used for permanent teeth.

The tooth designated "1" is the maxillary right third molar ("wisdom tooth") and the count continues along the upper teeth to the left side. Then the count begins at the mandibular left third molar, designated number 17, and continues along the bottom teeth to the right side. Each tooth has a unique number or letter, allowing for easier use on keyboards. As specific numbers are employed for each tooth, it reduces the risk of mistake. Data can also be easily entered in the computer.

Advantages :

1. Individual number for each tooth. 2. Simple

Disadvantages:

1. Difficult in remembering the tooth no.
2. Matching the specific teeth and quadrants can be confusing.
3. There is no anatomic reference in this system and so it is difficult to follow for the beginners, and needs extra training to practice.

Permanent Teeth															
Upper Right								Upper Left							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Lower Right								Lower Left							

Primary teeth									
Upper Right					Upper Left				
A	B	C	D	E	F	G	H	I	J
T	S	R	Q	P	O	N	M	L	K
Lower Right					Lower Left				

3.International numbering system

The Federation Dentaire Internationale (FDI) system is a two-digit system, the first digit indicates the quadrant (1 through 4 for permanent and 5 through 8 for deciduous teeth) and the second digit indicates the tooth type (1 through 8 or 1 through 5). It is very simple, accurate, it is easy to memories in the visual and cognitive sense, it is user friendly, and prevents errors in differentiating left and right, upper and lower arches, and tooth type. However, in the case of deciduous teeth, there can be confusion and it is difficult to memorize. For specialists other than pedodontists, it can be difficult to understand or to define teeth, as in the case for example of 64, 85.

Upper Right								Upper Left							
18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
Lower Right								Lower Left							

(Permanent teeth)

Upper Right					Upper Left				
55	54	53	52	51	61	62	63	64	65
85	84	83	82	81	71	72	73	74	75
Lower Right					Lower Left				

(Primary teeth)

Advantages:

- Easy to remember and understand
- Unique number for each tooth
- Verbal communication possible Compatible with computer keyboard hence most accepted.

Sequence of eruption

For primary teeth:

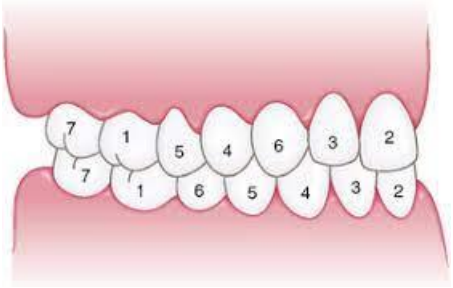
Upper arch: ABDCE

Lower arch: ABDCE

For permanent teeth:

Upper arch: 61245378

Lower arch: 61234578



Variations In Sequence Of Eruption

The mandibular first permanent molars are often the first permanent teeth to erupt. The mandibular central incisors quickly follow them. Then lateral incisor, canine, first premolar, second premolar, and second molar (the most common sequence of eruption of mandibular permanent teeth), while the most common sequence for the eruption of the maxillary permanent teeth is first molar, central incisor, lateral incisor, first premolar, second premolar, canine, and second molar. It

is desirable that the mandibular canine erupt before the first and second premolars. This sequence aids in: 1. Maintaining adequate arch length and 2. Preventing lingual tipping of the incisors, which not only causes a loss of arch length but also allows an increased overbite to develop. An abnormal lip musculature or an oral habit that causes a greater force on the mandibular incisors than can be compensated for by the tongue allows the anterior segment to collapse. For this reason, use of a passive lingual arch appliance is often indicated when the primary canines have been lost prematurely or when the sequence of eruption is undesirable. A deficiency in arch length can occur if the mandibular second permanent molar develops and erupts before the second premolar. Eruption of the second permanent molar first encourages mesial migration or tipping of the first permanent molar and encroachment on the space needed for the second premolar. In the maxillary arch, the first premolar ideally should erupt before the second premolar, and the canine should follow them. The untimely loss of primary molars in the maxillary arch, which allows the first permanent molar to drift and tip mesially, results in the permanent canine is being blocked out of the arch, usually to the labial side. The position of the developing second permanent molar in the maxillary arch and its relationship to the first permanent molar should be given special attention. Its eruption before the premolars and canine can cause a loss of arch length, just as in the mandibular arch. The eruption of the maxillary canine is often delayed because of an abnormal position or deviations in the eruption path.

Lingual Eruption Of Mandibular Permanent Incisors

The primary teeth may have undergone extensive root resorption and may be held only by soft tissues. In other instances, the roots may not have undergone normal resorption and the teeth remain solidly in place. It is common for mandibular permanent incisors to erupt lingually, and this pattern should be considered essentially normal. The tongue and continued alveolar growth seem to play important

roles in influencing the permanent incisors into a more normal position with time. Although there may be insufficient room in the arch for the newly erupted permanent tooth, its position will improve over several months. In some cases there is justification for removal of the corresponding primary tooth. Extraction of other primary teeth in the area is not recommended, however, because it will only temporarily relieve the crowding and may even contribute to the development of a more severe arch length inadequacy. Even when mandibular permanent incisors erupt uneventfully, they often appear rotated and staggered in position. The molding action of the tongue and the lips improves their relationship within a few months.

TEETHING AND DIFFICULT ERUPTION

1) Increase in salivation, the child will want to put the hand and fingers into the mouth—these observations may be the only indication that the teeth will soon erupt.

2) The young child may become restless and fretful during the time of eruption of the primary teeth. He may loss his appetite.

3) In the past, many conditions, including croup, diarrhea, fever, convulsions, primary herpetic gingivostomatitis, and even death have been incorrectly attributed to eruption. Because the eruption of teeth is a normal physiologic process, the association with fever and systemic disturbances is not justified. A fever or respiratory tract infection

during this time should be considered coincidental to the eruption process rather than related to it.

4) Inflammation of the gingival tissues before complete emergence of the crown may cause a temporary painful condition that subsides within a few days. The surgical removal of the tissue covering the tooth to facilitate eruption is not indicated. If the child is having extreme difficulty and to relief pain use:

a) A nonirritating topical anesthetic may bring temporary relief. The parent can apply the anesthetic to the affected tissue over the erupting tooth three or four times a day.

b) Several low-dose products specifically formulated for infants are available without prescription. Caution must be exercised, however, when one is prescribing topical anesthetics, especially for infants, because systemic absorption of the anesthetic agent is rapid, and toxic doses can occur if the product is misused. The parent must clearly understand the importance of using the drug only as directed.

c) The eruption process may be hastened if the child is allowed to chew on a piece of toast or a clean teething object.

Eruption Hematoma (Eruption Cyst)

An eruption hematoma is a bluishpurple elevated area of tissue occasionally develops a few weeks before the eruption of a primary or permanent tooth. It may result from trauma to the area during function and then hemorrhage in the follicle of an erupted tooth and it will subside after eruption after breakage of the soft tissue by the tooth. The blood-filled cyst is most frequently seen in the primary second molar or the first permanent molar region (6 and E).

Because the condition is almost always self-limiting, treatment of an eruption hematoma is rarely necessary. However, surgical uncovering of the crown may occasionally be justified. When the parents discover an eruption hematoma, they may fear that the child has a serious disease such as a malignant tumor. The dentist must be understanding and sensitive to their anxiety while reassuring them that the lesion is not serious.

Eruption Sequestrum

The eruption sequestrum is occasionally seen in children at the time of the eruption of the first permanent molar (6). Clinically it is appear as a tiny spicule of nonviable bone overlying the crown of an erupting permanent molar just before or immediately after the emergence of the tips of the cusps through the oral mucosa. It is composed of dentin and cementum as well as a cementum-like material formed within the follicle. Eruption sequestrum are usually of little or no clinical significance. It is probable that some of these sequestra spontaneously resolve without noticeable symptoms. However, after an eruption sequestrum has surfaced through the mucosa, it may easily be removed if it is causing local irritation. The base of the sequestrum is often still well embedded in gingival tissue when it is discovered, and application of a topical anesthetic or infiltration of a few drops of a local anesthetic may be necessary to avoid discomfort during removal.

Ectopic Eruption

A variety of local factors may influence a tooth to erupt or try to erupt in an abnormal position such as arch length inadequacy and tooth mass redundancy. Occasionally this condition may be so severe that actual transposition of teeth takes place. First permanent molars may be positioned too far mesially in their eruption path, with resultant ectopic resorption of the distal root of the second primary molar.

There are two types of ectopic eruption— reversible and irreversible. In the reversible type, the molar frees itself from the ectopic position and erupts into normal alignment, with the second primary molar remaining in position while in the irreversible type, the maxillary first molar remains unerupted and in contact with the cervical root area of the second primary molar. By the ages of 7 and 8 years, any ectopic eruption of a permanent first molar should be considered irreversibly locked. The ectopic molar often occurred in more than one quadrant and was most often observed in the maxilla. Irreversible ectopic molars that remain locked, if untreated, can lead to premature loss of the primary second molar with a resultant decrease in quadrant arch

length, asymmetric shifting of the upper first molar toward Class II positioning, and supraeruption of the opposing molar with distortion of the lower curve of Spe and potential occlusal interference. Early assessment with intraoral or panoramic films approximating the timing of first permanent molar eruption is thus critical to identification of the problem and provides an opportunity to intercept potential sequelae. If the problem is detected at 5 to 6 years of age, an observation approach of "watchful waiting" with appropriate monitoring may be indicated, given the two-thirds potential for self-correction. With self-correction being unlikely as the child approaches 7 years of age, continued "locking" of the first molar with advanced resorption of the primary second molar usually warrants intervention. Another timing clue is that when the opposing molar reaches the level of the occlusal plane, intervention is indicated to establish proper vertical control and prevent supraeruption.

Early Eruption

(NATAL AND NEONATAL TEETH)

Natal teeth are (teeth present at birth) and neonatal teeth (teeth that erupt during the first 30 days) prevalence is low. About 85% of natal or neonatal teeth are mandibular primary incisors, and only small percentages are supernumerary teeth. It is common for natal and neonatal teeth to occur in pairs. Natal and neonatal molars are rare. Most studies suggest that the etiology for the premature eruption or the appearance of natal and neonatal teeth is multifactorial. A possible factor involving the early eruption of primary teeth seems to be familial, due to inheritance as an autosomal-dominant trait.

A radiograph should be made to determine the amount of root development and the relationship of a prematurely erupted tooth to its adjacent teeth. One of the parents can hold the x-ray film in the infant's mouth during the exposure. Most prematurely erupted teeth (immature type) are hypermobile because of limited root development.

1. If the tooth is extremely mobile to the extent that there is danger of displacement of the tooth and possible aspiration, so the treatment indicated in such a case is the removal of the tooth.

2. If the tooth has sharp incisal edge that may cause laceration of the lingual surface of the tongue, so treatment is the removal of the tooth. The preferable approach, however, is to leave the tooth in place and to explain to the parents the desirability of maintaining this tooth in the mouth because of its importance in the growth and uncomplicated eruption of the adjacent teeth. Eruption of teeth during the neonatal period presents less of a problem. A retained natal or neonatal tooth may cause difficulty for a mother who wishes to breast-feed her infant. If breast-feeding is too painful for the mother initially, the use of a breast pump and bottling of the milk are recommended. However, the infant may be conditioned not to "bite" during suckling in a relatively short time if the mother persists with breast-feeding. It seems that the infant senses the mother's discomfort and learns to avoid causing it.

Tooth numbering system

1. Zsigmondy- palmer system

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Lower Right								Lower Left							

Primary teeth									
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(Permanent teeth)

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Lower arch: ABDCE

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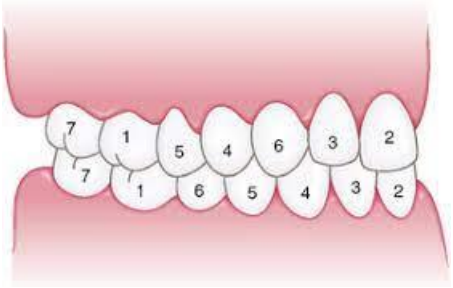
Upper arch: 61245378

Lower arch: 61234578



Variations In Sequence Of Eruption

The mandibular first permanent molars are often the first permanent teeth to erupt. The mandibular central incisors quickly follow them. Then lateral incisor, canine, first premolar, second premolar, and second molar (the most common sequence of eruption of mandibular permanent teeth), while the most common sequence for the eruption of the maxillary permanent teeth is first molar, central incisor, lateral incisor, first premolar, second premolar, canine, and second molar. It

is desirable that the mandibular canine erupt before the first and second premolars. This sequence aids in: 1. Maintaining adequate arch length and 2. Preventing lingual tipping of the incisors, which not only causes a loss of arch length but also allows an increased overbite to develop. An abnormal lip musculature or an oral habit that causes a greater force on the mandibular incisors than can be compensated for by the tongue allows the anterior segment to collapse. For this reason, use of a passive lingual arch appliance is often indicated when the primary canines have been lost prematurely or when the sequence of eruption is undesirable. A deficiency in arch length can occur if the mandibular second permanent molar develops and erupts before the second premolar. Eruption of the second permanent molar first encourages mesial migration or tipping of the first permanent molar and encroachment on the space needed for the second premolar. In the maxillary arch, the first premolar ideally should erupt before the second premolar, and the canine should follow them. The untimely loss of primary molars in the maxillary arch, which allows the first permanent molar to drift and tip mesially, results in the permanent canine is being blocked out of the arch, usually to the labial side. The position of the developing second permanent molar in the maxillary arch and its relationship to the first permanent molar should be given special attention. Its eruption before the premolars and canine can cause a loss of arch length, just as in the mandibular arch. The eruption of the maxillary canine is often delayed because of an abnormal position or deviations in the eruption path.

Lingual Eruption Of Mandibular Permanent Incisors

The primary teeth may have undergone extensive root resorption and may be held only by soft tissues. In other instances, the roots may not have undergone normal resorption and the teeth remain solidly in place. It is common for mandibular permanent incisors to erupt lingually, and this pattern should be considered essentially normal. The tongue and continued alveolar growth seem to play important

roles in influencing the permanent incisors into a more normal position with time. Although there may be insufficient room in the arch for the newly erupted permanent tooth, its position will improve over several months. In some cases there is justification for removal of the corresponding primary tooth. Extraction of other primary teeth in the area is not recommended, however, because it will only temporarily relieve the crowding and may even contribute to the development of a more severe arch length inadequacy. Even when mandibular permanent incisors erupt uneventfully, they often appear rotated and staggered in position. The molding action of the tongue and the lips improves their relationship within a few months.

TEETHING AND DIFFICULT ERUPTION

1) Increase in salivation, the child will want to put the hand and fingers into the mouth—these observations may be the only indication that the teeth will soon erupt.

2) The young child may become restless and fretful during the time of eruption of the primary teeth. He may loss his appetite.

3) In the past, many conditions, including croup, diarrhea, fever, convulsions, primary herpetic gingivostomatitis, and even death have been incorrectly attributed to eruption. Because the eruption of teeth is a normal physiologic process, the association with fever and systemic disturbances is not justified. A fever or respiratory tract infection

during this time should be considered coincidental to the eruption process rather than related to it.

4) Inflammation of the gingival tissues before complete emergence of the crown may cause a temporary painful condition that subsides within a few days. The surgical removal of the tissue covering the tooth to facilitate eruption is not indicated. If the child is having extreme difficulty and to relief pain use:

a) A nonirritating topical anesthetic may bring temporary relief. The parent can apply the anesthetic to the affected tissue over the erupting tooth three or four times a day.

b) Several low-dose products specifically formulated for infants are available without prescription. Caution must be exercised, however, when one is prescribing topical anesthetics, especially for infants, because systemic absorption of the anesthetic agent is rapid, and toxic doses can occur if the product is misused. The parent must clearly understand the importance of using the drug only as directed.

c) The eruption process may be hastened if the child is allowed to chew on a piece of toast or a clean teething object.

Eruption Hematoma (Eruption Cyst)

An eruption hematoma is a bluishpurple elevated area of tissue occasionally develops a few weeks before the eruption of a primary or permanent tooth. It may result from trauma to the area during function and then hemorrhage in the follicle of an erupted tooth and it will subside after eruption after breakage of the soft tissue by the tooth. The blood-filled cyst is most frequently seen in the primary second molar or the first permanent molar region (6 and E).

Because the condition is almost always self-limiting, treatment of an eruption hematoma is rarely necessary. However, surgical uncovering of the crown may occasionally be justified. When the parents discover an eruption hematoma, they may fear that the child has a serious disease such as a malignant tumor. The dentist must be understanding and sensitive to their anxiety while reassuring them that the lesion is not serious.

Eruption Sequestrum

The eruption sequestrum is occasionally seen in children at the time of the eruption of the first permanent molar (6). Clinically it is appear as a tiny spicule of nonviable bone overlying the crown of an erupting permanent molar just before or immediately after the emergence of the tips of the cusps through the oral mucosa. It is composed of dentin and cementum as well as a cementum-like material formed within the follicle. Eruption sequestrum are usually of little or no clinical significance. It is probable that some of these sequestra spontaneously resolve without noticeable symptoms. However, after an eruption sequestrum has surfaced through the mucosa, it may easily be removed if it is causing local irritation. The base of the sequestrum is often still well embedded in gingival tissue when it is discovered, and application of a topical anesthetic or infiltration of a few drops of a local anesthetic may be necessary to avoid discomfort during removal.

Ectopic Eruption

A variety of local factors may influence a tooth to erupt or try to erupt in an abnormal position such as arch length inadequacy and tooth mass redundancy. Occasionally this condition may be so severe that actual transposition of teeth takes place. First permanent molars may be positioned too far mesially in their eruption path, with resultant ectopic resorption of the distal root of the second primary molar.

There are two types of ectopic eruption— reversible and irreversible. In the reversible type, the molar frees itself from the ectopic position and erupts into normal alignment, with the second primary molar remaining in position while in the irreversible type, the maxillary first molar remains unerupted and in contact with the cervical root area of the second primary molar. By the ages of 7 and 8 years, any ectopic eruption of a permanent first molar should be considered irreversibly locked. The ectopic molar often occurred in more than one quadrant and was most often observed in the maxilla. Irreversible ectopic molars that remain locked, if untreated, can lead to premature loss of the primary second molar with a resultant decrease in quadrant arch

length, asymmetric shifting of the upper first molar toward Class II positioning, and supraeruption of the opposing molar with distortion of the lower curve of Spe and potential occlusal interference. Early assessment with intraoral or panoramic films approximating the timing of first permanent molar eruption is thus critical to identification of the problem and provides an opportunity to intercept potential sequelae. If the problem is detected at 5 to 6 years of age, an observation approach of "watchful waiting" with appropriate monitoring may be indicated, given the two-thirds potential for self-correction. With self-correction being unlikely as the child approaches 7 years of age, continued "locking" of the first molar with advanced resorption of the primary second molar usually warrants intervention. Another timing clue is that when the opposing molar reaches the level of the occlusal plane, intervention is indicated to establish proper vertical control and prevent supraeruption.

Early Eruption

(NATAL AND NEONATAL TEETH)

Natal teeth are (teeth present at birth) and neonatal teeth (teeth that erupt during the first 30 days) prevalence is low. About 85% of natal or neonatal teeth are mandibular primary incisors, and only small percentages are supernumerary teeth. It is common for natal and neonatal teeth to occur in pairs. Natal and neonatal molars are rare. Most studies suggest that the etiology for the premature eruption or the appearance of natal and neonatal teeth is multifactorial. A possible factor involving the early eruption of primary teeth seems to be familial, due to inheritance as an autosomal-dominant trait.

A radiograph should be made to determine the amount of root development and the relationship of a prematurely erupted tooth to its adjacent teeth. One of the parents can hold the x-ray film in the infant's mouth during the exposure. Most prematurely erupted teeth (immature type) are hypermobile because of limited root development.

1. If the tooth is extremely mobile to the extent that there is danger of displacement of the tooth and possible aspiration, so the treatment indicated in such a case is the removal of the tooth.

2. If the tooth has sharp incisal edge that may cause laceration of the lingual surface of the tongue, so treatment is the removal of the tooth. The preferable approach, however, is to leave the tooth in place and to explain to the parents the desirability of maintaining this tooth in the mouth because of its importance in the growth and uncomplicated eruption of the adjacent teeth. Eruption of teeth during the neonatal period presents less of a problem. A retained natal or neonatal tooth may cause difficulty for a mother who wishes to breast-feed her infant. If breast-feeding is too painful for the mother initially, the use of a breast pump and bottling of the milk are recommended. However, the infant may be conditioned not to "bite" during suckling in a relatively short time if the mother persists with breast-feeding. It seems that the infant senses the mother's discomfort and learns to avoid causing it.

Epstein pearls, Bohn nodules, Dental lamina cyst

Small, white or grayish white lesions on the alveolar mucosa of newborn may be incorrectly diagnosed as natal teeth. The lesions are usually multiple but do not increase in size. No treatment is indicated because the lesions are spontaneously shed a few weeks after birth.

- **Epstein pearls**: are formed along the mid-palatine raphe. They are considered remnants of epithelial tissue trapped along the raphe as the fetus grew.

- **Bohn Nodules :** are formed along the buccal and lingual aspect of dental ridges and on the palate away from the raphe. The nodules are considered remnant of salivary gland tissue.

- **Dental Lamina Cyst:** are found on the crest of maxillary and mandibular dental ridges. The cysts originated from remnant of dental lamina.

Epstein pearls

Bohn Nodules

Dental Lamina Cyst

Shedding Of Primary Teeth

The human dentitions consist of two generations. The need for two dentitions exists because : 1- Infants jaws are small and the size and number of teeth they can support are limited.2- since the teeth cannot increase in size, a second dentition consist of larger and more teeth is required for the larger jaws of adult. The physiological process resulting in elimination of deciduous dentition is known as shedding or exfoliation.

Pattern of shedding:

❖ Resorption of anterior teeth

The permanent anterior tooth germ position is lingual to the apical third of roots of primary teeth hence the resorption is on the occluso-labial direction, which correspond to the movement of permanent tooth germ. Later the resorption proceed horizontally because the crown of the permanent tooth lies directly apical to the roots of the primary tooth and this horizontal resorption will allows the permanent tooth to erupt into the position of the primary tooth.

❖ Resorption of posterior teeth

Initially, the growing crown of premolars are situated between the roots of the primary molars, so the root resorption of the posterior teeth will start at the inter radicular bone area followed by the resorption of the adjacent root surfaces.

Remenant of deciduous teeth

Sometimes parts of deciduous tooth that are not in the path of eruption remain embedded in the jaw for considerable time. They

mostly associated with the permanent premolars roots because the roots of lower deciduous molars are strongly curved or diverge. progressive resorption of the roots remnant will cause disappearance of these remnants.

Retained Deciduous Teeth

They may retained for long period of time beyond their shedding time. Such as teeth without permanent successor or their successor are impacted. Retained deciduous teeth are most often the upper lateral incisor, less frequently the mandibular second primary molars and rarely the lower central incisors.

***Factors caused differences in the time of eruption*:**

Local Factors

1) Infection around the tooth: if it is: A. near the eruption time it cause tearing of tissues and sometimes resorption in the area resulting in early eruption.

B- If the infection occur before long period of time it will result in late eruption because infection for long period will healed with fibrosis in the area which aid in late eruption.

2) Supernumerary tooth: may be of importance in late the eruption.

3) Trauma: any trauma may cause early shedding of primary teeth, which lead to late eruption of permanent successor teeth.

4) Gingival fibromatosis: Hereditary gingival fibromatosis (HGF) is characterized by a slow, progressive, benign enlargement of the gingivae. This dense fibrous tissue often causes displacement of the teeth and malocclusion, also it may prevent eruption of teeth and treatment usually is gingivectomy.

5) Ankylosed teeth:

The mandibular primary molars are the teeth most often observed to be ankylosed. The cause of ankylosis in the primary molar areas is unknown. It may follow a familial pattern. There is a relationship between the congenital absence of permanent teeth and ankylosed primary teeth.

Normal resorption of the primary molar begins on the inner or lingual surfaces of the roots. The resorption process is not continuous but is interrupted by periods of inactivity or rest. A reparative process follows periods of resorption. In the course of this reparative phase, a solid union often develops between the bone and the primary tooth. Extensive bony union of the primary tooth may prevent normal exfoliation and the eruption of the permanent successor. If ankylosis occurs early, eruption of the adjacent teeth may progress enough that the ankylosed tooth is far below the normal plane of occlusion.

The diagnosis of an ankylosed tooth It is not difficult to make. Because:

1. Eruption has not occurred.
2. The ankylosed tooth is not mobile.
3. Ankylosis can be partially confirmed by tapping the suspected tooth and an adjacent normal tooth with a blunt instrument and comparing the sounds. The ankylosed tooth will have a solid sound, whereas the normal tooth will have a cushioned sound because it has an intact periodontal membrane that absorbs some of the shock of the blow.
4. The radiograph is often a valuable diagnostic aid. A break in the continuity of the periodontal membrane, indicating an area of ankylosis, is often evident radiographically.

The Management Of An Ankylosed Tooth

Early recognition and diagnosis are extremely important.

1) The eventual treatment may involve surgical removal.

2) A tooth that is definitely ankylosed may at some future time undergo root resorption and be normally exfoliated. When patient cooperation is good and recall periods are regular, a watchful waiting approach is best.

3) For primary teeth: In situations in which permanent successors of ankylosed primary molars are missing, attempts have been made to establish functional occlusion using stainless steel crowns on the affected primary molars.

4) For permanent teeth: The incomplete eruption of a permanent molar may be related to a small area of root ankylosis. The removal of soft tissue and bone covering the occlusal aspect of the crown to provide a pathway for the developing permanent tooth. Unerupted permanent teeth may become ankylosed by inostosis of enamel. This process follows the irritation of the follicular or periodontal tissue resulting from chronic infection. The close association of an infected apex with an unerupted tooth may give rise to the process. In the unerupted tooth, enamel is protected by enamel epithelium. The enamel epithelium may disintegrate because of infection (or trauma), the enamel may subsequently be resorbed, and bone may be deposited in its place. The result is solid fixation of the tooth in its unerupted position.

Systemic Factors

1) Trisomy 21 Syndrome (Down Syndrome Ds):

Trisomy 21 syndrome (Down syndrome [DS] -that is, the presence of three number 21 chromosomes rather than the normal two. It is one of the congenital anomalies, in which delayed eruption of the teeth frequently occurs. The first primary teeth may not appear until 2 years of age, and the dentition may not be complete until 5 years of age. The eruption often follows an abnormal sequence, and some of the primary teeth may be retained until 15 years of age. DS occurs very early in embryonic development, possibly during the first cell divisions.

The diagnosis of DS

In a child is not usually difficult to make because of the characteristic facial pattern:

1. The orbits are small, 2. The eyes slope upward, 3. The bridge of the nose is more depressed than normal. 4. Retardation in the growth of the maxillae and mandible was evident in those with DS. 5. The smaller jaws contribute to a tendency for protrusion of the tongue and dental crowding. 6. The tongue also tends to be larger than normal. 7. Individuals with DS have a higher prevalence of periodontal disease mainly in the anterior region. However, susceptibility to dental caries is low for both primary and permanent teeth.

2) Cleidocranial Dysplasia

A rare congenital syndrome. The diagnosis is based on the finding of an absence of clavicles. 2. The fontanels are large, and radiographs of the head show open sutures. 3. The development of the dentition is delayed. Complete primary dentition at 15 years of age. 4. One of the important distinguishing characteristics is the presence of supernumerary teeth.

3) Hypothyroidism

❖ Congenital Hypothyroidism *(Cretinism)*

1. Congenital hypothyroidism is the result of an absence or underdevelopment of the thyroid gland and insufficient levels of thyroid hormone. 2. Child with congenital hypothyroidism is a small with abnormally short arms and legs. 3. The head is large. 4. Obesity is common. 5. The dentition of the child with congenital hypothyroidism is

delayed in all stages, including eruption of the primary teeth, exfoliation of the primary teeth, and eruption of the permanent teeth.

6. The teeth are normal in size but are crowded in jaws that are smaller than normal.

7. The tongue is large and may protrude from the mouth. The abnormal size of the tongue and its position often cause an anterior open bite and flaring of the anterior teeth.

❖ Juvenile Hypothyroidism (Acquired Hypothyroidism)

It results from a malfunction of the thyroid gland, usually between 6 and 12 years of age. In untreated juvenile hypothyroidism, delayed exfoliation of the primary teeth and delayed eruption of the permanent teeth are characteristic.

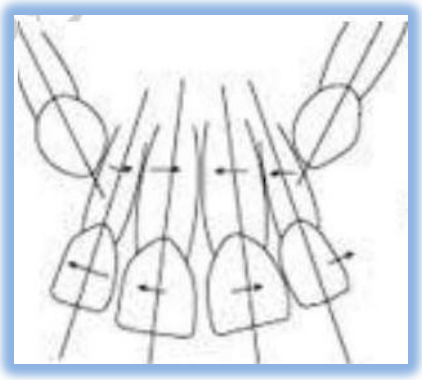
4)Chondroplastic Dwarfism

Easily diagnosed at birth. Growth of the extremities is limited because of a lack of calcification in the cartilage of the long bones. The head is large. The fingers may be of almost equal length, and the hands are plump. There is some evidence that the condition is more likely to occur when the ages of the parents differ significantly.

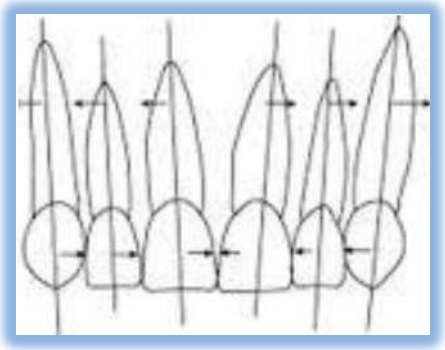
Chondroplastic Dwarfism

Ugly Duckling Stage

Also called Broadbent phenomenon, a self-correcting malocclusion is seen around 9-11 years of age or during eruptions of canine. As the permanent canines erupt, they displace the roots of lateral incisors mesially. This force is transmitted to the central incisors and their roots are also displaced mesially. Thus, the resultant force causes the distal divergence of the crown in an opposite direction, leading to midline spacing (diastema in the incisor region). The term ugly duckling stage indicates the anesthetic appearance of the child during this stage. This condition corrects itself after the canines have erupted when it apply pressure on the crowns of the incisors thereby causing them to shift back to original positions. No orthodontic treatment should be attempted at this stage.



a. The ugly duckling stage



b. Final anterior alignment

Dental Caries Definition, Classification And Etiology

Definition:

The term dental caries is used to describe the signs and symptoms of a localized demineralization of the mineral portion of dental tissues followed by the disintegration of their organic material, caused by tooth-adherent cariogenic bacteria, primarily Streptococcus Mutans, which metabolize sugars to produce acid, demineralizing the tooth structure over time. The destruction can affect enamel, dentin and cementum. The disease can result in bacterial invasion and death of the pulp and the spread of infection into the periapical tissues.

•Sequence of caries in primary dentition:

- First to be attacked are the mandibular molars followed by maxillary molars, then the maxillary anterior teeth. Only rarely are mandibular anterior teeth affected or the lingual/buccal surfaces of the primary teeth generally, except in cases of rampant caries.
- First primary molars in both the mandibular and maxillary arches are less susceptible to caries than the second primary molars, though the first primary molars erupt earlier than the second. Difference is thought to be due to differences in morphology of occlusal surfaces as the pits and fissures in second primary molars are deeper, and less completely coalesced.

•Sequence of caries in permanent dentition:

Once the first permanent molars erupt, one should expect frequent occurrence of caries in the occlusal pits and fissures. The maxillary and mandibular permanent incisors are not highly susceptible to caries attack except in children with rampant caries (RC). The mandibular second permanent molars are more susceptible to caries than the maxillary second permanent molars.

The Caries Diagnosis

1. **Visual examination**: The clinical visual examination consisting of five stages form the basis of caries diagnosis.
    - Systematic: Always start at the same place in the mouth – there is logic in making this the most distal surface in the upper right quadrant and working clockwise to the lower right. For every tooth, work round its surfaces in a systematic manner.
    - Clean: Dental plaque is not translucent. Polish the patient‟s teeth prior to attempting to diagnose caries.
    - Illumination: The dentist requires a light source to make diagnosis possible.
    - Dry: When we dry the teeth we will have the ability to detect disease at its earliest visible stage (the white spot lesion). A white spot enamel lesion has a matt enamel (acid-etched appearance) surface; this frequently indicates an active lesion. A lesion with a glossy surface is often arrested.
    - Put the sharp probe away: For many reasons: Probing of a demineralized site (which has the potential to remineralize) will further destroy the enamel structure creating an iatrogenic cavity and preventing any possibility of remineralization. There is the possibility of inoculating other sites with cariogenic bacteria.

    However, a blunt probe, such as a periodontal probe, can be used to remove plaque from fissures using a dredging motion, the side of a blunt probe may also be used to confirm if a surface has broken down.
2. **Radiographs**: The views that are of value for caries diagnosis are:
    - Bitewing: is the 1st choice of caries diagnosis, provide information on both occlusal dentine caries and proximal enamel and dentine caries.
    - Orthopantomogram (OPG): can detect the presence of an occlusal dentine carious lesion with a high degree of accuracy. Proximal surface lesions can also be seen on OPG but with much lower accuracy than with bitewings.
    - Bimolar view: Bimolars are not as useful a view as bitewings because there is often overlap of structures. However, they are of

use in the pre-cooperative child who will not cope with bitewings or an OPG.

- Periapical view: are as accurate as bitewings for caries diagnosis, but obviously less information is available on any one film. The key role of the periapical view is in the diagnosis of periodontal disease, periapical disease and the diagnosis and monitoring of dental traumatic injuries.

3. Adjuncts Aids to Caries Diagnosis

- Magnification: During restorative treatment, dentists are increasingly using magnification to assist with the preparation of teeth. Magnification can also help with the detection and diagnosis of caries.
- Temporary Tooth Separation (TTS): The placement of an orthodontic separator for about three to four days to move the teeth apart allows direct visual access to a surface for diagnosis. The tooth returns to its original position following removal of the separator within hours. This approach has two significant advantages over bitewing radiography:

¬ The avoidance of exposure to ionizing radiation.

¬ The ability to detect whether the surface is cavitated.

The drawbacks of TTS: the patient may experience some discomfort while the separator is in place.

- Laser Fluorescence: The currently available commercial device (Diagnodent, KaVo Germany) measures the porphyrins made by bacteria in the caries. This device is designed for the diagnosis of occlusal caries but it can be used on accessible smooth surfaces. In use, the dentist applies the probe tip to the tooth surface under investigation and a digital reading indicates the status of the surface through sound to deep dentine caries.
- Electric Caries Meter (ECM): Enamel is a very poor conductor of electricity. However, following carious attack the enamel becomes more porous and the ions present in the pores in the lesion will conduct electricity with much less resistance than sound enamel. This is the principle behind the working of the ECM, it is principally of use on occlusal surfaces.

All of the above methods have both advantages and disadvantages, but they should be considered a toolkit from which the dentist selects to improve the accuracy of caries detection and diagnosis.

The Caries Classification

Carious lesions can be classified according to their anatomical site.

1. Lesions may commonly be found in pits and fissures or on smooth surfaces. Smooth surface lesions may start on enamel (enamel caries) or on the exposed root cementum (root caries).

2. Primary caries is used to differentiate lesions on natural, intact tooth surfaces from those that develop adjacent to a filling, which are commonly referred to as recurrent or secondary caries.

3. Residual caries, as the term implies, is demineralized tissue that has been left behind before a filling is placed.

Caries lesions may also be classified according to their activity. A lesion considered to be progressing (the lesion would have developed further at a subsequent examination) would be described as an active carious lesion. In contrast to this is a lesion that may have formed years previously and then stopped further progression. Such lesions are referred to as arrested carious lesions or inactive carious lesions.
The first sign of a carious lesion on enamel that can be detected with the naked eye is often called a white-spot lesion.

4. Rampant caries is the name given to multiple active carious lesions occurring in the same patient.

5. Hidden caries is a term used to describe lesions in dentin that are missed on a visual examination but are large enough and demineralized enough to be detected radiographically.

•**Dental caries is a multifactorial disease**

–**<u>The primary factors are:</u>**

- ❖ The tooth
- ❖ The microorganisms
- ❖ Fermentable Carbohydrates
- ❖ Time

–**<u>The secondary factors are</u>**:

A. Local factors:

- Anatomy of the teeth
- Crowding or irregular teeth (makes cleaning difficult)
- Presence of dental appliances, e.g. partial denture , space maintainer, orthodontic appliances

B. Systemic factors such as :

1. Inherited defects: Children with congenital enamel defects such as amelogenesis imperfecta or dentinogenesis imperfecta may be more susceptible to caries.

2. "Family" caries: Streptococcus mutans, the main pathogen responsible for caries, is transmissible and there is very good evidence to show that it is passed from mother to baby.

3.Medicines: in particular, elixirs, CAN cause caries BUT only if they contain sugar. Some medicines are sucrose-free, but may contain other sugars such as glucose syrup. "Sugars-free" means no sugar at all. Dentists and their teams should advise parents and medical and pharmacy colleagues to add the letters „SF" for sugars-free to written prescriptions – this is particularly important in cases in which repeated prescriptions are required.

Rampant dental caries

Rampant caries has been defined as a "suddenly appearing, widespread, rapidly burrowing type of caries, resulting in early involvement of the pulp and affecting those teeth usually regarded as immune to ordinary decay."

Etiology

1. It is usually due to poor oral hygiene and taking frequent cariogenic snacks and sweet drinks between meals.
2. Patient behavioral pattern and/ or parent overindulgence /parent ignorance.
3. There is considerable evidence that emotional disturbances may be a causative factor in some cases of rampant caries. An emotional disturbance may initiate an unusual craving for sweets or the habit of snacking, which in turn might influence the incidence of dental caries.
4. **Additional Factors**

A. Saliva: Any patient with a salivary deficiency, from any cause, is at a higher risk for caries activity. It is generally accepted that the dental caries process is controlled to a large extent by a natural protective mechanism inherent within the saliva. A pronounced reduction or complete absence of saliva, however, results in an acidic environment with rampant caries.

B. Socioeconomic Status: children and adolescents living in poverty suffer twice as much tooth decay as their more affluent peers, and that their disease is more likely to go untreated

C. Anatomic Characteristics of the Teeth:

- Certain teeth of many patients, particularly permanent teeth, seem vulnerable to dental caries as they emerge. Because enamel calcification is incomplete at the time of eruption of the teeth and an additional period of about 2 years is required for the calcification process to be completed by exposure to saliva, the teeth are especially susceptible to caries formation during the first 2 years after eruption.
- In addition to occlusal surfaces, lingual pits on the maxillary permanent molars, buccal pits on the mandibular permanent molars, and lingual pits on the maxillary permanent lateral incisors are

vulnerable areas in which the process of dental caries may proceed rapidly Seen in primary and permanent dentition:

Clinical Features

• In primary teeth, initial lesions appear on labial surface of maxillary incisors near the gingival margin as a white area/ pitting on enamel surface.

• In permanent teeth –Related to the eruption of teeth.

– Buccal and lingual surface of premolar and molar are involved.

– Proximal and labial surface of maxillary incisors and proximal surface of mandibular incisors are involved.

Complication

o Affects maxillary anterior which may lead to psychological problem
o Minimal trauma can lead to fracture of teeth or Difficulty in speech.
o Development of abnormal habits
o Orthodontic problems

Early childhood caries

The American Academy of Pediatric Dentistry (AAPD) defines early childhood caries (ECC) as the occurrence of any sign of dental caries on any tooth surface during the first 3 years of life.

Caries affects the maxillary primary incisors and first primary molars in a way that reflects the pattern of eruption. The longer the tooth has been present and exposed to the caries challenge, the more it will be affected. The upper incisors are most vulnerable, while the mandibular incisors are protected by the tongue and saliva from submandibular and sublingual glands.

Common terms have been „bottle caries“ or „nursing caries“, but the terms ECC, and S-ECC in severe cases, are now more commonly used.

Etiology

- ❖ Exposure for long periods of time to cariogenic substrates (usually sugary drinks, sweetened drinks) in nursing bottles and/or feeder cups given as pacifiers or dinky feeder.
- ❖ Nursing bottle given at bedtime.
- ❖ Parental history of caries (especially mother).
- ❖ Associated with low socio-economic status , low educational level of parents
- ❖ Malnutrition and low-birth weight infants (less than 2500 g)

Progression of Lesion

- Initially a demineralized, white area is seen along gum line on the labial aspect of maxillary incisors, which is undetected by parents.
- These white lesions become cavities which involve the neck of tooth in a ring-like lesion.
- Finally, the whole crown of incisors is destroyed leaving behind brown black root stumps.

Management

Factors Affecting Management

• Extent of lesion

• Age of patient and its related behavioral problems of child

Prevention:

λ The main strategies for prevention is to aware and alert the parents, prospective new parents about the condition and its cause

λ Sealing of all caries free pits and fissures

λ Topical fluoride application

λ Water fluoridation in suboptimal fluoride water level areas

λ Supervised home care should be taught .

Treatment

Proper treatment: Divided into 3 visit\

First Visit

All lesions should be excavated and restored

λ Assess cooperation of child and decide on whether treatment will be conducted using local anesthesia, sedation or general anesthesia.

λ If abscess is present it is treated through drainage

λ Restoration of primary molars depending on extent of caries and cooperation of child with either composite, glass ionomer cement, pulpotomy, pulpectomy and preformed metal crowns (SSCs).

λ Antibiotics should be prescribed where acute soft tissue swelling or signs of systemic involvement (e.g. pyrexia) are present.

λ X-rays are advised to assess the condition of succedaneous teeth

Parent Counseling

λ The parents are questioned about the child‟s feeding habit, especially regarding the use of nocturnal bottles

λ The parent should be asked to try weaning the child from using the bottle as pacifier while in bed

λ In case, considerable emotional dependence on bottle, suggest the use of fluoridated water

λ The parent should be instructed to clean child‟s teeth after every feed.

λ Parents are advised to maintain a diet record of the child for one week which include time, amount of food given, the type of food, number of sugar exposure.

Second visit

Second Visit It should be scheduled one week after the first visit.

• Analysis of diet chart and explanation of disease process of child‟s teeth should be undertaken by simple equation

• Isolate the sugar factors from diet charts and control sugar exposure by intelligent use

• Reassess the restoration or redo if needed

Third and Subsequent Visits

• Restoring all grossly decayed tooth and Endodontic treatment

• Crowns can be done for grossly destructed teeth or endodontically treated teeth

• Extraction of unrestorable teeth, followed by space maintainers are used

• Review and recall after 3 months.

	Rampant caries	Early childhood caries
1	Acute, burrowing type of caries and showed early involvement of pulp. Involving those surfaces which are usually immune to decay.	It is a specific form of rampant caries
2	It occurs in all age group including adolescence	It occurs in infants toddler or preschoolers
3	It occurs in both primary and permanent dentition	Affect the primary dentition only
4	Mandibular incisors are Usually, affected	mandibular incisors are not affected
5	Multifactorial etiology like frequent snacking excessive sticky refined carbohydrate intake, decrease, salivary flow and genetic background.	Primarily associated to improper feeding practice such as bottle feeding or breast feeding or pacifier feeding during sleep.

د. رسل سعد

MORPHOLOGY OF INDIVIDUAL PRIMARY TEETH

MAXILLARY FIRST MOLAR

Buccal aspect:

1. The occlusal outline is scalloped with no definite cusp form.
2. The crown height is more mesially than distally.
3. The crown shows marked cervical constriction.
4. The mesial outline is straight and the distal outline is convex
5. The contact area is in middle 1/3.
6. The buccal surface is smooth with little evidence of developmental Grooves.
7. The cervical third of crown has prominent cervical ridge
8. The three roots are thin and widely spread
9. The root trunk is short
10. The trifurcation of roots begins just below the cervical line

The lingual aspect:

1. The crown is narrower on lingual aspect
2. The general outline of the crown is similar to the buccal aspect.
3. The mesiolingual cusp is the most prominent, largest and sharpest.
4. The distolingual cusp is poorly developed.
5. All three roots are seen from this aspect.
6. The palatal root is longer and larger than others.

Mesial aspect:

1. In the cervical third the crown is much wider buccolingually than the occlusal third.

2. The crown tapers occlusally.

3. The buccal outline shows prominent cervical ridge.

4. The buccal outline is straight from the ridge to the occlusal margin.

5. The lingual outline is convex in cervical and middle thirds and straight in the occlusal third.

6. The mesial marginal ridge may show a developmental groove.

7. The root trunk is short.

8. Only palatal and mesiobuccal roots are visible from this aspect.

Distal aspect:

1. The crown is narrower buccolingually and shorter cervicoocclusally than on the mesial side.

2. The cervical ridge is less prominent than from the mesial aspect.

Occlusal aspect:

1. The occlusal surface bears four cusps: mesiobuccal, distolingual, distobuccal and mesiolingual.

2. The crown is broader buccally more than lingually and mesially more than distally.

3. The crown shows lingual and distal convergence.

4. The occlusal surface is rectangular with the short sides represented By the marginal ridges.

5. The occlusal surface shows:

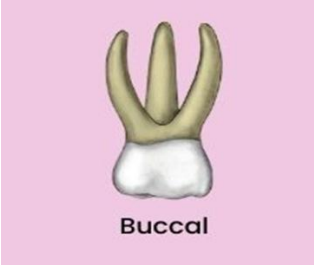
a. Central fossa

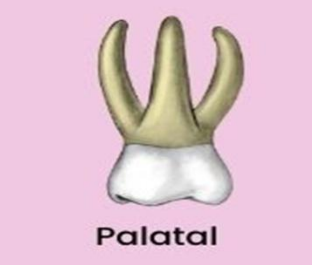
b. Central groove that connects the mesial and distal fossae, which are present just inside the mesial and distal marginal ridges respectively.

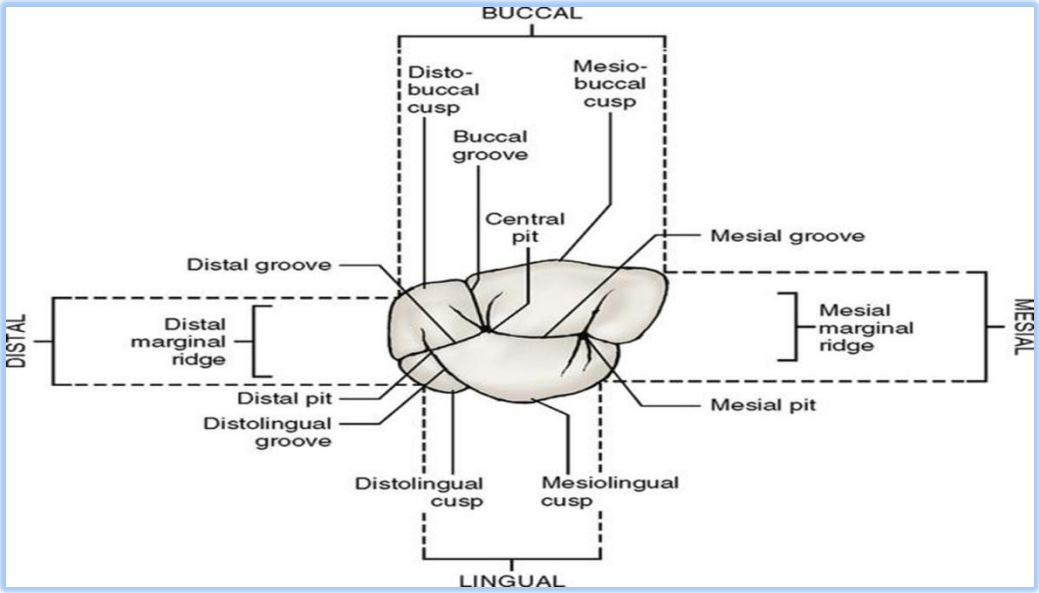
c. Buccal developmental groove separates mesiobuccal and e distobuccal cusps.

d. A well-defined triangular ridge connects mesiolingual and distobuccal cusps called as oblique ridge.

e. Supplemental grooves radiating from the central groove are present.







MAXILLARY SECOND MOLAR

Buccal aspect:

1. The primary maxillary second molar resemble the permenant maxillary first molar, but it is smaller in size

2. The buccal view show two well define buccal cusps with buccal developmental groove in between

3. The mesial and distal outlines converge cervically from contact areas

4. All three roots are longer, and thicker as compared to the maxiallary first molar

5. The root trunk is very short

Lingual aspect:

1. The crowns shows three cusp: mesiolingual cusp,distolingual cusp and a supplemental cusp.

2. Cusp present on the lingual surface of mesiolingual cusp is called the 'tubercle of Carabelli' or fifth cusp.

Mesial and Distal aspects:

1. The buccolingual width is more as compared to crown height.
2. The mesiobuccal and lingual roots are seen from this aspect.
3. The mesiobuccal root extends far beyond the outline of the crown.
4. Buccal outline shows cervical ridge.
5. Both the buccal and lingual outlines show occlusal convergence.

Occlusal aspect:

1. The tooth resembles permanent first molar.

2. The occlusal surface is rhomboidal with 4 well developed cusps

i.e.mesiobuccal, distobuccal, mesiolingual and distolingual.

3. The buccal outline is flat with a developmental groove in between the cusps.

4. The occlusal surface shows:

a. Central fossa with central pit

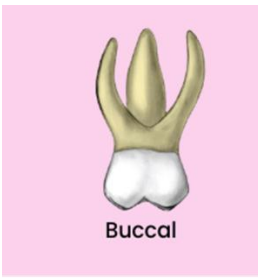
b. Mesial triangular fossa, distal triangular fossa

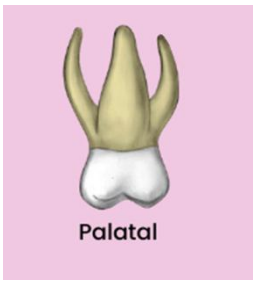
c. Central groove is seen connecting mesial and distal pits.

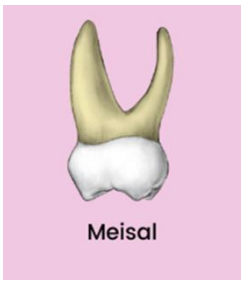
d. The oblique ridge is prominent connecting the mesiolingual cusp with distobuccal cusp.

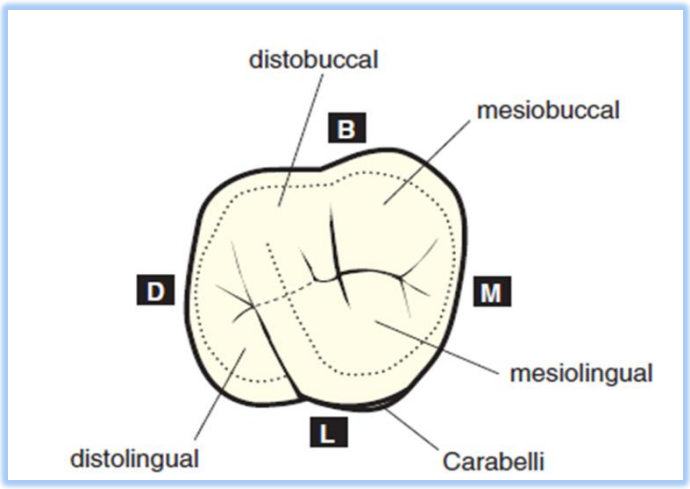
e. Distal to oblique ridge, distal fossa with distal groove is present.

f. The distal groove separates two lingual cusps and continues on the lingual surface as lingual developmental groove.









MANDIBULAR FIRST MOLAR

The anatomy of mandibular first molar does not resemble any tooth in permenant dentition

Buccal aspect:

1. The crown is wider mesiodistally
2. The mesiobuccal cusp is the largest and longest cusp.
3. The mesial outline is nearly straight whereas the distal outline is convex.
4. The mesial and distal roots are widely separated.
5. Roots are slender and the furcation is close to the cervical line.
6. Buccal surface shows a prominent cervical ridge.

Lingual aspect:

1. The crown and root converge lingually on the mesial side Part of mesial surface is visible from the lingual aspect.
2. The mesiolingual cusp is larger and longer than the distolingual cusp.
3. The lingual groove extends between two lingual cusps and ends in a depression in cervical third

Mesial aspect:

1. Buccal outline shows prominent cervical ridge.
2. the crown appears to lean towards lingual surface.
3. From cervical ridge the buccal outline is straight.
4. The mesial marginal ridge is concave is located more occlusally than distal marginal ridge.

5. The occlusal table is small buccolingually.
6. The cervical portion of the crown is quite wide in comparison (cervical convergence),
7. The mesial root is flat and squarish with a broad apex.
8. The mesial root has a depression along most of its length.

Distal aspect:

1. Buccal cervical ridge is less prominent from the distal side than from the mesial
2. The distobuccal and distolingual cusps are nearly of the same height.
3. The distal marginal ridge is located more cervically than mesial marginal ridge.
4. The distal root is more rounded, less broad, thinner and shorter than the mesial root.

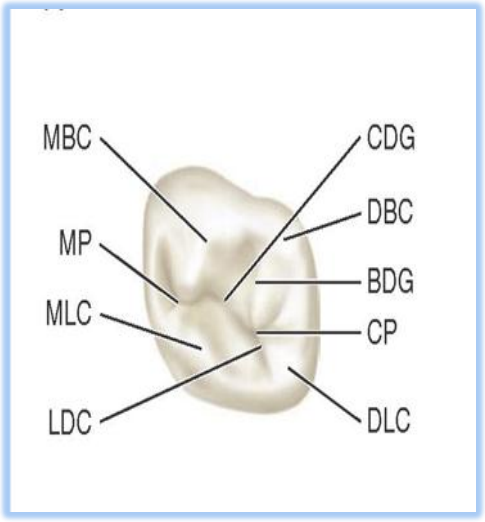
Occlusal aspect:

1. The general outline of this tooth from the occlusal aspect is rhomboidal.
2. Four cusps are present, they are mesiobuccal, mesiolingual, distobuccal and distolingual.
3. The mesiobuccal angle is acute and prominent.
4. The distobuccal angle is obtuse.
5. The crown shows lingual and distal convergence.
6. The mesiolingual cusp is the largest cusp.
7. The occlusal surface shows:
8. Transverse ridge is seen between the mesiobuccal and mesiolingual cusps.

10.Buccal developmental groove divides two buccal cusps and extends from between the buccal cusps to the central pit.

11.Central developmental groove separates the mesiobuccal and mesiolingual cusps.

12.Mesial and distal fossae contain mesial and distal pits respectively.



MANDIBULAR SECOND MOLAR

• The primary mandibular second molar resembles the permanent mandibular first molar.

It is the largest tooth in the deciduous dentition.

Buccal aspect:

1. The crown is wide mesiodistally.

2. The crown appears to be tilted distally on its root base.

3. There are 3 cusps of nearly equal size, namely mesiobuccal, distobuccal and distal.

4. These cusps are separated by mesiobuccal and distobuccal grooves.

5. The roots are widely separated.

6. Root trunk is short.

Lingual aspect:

1. Mesiolingual and distolingual cusps are about the same size and height.

2. Both the cusps are separated by lingual groove.

3. Root trunk is slightly longer.

Mesial aspect:

1. Buccal outline shows a prominent mesial cervical ridge giving the crown an appearance of lingual tilt.

2. The buccal and lingual outlines converge towards the occlusal surface.

3. The mesial marginal ridge is traversed by the mesial marginal groove.

4. The mesial surface is convex and flattens cervically.

5. The mesial root is broad and flat with a shallow depression.

6. Mesial root has two root canals.

Distal aspect:

1. Crown is narrower on the distal side than on mesial.

2. Distal root is broad and has less blunt apex.

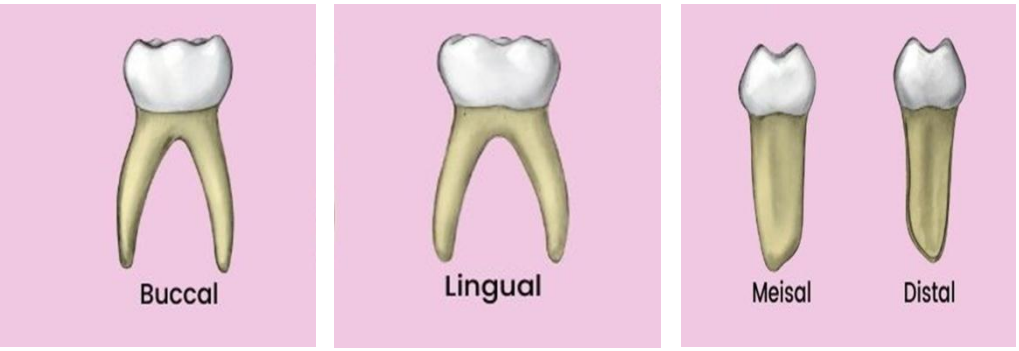
3. Distal root may have I or 2 root canals.

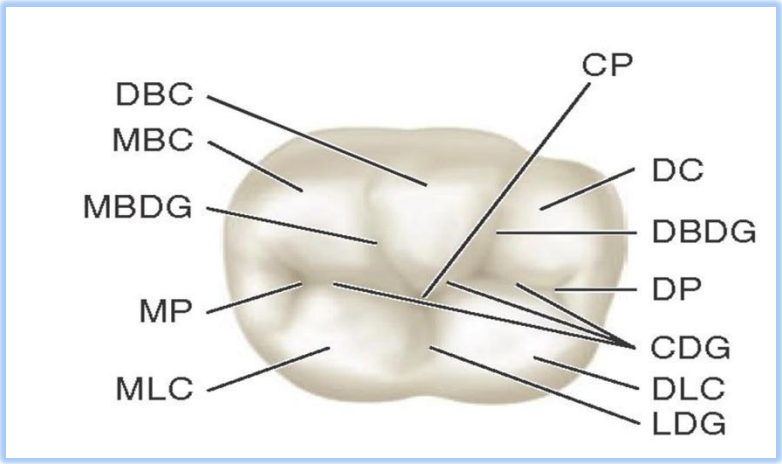
Occlusal aspect:

This tooth has 5 cusps with mesiobuccal cusp being the largest cusp.

Occlusal surface shows:

- Central fossa
- Mesial and distal triangular fossa
- Central groove, mesiobuccal groove, distobuccal groove and lingual groove.





MORPHOLOGIC DIFFERENCES BETWEEN PRIMARY AND PERMANENT TEETH

The morphology of the primary dentition is different in many respects from that of the permanent dentition, and not only in the sizes of the crowns and roots. They have following morphologic difference:

Features of a Deciduous Crown

1. The crown of the deciduous tooth is shorter than the permanent tooth.

2. The occlusal table of a deciduous tooth is narrower labiolingually than is the permanent tooth.

3. The deciduous tooth is constricted in the cervical portion of the crown.

4. The enamel and dentin layers are thinner in the deciduous tooth.

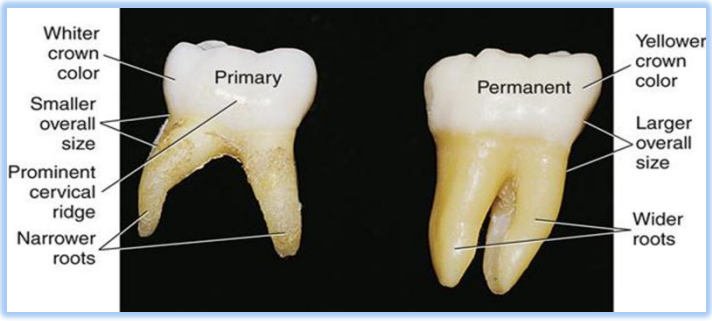
5. The enamel rods in the gingival third extend in a slightly occlusal direction

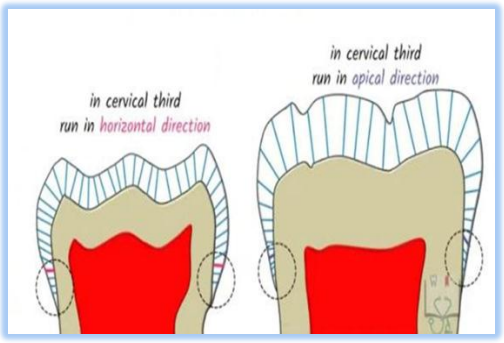
from the dentino-enamel junction in deciduous teeth but extend slightly

apically in the permanent dentition.

6. The contact areas between the deciduous molars are very broad and flat.

7. The color of the deciduous tooth is lighter than permanent teeth





(Direction Of Enamel Rods)

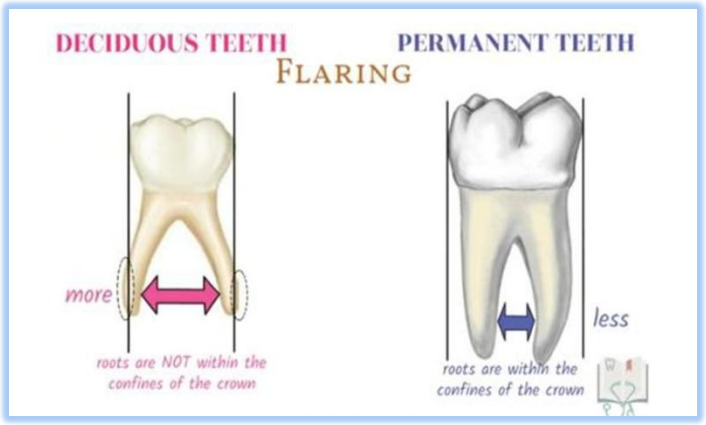
(Contact Area)

Features of a Deciduous Root

1. The root of the deciduous anterior tooth is narrower mesiodistally than is that of the permanent anterior tooth.

2. The roots of the posterior deciduous tooth are longer and slenderer in relation to crown size than are those of the permanent tooth.

3. The roots of the deciduous molar flare more as they approach the apex (which affords the necessary room for the development of the permanent tooth buds) than do the permanent molar roots



(Roots flaring of primary teeth)

Features of a Deciduous Pulp

1. The pulp of the deciduous tooth is larger than that of the permanent tooth in relation to the crown size.

2. The pulp horns of the deciduous tooth (especially the mesial horns) are closer to the outer surface of the tooth than are those of the permanent tooth.

3. The mandibular molar has larger pulp chambers than does the maxillary molar in the deciduous tooth.

4. The form of the pulp chamber of the deciduous tooth follows the surface of the crown.

5. Usually there is a pulp horn under each cusp.

6. Thin and slender roots pulp canals.

7. Accessory canals extend from floor of the pulpal chamber to the furcation or interradicular area.

8. Increased blood supply, due to which the deciduous pulp exhibits typical inflammatory response.

9. Responds by inflammatory process, resulting in increased internal resorption.

10. Reduced sensitivity to pain—due to less number of nerve fibers.

11. Increased reparative dentin formation.

12. Poor localization of infection and inflammation.

13. Multiple ramifications, making complete debridement impossible.

14. Ribbon shaped root canal (hour glass appearance) that is narrower Mesio-distally, discourages gross enlargement of the canal.

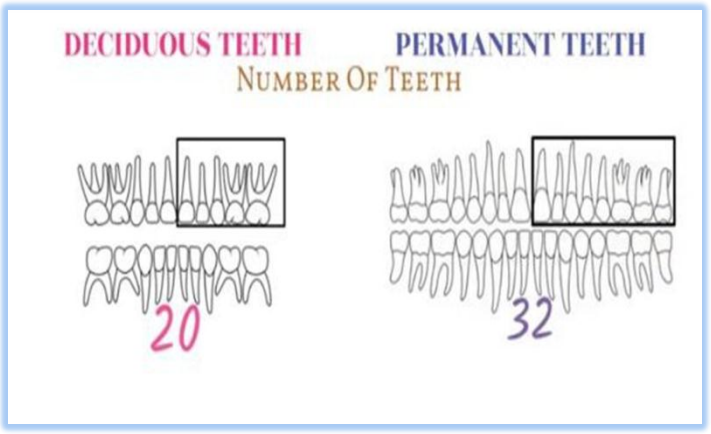
GENERAL DIFFERENCES

1-No. of teeth present for primary is 20 and permanent is 28-32

2- Bicuspids and third molars are absent in the primary teeth.

3- Primary teeth are smaller in size when compare to permanent teeth.

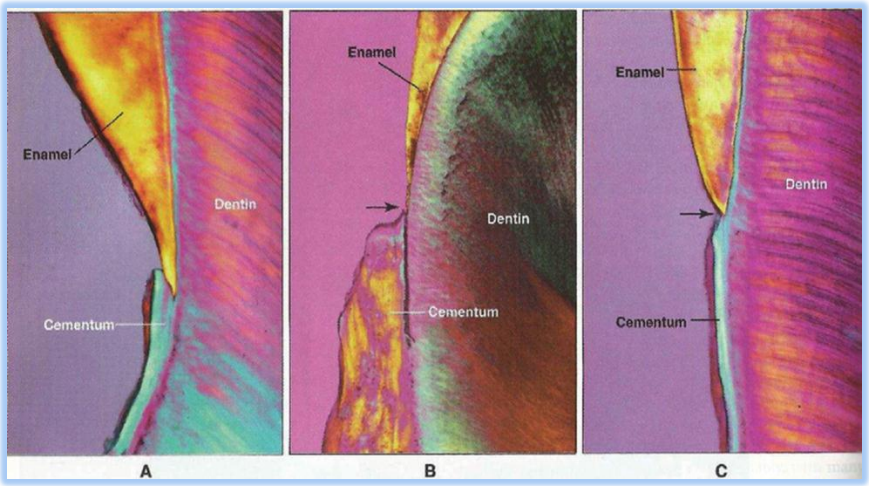
4- First tooth to erupt into the oral cavity is mandibular incisor whereas in permanent teeth it is the mandibular first molar.



SIZE AND MORPHOLOGY OF THE PRIMARY TOOTH PULP CHAMBER

Considerable individual variation exists in the sizes of the pulp chambers and pulp canals of the primary teeth. Immediately after tooth eruption, the pulp chambers are large and generally follow the outline of the crown. They decrease in size as age increases and under the influence of both function and abrasion of the occlusal and incisal surfaces of the teeth. Radiographs do not demonstrate completely the extent of the pulp horn into the cuspal area. In addition, the cemento-enamel junction of primary teeth presents three interesting morphologic relationships, in which the cementum is over enamel, the cementum and enamel are edge to edge, or there is a gap between the cementum and enamel with dentin exposure. This irregularity in

the cement-enamel junction may indicate the need for care during restorative and other procedures to avoid damage



(CEJ Morphologic Relationships In Primary Dentition)

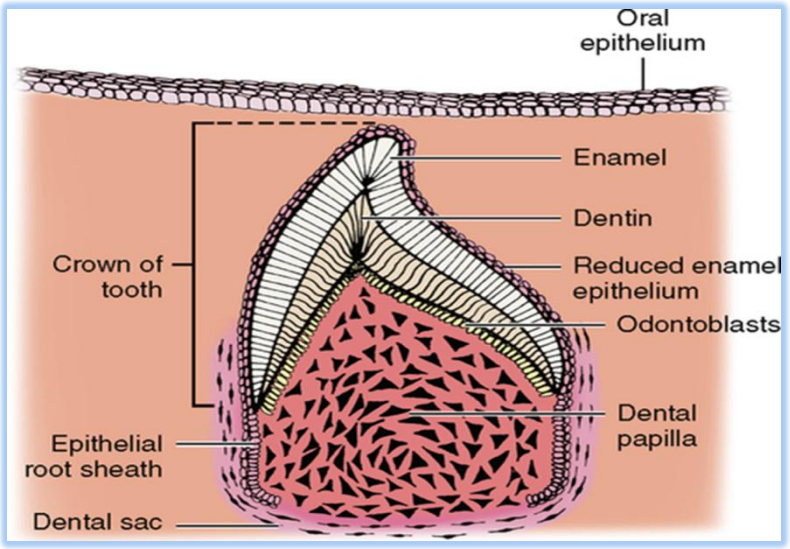
PRIMARY ROOT CANAL ANATOMY

To treat the pulps of primary teeth successfully, the clinician must have a thorough knowledge of the anatomy of the primary root canal systems and the variations that normally exist in these systems. To understand some of the variations in the primary root canal systems requires an understanding of root formation.

Root Formation

The roots begin after enamel and dentin formation has reached the future CEJ. The epithelial dental organ forms Hertwig's epithelial root sheath, which initiates formation and molds the shape of the roots. Hertwig's sheath takes the form of one or more epithelial tubes (depending on the number of roots of the tooth, one tube for each root). During root formation the apical foramen of each root has a wide opening. The dentinal walls diverge apically, and the shape of the pulp canal is like a wide open tube. Each root contains one canal at this time, and the number of canals is the same as the number of roots. When root length is established, the sheath disappears but dentin deposition continues internally within the roots. As growth proceeds, the root canal is narrowed by continued deposition of dentin and the pulp

tissue is compressed. Additional deposition of dentin and cementum closes the apex of the tooth and creates the apical convergence of the root canals common to the completely formed tooth. Root length is not completed until 1 to 4 years after a tooth erupts into the oral cavity. In the primary teeth the root length is completed in a shorter period of time than in the permanent tooth because of the shorter length of the primary roots. The primary tooth is unique in so far as resorption of the roots begins after a short period of complete root length formation. At this time the form and shape of the root canals roughly correspond to the form and shape of the external anatomy of the teeth. Root resorption or the deposition of additional dentin within the root canal system, however, significantly changes the number, size, and shape of the root canals within the primary tooth.



(Root formation)

ROOT COMPLETION OF PRIMARY TEETH

Primary tooth roots are completed between the ages of 18 months to 3 years. The complete primary dentition (with 20 teeth) is in the mouth from about 2 years of age to about 6 years, during which no permanent teeth are visible in the mouth, but permanent teeth are forming within the jaws.

EXFOLIATION (SHEDDING) OF PRIMARY TEETH

The roots of primary teeth are complete for only a short period of time. Only about 3 years after completion, primary tooth roots begin to resorb, usually at the apex or on one side near the apex. Resorption of a primary tooth root is the gradual dissolving away of the root due to the underlying eruption of the succedaneous tooth that will replace it. Root resorption continues as succedaneous teeth move closer to the surface until deciduous teeth eventually become loose and finally "fall off" (like leaves fall off of deciduous trees). This process of shedding is called exfoliation. When a primary tooth is shed, the crown of the succedaneous tooth is close to the surface and ready to emerge. Resorption of primary incisors occur in the lingual surface near the apex (image A) while in the primary molaries resorption occur in the inter radicular pone area(image B).

(A)

(B)

Root canal anatomy of primary anterior teeth

The form and shape of the root canals of the primary anterior teeth resemble the form and shape of the roots of the teeth. The permanent tooth bud lies lingual and apical to the primary anterior tooth. Owing to the position of the permanent tooth bud, resorption of the primary incisors and canines is initiated on the lingual surface in the apical third of the roots.

- **Maxillary Incisors**

The root canals of the primary maxillary, central, and lateral incisors are almost round but somewhat compressed. Normally these teeth have one

canal without bifurcations. Apical ramifications or accessory canals and lateral canals are rare, but they do occur.

- **Mandibular Incisors**

The root canals of the primary mandibular central and lateral incisors are flattened on the mesial and distal surfaces and sometimes grooved, pointing to an eventual division into two canals. The presence of two canals is seen less than 10% of the time. Occasionally lateral or accessory canals are observed.

- **Maxillary and Mandibular Canines**

The root canals of the maxillary and mandibular canines correspond to the exterior root shape, a rounded, triangular shape with the base toward the facial surface. The canines have the simplest root canal systems of all the primary teeth and offer few problems when being treated endodontically. Bifurcation of the canal does not normally occur. Lateral canals and accessory canals are rare.

- **Root canal anatomy of primary molars**

Normally the primary molars have the same number and position of roots as the corresponding permanent molars. The maxillary molars have three roots: two BUCCAL and one palatal; the mandibular have two roots: mesial and distal. In the primary molars, resorption usually begins on the inner surfaces of the roots next to the inter-radicular septum. When full length of the roots of the primary molars has just been completed, only one root canal is present in each of the roots. The continued deposition of dentin internally may divide the root into two or more canals. During this process,communications exist between the canals and may remain in the fully developed primary tooth. Subsequent deposition of secondary dentin may produce a complete separation of the root canal into two or more individual canals. Many fine- connecting branches or lateral fibrils form a connecting network between the facial and lingual aspects of the root canals. Accessory canals, lateral canals, and apical ramifications of the pulp in primary molars occur in 10% to 20%.

- **Maxillary First Primary Molar**

It has three to four canals that roughly correspond to the exterior root form with much variation. The palatal root is often rounded; it is often longer than the two facial roots. In most of these teeth three separate canals are present, with a very narrow isthmus connecting them especially between the palatal and distal. Islands of dentin may exist between the canals, with many connecting branches and fibrils.

- **Maxillary Second Primary Molar**

It has three to five canals roughly corresponding to the exterior root shape. The mesiofacial root usually bifurcates or contains two distinct canals. This occurs in approximately 85% to 95% of maxillary second primary molars. Fusion of the palatal and distofacial roots may occur. These fused roots may have a common canal, two distinct canals, or two canals with a narrow connecting isthmus of dentin islands between them and many connecting branches or fibrils.

- **Mandibular First Primary Molar**

It usually has two canals roughly corresponding to the external root anatomy, but it may have two to four canals. It is reported that approximately 75% of the mesial roots contain two canals, whereas only 25% of the distal roots contain more than one canal.

- **Mandibular Second Primary Molar**

It may have two to four canals, but it usually has three. The mesial root has two canals approximately 85% of the time, whereas the distal root contains more than one canal only 25% of the time

د. رسل سعد

Functions of primary teeth

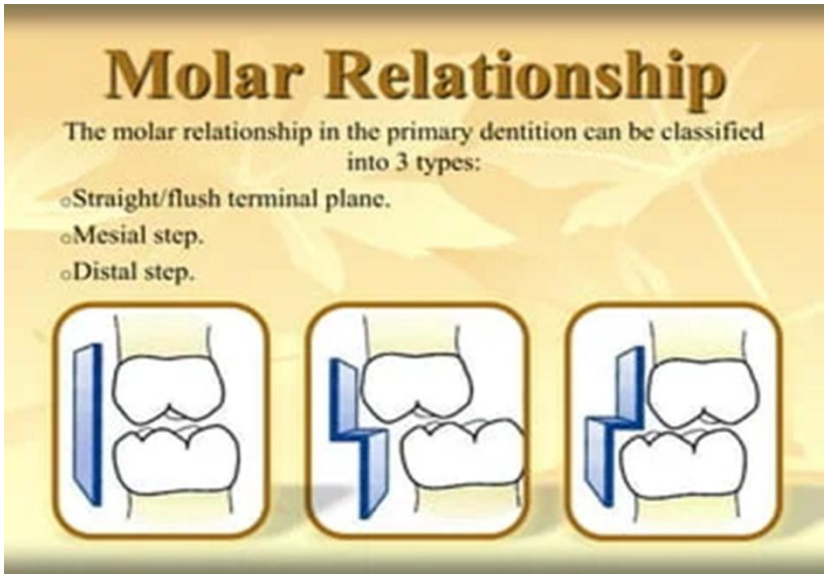
Function of Primary teeth are essential in the development of the mouth. The primary teeth maintain the arch length within the jaw, the bone and the permanent teeth replacements develop from the same tooth germs as the primary teeth. The primary teeth provide guides for the eruption pathway of the permanent teeth.

Well deciduous teeth are important and they are required to serve a number of functions above and beyond simply biting and chewing. This is why the children and parents need to take care of them and make sure they last until the permanent teeth are ready to come through.

Many opinions have been expressed about the features that characterize a normal primary dentition, but three features are seen frequently enough for them to be considered normal:

1. 'Straight' or 'mesial step second molar relationship'

In most dentitions the maxillary and mandibular primary second molars are in cusp-to-cusp occlusion so that their distal surfaces are in the same distal plane. Frequently, however, there is a mesial step in this vertical plane. This can also be considered normal. Distal „step" indicate a class II arch relationship

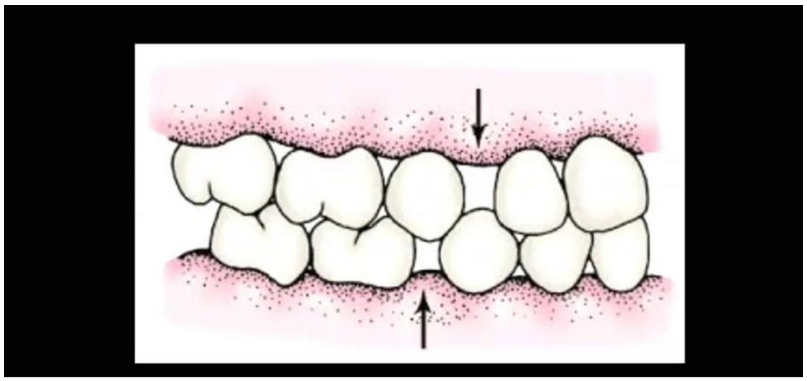


2. Incisor spacing:

Spacing among the primary incisors is normal, and indicates that the permanent successors will probably have adequate space into which to erupt. Lack of spacing or imbrication of primary incisors are signs that permanent incisors will probably be crowded when they erupt.

3. Anthropoid (primate space):

The most common sites for spaces in the primary teeth are in the canine regions. The anthropoid spaces are mesial to the maxillary canines and distal to the mandibular canines.



The major functions of primary teeth

1-Speech production and development

Learning to speak clearly is crucial for cognitive, social, and emotional development. The proper positioning of primary teeth facilitates correct syllable pronunciation and prevents the tongue from straying during speech formation.

2-Eating and nutrition.

The ability to bite and chew also helps to break up food into more easily digestible pieces and allow for better digestion of food. As the food is being broken up by the teeth, it is also mixed with saliva containing enzymes that begin the digestive process. A child that swallows too rapidly without chewing the food adequately will prolong the digestive process.

Children with malformed or severely decayed primary teeth are more likely

to experience dietary deficiencies, malnourishment, and to be underweight. Proper chewing motions are acquired over time and with extensive practice. Healthy primary teeth promote good chewing habits and facilitate nutritious eating

3-Self-confidence

Even very young children can be quick to point out ugly teeth and crooked smiles. Taking good care of primary teeth can make social interactions more pleasant, reduce the risk of bad breath, and promote confident smiles and positive social interactions.

4- Place Holder (space maintainer)

One of the major functions of primary teeth is to hold an appropriate amount of space for developing adult teeth. In addition, these spacers facilitate the proper alignment of adult teeth and also promote jaw development. Left untreated, missing primary teeth cause the remaining teeth to "shift" and fill spaces improperly. For this reason, pediatric dentists often recommend spacemaintaining devices.

5-Excellent oral health

Badly decayed primary teeth can promote the onset of childhood periodontal disease. As a result of this condition, oral bacteria invade and erode gums, ligaments, and eventually bone. If left untreated, primary teeth can drop out completely – causing health and spacing problems for emerging permanent teeth. To avoid periodontal disease, children should practice an adult-guided oral care routine each day, and infant gums should be rubbed gently with a

clean, damp cloth after meals

6-Development of the Jaw Bones and Facial Muscles

The presence or absence of teeth will affect the way in which the jaw bones and facial muscles develop. The growth of the jaw bones is affected by the facial muscles. Teeth and the chewing function help to exercise the facial muscles and facilitate the development of the jaw bones.

TYPES AND FUNCTION OF INDIVIDUAL PRIMARY TEETH

INCISORS

Incisors are the eight teeth in the front of the mouth (four on top and four on bottom). These are the teeth that are used to take bites of eaten food. Incisors are usually the first teeth to erupt — at around 6 months for the baby teeth, and between ages 6 and 8 for the adult

Function of primary incisors

1. Incisors cut and slice food when the child takes a bite. The incisors are the main teeth used for cutting pieces of food, for example when eating a whole apple, the incisors are the teeth that slice through the apple and help to get the piece of apple into the mouth to be fully chewed by other teeth.

2. Incisors support the lips and face. The sides of the lips are probably resting right up against the front teeth. Because of this, incisor teeth help to form the overall appearance of the face.

3. Help in speech. As in pronunciation of some sounds, the tongue touches the upper incisors. It touches near the top of the incisors for the “t” sound

and near the bottom for the “th” sound. Many sounds need the incisor teeth to be pronounced. It‟s also why denture wearers have to re-learn how to speak clearly when they get their dentures.

4. They can make the smile beautiful. The first thing that most people notice in the smile will be the teeth. Since the incisors are the front teeth, they have a tremendous effect on how the smile looks.

5. Incisors help to guide the jaw when closing the mouth.

CANINES

The four canines are the next type of teeth to develop. These are the sharpest teeth and are used for tearing food apart. Primary canines generally appear with the upper canines coming in just ahead of the lower canines. In permanent teeth, the order is reversed.

MOLARS

Molars are used for chewing and grinding food. Primary molars are replaced by the first and second premolars. The permanent molars do not replace any primary teeth, but come in behind all of them, further back in the jaw