

DIPLOMA OF PRIMARY CARE
DENTISTRY

-RCSI-

PART – 1
CLINICAL SKILLS

PART 3: PAEDIATRIC DENTISTRY

- ∇ Children should first visit a dentist as soon as they have teeth (about 6 months of age).
- ∇ For young children, watching other members of the family receive a check-up prior to their turn may be preferable (**'modelling'**).
- ∇ For infants and very young children a full dental examination is not essential if compliance is an issue.
- ∇ The emphasis should be on acclimatization, delivering age-appropriate preventive advice, and establishing rapport and a positive trusting professional relationship with the family.
- ∇ Confirm who is with the child and who has parental responsibility: check medical history and reason for attendance.
- ∇ Talk to the child: communication is the key to success!
- ∇ Show the patient the chair, mirror, and light, and explain their purpose.
- ∇ Deal with the patient's complaint. If the child is in pain, the source of this needs to be determined and dealt with as quickly as possible.
- ∇ Younger children can sometimes be more successfully examined using the **'knee to knee' examination technique.**

Treatment planning for children:

A. Diagnosis:

- Dental caries is often a rapidly progressing condition in children. It is essential to secure an accurate diagnosis before making a treatment plan.
- This is achieved by taking a history, doing an examination, and, where appropriate, taking b/w radiographs.
- Bitewings are important for an accurate unless approximal surfaces of the 1° molars can be visualized (the dentition is spaced).

B. Treatment plan:

- The ultimate aim in dentistry for children is for the child to reach adult-hood with good dental status and a positive attitude towards dental health and dental treatment.
- The final Rx plan will take into account the following considerations:
 - Behaviour management
 - Prevention
 - Restorative treatment
 - Long-term prognosis for first permanent molars
 - Palpate for 3|3 at 9–10yrs (Palatally displaced maxillary canines).
 - Beware disturbances in eruption sequence and asymmetry.

- ⇒ Early referral to specialist for skeletal discrepancies, and for any significant abnormal findings.
- ⇒ The Rx plan is drawn up visit by visit.
- ⇒ Each visit has both preventive and operative components (optimally aiming to deliver only one key preventive message per visit).

- ❖ Look out for any signs of underlying medical or social problems which may modify the treatment plan:
 - Systemic disease.
 - Failure to thrive.
 - Evidence of abuse or neglect.
 - Small stature.
 - Other family circumstances which might affect care, such as home distance from the surgery and other family work or caring commitments.

Techniques for behaviour management:

- General principles:
 - Show interest in the child as a person.
 - Touch > facial expression > tone of the voice > what is said.
 - Don't ignore a child's fears or anxieties.
 - Explain—why, how, when.
 - Aim to reward behaviour which approximates to positive, desired patterns.
 - Try to ignore inappropriate or negative behaviour.
 - Get child involved in treatment like holding saliva ejector.
 - Giving the child some control over the situation will also help them to relax: a stop signal such as raising their hand if they want you to stop for any reason ('enhancing control').

- ⇒ The aim is to acclimatize the child to the new experiences associated with dental care, and establish a positive, trusting relationship with the child and family. Tell, show, do Self-explanatory, but use language the child will understand.

- 1. Behaviour shaping:**
- Aim to guide and modify the child's responses, selectively reinforcing appropriate behaviour, while discouraging/ignoring inappropriate behaviour.

2. Reinforcement:

- This is the strengthening of patterns of behaviour, usually by rewarding good behaviour with approval and praise.
- If a child protests and is uncooperative during treatment, do not immediately abandon the session and return them to the consolation of their parent, as this could inadvertently reinforce the undesirable behaviour.
- Try to ensure that something is completed (placing a dressing or even an examination) and focus on the successful completion of this, rather than the failure to complete what might have been originally planned.

3. Cognitive behavioural therapy:

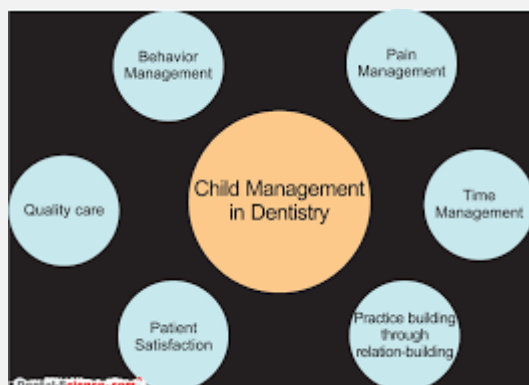
- A goal-oriented therapy which aims to help the child manage their anxiety by changing how they think and behave in relation to their problems.
- This can be used with assistance from psychologists and chairside self-help methods.

4. Modelling:

- Useful for children with little previous dental experience who are apprehensive. Encourage the child to watch other children of similar age or siblings receiving dental treatment happily.
- Watching a model on a video can also be helpful ('my first dental check-up')

5. Desensitization:

- Used for a child with pre-existing fears or phobias.
- Involves helping the patient to relax in the dental environment, then constructing a hierarchy of steps which gradually approximate to the fear-provoking stimulus for that patient.
- These steps are then introduced to the child gradually, with progression on to the next stimulus only when the child is able to cope with previous situation.
- It is a useful approach for managing needle phobia.



Sedation:

- Sometimes indicated for the genuinely anxious child who wishes to co-operate and also may help children with over-active gag reflexes and those for whom analgesia additional to LA may be needed (for difficult extractions such as 6s).

a. Inhalation:

- Uses nitrous oxide/oxygen mixture to produce relative analgesia (RA) and is the most popular technique for use with children.
- Effective for decrease anxiety and increase tolerance of invasive procedures in children who wish to cooperate but are too anxious to do so without help.
- It is a good idea not to carry out any Rx during the visit when the child is introduced to 'happy air'. Let the child position the nose piece themselves.



b. Intravenous:

- Not commonly used in children <12 years of age.

c. Oral:

- Drugs such as midazolam and chloral hydrate have been advocated in the past.
- Specialized knowledge and skills are required, and midazolam is no longer indicated.

d. Intramuscular:

- Rarely used in children.

e. Per rectum:

- Popular in some countries. Other options include intranasal sedation, acupuncture, and even acupressure, to help patients with a particularly severe gag reflex.

General anaesthesia:

- Allows dental rehabilitation &/or dental extractions to be achieved at one visit.
- GA should only be used for dental Rx when absolutely necessary (when other methods of management, e.g. LA or sedation, are deemed un-suitable).
- Alternative strategies and the risks of GA must be discussed to enable parents to make an informed decision.



✚ The child with toothache:

- When faced with a child with toothache, pulpal or periodontal pathology are the commonest causes.
- The dentist has to use clinical acumen to try and determine the state of the affected tooth/teeth, as this will decide the treatment required.

Table 3.1 Management of a child with toothache

Diagnosis	Emergency management	Definitive management
Reversible pulpitis	LA Excavate soft caries Restore temporarily with a zinc oxide/eugenol or GIC If exposed and vital—dress polyantibiotic paste (e.g. Ledermix®, Odontopaste®)	Pulpotomy or extraction (if time and cooperation allows, definitive Rx should be completed at the first visit)
Irreversible pulpitis	LA Excavate soft caries Dress polyantibiotic paste Restore temporarily with a zinc oxide/eugenol or GIC	Pulpotomy/pulpectomy or extraction
Acute periradicular periodontitis	LA (may not be necessary if loss of vitality is certain) Excavate soft caries until pulp chamber accessed—dress pulp chamber with polyantibiotic paste on cotton wool Seal with temporary dressing	Pulpotomy/pulpectomy or extraction
Acute periodontitis with facial swelling <i>If:</i> No or mild pyrexia (<38°C) Localized acute erythematous tender soft tissue swelling No significant involvement of 'danger areas' (see below in table) Not otherwise systemically unwell	Antibiotics and analgesics Ensure adequate fluid intake Establish drainage via tooth (and dress) if possible Review every 24h to ensure resolution	Extraction of tooth (or pulpectomy in selected cases) once acute phase has resolved
Acute periodontitis with facial swelling <i>If:</i> Significant pyrexia >38°C Poorly localized, spreading infection Systemically unwell: dehydration, lethargy, nausea, and vomiting Swelling involving a 'danger area', i.e. floor of mouth (inability to feel the lower border of the mandible is a serious sign) Trismus	Immediate referral to specialist centre Aggressive antibiotic Rx (e.g. amoxicillin and metronidazole)	Extraction of tooth &/or IO/EO drainage

1. History:

- Take a pain history from the child and parent.
- Beware of variations in accuracy; anxious children may deny being in pain when faced with an eager dentist, whereas parents who feel guilty for delaying seeking dental Rx may exaggerate pain.
- Some pathology is painless, chronic periradicular periodontitis.
- Include medical history and confirm who the child has attended with.

2. Examination:

- Swelling, temperature, lymphadenopathy
- Intra-orally look for caries, abscesses, chronic buccal sinuses, mobile teeth (due to exfoliation or apical infection), and erupting teeth.
- Colour change may indicate a history of trauma/loss of vitality.

3. Percussion:

- Can be unreliable in children.
- Use gentle finger pressure first.
- Care is needed to establish a consistent response and compare with unaffected 'control' teeth.

4. Sensibility testing:

- Using thermal (ethyl chloride on cotton wool) or electrical stimulation.
- Again, establish a consistent, reliable response on a 'control' tooth before testing the tooth/teeth in question.
- Check for false positives, by altering the intensity of stimulus (cotton ball with ethyl chloride, followed by a dry cotton ball).
- Less reliable in 1° teeth.

5. Radiographs:

- Bitewing X-rays may be useful.
- Not only are they less un-comfortable for small mouths than periapicals, but they also often show the bifurcation area where radiolucency 2° to periodontitis is often first apparent.
- An upper standard occlusal may be a helpful alternative to periapicals for anterior painful teeth.

6. Diagnosis:

- Fleeting pain on hot/cold/sweet stimuli = reversible pulpitis.

- Longer-lasting pain on hot/cold/sweet stimuli &/or spontaneous pain with no initiating factor (child kept awake) but no mobility, not tender to percussion (TTP) = irreversible pulpitis.
- Pain on biting and pressure &/or swelling and tenderness of adjacent tissues, mobility = acute periradicular periodontitis.

⇒ Other common potential causes of toothache include:

- Dentoalveolar trauma.
- Mucosal ulceration.
- Teething.
- Mobility prior to exfoliation of deciduous teeth.

Abnormalities of tooth eruption and exfoliation:

1. Natal teeth:

- Most frequently occur in lower incisor region and because of limited root development at that age, are often mobile.
- If in danger of being inhaled or causing problems with breastfeeding, they can be removed (usually removed with no LA or some topical LA is applied).



2. Eruption cyst:

- This is caused by an accumulation of fluid or blood in the follicular space overlying an erupting tooth.
- The presence of blood gives a bluish hue.
- Most rupture spontaneously, allowing eruption to proceed. Rarely, it may be necessary to marsupialize the cyst.



3. Failure of/delayed eruption:

- Disruption of normal eruption sequence and asymmetry in eruption times of contralateral teeth >6 months warrants further investigation.
- It must be remembered that there is a wide range of individual variation in eruption times.



⇒ General causes: Hereditary gingival fibromatosis, Down syndrome, Gardner syndrome, hypothyroidism, cleidocranial dysostosis, and rickets.

✚ Abnormalities of tooth number:

1. Anodontia: means complete absence of all teeth. Rare.
2. Hypodontia (oligodontia): developmental absence of one or more teeth.
 - ⇒ Most commonly affected teeth are 8 (25–35%), 2 (2%), lower 5 (3%).
 - ⇒ Affects F > M and is often associated with smaller than average tooth size in remainder of dentition.
 - ⇒ Peg-shaped 2 often occurs in conjunction with absence of contralateral
3. Hyperdontia: Better known as supernumerary teeth.
 - ⇒ Occurs most frequently in premaxillary region.
 - ⇒ Affects M > F.
 - ⇒ Associated with cleidocranial dysostosis and CLP.
 - ⇒ Classification is either by shape or position and orientation:

Table 3.2 Classification of abnormalities by shape and position

Shape	or	Position
Conical (peg-shaped)		Mesiodens
Tuberculate (barrel-shaped)		Distomolar
Supplemental		Paramolar
Odontome		

- ⇒ Effects on dentition and treatment:
 - No effect.
 - If unerupted keep watch (radiographic review occasionally to exclude cystic change/damage to adjacent teeth—both relatively rare).
 - If erupts—extract.
 - Crowding.
 - Displacement.



✚ Abnormalities of tooth structure:

A. Disturbances in structure of enamel:

1. **Hypoplasia:** caused by disturbance in matrix formation and is characterized by pitted, grooved, or thinned enamel.
2. **Hypomineralization:** Hypocalcification is a disturbance of calcification.
 - Affected enamel appears white, yellow, or brown and opaque.
 - Affected enamel may be weak and prone to breakdown.
 - Most disturbances of enamel formation will produce both hypoplasia and hypomineralization, but clinically one type usually predominates.

⇒ Localized causes: Infection ('Turner tooth'), trauma, irradiation, and idiopathic.

⇒ Generalized causes:

- Environmental (chronological hypoplasia):
 - Prenatal, e.g. rubella, syphilis.
 - Neonatal, e.g. prolonged labour, premature birth. Post
 - natal, e.g. measles, congenital heart disease, fluoride, nutritional.
- Hereditary:
 - Affecting teeth only—amelogenesis imperfecta.
 - Accompanied by systemic disorder, e.g. Down syndrome, tuberous sclerosis.

⇒ Treatment of hypomineralization/hypoplasia depends on extent and severity:

- ▽ Posterior teeth: Small areas of hypoplasia can be fissure-sealed or restored conventionally, but more severely affected teeth may require crowning. Stainless steel (SS) crown can be used in children as a semi-permanent measure.
- ▽ Anterior teeth: Small areas of hypoplasia can be restored using composites, microabrasion, or resin infiltration but larger areas may require veneers or crowns.

3. **Molar incisor hypomineralization (MIH):**

- Aetiology unknown.
- Primarily affects 6s, but ~50% also have defects on permanent incisors.
- Affected 6s have hypomineralized defects of enamel.
- Yellow/white opacities on buccal surface of affected incisors.
- Distribution often asymmetrical.
- Incisors less prone to enamel breakdown than 6s.
- Treatment options include intracoronal restoration, SS crowns, microabrasion, vital bleaching, resin infiltrate, or extraction, depending on aesthetics and prognosis.



4. Amelogenesis imperfecta (AI):

- There are now known to be mutations in at least 15 different genes that are associated with AI8 (commonly affected genes: AMELX, ENAM, AMBN, KLK4, MMP20).
- Main types:
 - Hypoplastic: enamel may be thin (smooth or rough) or pitted. Most commonly autosomal dominant inheritance.
 - Hypocalcified: enamel is dull, lustreless, opaque white, honey, or brown coloured. Enamel may breakdown rapidly in severe cases.
 - Hypomaturation: mottled or frosty-looking white opacities, sometimes confined to incisal third of crown (**'snow-capped teeth'**).



+ Abnormalities of tooth structure:

1. Double teeth:
 - a. Gemination: This occurs by partial splitting of a tooth germ.
 - b. Fusion: Fusion occurs as a result of the fusion of two tooth germs.
2. Macrodontia/megadontia: Generalized macrodontia is rare but is unilaterally associated with hemifacial hypertrophy.
3. Microdontia: overall prevalence is 2.5%.
4. Dens in dente:
 - This is really a marked palatal invagination, which gives the appearance of a tooth within a tooth.
 - Usually affects 2s, but can also affect premolars.
 - Where the invagination is in close proximity to the pulp, early pulp death may ensue.
5. Dilaceration:
 - This describes a tooth with a distorted crown or root.
 - Usually affects 1s.
 - The effects depend upon the developmental stage at the time of injury.

Table 3.3 Types of dilaceration

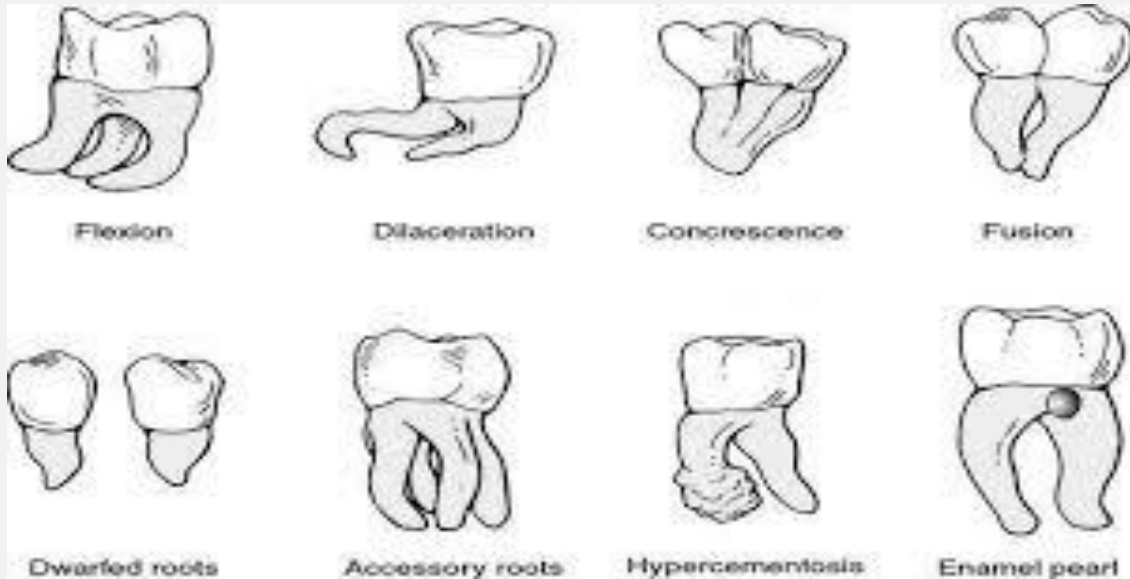
Developmental	Traumatic
Crown turned upward and labially	Crown turned palatally
Regular enamel and dentine	Disturbed enamel and dentine formation seen
Usually no other affected teeth	
Affects F > M	

6. Turner tooth:

- This term is used to describe the effect of a disturbance of enamel and dentine formation by infection from an overlying 1° tooth which therefore usually affects premolar teeth.

7. Taurodontism:

- Taurodontism means 'bull-like'.
- May occur in some types of AI.
- Radiographically an elongation of the pulp chamber is seen, resembles a bull's head.



✚ **Abnormalities of tooth colour:**

1. Extrinsic staining:

- By definition this is caused by extrinsic agents and can be removed by prophylaxis.
- Green, black, orange, or brown stains are seen, and may be formed by chromogenic bacteria or be dietary in origin.
- Chlorhexidine mouthwash causes a brown stain by combining with dietary tannin.

2. Intrinsic staining:

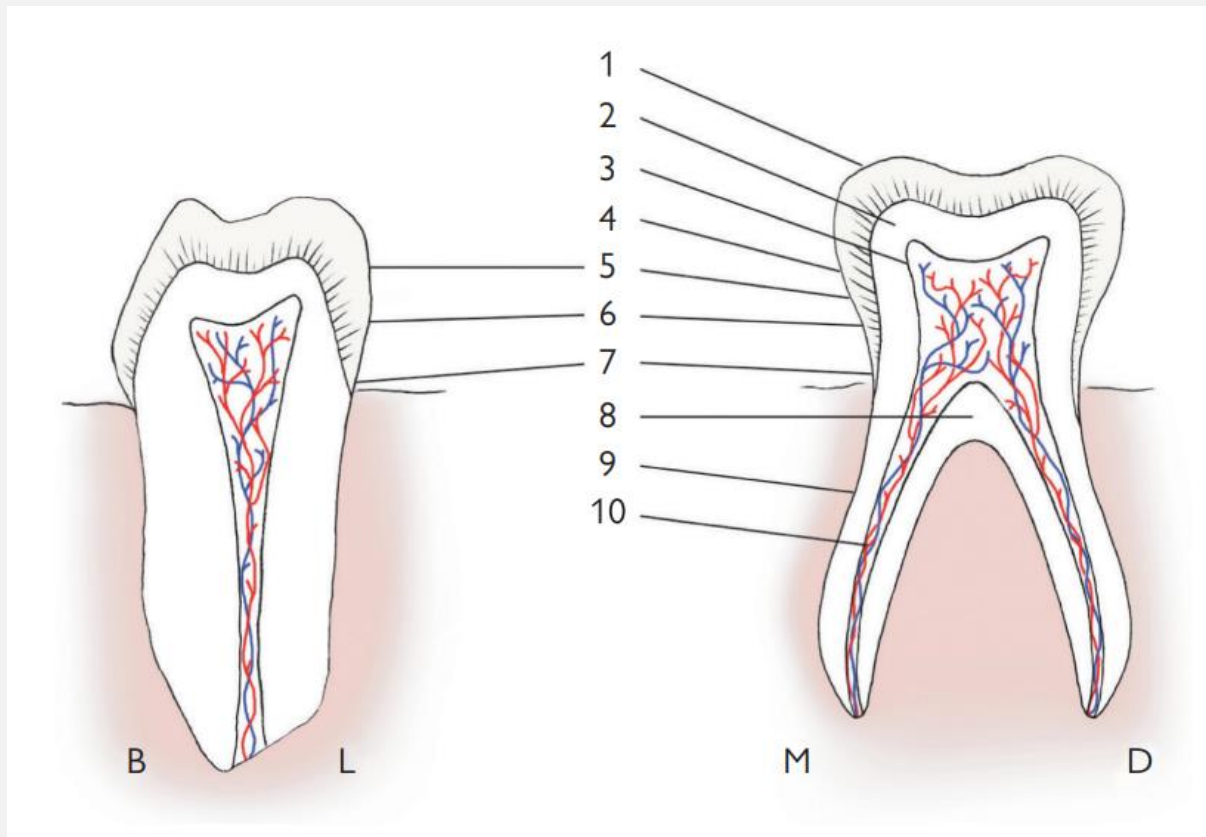
- This can be caused by:
 - Changes in the structure or thickness of the dental hard tissues, enamel opacities.
 - Incorporation of pigments during tooth formation, tetracycline staining (blue/brown), porphyria (red).
 - Diffusion of pigment into hard tissues after formation, e.g. pulp necrosis products (grey), root canal medicaments (grey).

3. Enamel opacities:

- These are localized areas of hypomineralized (or hypoplastic) enamel.
- Fluoride is only one of a considerable number of possible aetiological agents.

Anatomy of primary teeth:

1. Thinner enamel
2. Larger pulp horns
3. Pulpal outline
4. Narrower occlusal table
5. Broad and flat contact points
6. Bulbous crown
7. Inclination of the enamel prisms
8. Cervical constriction
9. Alveolar bone permeability
10. Thin pulp floor and accessory canals



Restoration of carious primary teeth:

1. Local anaesthesia
2. Isolation: Ideally, a rubber dam should be used routinely for restorative procedures.
3. Instruments:
 - a. Burs: For access use a small bur and for caries removal use the largest round bur which fits into the cavity.
 - b. Handpiece: Some children are apprehensive of the aspirator tip, making use of a high-speed, water-cooled handpiece difficult; others find the vibration of the slow-speed handpiece distressing, and may confuse it with pain.
4. Material selection for intracoronal restorations:
 - a. **GIC**:
 - This has advantages of adhesion and fluoride release but is more technique sensitive and less wear resistant than amalgam.
 - Useful in non-load-bearing Class III and V cavities, temporization of 1° teeth in young, pre-cooperative children, or teeth near to exfoliation.
 - b. **Resin-modified GI cement (RMGIC)**:
 - This has been demonstrated to have excellent performance in 1° teeth.
 - c. **Compomer**:
 - A modified composite-type material with some of the properties of GIC.
 - More technique and moisture sensitive than amalgam, but studies suggest similar longevity.
 - d. **Composite resin**:
 - Early studies suggested poor performance in 1° teeth, but modern materials placed with good isolation (rubber dam) perform as well, or better than amalgam, but take longer to place.

⇒ Reasons for failure of restorations in primary teeth:
 1. Recurrent caries, often due to failure to adequately complete caries removal because of flagging patient cooperation or failure to use adequate
 2. Cavity preparation does not satisfy the mechanical requirements of the filling material.
 3. Inadequate moisture control, especially true of GICs, compomers, and composites.
 4. Presence of occlusal high spot.

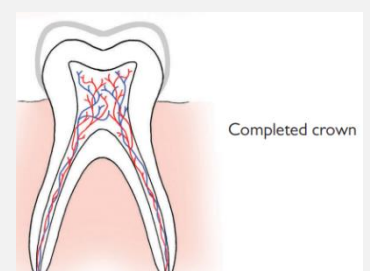
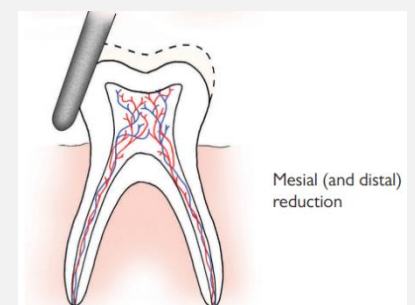
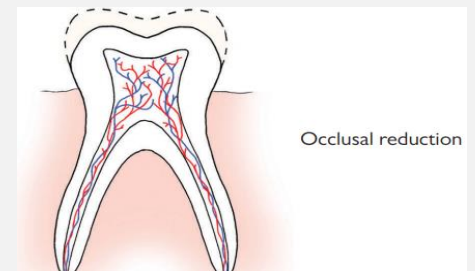
❖ Stainless steel crowns:

- SS crowns are the most durable restoration for 1° molars with extensive caries and those where pulp Rx has been performed.
- SS crowns are preformed metal crowns made from high-grade SS and do contain small traces of nickel.
- They are therefore not suitable for patients with a known nickel allergy.
- Indications:
 - Badly broken down 1° molar.
 - After pulp therapy in 1° molars.
 - As interim measure for 2° molars, where crowns are required but the patient is too young.
 - Temporary coverage during preparation of cast crown for premolar or 2° molar.
 - Developmental anomalies.
 - Severe tooth loss due to bruxism/erosion.

⇒ There are two principal methods for placement:

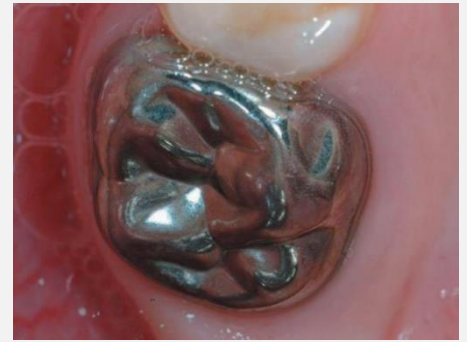
1. **Conventional technique:**

- SS crowns rely for retention only on a tight adaptation at the gingival margin of the preparation, therefore taper of preparation walls is not critical,
- LA and if possible, rubber dam.
- Measure M–D length with dividers to aid crown selection.
- Remove caries.
- Occlusal reduction (~1mm), roughly following cuspal planes.
- Approximal reduction (~20° from vertical) using tapered diamond, without producing a ledge at gingival margin.
- Remove buccal and lingual bulbosities only sufficient to seat crown (often little/no reduction required).
- Select crown. Correct size will be a 'click' fit.
- Check height and occlusion.
- If extensive blanching of surrounding tissues or over-extended, trim crown.
- Use pliers to adapt contact points and crimp margins. Smooth margins with stone.
- Cement with zinc polycarboxylate or GIC.



2. 'Hall' technique:

- Taught as the gold standard for restoring 1° molars with distal or mesial caries.
- No conventional preparation or caries removal is normally carried out, and is referred to by advocates as a 'biological' technique (as opposed to 'conventional').
- After simply removing any loose debris, a crown is cemented over the carious, unprepared molar, with the child 'biting' the cement-filled crown down into place.
- The technique has several potential advantages, and it may allow effective Rx for children who might otherwise be unable to accept 'conventional' interventions.
- LA is not usually required and it is quicker than conventional SS crown placement.
- Advocates of the technique suggest that it achieves a coronal seal, cuts off carious lesions from substrate, and protects the pulp from chemical, thermal, and mechanical insults.
- It is recommended that its use is restricted to asymptomatic teeth with no evidence of pulpal inflammation/necrosis/periodontal involvement.



The End