

# Crowns in Pediatric Dentistry

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Continuous Education**

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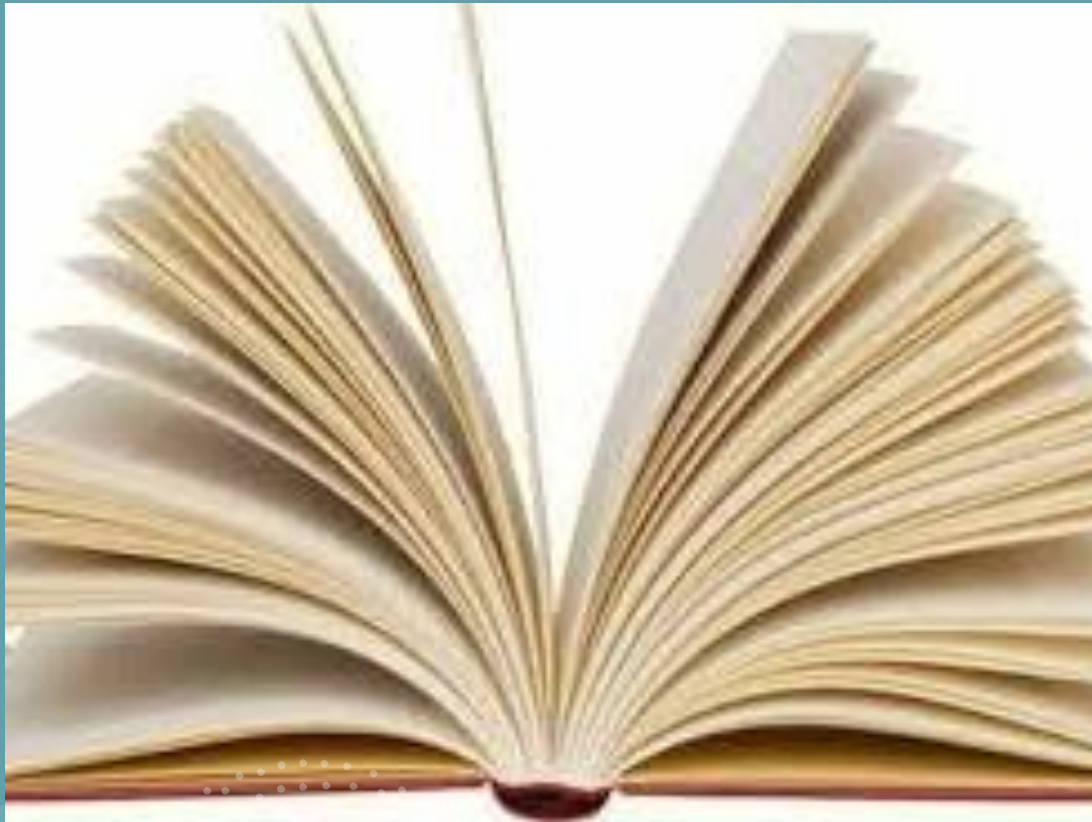
Early childhood caries remains a significant problem challenging the dental clinician diagnostic, preventive, and restorative skills.



The deciduous teeth caries can destroy the tooth faster than permanent, deciduous tooth pulp is larger than permanent and enamel and dentin thickness is less.



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## Objectives

- Deciduous teeth play a key role in phonetics, eating, aesthetics and maintaining space for permanent teeth .



## Objectives

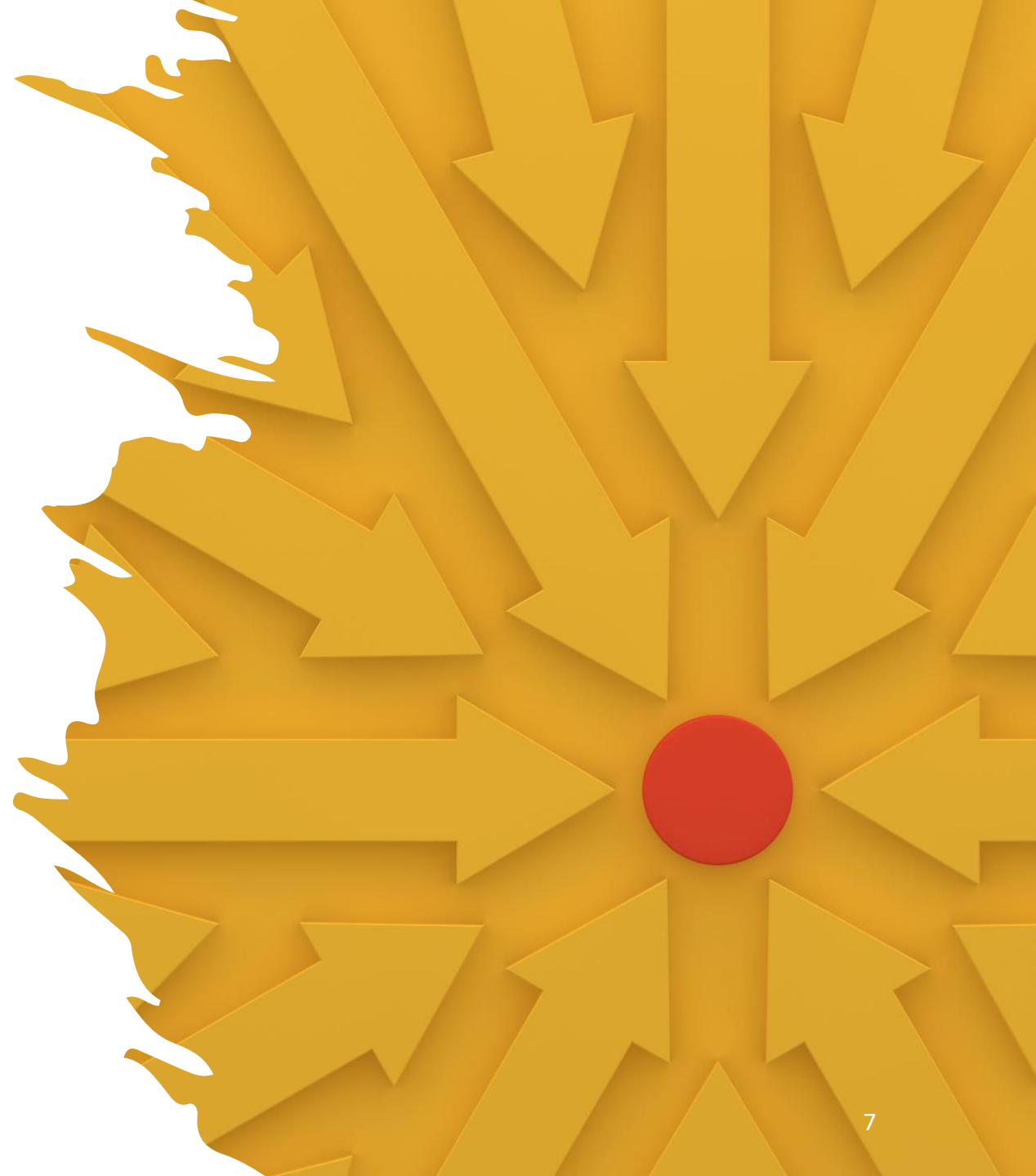
- To achieve biologically compatible , competent for mastication and clinically acceptable restoration.
- To maintain the form and function and where possible the vitality of the tooth should be maintained.



The crowns have become an important factor in the restoration of the extensively carious lesion by:

- Maintaining arch integrity for the primary and permanent teeth
- Introducing in the child positive attitudes towards oral health.

# Indications of Crowns



# Extensive Caries



- CI II cavity where one or more cusps are destroyed or weakened by caries.
- Caries involving 3 or more surfaces
- Rampant caries.



# Abutment for space maintainer



:As in

crown and loop space maintainer, used where band placement is difficult due to reduced undercut as in first deciduous molar or when the abutment undergoes pulp therapy.

# Single tooth cross bite

“Reverse”  
stainless  
steel crown

“Dental  
tipping”  
2-4 weeks

The reverse crown method corrects, “Dental tipping” type single tooth crossbite rapidly, comfortably, inexpensively, and without the need for special patient cooperation.

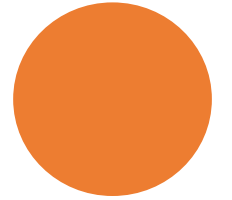
**Two disadvantages** of using reverse stainless steel crown are

- Silver appearance of the crown form,
- limitation of working with an inclined slope that is already formed.



# Bruxism :

Stainless steel crown can be given to compensate for the wear and to reduce the masticatory forces on the erupting permanent teeth.



# Preformed Metal Crown in an Immature Permanent Molar with MIH



# Teeth deformed by developmental defects or anomalies :Teeth with hyperplastic defects

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- Handicapped children: Oral hygiene maintenance is difficult, so crowns are preferred to restore carious tooth than amalgam restorations
- Others: As in habit breaking appliance, in the management of recurrent caries around existing restorations and as abutment to a prosthesis



# Following pulp therapy:

The tooth becomes brittle and weakened following pulp therapy leading to fracture especially in mesiodistal direction leading to extraction. Thus a stainless steel crown should be routinely used following pulp therapy .





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## Factors to be Considered in Preoperative Evaluation

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- Dental Age of the Patient
- Cooperation of the Patient
- Motivation of the Parents
- Medically Compromised and Disabled Children



# Failure in Crowns :In General

- A study showed that crowns placed in children aged under four years are predicted to have a higher failure rate than those placed in children 4 years and older.
- Crowns placed over formocresol pulpotomies show a greater relative risk (3.97 times) of failure than those placed over vital coronal pulps.
- Inadequately contoured crown and residues of set cement remaining in contact with the gingival sulcus are suggested as reasons for gingivitis associated with preformed metal crowns.
- Poor oral hygiene

(Randall RC (2002)  
Pediatr Dent 24:  
489-500)





Options of full coverage restoration

# Polycarbonate Crowns



# Polycarbonate Crowns



- Formed from acrylic or polycarbonate resin shells and cemented with self adhesive resin, polycarbonate crowns provide an aesthetic, tooth-colored restoration at a low cost. Their durability varies from application to application, but they are most often used for temporary restorations. Polycarbonate crowns come in one universal shade, which can be modified with cements and liners.

# Polycarbonate Crowns

- **ADVANTAGES:**

- Improved aesthetics
- Low cost
- Less chair side time
- Flexible



- **DISADVANTAGES:**

- Technique-sensitive  
Require adequate hemorrhage and moisture control
- Breakages
- Dislodgement
- Discoloration

# Stainless Steel Crowns



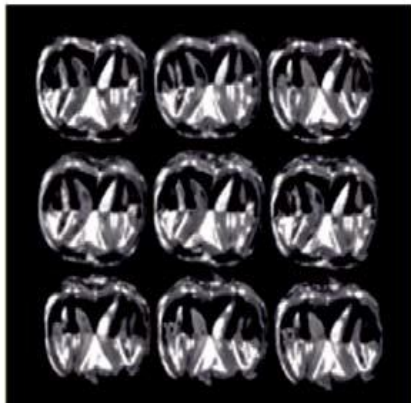
## HISTORY

- Stainless steel crown was first introduced as chrome steel crown by William Humphrey
- Stainless steel crowns were introduced to pediatric dentistry by Rocky Mountain Company in 1947
- First used in the late 1940s and became commonly used in the 1960s

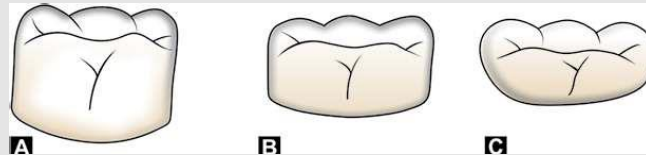
# Classification of stainless steel crowns Based on shape



A



B



A

B

C

A -**Untrimmed**- crowns are neither trimmed nor contoured

B-**Pretrimmed**- crowns have straight non-contoured sides but are festooned to line parallel to the gingival crest. they still require contouring and trimming

C-**Precontoured** – these are festooned and precontoured though a minimal amount of trimming may be necessary

# Stainless Steel Crowns

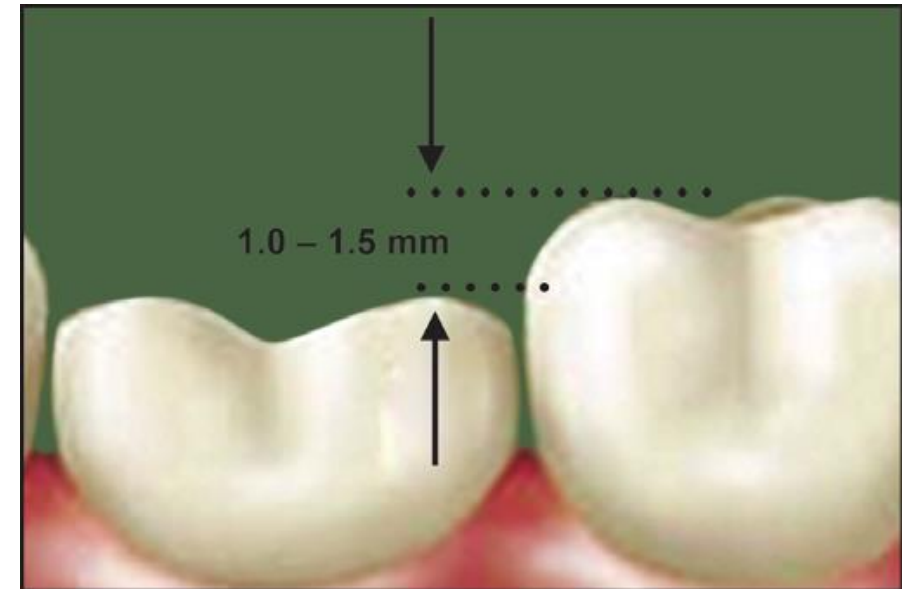
- Stainless steel crowns are composed from blend of iron, carbon, chromium and other metals that make up stainless steel prevents corrosion otherwise exacerbated by saliva.
- They are very durable, but do not have a natural tooth color and are primarily used on molar teeth for aesthetic reasons.





# Technique

1. The occlusal clearance should be 1.5- 2mm.
2. The proximal surfaces converge toward the occlusal and lingual following the normal proximal contour.
3. An explorer can be passed between the prepared tooth and the proximal tooth at the gingival margins of the preparation to check the thickness of the margins.
4. The buccal and lingual surfaces are reduced at least 0.5 mm with the reduction ending in a feather edge 0.5 mm to 1 mm into the gingival sulcus.
5. The buccal and lingual surfaces converge slightly towards the occlusal.
6. The occlusal third of the buccal and lingual surfaces are gently rounded.
7. All point and line angles in the preparation are rounded and smoothed.



## Crown adaptation in special cases

When multiple crowns are to be placed in the same quadrant, the adjacent proximal surfaces of the teeth should be reduced more than usual to facilitate placement of the crowns .

This is especially important on the distal surface of the second primary molar prior to eruption of the first permanent molar any overhang here could displace the eruption path of the permanent molar.

When there is mesiodistal drift of the teeth.

# Resin Veneer Crowns



- Stainless steel crowns with white facings are resin veneered crowns that combine the durability of a stainless steel crown with the aesthetics of a resin facing.

# Resin Veneer Crowns

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## ADVANTAGES:

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Durable

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Good aesthetics

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Insensitive to hemorrhage or moisture

## • DISADVANTAGES:

- Higher cost
- Limited trimming or crimping of crown
- Potential allergenicity

# Criteria for failure of resin faced stainless steel crowns

- about 1/4th of the resin facings were completely lost in 3 years or less.
- Increased overbite was significantly associated with an increased facing failure rate indicating tooth position influences treatment outcome

(Roberts C, Lee JY, Wright JT (2001) Clinical evaluation of and parental satisfaction with resin-faced stainless steel crowns. *Pediatric Dentistry* 23: 28-31)

# The Hall Technique

- The Hall technique is named after Dr. Norna Hall, a former general dental practitioner in Scotland .
- The Hall technique is an extension of sealing carious tissue, by glass ionomer cementation of a preformed metal crown (PMC) over a carious primary molar—without any carious tissue removal, crown preparation, or the use of local anesthesia .
- Once a clinical and radiographic assessment confirms that there is no irreversible involvement of the pulp, an appropriately sized PMC is selected and cemented over the tooth sealing in the carious lesion and coronal tooth structure under the crown

# Indications and Contraindications

The Hall technique is indicated in:

- Small to moderate carious lesions, especially approximal lesions
- Hypoplastic primary molars
- In children whose cooperation during traditional operative dentistry poses a challenge

The contraindication is:

- Children with systemic problems like those at risk of bacterial endocarditis .

# Composite Clearfix Crowns

Composite strip crowns

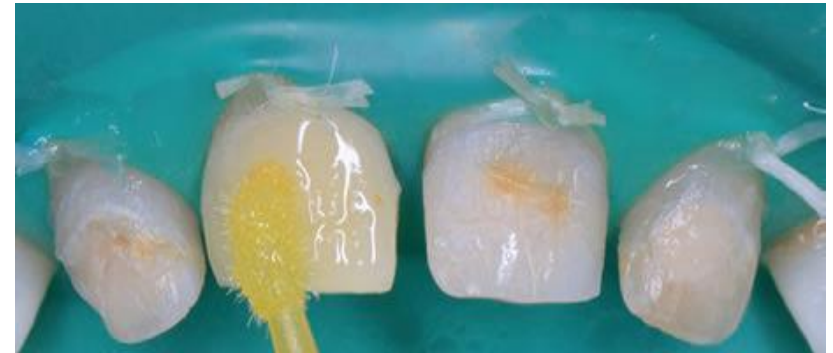
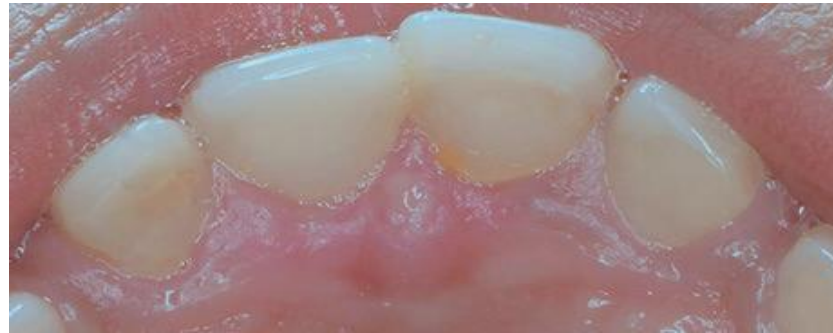
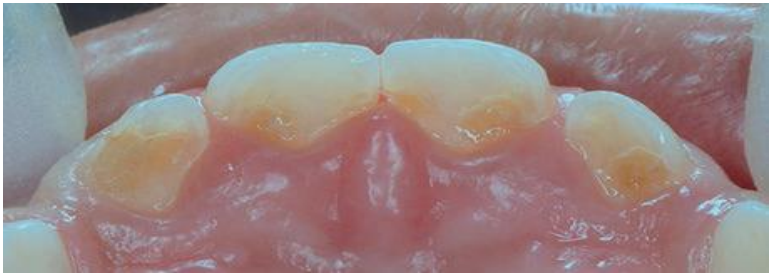
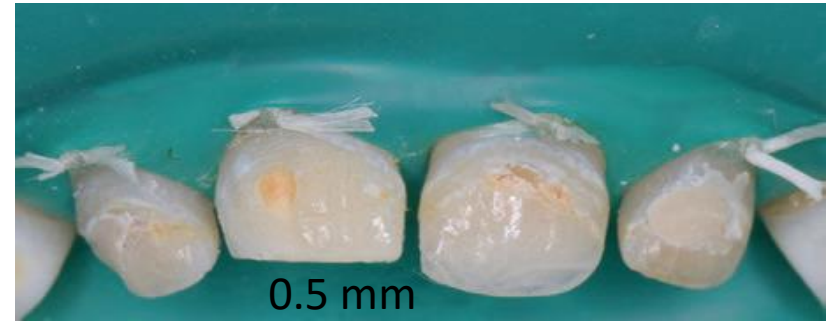
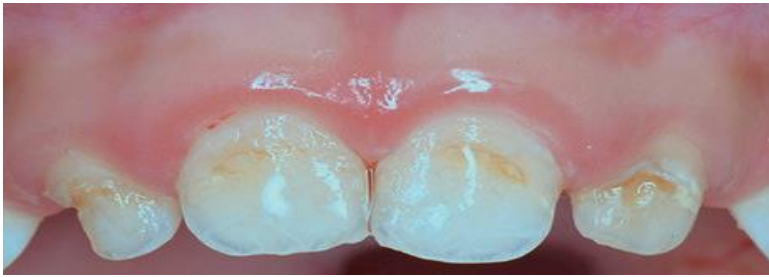




# Composite Clearfix Crowns

## Strips crowns

- It is also known as 'celluloid' or composite strip crown'. It is a transparent, hollow plastic material crown. The tooth is prepared and crown is filled with composite and placed over the prepared tooth and finally cured with composite light cure.

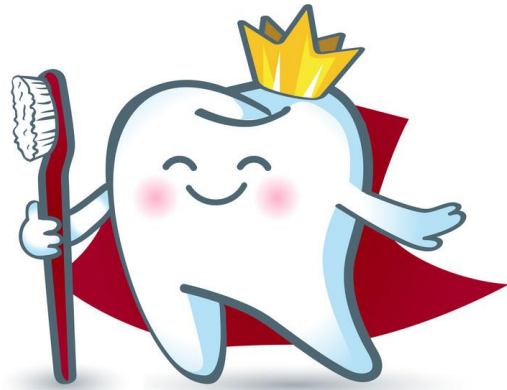


# Technique

# Composite Clearfix Crowns

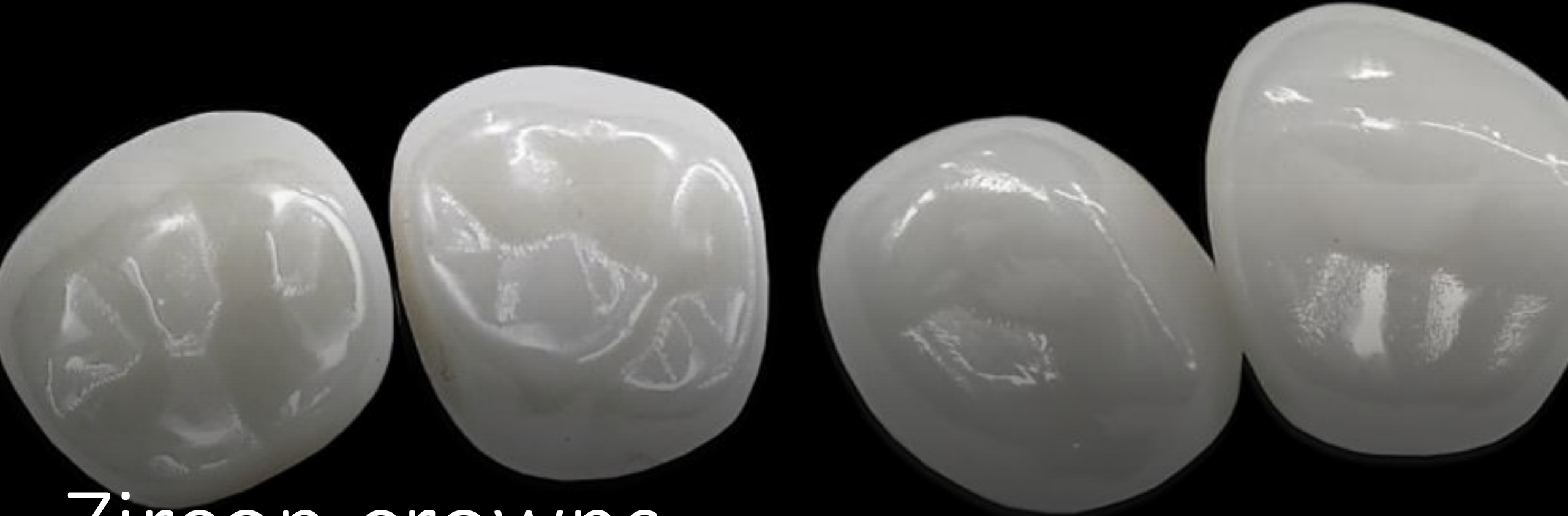
- **ADVANTAGES:**

- Excellent aesthetics
- Moderate cost




- **DISADVANTAGES:**

- Technique-sensitive
- Low durability
- Require adequate hemorrhage and moisture control



# Zircon crowns



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- The image shows four white, teardrop-shaped crowns for primary dentition, arranged in a row. They are made of zirconia and have a smooth, glossy finish. The crowns are set against a black background, and a white, torn-paper-like border separates them from the text below.
- These are crowns made of zirconia for the primary dentition that contain no metal.
  - Zirconia is currently the strongest dental ceramic available and is also esthetically pleasing. Even though zirconia is widely accepted as a restorative material for the permanent dentition, it is a relatively new restorative material for the primary dentition.

# *Preparation Guide – Notch technique*



**Step 1- Occlusal flat preparation**

Step 1: Supragingival depth cuts- 1.5mm



Step 2: Subgingival preparation - 2mm



Step 3: Subgingival preparation - 2mm



Step 3: Subgingival preparation - 2mm



# *Check passive fit of crown*







# Criteria for failure of Zirconia crowns

- Improperly polished and only glazed zirconia can be destructive to the opposing tooth structure .
- The abrasive effect of zirconia crowns negatively impacts the tooth root and other neighbouring teeth .

(Tote JV, Godhane A, Das G, Soni S, Jaiswal K, et al. (2015) Posterior Esthetic Crowns in Pediatric Dentistry. Int J Dent Med Res 1: 197-201)

# *Advantages of preformed zirconia crowns*

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Life like esthetics + strength

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Single appointment

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Proven durability-more then 15 year

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Alternative to nickel allergic patient

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Full coverage protection

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Autoclavable

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Bio-compatibility

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Maintainence required is less





## Dis-advantages of preformed zirconia crowns

- Minimal modification can be done- tooth prepared to fit the crown
- Brittle material
- Saliva and bleeding
- Cost

# Evaluation

The following criteria should be utilized to evaluate the crown restoration:

- The crown is smooth and polished.
- The crown margins are smooth and closely adapted to the tooth preparation.
- The contacts are properly established.
- The crown is in the proper occlusion.
- The crown extends about 1mm gingival to the gingival crest, and there is no gingival blanching.
- All excess cement is removed.



# Conclusion

Treatment of caries in the primary dentition is still an integral part of child healthcare. In pediatric dentistry several options are available for providing full coverage restoration for the primary dentition, with each approach having advantages and disadvantages. Commonly used full coverage crowns include stainless steel crowns and its modifications, polycarbonate crowns and strip crowns and zirconia crowns.

The choice of crown depends on **Operator preferences**, esthetic demands by parents, **the child's behavior**, and moisture and hemorrhage control are all variables which affect the decision and ultimate outcome of whatever restorative outcome is chosen.



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Thank You