

Restorative Dentistry for Children

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KEYWORDS

- Pediatric • Dentistry • Restorations • Resin-based composite
- Glass ionomer cement • Stainless steel crowns

KEY POINTS

- The indications and contraindications of the use of dental restorative materials are identified, including the implementation of risk assessment in decision making.
- The specific clinical use of glass ionomer cement/resin-modified glass ionomer cement is presented.
- The specific clinical use of resin-based composite is presented.
- The specific clinical use of full-coverage stainless steel crowns is presented.

INTRODUCTION

Initiating preventive dentistry care for children, preferably beginning no later than the age of 1 year, helps prevent dental caries.¹ Although it is ideal to strive for children to be caries free, data indicate that 70% of children have experienced at least 1 cavitated carious lesion by age 17.² Many children, particularly children at high risk for dental caries, still experience cavitated lesions in both the primary and permanent dentitions.

Using the concept of minimally invasive dentistry, restoration placement is a last resort when prevention of a cavitated lesion has failed. Teeth can be restored using a minimally invasive restorative protocol with restorative materials that most appropriately meet the needs of the patient, risk assessment, age of the patient, size of the cavitated lesion, and ability to isolate the cavity preparation all being important considerations.

GLASS IONOMER CEMENT/RESIN-MODIFIED GLASS IONOMER CEMENT

Fluoride release occurs during the glass ionomer cement setting reaction and continues at low fluoride release levels for years.^{3,4} There is an advantage of using glass ionomer cement restorations in children that are at moderate risk for the development of caries or secondary caries because the fluoride associated with the glass ionomer restorative materials can inhibit tooth demineralization at the restoration cavosurface margin.⁵⁻⁷

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Occlusal Restorations

Occlusal glass ionomer cement restorations have shown clinical success.⁸⁻¹⁰ Contemporary heavily filled glass ionomer cements and resin-modified glass ionomer cements have compressive strengths that provide adequate wear properties for the posterior primary dentition. Glass ionomer would be considered for occlusal restorations when there might be difficulty in isolating a tooth to keep it dry enough for the placement of a resin-based composite restoration.

Class II Restorations

Class II resin-modified glass ionomer cement restorations have shown clinical success.⁸⁻¹² The advantage of not needing to acid-etch tooth structure before restoration placement and knowing the glass ionomer chemical reaction will occur even with mild saliva contamination, makes the material favorable for the pediatric patient, in whom speed is critical and tooth isolation difficult.

Preparation design for class II glass ionomer cement restorations in the primary dentition is similar to amalgam preparations. The proximal box should be deep enough to break contact, and the axial wall should ideally extend 1.25 mm. The lateral walls should slightly converge to the occlusal, which aids in mechanical retention of the restorative material. The proximal box buccal and lingual walls should remain within the line angles of the tooth; breaking buccal or lingual contact is not necessary. No cavosurface bevels are placed in glass ionomer cement preparations because glass ionomer cement is brittle and could easily break or chip at beveled cavosurface beveled margins. After preparation, a matrix band or T-band is placed interproximally and wedged firmly so that the restorative material can be placed and adapted into the cavity preparation, and an adequate contact point can be created with the adjacent tooth.

Class III Restorations

Class III glass ionomer cement restorations have shown clinical success.^{9,10} These glass ionomer cement restorations would be indicated when perfect isolation for a resin-based composite restoration is not possible. Lingual access for maxillary anterior teeth and labial access for mandibular anterior teeth is appropriate for class III preparations.

Class V Restorations

Class V glass ionomer cement restorations have shown clinical success in the primary dentition.^{9,10} Glass ionomer cement/resin-modified glass ionomer cement class V restorations are indicated when good isolation of the tooth is difficult or impossible for the placement of a resin-based composite restoration.

The Class V glass ionomer preparation design extends 1.25 mm pulpally, unless caries progresses further. No bevels are placed on the cavosurface margin because of the brittle nature of glass ionomer cement and potential for fracture at a beveled cavosurface margin.

Interim Therapeutic Restoration

The *interior therapeutic restoration* is the current term used in place of the initially introduced term *atraumatic restorative technique*. Atraumatic restorative technique was introduced in areas in which contemporary air-driven hand pieces and suction were not readily available.¹³ Hand instruments were used to remove caries, then chemically cured glass ionomer cement was placed as a restorative material. This technique originated for use in third-world countries, where access to dental care was difficult.¹⁴

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