Point of Care

The Point of Care section of JCDA *answers everyday clinical questions by providing practical information that aims to be useful at the point of patient care. The responses reflect the opinions of the contributors and do not purport to set forth standards of care or clinical practice guidelines. Readers are encouraged to do more reading on the topics covered. This month's responses were provided by David R. Farkouh, BSc(Hons), DMD, MSc(Paedo). If you would like to submit or answer a question, contact editor-in-chief Dr. John O'Keefe at jokeefe@cda-adc.ca.*

Question 1

How should I safely position young children in the dental chair during oral examinations and treatment?

Proper positioning of the pediatric patient in the dental operatory is fundamental to providing safe, controlled and efficient examination and treatment, while preventing injury to the child, dentist, dental assistant and parent.

The parent can assist with the clinical examination of an infant or toddler. In a "pillow exam" the parent and the dentist sit facing each other in a knee-to-knee position. The child is positioned in the parent's lap with his or her head resting on a pillow placed on the dentist's lap.[1] This position affords optimal visualization of the child's oral cavity for both the dentist and the parent, while allowing the parent to gently restrain the child if required (**Fig. 1**).

The pillow exam is impractical for school-aged children, but positioning children of this age in an adult-sized dental chair can also present challenges. In both the upright and unadjusted supine positions the child's head is positioned well below the level of the chair's headrest, leaving the dentist with a less than ideal position to examine or treat the patient (**Figs. 2a** and **2b**). By simply repositioning the supine child such that the head is on the headrest, the dentist has an ideal vantage point for optimal visualization of the oral cavity and for proper head stabilization (**Fig. 3**).

Given the sometimes unpredictable nature of a child's behaviour in the dental setting, head stabilization is also essential to safe dental examination and treatment. The child's head can be stabilized by positioning it between the dentist's forearm and lateral chest and applying light pressure, while stabilizing the mandible with the nondominant hand (**Fig. 4**). Proper head stabilization must be maintained throughout the dental appointment but is especially important during the administration of local anesthetic and use of a high-speed handpiece.

Although head stabilization alone is all that is needed for most children, stabilization of the legs and hands is also required in some cases. This can be accomplished by having the parent sit sideways in the dental chair with the child's legs resting over the parent's lap (**Fig. 5**). The parent can then stabilize the child's legs while the dentist stabilizes the head. The patient's hands can be stabilized by either the dental assistant or the parent if required. ✦

Reference

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Figure 1: *The proper positioning of infant, parent and dentist for an oral examination of the infant. The parent holds the child, and a pillow is used to support the child's head.*

Figure 2a: *Child sitting in the upright position in an adult-sized dental chair. The child's head is resting well below the level of the headrest.*

Figure 2b: *Child sitting in the supine position in an adult-sized dental chair.*

Figure 3: *Child positioned appropriately in an adult-sized dental chair. This position allows this dentist to adequately stabilize the head while improving his visualization of the oral cavity.*

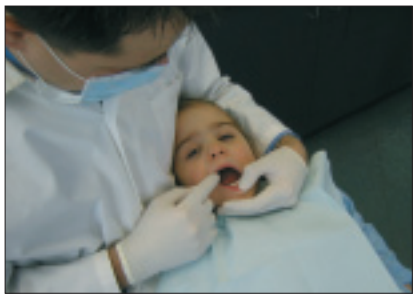

Figure 4: *Proper head stabilization for provision of dental care for children.*

Figure 5: *Child in the supine position. Appropriate head stabilization is provided by the dentist, while leg stabilization is provided by the parent sitting laterally in the dental chair with the child.*

Question 2 How should I treat a traumatized, discoloured maxillary primary incisor?

The maxillary incisors sustain 90% of all traumatic dental injuries.[1] Borum and Andreasen[2] investigated 545 traumatized primary maxillary incisors from the time of the trauma to the age of 10 years. Fifty-two percent of the traumatized teeth exhibited colour changes. These authors described 3 types of tooth discolouration: transient grey discolouration, permanent grey discolouration and yellow discolouration.

In most of the maxillary incisors with transient grey discolouration the pulp canal was obliterated; less than 4% developed pulpal necrosis. In contrast, 66% of the permanently grey primary incisors developed pulpal necrosis. These findings support the belief that grey discolouration is due to pulpal bleeding produced by the trauma (**Fig. 1**). If the pulp remains vital, deposited blood pigments can be resorbed, whereas if pulpal necrosis occurs the pigment cannot be resorbed. Borum and Andreasen[2] reported that 34% of the permanently grey discoloured primary maxillary incisors never progressed to pulpal necrosis.

Yellow discolouration of a traumatized maxillary incisor is closely related to obliteration of the pulp canal (in 81% of cases) through progressive deposition of dentin along the root canal walls. Less than 2% of affected incisors developed pulpal necrosis.[2]

Borum and Andreasen[2] concluded that colour change of the traumatized incisor alone is not a reliable predictor of pulpal status.

A maxillary occlusal or periapical radiograph is essential to determine the pulpal status of a discoloured traumatized incisor. If colour change is the only abnormality detected in a complete oral and radiographic examination, then regular clinical and radiographic follow-up of the traumatized incisor is recommended to ensure that the pulp of the incisor has not become necrotic. Maxillary occlusal radiography is recommended at 1-, 2- and 6-month reassessment visits after dental trauma.[3] Annual radiographic examination of the traumatized tooth is advisable until the tooth exfoliates. If esthetic appearance is a concern, then a shade-matched composite resin restoration can be placed to cover the buccal surface of the discoloured incisor.

Treatment of the discoloured traumatized incisor is indicated if any of the following additional signs and symptoms of pulpal necrosis are present[3]:

- excessive mobility
- radiolucency
- pain
- draining fistula
- swelling.

Controversy exists over the most appropriate treatment of primary anterior teeth with pulpal necrosis. Some clinicians may treat these teeth with a primary incisor root canal using a resorbable paste filling such as nonfortified zinc oxyde eugenol and a composite resin strip crown. Others may extract these teeth because of the potential for damage to the developing permanent incisor and spread of infection

Figure 1: *Photograph of 2 grey discoloured maxillary primary central incisors following traumatic injury to the teeth.*

to surrounding tissues. Root canal treatment is contraindicated in primary teeth with extensive loss of root structure, advanced internal or external resorption, or periapical infection involving the crypt of the adjacent permanent incisor.[4] In situations in which root canal therapy is contraindicated, the treatment of choice is extraction of the incisor.[3] ◆

References

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2. Borum MK, Andreasen JO. Sequelae of trauma to primary maxillary. I. Complications in the primary dentition. *Endod Dent Traumatol* 1998; 14(1):31–44.
3. McTigue DJ. Introduction to dental trauma: managing traumatic injuries in the primary dentition. In: Pinkham JR, editor. Pediatric dentistry: infancy through adolescence. 2nd ed. Philadelphia: W.B. Saunders Co.; 1994. p. 209–22.
4. Reference manual 2002-03. American Academy of Pediatric Dentistry. *Pediatr Dent* 2002; 24(7 Suppl):87.

Question 3 How should I treat hypoplastic permanent first molars?

Hypoplastic and hypomineralized first permanent molars are frequently observed in children. Researchers have found that 18–19% of 7- to 13-year-olds have at least one hypoplastic first permanent molar.[1,2] The causes of such enamel defects are often not evident from a thorough clinical examination or the medical and dental history. A number of factors have been associated with enamel hypoplasia of the first permanent molars (**Table 1**).[3]

Calcification of the first permanent molar begins at birth, and the crown is completely formed between 2.5 and 3 years of age.[3] Any local, system or genetic disruption (**Table 1**) occurring during this developmental period has the potential to cause enamel hypoplasia of the first permanent molars.

Because the size, shape and location of enamel defects can vary greatly, in many cases it is impossible to restore the tooth with conventional cavity preparations (**Fig. 1a**).[3] In addition, these molars are more susceptible to dental caries, which further complicates their treatment.[4] Many clinicians find themselves frustrated when conventional direct restorations such as composite resins and amalgam fail on hypoplastic permanent molars. The ideal restorative treatment for these molars should aim to reliably restore lost or weakened tooth structure, alleviate pain or sensitivity, and maintain occlusion.

Full-coverage restorations are the treatment of choice for moderate to severely hypoplastic permanent molars, a stainless steel crown being the recommended treatment for children (**Fig. 1b**).[3] Stainless steel crowns are simple to place, and, if properly adapted and cemented to the prepared tooth, they can be reliable and durable for many years.[5] Many permanent molars restored with stainless steel crowns do not require further restoration; however, some authors have suggested that they be replaced by a cast metal restoration when the child is an adolescent.[3]

If single or multiple molars are extensively involved, the timely extraction of hypoplastic first molars may be considered. Root canal treatment of first permanent molars in children between the ages of 8 and 16 years has only a 36% success rate.[6] If extraction is to be considered, the optimal age for doing so is between 8.5 and 10.5 years, as appropriately timed extractions may allow the second molar to

Table 1 **Local, systemic and genetic factors associated with enamel hypoplasia of permanent first molars (adapted from Mahoney[3])**

Local	Systemic	Genetic
Trauma or infection of a primary predecessor	Ingestion of excess fluoride	Amelogenesis imperfecta
Repaired cleft lip and palate	Antenatal or neonatal infection	
Trauma due to extraction of primary predecessor	Vitamin D dependent rickets	
	Premature birth or very low birth weight	
	Nutritional deficiencies	
	Radiation therapy	
	Neurological deficiencies	

Figure 1a: *A moderately hypoplastic, hypomineralized maxillary right permanent first molar in a 6-year-old child. Caries has formed in the occlusal pit. The defect on tooth 16 extends to the gingival margin on both the buccal and palatal aspects of the tooth.*

Figure 1b: *The tooth was appropriately restored with a stainless steel crown.*

erupt into the arch as a replacement for the extracted first molar.[3] Consultation with an orthodontist or pediatric dentist may be indicated before extraction of hypoplastic first permanent molars. ◆

References

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Question 4 What is early childhood caries, and what should I be telling the parents of my young patients?

Early childhood caries (ECC) is the occurrence of any sign of dental caries on any tooth surface during the first 3 years of life.[1] The American Academy of Pediatric Dentistry has described one particular form of ECC, severe early childhood caries (S-ECC), defined as any smooth-surface carious lesion in a child younger than 3 years of age.[2]

Most clinicians are familiar with a form of S-ECC called baby bottle tooth decay, which is associated with frequent and prolonged consumption of liquids containing fermentable carbohydrates.[2] In the initial stages of the disease process, S-ECC typically presents as chalky white enamel on the lingual surfaces of the maxillary incisors. As the condition progresses, brown cratering lesions appear on the maxillary incisors (**Fig. 1**), and the decay extends to the labial surfaces and onto the molars. The lower anterior teeth, which are protected by the tongue, are involved only in extremely severe cases of ECC.[3]

The use of a bottle containing milk, juice or any other sweetened liquid with fermentable carbohydrates as a pacifier, especially nocturnally, puts a child at risk of ECC. Frequent consumption of such liquids without appropriate preventive measures contributes to the risk. Children who are breast-fed on demand without the benefit of proper oral hygiene practices are also at risk for ECC.[2]

The following recommendations to prevent ECC should be made to the parents of young patients[2]:

1. Do not give infants a bottle containing a liquid with fermentable carbohydrates (such as sucrose and fructose) while they are falling asleep.
2. Avoid on-demand nocturnal breastfeeding after the eruption of the first deciduous tooth.

Figure 1: *Severe early childhood caries in a 20-month-old child involving all surfaces of the maxillary incisors and the occlusal surfaces of the first primary molars.*

3. Encourage infants to drink from a cup as they approach their first birthday. Weaning should be completed between 12–14 months of age.
4. Implement oral hygiene measures before the eruption of the first primary tooth.

Parents should bring their children for the initial dental visit when the first tooth erupts into the mouth or by 1 year of age. This first visit will give the dentist an opportunity to educate the parents about the prevention of dental diseases such as ECC. ➧

References

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Dr. David R. Farkouh *is a pediatric dentist in private practice in Toronto, Ontario. He is also on staff at the dental departments of the Bloorview MacMillan Children's Centre and The Hospital for Sick Children in Toronto, Ontario. E-mail: davidfarkouh@hotmail.com*