Many children have one or more discolored primary teeth resulting from enamel hypocalcification, enamel hypoplasia, amelogenesis and dentinogenesis imperfecta, or traumatic injuries. These teeth can be of various colors: yellowish, reddish, brown, grey or even black. Most parents want their child’s teeth to be white in appearance to match the adjacent teeth. Having nice looking teeth is important to these children so that they will have a positive self image and not be introverted due to shame or embarrassment caused by their discolored teeth and unsightly smile.

Fortunately, there are cosmetic techniques that allow us to lighten discolored teeth, including composite veneers, porcelain veneers and bleaching. Whether these teeth have pulpal involvement or not, we have the materials and techniques to esthetically restore these discolored teeth. When I attended dental school 30 years ago, I was told that bonding could not be accomplished with primary teeth because of the aprismatic layer of enamel.1 Today, we have the techniques available to remove this thin layer of non-prismatic enamel to allow bonding to occur.

A discolored primary incisor does not necessarily indicate that the tooth has pulpal injury. Holan and Fuks state: “The diagnostic value of dark-gray discoloration of the crown of primary incisors following traumatic injury as a predictor of pulp vitality is controversial.”2 In the case of a dark primary incisor, this discoloration indicates that during the course of the injury, the iron-containing pigment of the red blood cells, heme, was released. Will this discolored tooth return to its normal color? Will this discolored tooth remain dark or become darker?

A yellow primary tooth may indicate calcific degeneration or calcific metamorphosis of the pulp of the tooth. This can be confirmed with a radiograph, which would show the calcification of the pulp chamber. Because of the color of the dentin underlying the thin enamel of primary teeth, the tooth appears yellow.

A primary tooth appearing reddish could be the result of a ruptured blood vessel in the pulp or a tooth with internal resorption. A radiograph would aid in the diagnosis of the latter.

Enamel hypocalcification and hypoplasia, which cause irregularity in the surface of the enamel, can also cause discoloration of this surface.3 According to Soares, et al: “Alterations during tooth structure formation, mainly on anterior teeth, are known to severely compromise esthetics.”4 In a study reported by Slayton, et al, 698 children were examined at four and five years of age. Six percent of these healthy children had one or more teeth with enamel hypoplasia.5 In another study, Aine and co-workers found that the prevalence of enamel defects was “clearly higher” in both primary and permanent teeth when the child had been born prematurely.6

The purpose of this article is to give the reader a method by which discolored primary teeth can be restored to their natural tooth color.
Madeline, a 3-year-old girl, came to my office for her first dental visit. Upon oral examination I noticed the gray color of the maxillary left central incisor. The mother reported that the child had fallen three weeks prior to this dental visit. The tooth has remained asymptomatic. The gingiva was normal in appearance and the tooth was not mobile.

**FIGURE 1A:** Note the gray appearance of the maxillary left central incisor.

**FIGURE 1B:** A radiograph was taken which showed no apparent abnormality. The mother reported that the tooth discolored to its present gray color within two weeks of the injury. The author informed the mother that if the tooth remained grey it could be lightened. The technique suggested was to provide a composite veneer on the labial surface of the maxillary left primary incisor. At the subsequent appointment, informed consent was obtained. No anesthetic was required.

**FIGURE 1C:** The aprismatic layer of enamel was removed with an Erbium:YAG laser. If the laser had not been used a fine tapered diamond would have been used to remove the non-prismatic layer of enamel.

**FIGURE 1D:** The enamel was etched with a 35% phosphoric acid gel for 15 seconds. The etching gel was thoroughly rinsed off the surface and the surface dried with the air syringe.

**FIGURE 1E:** Due to the dark grey color of this tooth, a thin layer of opaquer was placed on the labial surface. The opaquer was cured with a bonding light.

**FIGURE 1F:** A bonding agent was next placed and light cured.

**FIGURE 1G:** A thin layer of composite was placed over the labial surface.

**FIGURE 1H:** The composite was sculpted with a composite placement instrument and then cured with a bonding light. Finishing and polishing were then completed with carbide finishing burs and polishing discs.

**FIGURE 1I:** The completed restoration.

See the technique described in Case History 2.
Matthew, age 3, has enamel hypoplasia on the maxillary right primary central incisor.

**FIGURE 2A:** Matthew’s mother reported no trauma that she could recall. Tooth eruption occurred within normal limits. Her pregnancy was unremarkable. Informed consent was given for the cosmetic restoration of Matthew’s tooth. No anesthetic was required to restore Matthew’s tooth.

**FIGURE 2B:** The Erbium:YAG laser was used to remove caries and remove the aprismatic layer of enamel. An alternative technique is to use a fine diamond bur and swipe it gently across the enamel surface to remove the aprismatic layer of enamel.

**FIGURE 2C:** A 35% phosphoric acid gel is placed for 15 seconds and then thoroughly rinsed and dried.

**FIGURE 2D:** A white opaquer was placed with a paint brush to obtain a thin, even surface on the area of hypoplastic enamel. A bonding agent was then placed over the entire enamel surface and light cured.

**FIGURE 2E:** A layer of composite was then placed over the entire labial surface and set with the curing light.

**FIGURE 2F:** The composite was then finished and polished. Contouring and polishing were completed with sandpaper discs.

**FIGURE 2G:** The completed restoration.
Dr. Fred Margolis received his BS and DDS from Ohio State University and his certificate in pediatric dentistry from the University of Illinois College of Dentistry. Dr. Margolis is a clinical instructor at Loyola University’s Oral Health Center. He is a fellow of the Pierre Fauchard Academy, International College of Dentists, American College of Dentists and the Odontographic Society. He is the author of a course manual, Beautiful Smiles for Special People, and has written articles for both lay and professional publications. He is a product evaluator for several dental manufacturers.

Dr. Margolis is director of the Institute for Advanced Dental Education and has lectured both nationally and internationally. He is a consultant to the ADA Council on Dental Practice and an ADA seminar series lecturer. Dr. Margolis maintains a full-time private pediatric dental practice in Buffalo Grove. Dr. Margolis can be reached at his office at (847)537-7695 or by e-mail at kidzdr@comcast.net.

REFERENCES


