

Policy on the Use of Dental Bleaching for Child and Adolescent Patients

Latest Revision

2023

How to Cite: American Academy of Pediatric Dentistry. Policy on the use of dental bleaching for child and adolescent patients. The Reference Manual of Pediatric Dentistry. Chicago, IL: American Academy of Pediatric Dentistry; 2025:136-40.

Purpose

The American Academy of Pediatric Dentistry recognizes the desire for dental whitening by pediatric and adolescent patients. This policy is intended to help professionals and patients make informed decisions about the indications, efficacy, and safety of internal and external bleaching of the young mixed and permanent dentitions and incorporate such care into a comprehensive treatment plan.

Methods

This policy was developed by the Council on Clinical Affairs, adopted in 2004¹, and last revised in 2019². This revision included a new literature search of the PubMed/MEDLINE database using the terms: *dental bleaching*, *dental whitening*, *tooth bleaching*, *etch*, *seal*, and *resin infiltration*; fields: all; limits: within the last 5 years, humans, English, clinical trials, and birth through age 18. Over 350 articles were selected and reviewed in this revision. Additional information was obtained from reviewing references within selected articles.

Background

The desire for improved dental esthetics has fueled innovations in dental materials. Patients, parents, and the news media request information on dental whitening for children and adolescents with increasing frequency. In addition, increased demand for bleaching materials and services has affected both the variety and availability of dental bleaching products on the market and venues that provide bleaching services.

Discoloration of teeth is classified by etiology.³ Clinical indications for internal or external dental whitening for individual teeth may include discoloration resulting from a traumatic injury (ie, calcific metamorphosis, darkening with devitalization), irregularities in enamel coloration of a permanent tooth due to trauma or infection of the related primary tooth, or intrinsic discoloration/staining (eg, fluorosis, tetracycline staining).⁴⁻⁹ Teeth staining from metals (eg, iron supplements) or consumption of tea, coffee, soft drinks, alcohol, and certain foods is extrinsic and easier to treat compared to intrinsic factors whether congenital or acquired. Severe discolorations may best be treated with microabrasion and subsequent bleaching to achieve desirable results.¹⁰

Due to the difference in the thickness of enamel of primary and permanent teeth, tooth coloration within a dental arch

may vary significantly during the mixed dentition. Full arch cosmetic bleaching during this developmental stage, however, would result in mismatched dental appearance once the child is in the permanent dentition. Adolescents present with unique dental needs, and the impact of tooth discoloration on an adolescent's self-image could be considered an indication for bleaching.¹⁰ Tooth whitening has been successful in adolescent patients using typical bleaching agents,¹⁰ but research is lacking on the effects of bleaching on the primary dentition.

Dental whitening may be accomplished by using dentist-directed modalities (ie, prescription-strength products for in-office or at-home use), over-the-counter bleaching products for self-application, or nondentist-directed whitening locations (as permitted by state regulations). Treatment under dental professional guidance offers several advantages. A pretreatment dental assessment helps identify pulpal pathology that may be associated with a single discolored tooth. This examination also identifies restorations that are faulty or could be affected by the bleaching process and the associated costs for replacing such restorations to maximize esthetic results.¹⁰⁻¹⁴ By using photographs and/or a shade guide, the dentist can document the effectiveness of treatment. In addition to providing in-office bleaching procedures, a dentist may fabricate custom trays for at-home use of a bleaching product. Custom trays ensure intimate fit and fewer adverse gingival effects.¹⁵ Over-the-counter products for at-home use include bleaching gels, whitening strips, brush-on agents, toothpastes, mints, chewing gum, and mouth rinses. Commercial locations may also utilize bleaching gels and brush-on agents without the supervision of a dentist. Advantages of both commercial bleaching centers and at-home products include patient convenience and lower associated costs. However, the lack of customization and supervision may result in an increase in side effects.

In-office bleaching products require isolation with a rubber dam or a protective gel to shield the gingival soft tissues. Peroxide-containing whiteners or bleaching agents improve the appearance by changing the tooth's intrinsic color. The professional-use products usually range from 10% carbamide peroxide (equivalent to about 3% hydrogen peroxide) to 38% carbamide peroxide (equivalent to approximately 13% hydrogen peroxide).¹⁶ However, products containing 20% to 35% hydrogen peroxide also have been studied.^{17,18} Additionally, ozone therapy has been used to whiten teeth.¹⁹

Home-use bleaching products contain lower concentrations of hydrogen peroxide or carbamide peroxide.^{7-9,20} Efficacy and long-term outcomes of home whitening products will vary according to the concentration of peroxide used and the severity of the initial tooth discoloration.²¹⁻²⁴ Many whitening toothpastes contain polishing or chemical agents to improve tooth appearance by removing extrinsic stains²⁵ through gentle polishing, chemical chelating, or other nonbleaching action.¹¹ Carbamide peroxide is the most commonly used active ingredient in dentist-dispensed tooth-bleaching products for home use.^{11,25,26}

Permanent teeth with intrinsic discoloration (eg, fluorosis, hypomineralization) present a difficult esthetic challenge. Techniques involving breakdown of the outer enamel surface using acid etch and pumice (microabrasion), followed by subsequent remineralization with sodium fluoride or casein phosphate, have been used with positive results.^{27,28} Additionally, techniques using acid etch and sodium hypochlorite bleach and sealing over the surface with sealant have successfully corrected some discolorations.²⁹ More recently, unfilled resin infiltration systems have been used to treat these defects, with and without the use of bleaching agents, with significant improvements.³⁰⁻³⁴

Side effects from bleaching vital and nonvital teeth have been documented. Most research on bleaching has been performed on adult patients, with only a small amount of published bleaching research using child or adolescent patients.^{8-10,20,22,35-38} The more common side effects associated with bleaching vital teeth are tooth sensitivity and tissue irritation. Tooth sensitivity associated with vital bleaching may be due to permeation of enamel and dentin by hydrogen peroxide and a subsequent mild, transient inflammatory response.³⁹⁻⁴¹ Hydrogen peroxide is a highly reactive substance which can cause damage to oral hard and soft tissues when used at high concentrations and for an extended period of time.^{42,43} Studies have examined the possibility of local and systemic cytotoxic and genotoxic effects that occur during bleaching.⁴⁴⁻⁴⁶ Two studies^{45,46} found no clinically-significant systemic genotoxic risk, while another⁴⁴ found the potential to induce systemic oxidative stress (albeit on a small sample size tested 1 day after bleaching).

Research regarding dental bleaching and pregnant patients is lacking. Effects on the unborn fetus are unknown. Given this lack of evidence regarding its safety, deferring dental bleaching, along with other elective dental treatment, until after delivery (and possibly after breastfeeding) can help minimize risk to patient and fetus.⁴⁷

Between 8% and 66% of patients experience post-bleaching sensitivity, most often during the early stages of treatment.^{11,20,22,36,37} Pre- and posttreatment medicaments and additives to bleaching products have been used to reduce sensitivity, with mixed results.^{18,48-52} The use of casein phosphopeptide-amorphous calcium phosphate with fluoride (which reduced whitening treatment times with laser or light-emitting diode [LED] lights) and ozone therapy have shown to reduce sensitivity.¹⁹ Overtreatment has been shown to harm tooth

structure, which is of particular concern when bleaching products are used excessively by overzealous teens and young adults.^{42,53,54} Tissue irritation, in most cases, results from an ill-fitting tray rather than the bleaching agents and resolves once a more accurately-fitted tray is used.⁵⁵ Both sensitivity and tissue irritation usually are temporary and cease with the discontinuance of treatment.^{4,5,20,22,25,36,37,56,57} Additional risks may include erosion, mineral degradation, pulpal damage, and increased marginal leakage of existing restorations.^{20,58} However, when used correctly (in accordance with manufacturer's instructions or as directed by the dentist), teeth bleaching has been proven to be safe and causes no irreversible tooth structure damage.⁴²

Internal bleaching for nonvital endodontically-treated teeth in young patients can be performed in the same way as for adults.⁴² The more common side effect from internal bleaching of nonvital teeth is external cervical root resorption.⁵⁹⁻⁶² With external bleaching of nonvital teeth, the most common side effect is increased marginal leakage of an existing restoration.^{7,63-67} Both hydrogen peroxide and carbamide peroxide bleaching agents produce a degradation product that results in a hydroxyl-free radical.^{68,69} This byproduct has been associated with periodontal tissue damage and root resorption.⁷⁰ Due to the concern of the hydroxyl-free radical damage⁷¹⁻⁷³ and the potential side effects of dental bleaching, minimizing exposure at the lowest effective concentration of hydrogen peroxide or carbamide peroxide has been recommended.⁷⁰ When bleaching primary anterior teeth, the underlying permanent teeth are in jeopardy of developmental disturbance from intramedullary inflammatory changes.^{42,74}

Of concern is the preponderance of nondental providers offering teeth whitening services to the public.⁷⁵ Tooth whitening is defined as any process to whiten, lighten, or bleach teeth.⁷⁵ Teeth-whitening kiosks, beauty salons, and retail stores are providing whitening services and dispensing teeth-whitening agents.^{25,76} Dental organizations have supported state regulations that restrict the practice of providing bleaching services to only dentists or other qualified dental staff under the direct supervision of a dentist.⁷⁵⁻⁷⁷ The use of over-the-counter whitening products remains exempt from such regulation. Legislation defining the scope of practice by nondentists offering whitening treatment varies from state to state.^{76,78} Consumers may contact their state's dental board or board of health to learn more about educational and licensure requirements for nondentist providers.

Policy statement

The AAPD supports procedures that have been shown to be safe and effective for whitening discolored teeth of children and adolescents. Although the use of whitening agents can improve dental esthetics and enhance a person's self-esteem, AAPD advocates dental bleaching be incorporated into an individualized, comprehensive, and sequenced treatment plan in accordance with safety and efficacy standards defined by clinical research and best practice. Because side effects are

- important considerations for dental bleaching, AAPD encourages
- state regulations that restrict provision of bleaching services to credentialed practitioners.
 - over-the-counter or dentist-dispensed at-home bleaching products used by young patients to be supervised by an adult.
 - additional research on the use of dental whitening agents for children.

Furthermore, the AAPD discourages

- full-arch cosmetic bleaching for patients in the mixed dentition and primary dentitions.
- use of dental bleaching products during pregnancy.

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