

# Ethical considerations in dental bleaching: Patient rights, informed consent, and professional responsibility

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**ABSTRACT:** Dental bleaching, a popular cosmetic procedure projected to drive a global industry worth USD 10.6 billion by 2030, necessitates thorough ethical consideration, including patient rights, informed consent, and professional responsibility. Dentistry's commitment to patient well-being requires balancing esthetic goals with ethical principles of beneficence, non-maleficence, autonomy, and justice. Ethical frameworks, rooted in documents like the Nuremberg Code and the Declaration of Helsinki, guide dental practice. Bleaching agents such as hydrogen peroxide and carbamide peroxide break down chromogenic molecules to whiten teeth. Despite general safety under professional supervision, ethical concerns include ensuring informed consent, managing expectations, and preventing overuse. Access and equity issues reveal disparities in dental bleaching availability, influenced by socioeconomic status and insurance coverage, affecting self-esteem and well-being. Addressing these requires systemic interventions, expanded coverage, and promoting acceptance of diverse dental appearances. For minors and vulnerable populations, careful assessment of bleaching appropriateness is necessary, considering dental maturity and psychological implications. Responsible disposal of bleaching agents is crucial to mitigate environmental risks. (*Am J Dent* 2025;38 Sp Is A:4A-8A).

**CLINICAL SIGNIFICANCE:** This paper highlights the ethical considerations in dental bleaching, including patient rights, informed consent, professional responsibility, access, equity, and environmental impact. Dentists must prioritize patient health and uphold ethical principles to navigate dental bleaching complexities, ensuring safe, effective, and equitable care.

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## Introduction

In recent years, dental bleaching has emerged as a popular cosmetic procedure, offering individuals the opportunity to achieve a brighter and whiter smile.<sup>1</sup> This esthetic enhancement, however, brings forth a myriad of ethical considerations that extend beyond the realm of clinical expertise. With the standards of beauty rising and cosmetic products becoming available over the counter, and patient awareness improving, teeth whitening has become more popular than ever before. The global teeth whitening industry has been predicted to reach USD 10.6 billion by 2030.<sup>2</sup> As the demand for dental bleaching continues to rise, it becomes imperative to delve into the ethical dimensions surrounding this practice, focusing on crucial aspects such as patient rights, informed consent, and professional responsibility.

Dentistry, as a healthcare profession, is inherently bound by a commitment to prioritize the well-being of patients. Ethical considerations play a pivotal role in ensuring that dental practices align with the principles of beneficence, non-maleficence, autonomy, and justice.<sup>3,4</sup> In the context of dental bleaching, a delicate balance must be struck between the pursuit of esthetic goals and the ethical obligations owed to patients.

The history of ethics in medicine and dentistry traces back to ancient civilizations, where codes of conduct and moral principles guided healing practices. However, formalized ethical frameworks in healthcare began to emerge more prominently in the modern era. In the 20<sup>th</sup> century, medical ethics gained significant attention with the development of landmark documents such as the Nuremberg Code (1947) and the Declaration of Helsinki (1964), which established fundamental principles for ethical research involving human

subjects.<sup>5,6</sup> These documents laid the groundwork for subsequent ethical guidelines and regulations in healthcare.

Similarly, dentistry gradually integrated ethical considerations into its practice, recognizing the importance of patient welfare, autonomy, and professional integrity. While early dental practices were primarily focused on technical proficiency and oral health maintenance, the ethical dimensions of patient care became increasingly emphasized as dentistry evolved into a recognized healthcare profession. The American Dental Association (ADA) and other professional organizations played pivotal roles in promulgating ethical standards and guidelines for dental practice, ensuring that ethical principles became integral to dental education and clinical practice and emphasizing the fundamental philosophies of medicine.<sup>3,7-9</sup>

Over time, dentistry has undergone significant transformations, driven by advancements in technology, changes in healthcare delivery systems, and evolving societal expectations. These changes have led to a broader array of treatment options and increased patient demand for cosmetic and elective dental procedures. However, alongside these advancements, concerns have arisen regarding the potential for conflicts of interest between dentists' financial interests and patients' welfare. For instance, dentists may be incentivized to recommend costly treatments or procedures that yield higher profits, even if they are not essential for the patient's oral health.

Moreover, patients often place implicit trust in their dentists to act in their best interests, relying on their professional expertise to make informed decisions about their dental care. This trust underscores the ethical principles of non-maleficence (do no harm) and beneficence (act in the patient's best interest), which are foundational to healthcare

ethics. Dentists have a moral obligation to prioritize patient welfare above financial considerations, ensuring that treatment recommendations are based on clinical need, evidence-based practice, and respect for patient autonomy. In recent years, the pursuit of a brighter, whiter smile has become a pervasive trend in dental esthetics, prompting an increasing number of individuals to seek both professional and at home teeth bleaching procedures.

Dental bleaching, a widely practiced cosmetic procedure aimed at enhancing the esthetic appearance of teeth, encompasses a spectrum of techniques predicated on the application of bleaching agents to alter tooth coloration. The principal bleaching agents employed in dental practice, notably hydrogen peroxide ( $H_2O_2$ ) and its precursor carbamide peroxide ( $CH_6N_2O_3$ ), exert their effects through a multifaceted mechanism of action deeply rooted in oxidative chemistry. Upon application to dental tissues, these agents initiate a cascade of chemical reactions culminating in the degradation of chromogenic molecules responsible for tooth discoloration.<sup>10</sup>

Hydrogen peroxide, the quintessential bleaching agent, exists in various formulations ranging from aqueous solutions to viscous gels, each tailored to specific clinical contexts.<sup>11</sup> Upon contact with dental enamel, hydrogen peroxide undergoes rapid decomposition into hydroxyl radicals ( $\bullet OH$ ) and oxygen molecules ( $O_2$ ). The highly reactive hydroxyl radicals penetrate the enamel matrix, where they engage in oxidative reactions with organic pigments embedded within the tooth structure, thereby facilitating the breakdown of chromophores responsible for extrinsic and intrinsic staining.<sup>12</sup> Concurrently, the liberated oxygen molecules diffuse through enamel pores, disrupting the crystalline lattice and further facilitating the diffusion of reactive oxygen species into deeper dental tissues. Similarly, carbamide peroxide, a stable compound comprised of urea and hydrogen peroxide, serves as a precursor to hydrogen peroxide upon contact with dental tissues. Once applied, carbamide peroxide undergoes hydrolysis, releasing hydrogen peroxide in a controlled manner over an extended period. This gradual release ensures sustained bleaching efficacy while minimizing potential adverse effects associated with high-concentration hydrogen peroxide formulations.<sup>12,13</sup> While dental bleaching is generally considered safe when performed by trained professionals, there are several ethical considerations associated with this procedure.

### Professionalism

*Informed consent* - Informed consent is a cornerstone of ethical dental practice, particularly in procedures like dental bleaching where patient expectations and outcomes can vary.<sup>14</sup> Providing patients with comprehensive information regarding realistic expectations is paramount. Patients must understand that while dental bleaching can significantly improve the appearance of their teeth, it may not achieve the exact shade they desire or produce uniform results across all teeth. By transparently communicating the potential outcomes, including possible variations in tooth color and the need for maintenance treatments, dentists empower patients to make informed decisions aligned with their goals and preferences.<sup>15</sup>

Moreover, discussing the effects of bleaching on dental health is crucial for obtaining informed consent. Patients should be educated about common side effects such as transient sensitivity, which typically resolves within a few days to weeks post-treatment.<sup>13</sup> This information allows patients to anticipate and manage potential discomfort effectively. Additionally, dentists must candidly address the risk of idiopathic cervical root resorption, particularly with excessive or prolonged bleaching regimens. While this complication is rare, its possibility underscores the importance of cautious treatment planning and regular monitoring to safeguard dental health.<sup>16</sup>

Emphasizing that dental bleaching is a cosmetic procedure performed at the patient's discretion further underscores the necessity of informed consent. Unlike medically necessary interventions, such as restorative treatments or periodontal therapy, bleaching is elective and driven primarily by esthetic concerns. Patients should understand that while bleaching can enhance their smile, it is not essential for maintaining oral health or function. This distinction reinforces the patient's autonomy in choosing whether to pursue bleaching and underscores the dentist's obligation to respect the patient's wishes while prioritizing their well-being. By fostering open dialogue and informed decision-making, dentists uphold the ethical principle of autonomy while promoting patient-centered care in the context of dental bleaching procedures.

*Managing patient expectations* - Overuse of dental bleaching procedures and managing patient expectations pose significant ethical considerations within the realm of dentistry. Patients often seek repeated bleaching treatments due to the temporary nature of the effects achieved with each session. Initial bleaching treatments can yield noticeable improvements in tooth color, leading patients to desire subsequent sessions to maintain or enhance their results. However, this desire for continued bleaching raises concerns about the potential risks associated with overuse, including tooth sensitivity, gingival irritation, and enamel damage.

Furthermore, patient expectations play a pivotal role in driving demand for repeated bleaching treatments.<sup>17</sup> As individuals become accustomed to the immediate results achieved after each session, they may develop unrealistic expectations regarding the permanence and degree of whitening achievable through bleaching. This phenomenon can lead to patient dissatisfaction if the outcomes fail to meet their inflated expectations or if they perceive a regression in tooth color over time.

Dentists must navigate these challenges by providing patients with realistic information about the temporary nature of bleaching effects and the potential risks associated with overuse. It is essential to emphasize the importance of moderation and adherence to recommended treatment protocols to minimize adverse outcomes and ensure long-term dental health. Additionally, fostering open communication and setting realistic treatment goals based on individual patient needs and preferences can help manage expectations and mitigate the desire for excessive bleaching.<sup>18</sup>

Ultimately, dentists must balance patient desires for esthetic improvement with ethical considerations regarding patient safe-

ty and oral health. By promoting informed decision-making, discussing potential risks and benefits, and emphasizing the importance of responsible treatment practices, dentists can uphold ethical principles while delivering quality care in the context of dental bleaching procedures.

*Adverse effects* - Ensuring patient safety is paramount in dental practice, particularly when considering the potential side effects associated with dental bleaching procedures. While bleaching can yield esthetically pleasing results, it is imperative for dentists to prioritize patient well-being and mitigate the risk of adverse reactions. Temporary tooth sensitivity and gum irritation are common side effects of bleaching, stemming from the oxidative nature of bleaching agents and their interaction with dental tissues. Tooth sensitivity typically occurs due to the penetration of bleaching agents through enamel pores, leading to irritation of the dentin and activation of nerve fibers, resulting in transient discomfort.<sup>19</sup> Similarly, gingival irritation may arise from the contact of bleaching agents with the soft tissues surrounding the teeth, leading to inflammation, redness, and discomfort.<sup>19,20</sup> Dentists must assess patients' susceptibility to these side effects and tailor treatment protocols accordingly, employing strategies such as the use of desensitizing agents or customized bleaching trays to minimize adverse reactions and enhance patient comfort.

Furthermore, excessive or prolonged bleaching regimens have been associated with the risk of dental root resorption, characterized by the breakdown of tooth structure at the root surface. While the exact mechanisms underlying root resorption are not fully understood, it is believed to involve the activation of osteoclasts and inflammatory mediators in response to bleaching-induced trauma.<sup>21</sup> Dentists must educate patients about these potential side effects, discuss risk factors, and monitor their oral health throughout the bleaching process to ensure early detection and appropriate management of adverse reactions. By prioritizing patient safety and employing evidence-based strategies to minimize risks, dentists can uphold the highest standards of care in dental bleaching procedures while achieving optimal esthetic outcomes for their patients.

*Unlicensed and unregulated providers* - Dental bleaching, while primarily a cosmetic intervention, involves the application of potent bleaching agents to alter tooth coloration, requiring a thorough understanding of dental anatomy, oral health, and treatment protocols. Given the potential risks associated with bleaching, including tooth sensitivity, gingival irritation, and enamel damage, it is imperative that such procedures be performed by licensed dental professionals with specialized training in dental esthetics. Dentists possess the requisite expertise to assess patient suitability, customize treatment plans, and manage potential complications, ensuring both optimal esthetic outcomes and patient safety. Entrusting dental bleaching exclusively to licensed dentists upholds ethical standards, safeguards patient welfare, and reinforces the importance of professional oversight in delivering safe and effective dental care.<sup>22</sup>

The American Dental Association (ADA) has been supporting efforts to educate the public about the importance

of consulting a licensed dentist to assess the appropriateness of tooth whitening/bleaching treatments. Additionally, the ADA Council on Scientific Affairs has been compiling scientific research to outline treatment considerations for dentists prior to initiating such procedures, with the aim of reducing the incidence of adverse outcomes. The ADA has also been petitioning the Food and Drug Administration to properly classify tooth whitening/bleaching agents considering the findings from the Council on Scientific Affairs. Furthermore, the ADA has been urging constituent societies, through legislative or regulatory efforts, to support the proposition that the administering or application of any intra-oral chemical for the sole purpose of whitening/bleaching of the teeth, except for lawfully permitted self-application or application by a parent and/or guardian, constitutes the practice of dentistry, and any non-dentist engaging in such activity is committing the unlicensed practice of dentistry.<sup>23</sup>

*Access and equity* - Access and equity in dental bleaching procedures highlight significant disparities in healthcare accessibility and affordability, particularly concerning elective cosmetic treatments not covered by dental insurance.<sup>24</sup> As dental bleaching is often perceived as a non-essential procedure, individuals without sufficient financial resources may face barriers to accessing this service, exacerbating existing disparities in oral health and self-esteem.<sup>25</sup>

The lack of insurance coverage for dental bleaching underscores broader issues of inequity within healthcare systems, where access to certain treatments is contingent upon socioeconomic status rather than clinical need. Consequently, individuals from lower-income backgrounds may be unable to afford bleaching procedures, leading to feelings of exclusion and inadequacy, especially in societies where beauty standards are heavily emphasized.<sup>26</sup>

Moreover, the portrayal of idealized smiles and tooth color in media and popular culture further perpetuates unrealistic beauty standards, contributing to societal pressure to attain a "perfect" smile through cosmetic interventions like dental bleaching. This pressure can have detrimental psychological effects on individuals who are unable to afford such treatments, fostering feelings of inferiority and self-consciousness about their appearance.

The inability to access dental bleaching can also impact individuals' self-esteem and social interactions, as they may feel self-conscious or embarrassed about their discolored teeth in professional or social settings. This can lead to a sense of social isolation and diminished confidence, ultimately affecting overall well-being and quality of life.<sup>27</sup>

Addressing issues of access and affordability in dental bleaching requires systemic interventions aimed at reducing financial barriers to care and promoting equitable distribution of resources. This may involve advocating for expanded insurance coverage for cosmetic dental procedures, implementing sliding fee scales or subsidized programs for low-income individuals, and raising awareness about the importance of oral health equity within healthcare systems.<sup>28</sup>

Furthermore, efforts to challenge unrealistic beauty standards and promote acceptance of diverse dental appearances can help mitigate the psychological impact of unattainable esthetic ideals. By fostering a culture of inclusivity and priori-

tizing oral health over cosmetic enhancements, dental professionals can contribute to creating a more equitable and compassionate society where everyone can access quality dental care without facing financial hardship or social stigma.<sup>25,27,29</sup>

*Minors and vulnerable populations* - When considering dental bleaching for minors and vulnerable populations, dentists must exercise caution, ensuring both safety and appropriateness. It is essential to assess factors such as dental maturity, oral health, and underlying medical conditions.<sup>30</sup> Additionally, the procedure should be considered in cases of pathologies like non-vital teeth or tetracycline staining, which can significantly impact a child's confidence and well-being. Dentists should prioritize holistic care, recognizing the potential psychological implications and ensuring that bleaching aligns with the individual's best interests.<sup>31,32</sup> However, it is crucial to avoid bleaching in minors seeking whiter teeth for purely cosmetic reasons, as this can lead to damage to the enamel, gums, and potential resorption of the cervical regions of the roots.<sup>13</sup> By taking these factors into account, dentists can navigate the ethical complexities of bleaching procedures in minors and vulnerable populations with sensitivity and diligence.

*Environmental impact* - The disposal of bleaching agents and related materials poses environmental concerns within dental practice. Ethical considerations dictate responsible disposal practices and require dentists to assess the environmental impact of dental procedures. Bleaching agents contain chemical compounds that, if improperly disposed of, can potentially contaminate water sources and harm ecosystems. Therefore, dentists must adhere to proper disposal protocols, such as neutralizing and diluting bleaching agents before disposal, to mitigate environmental risks.<sup>33</sup> Additionally, dentists should explore eco-friendly alternatives and adopt sustainable practices wherever possible to minimize the environmental footprint of dental procedures. By prioritizing environmental responsibility, dentists uphold ethical principles and contribute to the preservation of environmental health for future generations.<sup>34</sup>

## Conclusion

Ethical considerations in dental bleaching encompass a broad spectrum of patient rights, informed consent, and professional responsibilities. Dentists must prioritize patient health above all else, ensuring that treatment decisions are guided by ethical principles such as beneficence, autonomy, and justice. By putting patients' well-being first, dentists can navigate the complexities of dental bleaching with integrity and compassion.

Balancing patient expectations with ethical obligations is paramount in achieving successful outcomes while upholding professional standards. Dentists must communicate openly with patients, managing expectations realistically and transparently to foster trust and mutual understanding. By maintaining a patient-centered approach, dentists can navigate the nuances of dental bleaching while preserving the integrity of the patient-dentist relationship.

Looking ahead, the popularity of dental bleaching is expected to rise, presenting both opportunities and challenges

for dental professionals. As demand for cosmetic procedures continues to grow, dentists have a responsibility to ensure that these treatments are conducted safely and ethically. By staying abreast of emerging research and technological advancements, dentists can uphold the highest standards of care while meeting the evolving needs of their patients.

Furthermore, dental insurances could play a pivotal role in promoting equity of access to dental bleaching procedures. By including these treatments in coverage plans, insurance companies can help mitigate disparities in healthcare access and ensure that all individuals can benefit from cosmetic dental interventions.

In essence, ethical considerations are integral to the practice of dental bleaching, shaping the delivery of care and safeguarding patient well-being. By adhering to ethical principles, dentists can navigate the ethical complexities of dental bleaching with integrity, professionalism, and a commitment to excellence.

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