ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

PRINCIPLES FOR CHOOSING TOOTHPASTE BASED ON SCIENTIFIC AND THERAPEUTIC CRITERIA

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Abstract. This article provides a comprehensive overview of scientifically grounded principles to be followed when selecting a toothpaste. In particular, it offers an in-depth analysis of the components of various toothpastes and their positive and negative effects on oral health. Different types of toothpaste are compared in terms of their functional characteristics and suitability for specific dental needs from a medical-theoretical perspective. Furthermore, the article substantiates the necessity of individual selection based on the condition of the teeth and gums, and highlights the importance of a proper choice with reference to scientific evidence.

Keywords: toothpaste, fluoride, caries, abrasive, dentistry, oral hygiene, inflammation, sensitivity.

Introduction. Due to the advancement of modern medicine and dentistry, the role of oral hygiene in maintaining overall health is being increasingly substantiated scientifically. It has been proven that dental and gum diseases not only affect the oral cavity but also have direct or indirect impacts on cardiovascular, endocrine, and gastrointestinal systems. From this perspective, proper selection of oral hygiene products—especially toothpaste—is regarded as a key factor in preserving health.

According to the World Health Organization (WHO), dental diseases—particularly caries, periodontitis, and gingivitis—are among the most widespread chronic conditions globally. The prevention of these diseases largely depends on the composition of toothpastes, including fluoride content, antibacterial components, abrasiveness, and other characteristics.

Numerous scientific studies show that the daily use of toothpaste not only helps maintain the microbial balance in the mouth but also strengthens the enamel, slows the progression of caries, and prevents gum inflammation. However, due to individual differences in oral health and dental needs, toothpaste should not be selected based on a universal approach but rather according to personal requirements.

For instance, individuals with tooth sensitivity are advised to use toothpastes enriched with potassium nitrate, whereas antibacterial and low-abrasive products are more suitable for preventing tartar buildup. In children, fluoride levels must be strictly controlled as high doses can be toxic to developing bodies.

Therefore, this article examines scientifically grounded approaches to selecting toothpaste, analyzes the composition and therapeutic functions of various products, and discusses principles for making personalized choices based on dental needs. The content provides practical recommendations for dentists, pharmacists, healthcare professionals, and the general public.

Main Body. The primary function of toothpaste is to clean the oral cavity mechanically, prevent caries, maintain gum health, and freshen breath. However, each type of toothpaste contains specific ingredients tailored to a therapeutic purpose. Thus, the first step in choosing a toothpaste should be to examine its composition.

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1. **Fluoride Toothpastes**. Fluoride is one of the most commonly used active components in toothpaste and plays a key role in caries prevention. Research indicates that fluoride concentrations of 1000–1450 ppm effectively strengthen enamel and provide protection against caries. However, fluoride toothpastes must be used cautiously in children.
2. **Antibacterial and Anti-inflammatory Toothpastes**. Ingredients like triclosan and chlorhexidine inhibit microbial growth. Products such as Lacalut Active and Parodontax are widely used in cases of periodontitis and gum inflammation. These toothpastes typically contain low-abrasive agents, antiseptics, and plant extracts to soothe gum tissues.
3. **Toothpastes for Sensitivity**. Brands like Sensodyne and Elmex Sensitive are based on potassium nitrate and strontium salts. These substances reduce signal transmission to tooth nerves, thereby minimizing pain perception [2].
4. **Whitening Toothpastes**. Toothpastes such as Crest 3D White and Colgate Optic White include abrasive particles, hydrogen peroxide, or baking soda to remove surface stains. However, long-term use may lead to enamel erosion [3].
5. **Toothpastes with Natural Ingredients**. Recently, products like R.O.C.S., SPLAT, and Himalaya, based on herbal extracts, have gained popularity. These toothpastes typically do not contain parabens, SLS, or synthetic preservatives, though their efficacy may sometimes be lower than that of fluoride-containing pastes.
6. **Special Toothpastes for Children**. Products such as Elmex Kids and R.O.C.S. Baby are low in abrasiveness, pleasant in taste, and formulated with safe ingredients. The fluoride concentration in these pastes should not exceed 500 ppm to reduce the risk of ingestion.

Findings. Based on research and analysis, the following conclusions have been drawn:

✓ The effectiveness of a toothpaste is directly related to its active ingredients, fluoride content, and compatibility with specific dental needs.

✓ There are specially formulated products for issues like sensitivity, gum inflammation, whitening, and children's hygiene.

✓ Improper selection of toothpaste can lead to enamel erosion, gum inflammation, or allergic reactions.

✓ Consumers often base their choices on advertising or price, which can worsen dental problems.

Discussion. The scientific data and analyses presented in this article demonstrate that choosing the right toothpaste is a vital health decision. It is incorrect to assume that one product fits all, as individuals differ in oral cavity condition, enamel structure, sensitivity, and other factors.

According to dental experts, toothpaste selection should adhere to the following principles:

✓ Be based on a preventive focus (e.g., for caries or gum disease).

✓ Match specific conditions (e.g., sensitivity, whitening, natural composition).

✓ Be safe for health (certified and clinically approved).

An informed, medical approach enables consumers to maintain dental health in the long term. Therefore, toothpaste selection should be approached seriously, with attention to its ingredients and personal dental needs.

Conclusion. Toothpaste is not merely a basic hygiene product but a crucial preventive and therapeutic medical agent. As the article has shown, its composition, active ingredients, and functional scope must serve as primary criteria for selection. Modern dentistry recommends the use of toothpaste not only as a cleanser but also as a treatment tool.

Key findings from the research include:

✓ Fluoride-containing pastes are the most effective for caries prevention.

✓ Toothpastes with antibacterial components reduce gum inflammation.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

- ✓ Special formulations for sensitive teeth help alleviate pain.
- ✓ Whitening agents should be used cautiously.
- ✓ Natural ingredient-based toothpastes are beneficial for avoiding allergic reactions.
- ✓ Children require low-fluoride, gentle, and safe products.

Choosing the right toothpaste impacts not only aesthetics and breath freshness but also oral and overall health. Thus, personalized selection based on dental consultation and scientific evidence is essential. Future developments in medicine and pharmaceuticals will likely lead to more functional, safe, and effective toothpaste products.

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