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# Helitosis-a Bad Breth, Ignored Social Condition

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**ABSTRACT**

*Purpose: Halitosis is defined as an unpleasant odor that emanates from the oral cavity with intra–oral and/or extra–oral origins. Fifty percent of people worldwide view themselves as having halitosis, with 90% of the etiology being intra–oral. Dental hygiene practitioners*

*Should be knowledgeable about the current classifications, diagnosis and treatment modalities to best meet the needs of patients either self–reporting or diagnosed with this problem. Classification of halitosis, assessment, diagnosis, intra–oral and systemic contributing factors, treatment, management and clinical application are discussed in this review.*

**KEYWORDS: : Halitosis/etiology; Halitosis/epidemiology; Halitosis/diagnosis; Halitosis/therapy**

## Introduction

Halitosis, *fetor oris*, oral malodor or bad breath are the general terms used to describe unpleasant breath emitted from a person's mouth regardless of whether the odorous substances in the breath originate from oral or non-oral sources.

Halitosis is an oral health condition characterized by consistently emanating odorous breath and may be caused by several agents including certain foods, poor oral health care, improper cleaning of dentures, decreased salivary flow rate, tobacco products or a medical condition. In 90% of cases, though, the causes of halitosis are located in the mouth and can be attributed to deep carious lesions, periodontal disease, oral infections, periimplant disease, pericoronitis, mucosal ulcerations, impacted food or debris, factors causing decreased salivary flow rate and, mainly, tongue coating.[1]

The tongue is a major site of oral malodor production, while periodontal disease and other factors seem to be only a fraction of the overall problem.[2] In addition, current social norms emphasize the importance of personal image and interpersonal relationships. Thus, halitosis may be an important factor in social communication and, therefore, may be the origin of concern not only for a possible health condition but also for frequent psychological alterations leading to social and personal isolation.[3] Although oral malodor or bad breath is an unpleasant condition experienced by most individuals, it typically results in transient discomfort.

At least 50% of the population suffer from chronic oral malodor and approximately half of these individuals experience a severe problem that creates personal discomfort and social embarrassment. The mouth air of chronic malodor sufferers is tainted with compounds such as hydrogen sulfide, methyl mercaptan and organic acids, which produce a stream of foul air that is gravely offensive to the people in their vicinity. Sufferers often make desperate attempts to mask their oral malodor with mints and chewing gum, compulsive brushing, and repeatedly rinsing with mouthwashes.[4] Currently, three methods for measuring halitosis are available: (1) organoleptic measurement, (2) gas chromatography and (3) sulfide monitoring. Although the organoleptic measurement has many shortcomings it still is the golden standard method to assess halitosis.[5]

## Therapeutic approach

Successful treatment of halitosis depends on a correct diagnosis and the implementation of a cause-related therapy.[6] After a positive diagnosis for oral halitosis has been made, the treatment plan is implemented, which comprises elimination of the causative agent and improvement of the oral health status.[7] Although the multiple possible etiologies include oral and non-oral causes, the majority of breath malodor cases originate from the oral cavity. Briefly, the treatment of oral malodor can therefore be focused on the reduction of the intraoral bacterial load and/or the conversion of VSC to nonvolatile substrates.

The management of halitosis starts by taking a detailed history of the condition, duration, severity, and impact on the patient's everyday life. Examination involves clinical, radiographic, and special tests. The contributing medical conditions, once identified, are referred for treatment accordingly. Clinical examination checks the patient's oral hygiene, caries, and periodontal status; plaque retention factors are also recorded. Radiographic examination should look for evidence of dental caries, alveolar bone defects, and defective restorations.[7] Special tests are performed to detect the foul-smelling VSCs along with the associated bacteria. The results collected can be used to confirm the diagnosis and to monitor the treatment progress. There are many diagnostic techniques among which are organoleptic measurement, gas chromatography, and halimeter examination.[8,9,10.11]

Since malodor originating from the mouth is due to the metabolic degradation of available proteinaceous substrates to malodorous gases by certain oral microorganisms, oral malodor can be ameliorated through: (1) Reduction of bacterial load, (2) reduction of nutrient availability, (3) conversion of VSC to nonvolatiles and (4) masking the malodor.[1,6,12]

## Mechanical Reduction

As in most oral diseases, mechanical removal of biofilm and microorganisms is the first step in control of halitosis.[13] Brushing and flossing of teeth are important, but tongue cleansing is paramount for halitosis reduction. It is estimated that approximately 60% of VSCs originate on the surface of the tongue.[13,14]In a study conducted to compare the effects of polystyrene tongue scrapers and toothbrush bristles on the surface of the tongue against measurable VSCs, the tongue scraper performed at 75% reduction while the toothbrush bristles reduced levels of VSCs by 45%. Patients reported they preferred the tongue scraper over the toothbrush.[15]

## Chemotherapeutic Reduction

Toothpastes and mouth rinses have long been used to help reduce halitosis through chemotherapeutic reduction. The most common active ingredients included in these products are triclosan, essential oils, cetylpyridinium chloride (CPC) and CHX.9 Zinc, another active ingredient in mouthwash, has been shown to be effective by inhibiting bacterial breakdown of proteins, thus inhibiting VSC production[14]. Chlorine dioxide solution (0.1% solution) has also been shown to maintain VSCs at lower levels when compared to a placebo mouth rinse[16].

## Chlorhexidine and zinc

A CHX and zinc mouthrinse had a strong effect on volatile sulfur-containing compounds and was effective for at least 9 hours. Control rinses with CHX or zinc alone had a moderate and strong effect for 1 hour, but this effect diminished with time, respectively, fast and slightly.[17]

**Cetylpyridinium and zinc ions**

A CPC and zinc mouthrinse had a good synergistic effect on volatile sulfur-containing compounds levels after 1 hour, but minimally above the effect of zinc alone.[17]

**Chlorhexidine, cetylpyridinium chloride and zinc-lactate**

Chlorhexidine is still the gold standard mouthrinse, but it does have some side effects. Due to these disadvantages, new formulations have been developed. Since CHX and CPC are both antimicrobial agents, it seems reasonable to assume that the new marketed mouthwash that contains CHX and CPC acts by reducing the number of VSC-producing bacteria on the dorsum of the tongue. Moreover, zinc-lactate, besides its antimicrobial activity, may reduce VSC scores by transforming them into insoluble compounds. Two dual-center, double-blind, placebo-controlled studies demonstrated that a new mouthwash containing CHX (0.05%), CPC (0.05%) and zinc-lactate (0.14%) is effective in the treatment of oral halitosis.[18,19] The one adverse effect of the active mouthwash was staining of the dorsum of the tongue.

Some studies have indicated a synergistic action between CHX and cetylpyridine.[20,21] Their data illustrate that the replacement of alcohol in a CHX formulation by CPC does not change the antimicrobial activity of the mouthrinse, even though the CHX concentration is reduced to 0.05%.[21] A 0.12% CHX and 0.05% cetylpyridinium solution was compared to a 0.05% CHX, 0.05% CPC and 0.14% zinc-lactate solution, and to other 3 different commercial mouthrinses with CHX.[20] Formulations combining CHX and CPC achieved the best results, both in terms of antimicrobial activity and anti-halitosis efficacy. Conversely, a formulation combining CHX with NaF showed significantly lower anti-halitosis and anti-microbial efficacy.

**Conclusions**

Fifty percent of the public worldwide suffers from some form of oral halitosis and is looking to the oral health care professional for guidance. Upon satisfactory completion of treatment for halitosis, research has shown that patients recognize an improvement in social life and satisfaction of care.40 Since halitosis is a recognizable condition, and a common chief complaint among patients,3 the clinician should be prepared to diagnose, classify, treat and manage patients that suffer from this uncomfortable and sometimes socially debilitating condition

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