

What's to Blame for Bad Breath?



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Oral malodor, bad breath, halitosis—whatever we choose to call it—can be an embarrassing situation for people. Bad breath has affected the entire population at some point in time. When we watch commercials on television or read consumer magazines, most advertisements recommend a gum or mint to reduce bad breath. These can work for most of us throughout the day as a cover-up, but only if we are removing the bacteria from the oral cavity and neutralizing the gas produced from those bacteria. Most patients don't understand that bad breath comes from the bacteria in our mouths and not from the foods we eat.

Since the 1970s, it has been reported that 90% of all malodor originates from odor-producing bacteria on our tongues and the remaining 10% results from gastrointestinal problems, such as ulcers.¹ Out of the 90% of malodor from odor-producing bacteria, most of the bacteria lies on the tongue, followed by periodontal pockets, and then teeth.¹ This information, noted in the dental literature, might not be reaching the public or manufacturers considering the majority of products available for bad breath are mints, gums, and alcohol-based mouthrinses. Tongue scrapers are available in retail markets, but determining how many people use them is difficult. In the author's opinion, tongue scrapers are underused considering the research available to encourage their use.

Causes of Malodor

With most of oral malodor, the tongue is the biggest offender.¹⁻⁴ Tongue cleaning is considered the only way to reduce the concentration of odor and bacteria located there.²⁻⁴ Filiform, foliate, and circumvallate papilla, associated with mucus-producing glands, offer specific anatomical areas for bacteria to live on the tongue.¹ Sloughed epithelial cells also increase the surface area for more odor-causing bacteria to thrive on the dorsum of the tongue.¹

The odor-causing chemicals are called volatile sulfur compounds (VSC).^{3,5,6} They are known as the main culprits of oral malodor. This group of VSC consists of hydrogen sulfide (H₂S), methyl mercaptan (CH₃SH), and dimethyl sulfide ([CH₃]₂S).^{5,7} All of these gases are considered poisonous in the industrial world when they are in higher concentrations than in the mouth. The rotten egg smell is particular of the sulfur gases and is a result of bacteria putrefying in the mouth and on the tongue.⁵ Tongue cleaning is traditionally accomplished by using a tongue scraper or a soft-bristled toothbrush.^{1,2,4,6,7} Research indicates tongue scrapers remove significantly more VSC than a toothbrush.⁶ Pedrazzi and colleagues found that 75% of the VSC were removed with tongue scraping, while only 40% were removed via tongue brushing.⁶ Additionally, the study showed that most participants found tongue scrapers to be more comfortable to use and reduced the gag reflex.⁶

Diagnosing Oral Malodor

Diagnosing the specific cause of a patient's oral malodor is difficult because of the limited ability to quantify oral malodor in the dental office. In research situations, gas chromatography is used to gain a numerical score of malodor.^{1,3,5} Complicating the issue, researchers have, on occasion, used their own noses to record oral malodor.¹ Most dental hygiene practices don't have a gas chromatographer, and hygienists often don't want to inhale their patients' breath for analysis. This leaves patient reports of bad breath and thorough medical and dental histories.

Although uncommon, there are medical conditions and diseases that contribute to oral malodor: respiratory tract conditions, tonsillitis, sinusitis, carcinomas, and liver disease, to name a few.¹ Additionally, gingivitis, acute necrotizing gingivitis, and periodontitis have been reported in the literature to have a link to oral malodor.¹ Of the 90% of malodor that comes from the mouth, the tongue has most of the malodor producing sites, while the teeth and periodontal pockets are included as well.¹

Dentistry offers many kinds of diagnosis, one of which is the treatment diagnosis. If a disease is suspected and the recommended treatment works, the cause of the disease is known retrospectively. Oral malodor fits into this category of diagnosis. After major medical conditions are ruled out or referred, dental hygienists can implement tongue cleaning and other oral hygiene instruction to help patients alleviate bad breath.

Benefits of Tongue Cleaning

In addition to contributing to bad breath, tongue coating can impact taste perception. Quiryne and colleagues evaluated tongue cleaning as a method to reduce oral bacterial load and tongue coating and to improve taste perception.⁷ They found that the amount of bacteria was not reduced significantly, though the coating on the tongue was significantly reduced.⁷ Taste perception was significantly better for the test patients after the 2 week period.⁷ Another study, by Almas and colleagues, found bacterial loads to be reduced after tongue cleaning, and that the quantity of both mutans streptococci and lactobacilli species were reduced from the tongue after 7 days of tongue scraping.² The study also evaluated oral malodor as perceived by the test patients, and their perceptions of odor reduction were statistically significant for this study.²

Many published studies acknowledge that tongue cleaning is beneficial to oral health.¹⁻⁷ No published studies have found that tongue scraping or brushing caused harm or injury. Further, many studies show that patients approved of tongue scraping and found it reduced their oral malodor.

Conclusion

Bad breath is a recognized condition and deserves treatment.¹ As the team member who reviews the latest research on oral hygiene, dental hygienists are the most logical work force to deal with oral malodor. Overall, 90% of bad breath odor comes from VSC in the mouth.¹ The tongue harbors most of the VSC, followed by periodontal pockets, and then teeth.¹ Dental hygienists have command of the science behind this and are able to offer solutions to their patients. We should be their resource and disseminate the information in dental journals to the end-user—our patients.