

# HALITOSIS: *Being Part of the Cure*

*"There are more animals living in the uncleaned matter in one's mouth than there are men in a whole kingdom, especially in those who never clean their mouths, owing to which such a stench comes from the mouth of many that one can hardly speak to them."*

Leewenhoek, 1683<sup>1</sup>

## PRACTICE POTENTIAL

*Did you know that one of the main reasons people finally go to a dentist is because they are worried about their bad breath?*

*How often have you seen people avoiding direct conversation by covering their mouth with their hand or turning their head away before speaking?*

Today it is estimated that 25 million Americans suffer from chronic halitosis. Many of these people are unaware of their offending breath until somebody has the courage to tell them. But once they are aware that they have the problem, they will usually do anything to avoid the embarrassment that it causes. All one has to do is look at the millions of dollars a year spent on various mouthwashes, flavoring agents, mints and other masking substances, to see that halitosis is a serious social problem.

Studies show that disorders of the oral cavity are responsible for most instances of bad breath. But it is clear when you look at the numbers, companies producing mints and sprays are the ones' carrying out bad breath treatment and not the dentist. This is because most dentists receive little or no instruction in dental school about the causes and chemistry of halitosis. When it comes to helping people who suffer from bad breath the dental community is clearly missing the boat.

*When is the last time you asked one of your patients if they ever suffer from bad breath?*

## DESCRIPTION -

### The Causes of Halitosis

Halitosis is a condition that has a multifactorial etiology and even though it is most often

caused by oral problems, bad breath can also be a symptom of a serious disease. One of the best examples of this is diabetes. While an odor is not detectable in well-controlled patients, an acetone sweet fruity odor can often be detected in the uncontrolled patient. This is due to the abnormal accumulation of ketones in the blood which are excreted through the respiratory system. This odor is indicative of diabetic acidosis and can even be a sign of an impending hyperglycemic coma.

### Extra-Oral Causes of Halitosis

In Table 1 you will find a list of many of the extra-oral conditions that can cause halitosis. Since patients are more likely to see a dentist than a physician concerning their bad breath, it is imperative that you have a good working knowledge of all the different pathologies which can give rise to such odors. With this background, you will be able to refer the patient to their physician once you have eliminated all of the oral possibilities.

Most of the odors which are not intra-oral in origin result from excretion of metabolites in the blood through the lungs. Some of the more common examples of this are the acetonc breath of the uncontrolled diabetic, the ammoniacal breath accompany-

ing uremia, and the odor which comes from some of the food we eat. These systemic breath odors tend to be of greater intensity and last longer than do physiologic mouth odors such as morning breath. This explains why patients complain of garlic or onion breath long after they have eaten and even after they have brushed, flossed and rinsed.

It used to be thought that halitosis could originate directly from the gastric contents of the stomach. We now know that this is not true except when belching or vomiting since odor and gas cannot escape when the esophagus is in a normal closed condition. Instead, the metabolites from ingested foods are absorbed, carried through the blood and excreted through the lungs.

### Intra-Oral Causes of Halitosis

It is thought that disorders of the oral cavity cause up to 85% to 90% of all the cases of halitosis. Table 2 lists the more common causes of halitosis that a dentist will encounter. Most of these factors have in common the ability to increase bacterial and food retention or decrease their clearance from the oral cavity.

Research has shown that volatile sulphur-containing compounds (VSC) like hydrogen

Table 1 <sup>2</sup> Extra-Oral Causes of Halitosis		
Disorders of the Upper Respiratory Tract	Gastrointestinal Conditions	Systemic Diseases
Chronic sinusitis	Peritonsillar abscess	Leukemia
Foreign bodies	Retropharyngeal abscess	Agranulocytosis
Atrophic rhinitis	Cryptic tonsillopathy	Febrile illness with dehydration
Wegner's granulomatosis	Vincent's angina	Ketoacidosis
Tuberculosis	Carcinoma of the tonsil or pharynx	Hepatic failure
Syphilis	Pharyngitis sicca	Azotemia
Rhinoscleroma	Gangrenous angina	
Adenoiditis	Zenkers diverticulum	Drugs
Nasopharyngeal abscess	Posterior carcinoma	Lithium salts
Carcinoma of the larynx	Congenital bronchoesophageal fistula	Penicillamine
Laryngoscleroma	Gastric carcinoma	Griseofulvin
	Hiatus hernia	Thiocarbamide
	Xactly Syndrome	Diethylsulfoxide
	Pyloric stenosis	
	Enteric infections	Functional
Disorders of the Lower Respiratory Tract		Psychoses
Pulmonary abscess	Neurologic Disorders	Depression
Carcinoma of the lungs	Dysosmia	
Bronchiectasis	Dysgeusia	
Necrotizing pneumonitis	Zinc deficiency	

continued

sulfide, methyl mercaptan, dimethyl sulfide and dimethyl disulfide are largely responsible for halitosis of oral origin. These compounds are the bi-products of bacterial action and of the putrefaction of saliva.<sup>1</sup>

The putrefaction process of saliva involves the breakdown of food debris, mucopolysaccharide, and other sulfur-containing substrates like exfoliated epithelial cells and damaged leukocytes. All of these substances are readily found in everyone's mouth.

However, this process is clearly accentuated when inflammatory and degenerative disorders like gingivitis and periodontitis are present. For example, when the typical deep pockets associated with chronic periodontal disease exist, you will usually find an increase in the trapping of food, a larger population of gram negative organisms and an increase in the pH. All these factors cause hydrogen sulfides to be released from these pockets.<sup>3,4</sup>

According to the latest studies, the main culprit causing most bad breath are the sulfur producing bacteria that run amok at the back of the tongue. Here these bacteria bed down among the tiny finger like villi, where they get covered and protected with a coat of plaque and mucus.<sup>4,5</sup>

Excessive smoking is also believed to be a cause of fetid breath. This may occur because smoking encourages a hairy tongue condition which can trap food debris and tobacco odor. Smoking also decreases salivary flow.<sup>2,3,4</sup>

Any situation which decreases salivary flow will inhibit the mouths' normal self-cleaning process. This allows the build up of methyl mercaptans and hydrogen sulfides to occur. A perfect example of this is the morning breath we experience after a night of sleep when our salivary production is normally decreased.

## MAKING A DIAGNOSIS

Due to its multifactorial etiology, diagnosis of the origin of halitosis is essential for its treatment. The first step to making a proper diagnosis is the taking of a complete medical history.

Evaluating the information in your standard medical history will give you most of the information you need, but it will still be necessary to ask your patients further questions. Some questions you may want to ask are:

*When is the last time you visited the dentist?*

Someone who does not go to the dentist regularly has a higher risk of halitosis from caries and periodontal disease.

*What are your oral hygiene habits?*

This is an important question because even patients who are very meticulous about brushing and flossing may still suffer from bad breath that is oral in its origin. Remember the tongue is believed to be the main source of oral odor. Odds are these patients have never been taught to brush their tongue.

*Do you use an over-the-counter mouth rinse regularly?*

Most commercial mouth rinses have a high alcohol content. As is true with any regular alcohol use these rinses will tend to dry the mucosa and alter the delicate balance of the mouths' microflora.<sup>1,2</sup>

*When you sleep do you breath through your mouth?*

Dryness of the mouth is almost always associated with halitosis as it causes oral stagnation and allows the tissues to be volatilized.

*Are you taking any medication?*

Many medications can cause dryness of the mucosa. Some also have a distinct odor of their own which enters the breath via the lungs.

*Have you been experimenting with ethnic foods that use different spices?*

Many spices like garlic and onions affect the breath. In the digestive system the by-products of these spices are able to enter into the bloodstream. From there they enter the breath by being excreted from the lungs.<sup>2,3</sup>

*Are you on a special diet?*

Dieting can make you prone to halitosis. When a person doesn't eat they experience what has been called "hunger odor".<sup>4</sup> This may actually be caused by the putrefaction of pancreatic juices in the stomach. Dieters also burn stored fat which gives off acetone. These odors enter the breath via the lungs.

It should be noted that fad diets can result in acidosis or ketosis. When this happens the unpleasant breath odor is often exactly the same as that noted in an impending diabetic coma.

*Do you drink alcohol?*

Remember alcohol tends to dry out the oral tissues. Alcohol is also excreted into the breath via the lungs.

*Do you smoke?*

Smoking encourages periodontal disease, decreases salivary flow and causes a hairy tongue condition which can trap food debris and tobacco odor.

*If you are a denture wearer, how often and by what method do you clean your dentures?*

Dentures tend to collect food more than natural teeth. It is also true that since most denture wearers are older their salivary flow seems to be less. Both these factors contribute to an increase in halitosis for the denture patient.

*How long have you noticed the problem?*

The duration of the problem can be significant in making a diagnosis. For example, a long duration of symptoms is more consistent with persistently poor hygiene while a short duration of symptoms may suggest an infectious source like an abscess.

**Table 2**

**Intra-Oral Causes of Halitosis**

Dry mouth due to: mouth breathing lack of flow of saliva during sleep dehydration salivary gland dysfunction caused by Anti-cholinergic drugs, radiotherapy, Sjogrens syndrome Denture wearing Increase in alkalinity Healing extraction sites Food retention	Poor oral hygiene Dental plaque Dental caries Gingivitis Stomatitis Periodontitis Unclean tongue Hairy tongue Smoking Oral carcinoma
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*Has your bad breath been confirmed by others?*

It is very difficult to determine for yourself if you have bad breath. Trying to smell your own breath usually doesn't work and having a bad taste in your mouth doesn't necessarily mean that you have bad breath. Since most patients do not have access to sophisticated measuring instruments like the gas chromatography units being used by researchers, the only way they can really tell if they have bad breath is to ask somebody to check it for them.<sup>6</sup>

The next step after completing a history is to do an intra-oral examination. This will usually pinpoint the cause of the patients halitosis. Carefully inspect all areas of the oral cavity including the teeth and gums, the buccal vestibule, the floor of the mouth, the lateral aspects of the tongue, the posterior third of the tongue, and all of the hard and soft palate.

Palpation of all areas should be done not only to evaluate suspicious looking lesions but also to detect hidden lesions. If the cause of the halitosis is still not obvious, a mirrored examination of the nasopharynx, hypopharynx and the larynx may be indicated.<sup>1,2</sup>

Today, the technology exists to measure the level of volatile sulfur compounds right in your office. VSC measurement with a **Halimeter\*** has been clinically proven to be useful in the diagnosis of oral malodor.<sup>4</sup>

If after all of the diagnostic procedures have been completed and you are still unable to identify an oral cause of the patients halitosis, referral to a physician for a complete medical examination is recommended.

## TREATMENT

Since most halitosis is caused by local factors, the elimination of these factors should be the first step in the treatment approach, especially when a medical history is negative. The following steps are recommended:

1) **Improve oral hygiene techniques-** Since improper oral hygiene is probably the most common underlying factor in halitosis, the institution of an effective home care program is essential. In addition to conventional tooth brushing and flossing, daily irrigation of all the oral tissues and regular scraping or brushing of the tongue is recommended.

Since the tongue is a main reservoir for bacteria which produce VSC one method to control odor is to eliminate the bacteria

that live their. This can be accomplished by brushing the tongue and using a solution which contains chlorine dioxide. Studies have shown that sulfur molecules are oxidized by chlorine dioxide.<sup>8</sup> The reaction creates a powerful deodorizing effect in which the volatile sulfur gas is eliminated. This deodorizing agent along with brushing or scraping will abrade the tongue and remove the bacteria. This product is produced by a few companies the most well known being OXYFRESH.<sup>3</sup> The patient should be given a supply of this product to use at home. OXYFRESH comes in a toothpaste, gel and rinse.

Another hygiene technique which has been found useful in controlling halitosis is the use of a **hydromagnetic oral irrigator\***. These new units can ionize whatever solution you care to use to irrigate the soft tissues. It has been shown that by irrigating the soft tissues and the teeth with ionized solutions you can inhibit the formation of plaque and calculus. This technique is especially useful for patients who have a hard time flossing properly.<sup>8</sup>



2) **Control periodontal disease-** By eradicating periodontal pockets you will destroy one of the niches for the bacteria that produce volatile VSC. Controlling this disease process will also reduce the amount of leukocytes and blood that will be found in the saliva.

3) **Perform all necessary restorative care-** Restoring all existing carious lesions, closing open contacts between teeth, extracting all unrestorable teeth and correcting any other defects like over contoured fillings and crowns that are impossible to clean, will help to minimize the accumulation of bacteria and food debris involved in the putrefaction process.<sup>4</sup>

4) **Increase salivary flow -** Eating smaller meals more frequently, drinking water with a little lemon in it, chewing gum, and sucking a citrus or mint candy, will all increase salivary flow.<sup>4</sup> This will enhance the mouths' natural ability to clean thus reducing the number of oral bacteria as

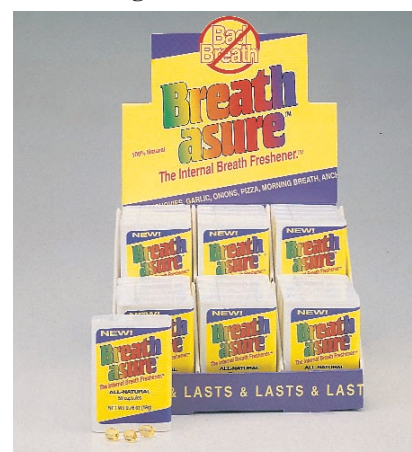
well as their substrates and end-products that could stagnate and putrefy in saliva.

Those patients who suffer from xerostomia can use an artificial saliva to moisten the oral cavity without any untoward adverse reactions. Laclede Companies' products, **Biotene** and **Oral Balance\*** are excellent.<sup>4</sup>



5) Patients who wear a prosthesis like a denture, or a partial will need special home care instructions. Since food debris easily gets caught around clasps and on denture teeth, it is important to tell your patient to rinse out their appliances after every meal. A good cleaning should be done at least once in the afternoon and then prior to soaking the prosthesis in a disinfecting solution for the evening. Wearing dentures during sleep when salivary flow is diminished will enhance the putrefaction process. Therefore, the patient who insists on keeping there denture in at night will certainly be more difficult to help.

6) For people who eat spicy food like garlic and onions, excellent oral hygiene is not enough to stop bad breath since the metabolites these foods produce are absorbed, and excreted through the lungs.<sup>1,2,3</sup> One product which works well to control this type of bad breath is **Breathasure**. This simple product which is made of parsley seed and sunflower seed oil in a gel cap seems to prevent the odor causing by-products of these foods from entering the blood stream.



*continued*



7) Patients wearing removable orthodontic appliances also need to be given special oral hygiene instructions. Since these appliances are usually worn 24 hours a day, it is imperative to take them out after every meal and clean them. We recommend that they also be soaked once a day in a good disinfectant like Retainer Brite\*.

When all the previously described oral measures have been taken and they fail to improve the halitosis condition in a relative short period of time, systemic disease or some other cause should be suspected. Referral to a physician for a complete medical examination should then be made. Remember while halitosis is usually due to benign oral disorders it may be the first manifestation of a serious or even fatal disease.<sup>1</sup>

## CONTRAINDICATIONS AND CONCERNS

Although millions of dollars are spent every year on over-the-counter mouthrinses and deodorizing sprays, it is clear that most of them will only mask bad breath temporarily. Furthermore, most of these mouthrinses contain a high percentage of alcohol which when used too frequently will dry the mucosa and alter the delicate balance of the oral microflora.

The application of topical antibiotics have been found to be effective in reducing the bacteria that cause inflammation of gingival tissue and the production of offensive odors. However they should not be used indiscriminately because prolonged use can have many adverse side effects.

When examining a patient there are a few things to remember. First, bad breath is a very real problem for the patient and is not to be taken lightly. Second, keep your comments business-like and professional. Third, it is important to assure the patient that their situation is not unique or untreatable.<sup>4</sup>

Patients under physical or emotional stress will often neglect their oral hygiene. Moreover, emotional upsets that affect digestion and body chemistry can sometimes influence the breath.

It is always important to ask your patients what medications they are taking. Antihistamines, decongestants, antidepressants, tranquilizers, diuretics and antidepressants all decrease salivary flow. Make sure to ask about over-the-counter drugs as well, most people will forget to tell you about them.

## INCOME POTENTIAL

There are only three ways to increase the profits from your dental practice: increase production; lower office expenses; or establish a profit center.

The one certainty about bad breath is that it is very profitable. Unfortunately the millions of dollars a year spent to combat this problem are spent on various mouthwashes, flavoring agents, mints, and other masking substances, instead of in your office.<sup>7</sup>

Does your initial screening form ask any questions about whether your patient is concerned about their breath? Have you ever simply asked your patients if they are concerned about their breath? If you have not asked, then you are missing a great opportunity to establish a new profit center in your office while helping your patients with something they perceive to be a big problem.

Treating your patients for halitosis can also be another opportunity for you to interact closely with one of your best untapped referral sources, the M.D.. Your knowledge of the many systemic problems that can cause halitosis will set you apart from the other dentists in your community. By working closely with the physicians in your area you can create an excellent referral network.

## CUSTOMARY FEE RANGE

Most doctors treating halitosis phase their therapy. Phase 1 usually includes your initial consultation, diagnosis, all oral hygiene instructions and basic prophylactic care. Phase 2 involves the definitive periodontal and restorative care that most patients will need. When determining a fair fee for your services remember to include all the costs for your treatment time. For example, teaching the oral hygiene techniques necessary to control halitosis can take time. It is not unusual to see the patient for four to six appointments during Phase 1.

## SUPPLY LIST

Tooth brush  
Tongue brush/scrapper  
Floss  
Hydromagnetic oral irrigator (OxyCare 3000)\*  
Chlorine dioxide  
(Oxyfresh- toothpaste, rinse, gel)\*  
Breath Asure \*  
Biotene\* (sodium carboxymethyl cellulose to moisten the oral cavity)  
Retainer Brite \*  
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Halimeter\*  
(to measure methyl mercaptan levels)

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