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Disclaimer

The information in this book is not a replacement for the services of a dentist or health care professional.

Please do not use this e-book to diagnose or treat a medical or health condition.

Please consult a dentist in all matters relating to your dental care, and use discretion when using any of the strategies mentioned here.
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Dear Patient,

Thank you for downloading this e-book. I have compiled this as a quick resource to enable you to deal with the problem of bad breath. Statistics show that a large number of people suffer from bad breath at various times of their life; often caused by various issues or simply from the foods they consume.

In addition to finding useful information on bad breath in this e-book, you will be pleased to learn that you are now on our exclusive newsletter subscriber list.

This entitles you to some cutting edge information on dental health and wellness, all delivered to you in your email at regular intervals each month.

Each edition will feature valuable tips, dental health maintenance ideas, expert advice, and informative articles to keep your mouth healthy and pain-free. You can share this excellent resource of healthy living with your acquaintances, by forwarding it to their email address or asking them to sign up for FREE from the link you accessed. This newsletter is our commitment to improving your dental health as your preferred dental professional.

Thank you!
Definition of Bad Breath

Bad breath (halitosis) can be embarrassing and may cause anxiety. It's no wonder store shelves are overflowing with gum, mints, mouthwashes, and other products designed to combat this condition. But many of these products are mere temporary measures.

Certain foods, health conditions and habits are among the causes of bad breath. In many cases, you can improve bad breath with proper dental hygiene. If simple self-care techniques don't solve the problem, you may want to see your dentist or doctor to be sure a more serious condition isn't causing your bad breath.

In general, the main causes of bad breath are health conditions, hygiene habits and certain foods. Good dental hygiene can clear up the problem for many people but if this does not work, schedule an appointment with us to make sure you do not have a more serious cause of your bad breath.
Bad Breath

Bad breath, for which the medical name is halitosis, is an embarrassing condition that can also cause anxiety about social interactions. People often try to deal with the problem by sucking mints or using frequent mouthwashes but these are not cures; they simply mask the real problem and they are, therefore, merely temporary.

**Do you have bad breath?**

Bad breath is often caused by a buildup of bacteria in your mouth that causes inflammation and gives off noxious odors or gases that smell like sulfur -- or worse.

Everybody has nasty breath at some point, like when you get out of bed in the morning or after eating a spicy meal with onions and/or garlic.

If our noses can't reliably help us judge the quality of our own breath, how can we determine if we do have bad breath? The best way to find out is to ask a trusted friend or your significant other, "Does my breath smell?" Because it's really hard to tell on your own," Tina
Frangella, DDS, a dentist with Frangella Dental in New York, tells WebMD. If you don't feel you can ask another adult, ask your dentist or hygienist at your next dental appointment; after all, evaluating oral conditions is part of their job. If you find this type of question too personal to ask an adult, don't overlook asking a child. As we all know, sometimes the least inhibited and most honest responses come from children.

There's also another way to know if your breath is bad. It may seem a bit gross, but look at and smell your dental floss after you use it. If your dental floss smells badly or there is any blood on it, then chances are that there are foul odors in your mouth.

**How can a person can test the quality of their own breath?**

There are ways you can objectively smell your own breath. However, you have to take a slightly indirect route.

Try this technique. Lick your wrist, wait about five seconds while the saliva dries somewhat, and then smell it. What do you think?

That's the way you smell. Or, more precisely, that's the way the end of your tongue smells (your tongue's "anterior" portion). How was it? Did you pass this first check?
Now try this second experiment. It will check the odor associated with the back portion of your tongue (your tongue's "posterior" aspect).

Take a spoon, turn it upside down, and use it to scrape the very back portion of your tongue. (Don't be surprised if you find you have an active gag reflex.) Take a look at the material that has been scrapped off, usually it's a thick whitish material. Now, take a whiff of it. Not so bad? Pretty nasty? This smell, as opposed to the sampling from the anterior portion of your tongue, is probably the way your breath smells to others.

**What causes bad breath?**

There are no statistics on what percentage of the population has bad breath. That's because studies usually rely on someone reporting whether or not they think they have bad breath and may not be accurate.

But studies show that about 80% of bad breath comes from an oral source. For instance, cavities or gum disease can lead to bad breath, as can tonsils that have trapped food particles; cracked fillings, and less-than-clean dentures.

Several internal medical conditions also can cause your breath to go downhill fast. They include diabetes, liver disease, respiratory tract infections, and chronic bronchitis. You'll want to see your doctor to rule out things like acid reflux, postnasal drip, and other causes of chronic dry mouth (xerostomia).

One doctor interviewed on WebMd, Dr. Woodall, recalls a 30-year-old patient who had chronic bad breath, though her teeth were "immaculate" and her tongue was very clean. Her doctor tested her for acid reflux and other stomach conditions, "gave her some medicine, and her bad breath went away," Woodall says.
Bad breath treatments

Bad breath is, in most cases, caused by problems in the mouth. Often a visit to your dentist will solve the problem. If dental treatments are required to eliminate the odor it could be painful and expensive because you may require several visits. Add to that fact that not all of us are comfortable in the dentist chair. These are the perfect reasons why continuous oral care is important and regular check-ups are a must!

If no oral cause of your bad breath can be identified by your dentist, you may need to seek a specialist in breath odor or visit other health professionals.

Here are some DIY Halitosis treatments for you:

(Please note: These are only suggestions and are not guaranteed to work for everyone)

- At all times maintain a high level of oral and dental hygiene. In addition to brushing, it is important to clean between the teeth using dental floss, toothpicks, or an inter-dental brush as recommended by your dentist or hygienist.
- Use a tongue cleaner and clean right to the back of the tongue.
- Using a mouthwash is recommended. The best time to use it is just before sleeping.
- Drink plenty of fluids, avoiding too much coffee and alcohol.
- Clean your mouth after eating dairy products, fish, and meat.
- Chew sugar-free gum, especially if your mouth feels dry.
- Eat fresh food and fibrous vegetables.
- Visit your dentist regularly and have your teeth professionally cleaned as required.
What happens at a Halitosis examination?

A complete medical history

1) An interview is done. You will be asked: when, how long, and how often you have perceived a breath problem.

2) Complete periodontal charting. One reason for this is that if you have periodontal disease the odor will be coming from the periodontal pockets.

3) X-ray survey to rule out any obvious problems that could be causing an odor problem. These include food traps, open contracts, open margins, poorly fitting fillings, fistulas, impactions, dry mouth, pocketing, plaque accumulation, and tongue coating.

4) Special instructions will be given before your office visit such as:
   - Do not brush, floss or use mouthwash for 12 hours preceding your appointment.
   - No food or drink, except water for 5 hours before the appointment.
   - Tobacco and alcohol products must not be used for 12 hours
   - Onions, garlic and cabbage are forbidden for 48 hours. These foods have odors which are picked up by the blood system and are exhaled through the lungs for several days after a meal
   - Do not use antibiotics for 3 weeks so as to not artificially change the micro-organism population in the body.
- Perfumes, aftershaves and other scents are discouraged.

5) Two ways can be used to determine odor at exam time:

- Use of the doctor's nose. An increase in VSC's will produce a characteristic unpleasant odor, the evaluation of which can be developed through experience and repetition.

- A Halimeter can be used which measures volatile sulfur compounds in parts per billion. Readings below 100ppb are not detectable by the average human nose and are considered "normal". Above 100 ppb, a noticeable odor begins to build and 300-400 ppb, the unpleasant odor can be smelled from several feet away.

**The fundamental cause of bad breath**

Just as your experimentation has suggested, for most people the fundamental cause of bad breath is the whitish coating that covers the surface of the posterior portion of their tongue. More accurately, bad breath is caused by the bacteria that live in this coating. The second most common fundamental cause of bad breath is bacteria accumulation elsewhere in a person's mouth.
**Symptoms of bad breath**

Some people do not know that they have bad breath; however, other people they are talking to or living with will know! Therefore, if you suspect you have bad breath, ask your spouse or other family or friends to tell you. Do this if you are merely worrying about the matter – it will set your mind at rest. If you are too embarrassed to ask anyone if you have bad breath, try one of the self-tests we’ve listed above.

Think about your habits of oral hygiene if you have been told you have bad breath. Brush your teeth more often; brush your tongue and use dental floss.

If all this doesn’t work; consult us for advice. You may need referring to a doctor in some cases.

Bad breath odors vary depending on the source or the underlying cause of the bad breath. Because it's difficult to rate your own breath, many people worry excessively about their breath even though they have little or no mouth odor. Others have bad breath and don't know it. Because it's difficult to assess how your own breath smells, follow our guides to finding out how to determine if you suffer from halitosis.
How do I control my bad breath?

Here are some tips for controlling bad breath.

- **Practice good oral hygiene.** Brush and floss after every meal, or at least twice a day. Brush for two minutes each time. Proper brushing also involves brushing your tongue, cheeks, and the roof of your mouth to remove bacteria and food particles. Flossing removes bacteria, plaque, and food particles that may be trapped between teeth. Many dentists and dental hygienists also recommend cleaning your tongue with a tongue scraper, a plastic tool that scrapes away bacteria that builds up on the tongue. Mouthwashes and rinses can also temporarily relieve bad breath.

- **Remember your retainer.** If you wear a retainer or have some kind of removable appliance, clean it thoroughly each time you brush. If you have braces, take extra time and care to clean all the nooks and crannies. Your orthodontist is a good source of information about keeping your braces clean.

- **Chew sugar-free gum.** Chewing sugar-free gum helps stimulate saliva. This helps cleanse the teeth and gums and prevents dry mouth.

- **Stop using tobacco.** Get help and kick the habit.
• **Use an antibacterial mouthwash.** Gargling once or twice a day is good for teeth and gums and kills bad-breath bacteria in your mouth.

![Mouthwash](image)

**Where does my dentist fit in?**

While there is no dental specialty that deals just with bad breath, Dr. Tarantola should be able to address your concerns about oral hygiene.

If he determines that your mouth is healthy, he may refer you to a general physician or a specialist to determine the cause of your bad breath. Your doctor can tell you if you are taking medications that can cause dry mouth, or if you have other medical conditions that may make you more likely to have dry mouth and bad breath.

Seeing your dentist regularly (at least every six months) and following his advice will reduce or eliminate any bad breath problems you may have. Then you won't have to worry about those potential "close encounters."
**When to see a doctor**

If you've been told you have bad breath or are aware that you do, review your oral hygiene habits. First, try making lifestyle changes such as brushing your teeth and tongue after eating, using dental floss, and drinking plenty of water.

If your bad breath persists after making such changes, see Dr. Tarantola. Let him know any medications you are on as they can sometimes be the culprit for causing issues that may end up causing bad breath. If he suspects a more serious condition is causing your bad breath, he or she may refer you to a doctor to find the cause of the odor.
How Dental Researchers Test for The Presence Of Halitosis.

Before a dental researcher can evaluate the effectiveness of a cure for bad breath they must first have a way to quantify the person's level of malodor, both initially and after the cure they are studying has been administered. Some of the different methods researchers use to measure bad breath are discussed below.

A) Organoleptic testing for bad breath.

Judging a person's breath by way of organoleptic testing simply means that the researcher performing the breath evaluation has used their sense of smell (their nose) as the means for making a determination. Historically this method of breath testing has been a frequent choice among dental researchers. Noses are readily available, inexpensive to obtain and operate, and to their credit, noses can detect up to 10,000 different smells.

One of the problems associated with using organoleptic testing is that this technique is not totally objective. Another is that factors other than just breath odors can and do influence organoleptic evaluations. As examples, research has shown that factors such as hunger, menstrual cycle, head position, and the degree of attentiveness and expectation can each influence a judge's interpretation of what they smell. Additionally, consumption or use of coffee, tea, juice, tobacco products and scented cosmetics by subjects prior to their evaluation can influence the testing.
As for quantifying the organoleptic measurement itself, what exactly does constitute a weak, strong, or average level of bad breath? Will each judge participating in the research be able to make equivalent comparisons? Complicating things even more, as we all know, when we are repeatedly exposed to a bad odor our sense of smell acclimates to the odor and therefore loses much of its sensitivity. Breath malodor that seems exceedingly objectionable at the beginning of testing may seem quite less so as the evaluation continues.

**B) Evaluating bad breath with gas chromatography.**

A number of scientific fields utilize gas chromatographs to identify compounds found in the samples they are studying. Likewise, gas chromatographs have been employed by dentists conducting halitosis studies and have provided a means by which a researcher can definitively quantify the precise levels of various compounds present in someone's breath. It is considered to be the "gold standard" for measuring breath malodor.

While gas chromatography is probably the best way to test for the compounds associated with bad breath, it has not been widely utilized in research studies for several reasons. Gas chromatographs are relatively expensive and require personnel with special training to
operate them. The equipment is not portable and a significant amount of time is needed to make each breath measurement.

C) Using Halimeters to quantify halitosis.

A specialized type of sulfide monitor (termed a Halimeter) has been developed and it provides a means by which a tester can quantify certain aspects of a person's breath. These machines, first introduced in 1991, measure levels of sulfide gases. Some sulfides, such as hydrogen sulfide and methyl mercaptan (collectively referred to in dental literature as volatile sulfur compounds or "VSC's"), are known to be causative agents of bad breath. A Halimeter's reading showing a high level of sulfides in a person's breath suggests that a corresponding high level of VSC's are present; although the apparatus does not test for individual types of VSC's specifically.

Since a Halimeter tests for a fewer number of compounds (sulfides only) than gas chromatographs and in fact tests for no individual compounds at all but instead just sulfides as a class. Halimeters provide for a less definitive evaluation of a person's breath malodor than gas chromatographs. Additionally, compounds such as ethanol (alcohol) and essential oils (both of which are frequently found in
mouthwashes) interfere with a Halimeter's ability to make a measurement. The advantages of using a Halimeter for a study rather than a gas chromatograph are that a Halimeter requires no special training to use, is portable, breath measurements can be made quickly and the apparatus itself is comparatively inexpensive.

**D) The BANA test.**

Some of the bacteria that cause periodontal disease (gum disease) produce waste products that are quite odiferous and as a result contribute to a person's breath problems. The presence of some of these types of bacteria can be tested for by way of performing a BANA test.

The bacteria in question have the characteristic of being able to produce an enzyme that degrades the compound benzoyl-D, L-arginine-naphthylamide (abbreviated BANA). When a sample of a patient's saliva that contains these bacteria is placed in with the BANA testing compound they cause it to break down, thus creating a color change in the testing medium.

**E) Utilizing chemiluminescence to detect bad breath.**

One of the more recently developed methods of testing for the presence of compounds associated with bad breath relies on the principle of chemiluminescence. This type of testing was first introduced in 1999. When a sample containing sulfur compounds (such as VSC's, the types of compounds which cause bad breath) is mixed in with the test's mercury compound, the resulting reaction causes fluorescence. The strength of chemiluminescence methodology is that it can provide better selectivity and sensitivity when measuring low levels of sulfur compounds, as compared to testing with a Halimeter.
Categorizing types of Halitosis.

Before a dental professional begins treatment, the type of halitosis the patient has must first be identified.

When a dental professional initiates the treatment of a patient's breath problem, they must first make an assessment so to categorize the type of bad breath condition they are dealing with. The three major classifications that are used to categorize a patient's breath malodor problem are "genuine halitosis," "pseudo-halitosis" and "halitophobia."

As you read through the definitions of each of these classifications, it should become obvious to you that this classification step is important because the type of remedy that is needed for each category can be quite varied.

A) Genuine Halitosis

This category refers to bad breath that can be readily detected by organoleptic testing (smelling the person's breath) or by the use of a scientific testing apparatus designed to detect the compounds typically associated with bad breath (volatile sulfur compounds).

B) Pseudo Halitosis

This classification refers to a situation where an oral malodor problem does not exist (cannot be detected by smell or scientific apparatus testing) but the patient still feels that they have bad breath. Since no real breath problem exists, treatment consists of counseling the patient about their misconception.
C) Halitophobia

This is a situation where a patient's perception of a breath problem continues to exist despite the successful treatment of their genuine halitosis condition or, in the case of pseudo-halitosis, after receiving counseling. At this point, treatment for the patient's condition needs to be referred to a medical professional who can provide appropriate psychological counseling.

The subcategories of genuine halitosis.

Breath treatment professionals will subdivide the genuine halitosis category into two further classifications, "physiologic" and "pathologic" halitosis.

1) Pathologic Halitosis

This classification recognizes a person's bad breath as being a symptom of a disease, or other pathologic condition, or aggravated by it.

2) Physiologic Halitosis

This category refers to those situations where the person's malodor is attributable to (the somewhat typical) putrefactive processes taking
place in the oral cavity. Usually these processes are taking place within the white-colored coating found on the posterior portion of the tongue. In most cases the person's breath problems can be resolved simply by improving their oral home care, especially their tongue cleaning habits.

This classification of bad breath is considered to be transient, in the sense that its presence comes and goes (as determined by temporary localized conditions in the mouth) and that it can be easily resolved. Examples include "morning breath" and bad breath associated with speaking. (The bad breath experienced in both of these situations is caused by the dry oral conditions that develop during sleep or when we speak for extended periods of time).

**The subcategories of pathologic halitosis.**

The "pathologic" halitosis category is further subdivided into subcategories based on the location of the disease process that is associated with the breath problem.

1) **Oral Pathologic Halitosis**

This category includes breath problems that are caused or aggravated by disease or other pathologic condition associated with the tissues of the mouth. As an example, problems with bad breath are often caused by the presence of periodontal disease (gum disease). The dental professional treating this type of case will need to provide the patient with instructions outlining proper oral hygiene, especially tongue cleaning. They will also need to provide treatment for the diseased oral tissues. In most cases this will start with a thorough professional dental cleaning.
2) Extraoral Pathologic Halitosis

With this classification, the person's breath malodor originates from a disease or a pathologic condition involving body tissues other than in the mouth. The odor may originate from:

- The nasal or laryngeal areas (upper respiratory tract).
- The lower respiratory tract (lungs) or upper digestive tract.
- Disorders anywhere else in the body. In these cases, compounds produced by the disease process are blood borne and a state of breath malodor is created when they are exhaled from the lungs. These disorders can include diabetes, liver cirrhosis, uremia, and internal bleeding.

The dental professional addressing these types of cases will need to provide the patient with instructions regarding proper oral hygiene. Definitively, however, the dentist will need to refer the patient to a physician or medical specialist for treatment.

Bad tastes

Bad taste can be caused by benzodiazopenes, new restorations, oxidation of the older metallic fillings (galvanism) and saliva acidity; you also have the "fork" syndrome when touching one of these fillings that can cause metallic taste. Also these conditions can cause metallic

**Watch what you eat**

What you eat affects what you exhale. That's because as food is digested, it's absorbed into your bloodstream and then is expelled by your lungs when you breathe.

Eat a healthy, balanced diet and regular meals. Certain diets -- such as extreme fasting and very low-carb diets -- can give you bad-smelling breath.

Consider snacking on raw carrots, celery, or apple slices. "It's good to have a nice watery vegetable in there - something like celery - that will help clear your mouth of debris," Frangella says.

Avoid breath busters such as onions, garlic, and some other spicy foods. Chronic garlic users cannot only have chronic bad breath, but the garlic can also cause body odor.
Causes of Bad Breath

There are many causes; most of them are to do with your mouth:

- **Dental Problems.** Poor dental hygiene and periodontal disease can be a source of bad breath. If you don't brush and floss daily, food particles remain in your mouth, collecting bacteria that can emit chemicals, such as hydrogen sulfide — the same compound that gives rotten eggs their characteristic smell. A colorless, sticky film of bacteria (plaque) forms on your teeth and if not brushed away, plaque can irritate your gums (gingivitis) and cause tooth decay. Eventually, plaque-filled pockets can form between your teeth and gums (periodontitis) worsening this problem — and your breath. The microscopic uneven surface of the tongue also can trap bacteria that produce odors. And dentures that aren't cleaned regularly or don't fit properly can harbor odor-causing bacteria and food particles.

- **Dry Mouth.** Saliva helps cleanse your mouth, removing particles that may cause bad odors. A condition called dry mouth (xerostomia) can contribute to bad breath because production of saliva is decreased. Dry mouth naturally occurs during sleep, leading to morning breath. Dry mouth is even more of a problem if you sleep with your mouth open. Some medications can lead to a chronic dry mouth, as can a problem with your salivary glands

- **Problems with your teeth.** If you don’t look after your teeth with regular brushing and flossing you are liable to have bad breath. Particles of food can stay in your mouth and gather bacteria and these can give out the rotten smell of hydrogen sulphide — the one that gives bad eggs their smell. If you
neglect brushing a sticky layer of bacteria can remain on your teeth, and maybe irritate your gums, causing gingivitis (inflammation of the gums around the roots of the teeth) and even cause tooth decay. In time, this plaque can develop between your teeth and gums (periodontitis, meaning inflammation of this area). This worsening can also cause bad breath. The rough surface of your tongue that has millions of filaments can as well be full of trapped bacteria and can cause a smell. Even if you don’t have your own teeth and have dentures, they need cleaning; otherwise they can smell.

- **Food.** It is not only decaying food particles that can cause bad smells; some foods cause undesirable odors in themselves; perhaps onions and garlic are the best examples but spices, herbs and some other vegetables can cause bad odors. Even after eating these foods and digestion has taken place the oils from them enter your bloodstream, and they give off their odors in your lungs and are present in your breath for a while.

- **Lack of Saliva.** Saliva helps to wash out your mouth, thus removing many of the bad breath producing particles. The condition known as xerostomia (dry mouth) adds to foul breath, especially during sleep.
This is even worse if you sleep with your mouth open. Problems with salivary glands can cause this problem and also some medications.

- **Mouth Nose and Throat Problems.** Nasal passage conditions or infections can cause sinus drips into the back of your throat causing mouth odor. Such conditions as ulcers in the respiratory system or cleft palates are places where bacteria can gather, causing bad breath. Likewise, tonsil infections can be a source of bacterial odors.

- **Tobacco.** This causes its own smell and also tends to dry out the mouth. Tobacco use can also cause periodontal disease, mentioned above.

- **Diseases.** As mentioned, in about 10 percent of bad breath cases the bad odors do not come from the mouth (extra-oral halitosis). For example, illnesses, such as some cancers and metabolic disorders, can cause a distinctive breath odor as a result of chemicals they produce. Diabetes and kidney or liver failure can lead to a fishy smell. Uncontrolled diabetes can also cause a fruity breath odor from chemicals called ketones. And chronic reflux of stomach acids (gastroesophageal reflux disease, or GERD) has been associated with bad breath. In addition, some medications — such as those used to treat high blood pressure, psychiatric conditions, or urinary problems — can indirectly produce bad breath by contributing to dry mouth. Other medications may be broken down in the body to release chemicals that can be carried on your breath.

**Causes and risk factors.**

There are various conditions and circumstances that cause or place a person at risk for having halitosis.
In most cases bad breath (halitosis) is caused by the presence of oral bacteria. However, there can be other factors that influence the odor associated with one's breath and, in fact, the quality of a person's breath will ultimately depend upon a number of different variables.

The next portion of our discussion details some of these specific risk factors and conditions. When reading this information you should take notice of the fact that many of the items we list directly relate to:

- Oral bacteria.
- Conditions which promote the growth of oral bacteria.
- Not cleaning, or not being able to clean, those areas where oral bacteria reside.

Later on we will describe in greater detail how bacteria cause mouth odors and outline methods for cleaning these bacteria away. Right now however, at this point in our discussion, just realize that anything that promotes the growth of oral bacterial will most likely heighten a person's problems with bad breath also.

**How do foods cause bad breath?**

Everyone knows that certain foods have a reputation for causing bad breath. Two of the most notorious ones are garlic and onions.
When we eat, our digestive system breaks the food we have consumed down into its component molecules; some of which have very unpleasant and characteristic odors. As these molecules are created they are absorbed into our circulatory system so they can subsequently be distributed throughout the remainder of our body as nourishment.

As our blood travels through our lungs some of these molecules will be released into them. As a result, as we exhale our breath will contain some of these offending molecules, thus producing breath malodor.

While this type of bad breath can be annoying or embarrassing, this is not the type of breath problem we discuss on the subsequent pages of this topic. Bad breath caused by the consumption of certain foods will resolve on its own in a day or so as your body completes the process of breaking down and utilizing, or excreting, the offending molecules. You can control this type of breath problem simply by avoiding or minimizing your consumption of these types of foods.

**Why is smoking a risk factor for halitosis?**

You are probably familiar with people who have "smoker's breath." While even though the precise odor associated with smoking depends on a number of factors, a great part of it is directly related to the tar, nicotine, and other foul smelling substances derived from tobacco's smoke that accumulates on a person's teeth and oral soft tissues (tongue, cheeks, gums, etc.).

Once again, while this type of breath malodor can be a problem, this is not the precise type of bad breath we address on the pages of this topic. Short of quitting smoking there is no effective way to totally eliminate smoker's breath; although immaculate oral hygiene can help to minimize it.
As a contributing risk factor, the act of smoking does have a drying effect on oral tissues. Decreased moisture in the mouth limits the washing and buffering effect of saliva on oral bacteria and their waste products, thus aggravating a person's problems with bad breath. More information about breath problems associated with dry mouth conditions is discussed just below.

It is also known that people who smoke are at greater risk for having problems with periodontal disease ("gum disease") than people who do not smoke. Gum disease, as it relates to bad breath, is also discussed in more detail below.

**Why is having a dry mouth (xerostomia) a risk factor for bad breath?**

Even if you don't have much of a problem with bad breath you have probably noticed that your breath is least pleasant in the morning when you first wake up. This is because during the night a person's mouth dries up somewhat, due to the human body's natural tendency to reduce salivary flow when a person sleeps. This same souring effect is sometimes noticed by teachers, lawyers, and anyone else whose mouth has become dry after having to speak for a prolonged period of time. Additionally, people who breathe through their mouth, are fasting, or
are under stress can find that they have comparatively dry mouths and therefore persistent problems with breath odors too.

One explanation for this phenomenon is that the moisture found in our mouth helps to cleanse it. The presence of oral fluids encourages us to swallow. With each swallow we take we wash away bacteria, as well as the food and debris on which they feed. This same moisture also dilutes and washes away the waste products that oral bacteria produce.

Additionally, saliva is a very special form of mouth moisture. It's the body's natural mouth rinse. Beyond the washing and diluting effect that any oral moisture can provide, saliva has the added benefit that it contains compounds that can kill bacteria and buffer their waste products. So when our mouth becomes dry, all of the benefits provided by each source of oral moisture are minimized. The net result is that the conditions for bacterial growth are enhanced while the neutralization of bacterial waste products is reduced.

Some people have chronically dry mouths. This condition is termed "xerostomia." Xerostomia can be a side effect of the medication a person is taking. Antihistamines (allergy and cold medications), antidepressants, blood pressure agents, diuretics, narcotics, or anti-anxiety medications are all often known to produce xerostomia.

Another contributing factor associated with xerostomia is a person's age. It is commonplace that as people age they find that chronic mouth dryness becomes more and more of a problem. With age our salivary glands tend to work less effectively and the composition of the saliva that they produce changes too. Both of these factors create a situation where the effects of salivary cleansing and buffering are reduced.
A factor that compounds the problems associated with mouth dryness is that people who suffer from xerostomia are more at risk for having periodontal disease ("gum disease"). As discussed in our next section, periodontal disease is a causative factor for bad breath.

**How does periodontal disease (gum disease) cause bad breath?**

Periodontal disease, often just called "gum disease," can be the source of a person's breath problems. Ask any dentist, the odor coming from the mouth of a person with active gum disease can be so distinctive that a dentist will often correctly anticipate the presence of gum problems even before they begin their examination of the patient.

Periodontal disease is the second most common (fundamental) cause of bad breath. Since periodontal disease is typically more of a problem for people over the age of 35 or so, the older we get the more likely that the source of our bad breath is related to conditions associated with the health of our gums.

Periodontal disease is a bacterial infection located in the tissues that surround a person's teeth. Advanced forms of periodontal disease typically result in serious damage to the bone that holds teeth in place. As this bone damage occurs, deep spaces form between the teeth and gums (termed "periodontal pockets"). These pockets provide an ideal location for bacteria to live in.
In many cases it is waste products coming from the bacteria that reside in these periodontal pockets, pockets which are often so deep that a person cannot effectively cleanse them, that is the cause of a person's bad breath. In addition, researchers have found that the amount of coating (as measured by weight) that is present on the tongues of people with periodontitis is greater than those in control groups. They have also found that the level of volatile sulfur compounds coming from this coating is four times greater than in people who do not have periodontal disease.

**How can sinus conditions promote bad breath?**

Sinus conditions can have an effect on the quality of a person's breath. Upper respiratory infections and allergies can create postnasal drip that deposits onto the back portion of a person's tongue (by way of the oral-nasal pathway found in the area of a person's soft palate). This discharge often has a foul taste and smell. Even worse, oral bacteria will feed upon this discharge and create their own smelly waste products thus adding to the problems the person is having with bad breath.

As a compounding factor, people with sinus conditions will often have stuffed up noses and therefore will have a need to breathe through their mouth. The drying effect of mouth breathing can create an environment that promotes bad breath. Additionally, sinus sufferers are likely to be taking antihistamines, a type of medicine that is known to create mouth dryness.

**Can untreated medical conditions cause bad breath?**

Although the most common source of breath odors is related to the accumulation of bacteria in the mouth, certain medical conditions can be the cause of a person's breath odors. If a person's bad breath persists after they have consulted with their dentist and tried the usual simple
solutions, then a consultation with a medical doctor may be indicated. Your doctor will of course know what types of conditions to look for but, in general, they will look for problems associated with the respiratory (pulmonary or bronchial), hepatic (liver), renal (kidney), and gastrointestinal (stomach and intestine) systems.

What types of dental conditions can cause bad breath?

There can be some types of untreated dental pathology that can contribute the problems a person is having with their breath. Any active infections in a person's mouth, such as those associated with abscessed teeth or a partially erupted wisdom tooth, can cause bad breath. Teeth that are broken or those having extensive untreated decay can trap enough debris and bacteria that they become the source of foul odors. Your dentist can identify and treat these problem dental conditions if they exist.

Can bad breath be caused by dentures?

Dentures (complete dentures, full dentures, partial dentures, etc.) can have a big influence on the quality of a person's breath. If you have dentures try this test to see if they might be the source of your breath malodor:
Remove your dentures and place them in a baggie. Seal the baggie shut and let it sit for about four or five minutes. Now, crack the baggie open and take a whiff. For better or worse, the odor you smell is representative of what your breath smells like to others.

While the most common cause of breath malodor is that caused by the accumulation of bacteria either on a person's tongue or on and around their teeth (periodontal disease), bacteria can and do accumulate on the surface of dentures and this can be the source of bad breath for some.

**Oral Hygiene**

If you want to prevent breath bad then start by practicing good oral hygiene of the mouth with regular cleaning, brushing, and flossing. Oral hygiene helps to prevent the build-up of the bacteria that forms on your teeth, tongue and gums that causes bad breath. If not removed on a regular basis plaque is formed and adheres to the crevices and fissures of the teeth. This generates acids that slowly eat away or decay the protective enamel layer of the teeth, causing holes (cavities) to form. Plaque also irritates the gum and causes gum disease leading to the loss of tooth in some cases.

Brushing of the tooth and flossing helps to remove the plaque formed on the teeth. Antiseptic mouthwashes help to kill many of the bacteria that help to form plaque. Using toothpaste that contains fluoride, drinking plenty of water, and regular visits to your dentist can help to promote oral hygiene and can help to eliminate bad breath.

Oral hygiene should be a lifelong habit that should be maintained from infancy through adulthood. With proper oral hygiene practices such as brushing and flossing, you too can avoid the bad breath problems.
Getting ready for your appointment with the dentist.

It’s best to have a morning appointment when going for breath testing. For three hours before the appointment do not eat, drink, smoke, chew gum, or brush your teeth. Do not wear lipstick, lip gloss, perfume or scented lotions. Any of these could mask odors. If you have been using antibiotics recently, within a month, check with your dentist to see if he/she might want to reschedule to later.

What Dr. Tarantola might do:

- Ask about your medical history
- When did you first get bad breath?
- Do you get it all the time or just occasionally?
- How often do you brush your teeth?
- How often do you floss your teeth?
- What kinds of foods do you eat?
- What medications do you take?
- Are you a mouth breather?
- Are you a snorer?
• Do you have sinus problems or allergies?
• Do you have any ideas yourself about the possible cause of your bad breath?
• Has anyone commented about your bad breath?

Your dentist will probably smell the breath from your mouth and your nose and will rate the smell on a scale of 0 to 5. Zero means no smell, 1 means barely present and up to 5 meaning unbearably foul. The dentist might scrape the back of your tongue with a spoon and rate that odor because the tongue can often be the source of the smell.

It is possible to analyze these odors with laboratory devices, but it is unlikely that the average dentist will have these on hand because of costs.

**Cranberry breath**

Wish you could sweeten your breath and the breath of people around you? Serve cranberries. Cranberries just may have the power to crush the offensive-smelling bacteria that can build up in your mouth and lead to bad breath. Apparently, the tart berries make the bacteria less sticky so plaque is less likely to form. Plaque not only makes your breath less than aromatic, but also it can lead to cavities and gum disease.
Treatment

Treatment depends on the cause. If the cause of the bad breath is an underlying health problem, the dentist will help you to control that condition or refer you to an appropriate medical specialist. Dental remedies will be as follows:

Treatment of Dental Disease. If Dr. Tarantola discovers that you have gum disease, you may be referred to a periodontist (gum specialist). Gum disease can cause the gums to pull away from the teeth, leaving deep pockets that accumulate odor-causing bacteria. Sometimes these bacteria can be removed only by professional cleaning. He might also recommend replacing faulty tooth restorations, which can be a breeding ground for bacteria.

- **Mouth Washes.** If the cause of your bad breath is the plaque on your teeth you may be recommended to use a mouth wash that is formulated to kill the bacteria. Researchers have found that those mouth washes containing cetylpyridinium chloride, and chlorhexidine can prevent the smells leading to bad breath. A popular choice here is ‘Listerine’. Other ingredients, such as zinc and chlorine dioxide are good for neutralizing the byproducts of bacteria.
Bad Breath

- **Toothpaste.** In addition, Dr. Tarantola might suggest using a herbal toothpaste containing natural bacterial agent that kills bacteria causing the buildup of plaque.

- **Treatment of Dental Diseases.** If gum disease is discovered you might be referred to a gum specialist. Gum disease causes the gums to recede from the teeth leaving deep pockets where odor producing bacteria can dwell. Sometimes cleaning these pockets will need professional treatment. Faulty dental work in the past can also be a place of breeding bacteria and the work might need to be redone.

**Bad breath prevention**

Spielman offers some sure-fire ways to detect and cure bad breath:

- **Lick.** We become accustomed to the smell in our own mouths and can't detect it, which is why blowing into your hand won't reveal the true quality of your breath. Instead, press your tongue (as far back as you can reach) against the back of your hand. Let the saliva dry for 10 seconds, then smell.

- **Scrape.** Sixty percent of bad breath is due to plaque that accumulates in the tongue's folds, particularly toward the back.
One of the best ways to clear it away is with a tongue scraper twice daily.

- **Rinse.** Many common mouthwashes use alcohol to kill bacteria -- which is not the best ingredient, Spielman says. Instead, gargle once a day with a solution containing zinc chloride. An intense green or blue color is your clue to the right stuff.

**What you can do at home**

Here are some steps you can perform yourself to prevent or get rid of bad breath:

- **Always brush your teeth after eating.** Simple to do at home but keep an extra toothbrush at work. At the very least, brush teeth at least twice daily, particularly after meals. Using an antibacterial toothpaste can reduce bad breath for up to twelve hours.

- **Floss daily.** Correct flossing removes any particles of food and plaque from between the teeth.

- **Clean your tongue.** Use a tongue scraper rather than a brush for this. The tongue often contains the origin of odors. Some toothbrushes have a built-in tongue cleaner on the reverse side which work fine.

- **Clean dentures properly.** Clean bridges or partial dentures thoroughly every day.

- **Drink lots of water.** Drinking plenty of water, especially for older people, can keep your mouth moist. Note: coffee, tea or alcohol can lead to a drier mouth. Chewing gum, preferably cinnamon flavored, or sugarless candy stimulates the flow of saliva which washes away particles of food and their bacteria.
If you have a chronic case of dry mouth the dentist might prescribe artificial saliva medications to stimulate saliva flow.

- **Change your diet.** Reduce your intake of alcohol and coffee and avoid foods known to lead to bad breath. It can help to eat high fiber foods. Eating cranberries are believed to crush the offensive-smelling bacteria that can build up in your mouth and lead to bad breath, so plaque is less likely to form.

- **Avoid using old toothbrushes.** Renew your toothbrush every three months and make sure you buy one with soft bristles. Replace your brush any time you have a cold or viral infection.

- **Have dental checkups regularly.** Have your teeth or dentures examined and cleaned at least every six months. Visiting your dentist regularly.

**Tea fights bad breath**

**Compounds found in tea can stop the growth of bacteria that cause bad breath.** Polyphenols, chemical components of tea, prevent both the growth of bacteria responsible for bad breath and the bacteria's production of malodorous compounds. It is caused by foul-smelling volatile sulphur compounds, like hydrogen sulphide,
produced by anaerobic bacteria that thrive in environments lacking oxygen, such as the back of the tongue and deep gum pockets. The polyphenols found in tea include chemicals called catechins and theaflavins. Catechins are found in both green and black teas, while theaflavins are found predominantly in black tea. Be cautious though, tea can also stain teeth.
Top 10 Worst Home Remedies for Bad Breath

- Excessive mouthwash use; this produces sloughy, bad smelling tissue that is worse than your breath!
- Breath mints and long lasting sugar candies subject your teeth to acid attacks and increase your risk for cavities.
- Chewing gum only masks bad breath and is a temporary fix.
- Mint chewing tobacco or smokeless tobacco causes gums to recede and increases the chance of losing the bone and fibers that hold your teeth in place. It can cause oral cancer.
- Infomerical items use items that have the ADA Seal of Approval but that doesn’t mean they’re technically ADA approved as a whole. Unapproved items could do more harm than good.
- Alcohol will cause dry mouth, causing bad breath.
• Brushing with cleanser it is poisonous and dangerous! Don't laugh - people actually do this in hopes of utilizing the strength of the cleanser to kill odors and bacteria!

• Intestinal cleansing methods don’t work. Bad breath generally does not originate from the stomach unless there are underlying issues. Anaerobic bacteria in your mouth is what produces bad breath.

• Using mouth rinses with alcohol dries out gum tissue and only covers bad breath. It does not deal with the cause.

• Tongue piercings allow you to harbor more bacteria on your tongue where sulfur compounds that cause bad breath live.

More ways to fix or battle bad breath

Here are some more ways to banish bad breath - hopefully for good.

• **Stay hydrated.** If you can't brush your teeth after a meal, drinking a lot of water can help speed up the process of cleaning harmful bacteria and debris from between your teeth. Drinking milk can even help deodorize some offensive breath odors.. Avoid sugary drinks.

• **Chlorophyll** is a natural breath freshener and is found in leafy green vegetables like parsley.

• **A few drops of peppermint or tea tree oil** can be applied to the tongue or toothbrush to help freshen the breath. In addition to its refreshing nature, their antibacterial properties will kill the bacteria found in the mouth.

• **Baking soda** has a long history of being used to maintain good oral health and for fighting bad breath.
• A mixture of 50% hydrogen peroxide and 50% water can be swooshed around in the mouth and used as a mouthwash. Hydrogen peroxide can kill many of the bacteria that can cause bad breath.

• **Don't drink too much coffee.** It may be tasty, but coffee is a tough smell to get off the back of your tongue. Consider switching to an herbal or green tea.

• **Don't smoke or use other tobacco products.** Cigarettes, pipes, and snuff can foul your breath. "Smoking can give people horrible breath," Dr. Woodall says. "And some people carry this stuff worse than others."

• **Cut back on alcohol.** Alcohol can lead to a dry mouth. Consuming too much beer, wine, and/or hard liquor can make your breath smell for up to 10 hours after you finish drinking.

• **Chew sugarless gum.** Doing so 20 minutes after a meal can help with saliva flow. Gum that's 100% xylitol-sweetened can help reduce cavities, but it's also provides a cooling sensation that gives you nice, fresh breath also.

• **Be careful with breath mints.** Sugar-free mints are okay for a quick fix; but, they only mask the offensive smell and don't do
anything to remove harmful bad bacteria. If you’re tempted to pick up a sugary mint as you leave your favorite restaurant restrain yourself, don't do it. The sugar will only sit in your mouth and on your teeth, making the problem worse.

**Why garlic is the bad breath king**

When you eat garlic you produce several sulfur-containing gases, lead researcher Fabrizis Suarez, MD, PhD, tells WebMD. "But what we found is most of the sulfur-containing gases, with exception of one, [are of oral origin]. AMS [allyl methyl sulfide] is the only one that is not metabolized by [intestine] or the liver, and this is why this gas can go back and be released in your mouth. It's coming from the [gut], not from the mouth, and that is what gives you the odor that you have after you eat garlic." Suarez is an assistant professor at the University of Minnesota and on the staff at the Minneapolis VA Medical Center.

This paper gives us the idea that sometimes you can have halitosis -- if you want to call the odor of garlic 'halitosis' -- that can come from the intestine instead of your mouth," he says. "But in most cases, the gases [that cause] halitosis are coming from your mouth, from the bacteria that is [on] the tongue.

Suarez and colleagues tested the mouth air, lung air, and urine from five healthy volunteers (with no history of halitosis) on two
separate occasions. On one day they were given 6 grams of raw garlic to eat, on the other day no garlic was eaten. On the day when no garlic was eaten, the researchers detected low levels of three sulfur-containing gases in the mouth air, indicating that the mouth usually contains low concentrations of these gases. In contrast, when garlic was eaten, the researchers found higher concentrations of those three gases, plus two other sulfur-containing gases. For all gases except allyl methyl sulfide, the concentration of gas was much higher in the mouth air than in the lung air or the urine, suggesting that they originate in the mouth.

Conversely, AMS concentrations in mouth air remained high for the four hours after garlic ingestion and were similar to levels in the alveolar [lung] and urine samples, indicating that this gas had undergone absorption form the gut and was being released from systemic sites," write the authors. In other words, the gas was going into the blood, circulating around the body, and being excreted in the breath and urine.

The researchers also showed that, after the five subjects brushed their teeth with toothpaste containing baking soda and hydrogen peroxide, levels of the orally generated sulfur gases went down to almost nothing -- but not the levels of allyl methyl sulfide, which remained pretty high.

"If you eat garlic, it doesn't matter what you do," Suarez says. "You are always going to smell some garlic."

In an article that appeared in the journal Gastroenterology, William Hasler, MD, responds to this issue by proposing the possibility of bad breath, or halitosis, help in the form of a dietary supplement.
"Finally, the findings [of this study] raise the question as to whether a dietary supplement could be developed that assists in gut metabolism of gases such as allyl methyl sulfide so that garlic lovers could enjoy their meals in much the same manner as supplemental lactase has allowed milk-intolerant individuals to tolerate dairy products," he writes.

Allyl methyl sulfide aside, Suarez says you can decrease the amount of sulfur-containing gases, created by garlic and other culprits, in your mouth by brushing your tongue, where many bacteria live.

Suarez offers one more solution to bad breath he discovered from his new study: "We used H$_2$O$_2$ -- hydrogen peroxide -- you gargle with that for one minute," he says. "It is very cheap, and you can decrease the sulfur-containing gases for eight hours."

**Ooh!, that smell: what to do if it's coming from you**

Bad breath can be embarrassing and it can be masking gastric problems, sinus infections, or severe gum disease," says Mark Wolff, DDS, PhD, director of operative dentistry at State University of New York at Stony Brook, who discussed advances in treating bad breath at the recent annual meeting of the American Academy of General Dentistry in New York City.

Today, he says, dentists are much more capable when it comes to treating bad breath.

About 75% of bad breath stems from the mouth, he tells WebMD, and is caused when decay and debris produce sulfur compounds that cause foul odor.
Better treatment begins with improved detection; that starts with new devices, such as the Halimeter, that can detect the amount of sulfur-producing bacteria in the mouth.

"Licking the back of your hand, letting it dry, and smelling it is still a powerful tool to see if you have bad breath, but now we can quantify it," says Wolff.

Along with good oral hygiene, some of the most promising treatments are mouthwashes, toothpastes, and other oral products that contain both chlorine dioxide and zinc.

"Zinc stops an enzyme from breaking down an amino acid that makes the sulfur -- and by doing this stops the process for a longer period of time -- while the chlorine dioxide kills the already formed bacteria," Wolff tells WebMD. "These products pack a one-two punch."

His advice to people with bad breath?

"Look for a product containing zinc and chlorine dioxide," he says. Often such products can eliminate bad breath for up to eight hours.

Another breeding ground for odiferous bacteria is a dry mouth”, he says.
An as-yet-unpublished study from SUNY Stony Brook found that when mouths are dried out, there's a six-fold increase in such sulfur compounds.

“The dryer the mouth, the less saliva, and the worse the breath, Wolff explains. Alcohol as well as some medications -- including antidepressants, asthma drugs, antihistamines, and some blood pressure medications -- may dry the mouth out”, he says.

"You have to get to the bacterial source and turn it off," he says. Try tongue rakes that gently scrape bacteria off the tongue”, says Wolff, “and clean between the teeth with floss.”

Daniel Lippiner, DDS, a periodontist and halitosis specialist in Manhattan, agrees that the first step toward treating bad breath is to isolate the cause.

"Treatment is dependent on what's found and what the reasons are," he says, "If the cause is gum disease then we treat the gum disease -- if it's caused by calcium deposits on the tonsils that are bad smelling, we can remove them from the folds of the tonsils."
Good solutions for bad breath

There's an old saying that nothing is certain in life but death and taxes. But add one more thing to the list -- bad breath. Just about everyone has had it.

At least 50% of the adult population has bad breath at one point or another, and just about everyone has it in the morning," says Andrew Spielman, DMD, PhD, associate dean for academic affairs and professor of basic science and craniofacial biology at the NYU College of Dentistry.

According to Spielman, 90% of bad breath is caused by bacteria, which break down food and salivary proteins in the mouth and, in the process, "release odorous compounds." Bacteria hide out on the tongue, which works much like Velcro to trap bad odors. Morning is the worst time because our mouths have been dry all night, giving bacteria plenty of time to work their smelly magic.