

Distinguishing Subjective Halitosis

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Abstract

Halitosis is chronic, endogenous malodor that is etiologically classified from type 1 to 5: oral, airway, gastroesophageal, blood-borne and subjective respectively.

Subjective halitosis, which may appear in clinically neurologic (neurogenic) or psychologic (psychogenic) forms, cannot be confirmed by using tests or performing visual inspection despite insistent complaints of malodor by the patient.

Neurogenic forms mainly consist of chemosensory dysfunctions (dysguisa, dysosmia) and self-halitosis (retronasal olfaction, bloodborne olfactory receptor responses, phantosmia); whereas psychogenic forms are olfactory hallucinations, halitophobia, olfactory obsession, and delusional halitosis.

This article reports clinically important properties of subjective halitosis that may be difficult to manage and provides a tool to aid dental practitioners. Practitioners can identify suspected subjective halitosis cases by asking patients simple questions to distinguish between subjective and objective forms.

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Halitosis is chronic, endogenous malodor and etiologically classified as follows: physiologic (type 0), oral (type 1), airway (type 2), gastroesophageal (type 3), bloodborne (type 4), and subjective (type 5).¹ Subjective halitosis is malodor that cannot be confirmed by others and no local or systemic cause exists despite the patient's complaints.¹ As much as 27% of halitosis cases are classified as subjective.² On the other hand, some studies demonstrated that the percentage of patients diagnosed with subjective halitosis was 38.5% (n = 252).³ While many studies give different percentages, it can be

presumed that perhaps as many as a third of halitosis cases are considered to be subjective or lack objective reasoning.

Recently, the terminology and definition for subjective halitosis were revised and redefined.^{1,4} Accordingly, subjective halitosis can appear in two clinical forms: neurogenic or psychogenic (Figure 1). Subjective halitosis, also known as nonmeasurable halitosis, has no psychopathologic connotations.

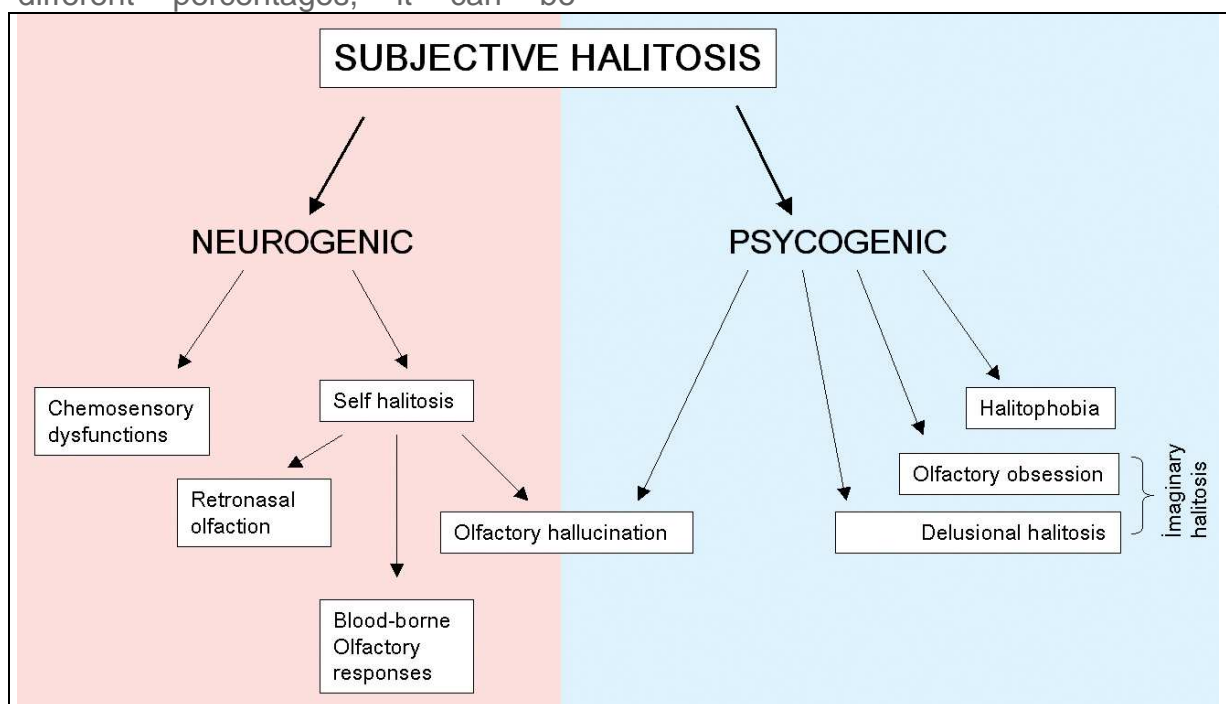


Figure 1. Subjective halitosis classification. In neurogenic forms of subjective halitosis, there is a real olfactory stimulation that can be at sensor level (self-halitosis) or perception level (chemosensor dysfunctions). This is lacking in the psychogenic forms that are sequentially appear halitophobia, obsessional, or delusional disorders, including olfactory reference syndrome.⁴

Table 1. Neurogenic Forms of Subjective Halitosis and Related Conditions (chemical stimuli exist at olfactory receptors) ⁴	
Neurogenic Form of Subjective Halitosis	Related Condition
Chemosensory dysfunction	Dysosmia, Dysguesia, Cacosmia, Hyperosmia, Parosmia, Olfactory (including taste) receptor dysfunctions
Self-halitosis	Retronasal or dorsolingual olfaction Bloodborne olfactory receptor responses Olfactory hallucination (phantosmia)*

Neurogenic forms of subjective halitosis (Table 1) have been extensively reviewed.⁴ In this form, there is a real chemical stimulus on the olfactory cells, but odorants are not emitted from the mouth to the environment. Essentially, only the patient perceives the odor. Conversely, in cases of psychogenic forms of subjective halitosis (Table 2) no chemical stimulus is triggered at the receptor level. If an objective halitosis case is not treated for a long period, psychogenic forms may manifest at any time for no other reason. The length of this time period depends on the patient's psychological resilience in compensating for stressors.¹ Halitophobia is the initial psychogenic form of subjective halitosis that arises when objective halitosis is prolonged. Halitophobia refers to fear of halitosis and is the simplest and earliest form of subjective halitosis.

Table 2. Psychogenic Forms of Subjective Halitosis and Related Conditions (chemical stimuli do not exist at olfactory receptors)		
Psychogenic Form of Subjective Halitosis	Related Condition	
Halitophobia	Halitosis anxiety Body odor psychosis Hypochondriasis Emotional disorder	
Imaginary halitosis	Olfactory obsession	Obsessive compulsive disorder
	Delusional halitosis	Olfactor delusion Monosymptomatic hypochondriacal psychosis Olfactory reference syndrome (ORS) Chronic olfactory paranoid syndrome Dysmorphic body odor Dysmorphophobia Delusional bromosis Somatic delusional disorder

Patients with types 1, 2, 3, and 4 halitosis (objective types) with a proclivity for social anxiety disorder typically have difficulty overcoming

their angst regarding oral malodor.⁵ Social anxiety disorder is defined as marked fear or anxiety about one or more situations in which the individual is exposed to possible scrutiny by others.⁶ Examples include social interactions (eg, having a conversation, meeting unfamiliar people), being observed (eg, eating, drinking), and performing in front of others (eg, giving a speech). Patients with objective halitosis may be uncomfortable with their oral malodor and avoid contact with others in public areas for fear of being criticized.

Moreover, many patients feel some sort of emotional distress, regardless of the actual degree of halitosis.⁷ Most phantosmia (olfactory hallucination)⁸ or anxiety episodes tend to disappear over time depending on the severity of the disease or emotional stress. Patients may not require psychotherapy if they receive appropriate halitosis treatment as soon as possible.

Three psychogenic forms can be recognized in subjective halitosis (Figure 1)⁴: halitophobia, olfactory obsession, and delusional. Halitophobia is the first type that appears and usually can be easily treated without psychologic medication by convincing the patient that the halitosis has just been successfully treated; thus, the complaint of halitosis will dissipate.

If halitosis is prolonged without treatment, the next psychogenic form, olfactory obsession, arises. It is characterized by intrusive repetitive behaviors, such as brushing teeth or rinsing the mouth dozens of times, and varying degrees may overlap phenomenologically and neurobiologically with obsessive-compulsive disorder. Obsessive-compulsive disorders are defined as recurrent and persistent ideas, thoughts, impulses, or images that are

experienced as intrusive and inappropriate and that cause marked anxiety or distress.⁶ In cases of olfactory obsession, the patient is constantly repeating the behavior and/or thinking about the condition. When olfactory obsession and halitosis are prolonged, delusional forms of subjective halitosis arise. These are characterized by showing reference to other people's behaviors. For example, patients think that people ridicule them, escape from them, turn their faces away, or open windows because of their halitosis. The latter two forms (olfactory obsession and delusional halitosis) are called imaginary halitosis.⁴ Imaginary halitosis can be healed by psychiatrists only. Each is a different stage or form of subjective halitosis, but there are not sharp boundaries between them.

Patients with subjective halitosis might first visit a dental practitioner, who may have difficulty distinguishing between objective and subjective halitosis. Moreover, confusion or even misdiagnosis may occur. The following sections of this article discuss tips and caveats for diagnosis of subjective halitosis.

Criteria for Identifying Subjective Halitosis

Currently used clinic protocols may not be sufficient to distinguish between subjective and objective halitosis. Examination methods to measure halitosis are self-assessment, other people's assessments, organoleptic tests, chemical-enzymatic tests, and halitometry.⁹ Patients seek consultation concerning malodor usually because of self-assessment and other people's assessments (feedback); these are considered the most decisive and summative measurements for halitosis.⁹ Other known methods, such as chemical and enzymatic tests, detect only oral bacteria or bacterial metabolites

instead of halitosis. The presence of bacteria, however, does not truly reflect the existence of halitosis. Likewise, the usefulness of organoleptic examination (sniffing the mouth by examiner), which is assumed to be a reliable method for diagnosis, has recently been challenged.⁹ This is because this method is extremely subjective, emotional, instinctive, learnable, intuitive, and also related to the socioeconomic background¹ or the examiner's experiences. It also lacks an international calibration and standardization and is not clinically reproducible.^{9,10} Furthermore, a sniffing examination has been found by patients to be outdated, primitive, shameful, and even repulsive.

Halitometers are gas detectors. Though they measure particular gases, they do not measure halitosis. When present, halitosis is composed of nearly 700 organic, nitrogen, or sulfur gases.¹¹ A concentration of one gas captured in one moment does not reflect an average halitosis level of the patient, because these levels fluctuate throughout the day, even as often as every 2 minutes.¹² Although an efficient gas measurement protocol for separating oral, nasal, and alveolar odor, and measuring capacity to produce oral malodor has been described,¹³ diagnosis of halitosis should be based mainly on self-assessment or other people's assessments. This approach to examination of halitosis lends itself to handling subjective cases.

Traditionally, halitosis examination includes checking the patient's saliva (pH level and volume), caries status, potentially flawed dental restorations (eg, crowns that are too long, too short, or maladjusted; overflowing fillings; nonhygienic pontics; rough surfaces on prostheses), tongue coating, gingival index, and periodontal and systemic

health status. Cases that lack biologic causes for objective halitosis, which include poor oral hygiene, flawed restorations, infectious foci in the mouth or tongue coating, and systemic disorders including paranasal, gastric, hepatic, pulmonary, urinary, endocrin, metabolic, degenerative, autoimmune, respiratory, or intestinal diseases, may require psychiatric consultation. Moreover, patients who give answers to halitosis-related questions (Table 3) that may be indicative of subjective halitosis can be prediagnosed as having this condition, and the clinician might consider referring such patients for psychiatric care.

Questions for Subjective Halitosis

Some signs of subjective halitosis may arise while consulting with the patient. Halitophobia can be categorically differentiated from other psychogenic forms. The patient may complain about fear of having halitosis. Repetitive behaviors or obsessive thoughts may not be obvious to a dental

practitioner.¹³ This can be simply categorized as anxiety and could indicate a psychiatric disorder.

Common indications of imaginary halitosis (ie, olfactory obsession or olfactory reference syndrome [ORS]) include: referential thinking (eg, interpreting remarks by others); repetitive behaviors or thoughts (eg, excessively brushing, washing, changing clothes, asking other people about the odor); and social anxiety (avoidance of social activities).¹⁴ ORS is a mental disorder in which the patient has a persistent, false belief about and preoccupation with emitting abnormal body/oral odor(s) that is foul and offensive to other individuals.⁶ It is a clinical condition that may potentially be a delusional form of subjective halitosis when oral malodor complaints are accompanied by complaints of body malodor as well. Patients with subjective halitosis may feel they have no halitosis when they are alone.

Table 3. Screening Questions and Prominent Answers of Patients With Halitosis		
Suggested Questions	Subjective Halitosis (Type 5)	Objective Halitosis (Types 1 through 4)*
1. Does your breath smell bad?	Halitophobia: I am in doubt if it smells bad. Others: Yes	Yes
2. Does any other part of your body smell bad, too?	Imaginary forms: Yes	
3. How do you know you have halitosis?	Imaginary forms: Refer to people's reactions Other forms: Self-perceive halitosis	
4. How long have you had halitosis?	Imaginary forms: Since childhood	
5. Do other people have halitosis, according to you?	Imaginary forms: No	
6. Do you remember someone in your past who taunted you with your halitosis?	Imaginary forms: Yes	
7. Do you perceive a particular taste on your tongue or throat at the moment when you think you have halitosis?	Neurogenic forms (except olfactor receptor specific dysfunctions): Yes Psychogenic forms: No	Type 1: Yes Others: No

8. Do you complain about your halitosis when you are alone?	Neurogenic forms: Yes Psychogenic forms: No	Yes
9. Do you have halitosis when/if your lips are closed?	Yes	No (except some type 2 or type 4 halitosis patients)
10. How long has the longest interruption of your halitosis been?	No interruption for even 1 minute (except some halitophobia patients)	Hours, or even days
11. Do you self-perceive your halitosis?	Neurogenic forms: Yes Psychogenic forms: No	
12. How many particular malodors do you distinguish in your mouth?	Neurogenic forms: Usually 1, rarely few Psychogenic forms: Always many	1, sometimes few
13. Is there anything you feel an urge to do often and repeatedly to lessen your worries about your malodor?	Imaginary forms (especially olfactory obsession): Brushing teeth, cleaning, rinsing	
14. Do others avoid you?	Halitophobia: Sometimes Imaginary forms: Yes	
15. Do you avoid people to hide your halitosis?	Halitophobia: Usually no Imaginary forms: Yes	
16. Do you avoid participating in social activities due to your halitosis?	Neurogenic forms: No Imaginary forms: Yes	
17. Do you or did you have a family history of psychiatric disorders in your family?	Imaginary forms: Maybe yes	
18. Does your halitosis disappear when you put a piece of ice in your mouth?	No (except chemosensory dysfunctions)	Type 1: Yes Others: No
19. Do you have trouble smelling?	Chemosensory dysfunctions: Yes	
20. Did you receive information about your olfactory disorder and its potential consequences from another healthcare professional? Were you given prognostic information?	No	

Table 3 lists suggested screening questions that may be used to assist clinicians in classifying suspected subjective halitosis versus objective cases. These questions are not a test to diagnose or monitor halitosis. Rather, they serve as a useful tool for obtaining particular information about whether a patient's halitosis may be subjective. They also provide the practitioner with a preliminary assessment about which form of subjective halitosis, if any, the patient may have. Therefore, statistical analysis has not yet been attempted for these questions. Some questions

were based on the authors' experiences in their practice, while some were adapted or modified from other researchers.¹⁵⁻¹⁹ The purpose of and reasons for each question are as follows:

Question 1: Separates halitophobia from other subjective forms.⁴

Question 2: Usually more than one site of origin, such as a foot or skin, is reported by patients with ORS.²⁰

Question 3: Separates imaginary (delusional and obsessive) forms from halitophobia, neurogenic forms, and

objective halitosis. Imaginary forms refer to either reactions of others or self-perceived malodor. The latter is due to the fact that patients with objective halitosis may not be aware of the condition or have become inured to their own malodor for a period,²¹ but they do not refer to others' behaviors. Patients with imaginary forms, eg, ORS patients, infer from other people's behaviors. They often misinterpret others' behaviors, eg, touching their nose with a finger, or opening a window in the room, or sniffing, as being referential to their malodor, which, in reality, is nonexistent and/or undetectable by others. Patients with objective halitosis, on the other hand, do not refer to others' behaviors.

Question 4: Patients with imaginary halitosis usually think they have had halitosis since their childhood or teenaged years. In fact, they have no halitosis but believe they have had it their whole lifetime. Conversely, patients with objective halitosis give a reasonable period for the onset of their halitosis, eg, a few months or years. If a patient gives an exact date of when his or her halitosis began, it is usually a case of objective halitosis. On the contrary, if an adult patient discloses that the halitosis began as an infant, it is probably a case of imaginary halitosis.²²

Question 5: Patients with subjective halitosis think other people do not have halitosis, even if they disregard regular oral hygiene care.

Question 6: Psychological trauma, such as ridicule or others publicizing a patient's halitosis, may cause mental or psychological injury. This may, thereafter, yield subjective halitosis and related disorders,²³ or any existent subjective form of halitosis. If a patient discloses such psychological trauma, any imaginary form of subjective

halitosis should come into question as a potential disorder.

Question 7: Separates neurogenic forms of subjective halitosis (retronasal or dorsolingual olfaction, dysgusie, chemosensory dysfunctions) from psychogenic forms of subjective halitosis and objective halitosis.

Question 8: The core issue for patients with subjective halitosis is worrying about what others think.²⁴ They do not complain about their halitosis when they are not around other people.

Question 9: Patients with subjective halitosis usually believe they have halitosis even when their lips are closed. Patients with neurogenic forms of halitosis continue to perceive malodor because their receptor level stimuli continue even when lips are closed. Rarely, people with type 2 (airway) halitosis have malodor self-perception even if lips are closed, because in such cases odorants are exhaled through the nasal cavity by contacting olfactor tissues.

Question 10: Patients with subjective halitosis report the oral malodor is continuously present.²⁰ Objective halitosis is usually interrupted by antiseptic or zinc-containing oral products, or can sometimes stop spontaneously within days. A long period between complaints of halitosis is an indication of objective halitosis. Halitophobia patients may give unreliable answers to this question.

Question 11: Patients with psychogenic forms of halitosis may not directly self-perceive their halitosis, while patients with neurogenic or objective halitosis may.

Question 12: In a study, 57% of cases had fixed odor beliefs, while the remaining 43% expressed doubts

regarding the veracity of their beliefs.²⁵ Patients with psychogenic halitosis usually assert that at least several bad odors exist in their mouths and may even describe having dozens of such odors. Other patients (with neurogenic forms of subjective halitosis and any type of objective halitosis) complain of having only one or maybe a few kinds of bad odor in their mouths. The kind of odor (eg, urine-like or sulfurous) has no diagnostic value. Every sniffer can potentially identify one odor differently; for example, one sniffer may identify an odor as “putrid” while the other may consider it “rotten.” Odor kind is a highly subjective criterion and is not clinically important. On the other hand, odor count is a better indicator of whether or not the case is a psychogenic form of subjective halitosis.

Question 13: This question is designed to help detect repetitive behaviors, such as repeatedly brushing teeth, washing, or smelling themselves.¹⁷ Such behaviors may indicate OCD or ORS; however, precise diagnosis should be made by a mental health professional.

Questions 14 through 16: Patients with ORS often avoid other people or believe that others avoid them,^{17,25,26} while patients with halitophobia may not avoid being around other people. A hidden key here is whether or not the person covers their mouth with their hand. To “cover mouth” while talking is a differential key. Halitophobia patients cover their mouth, but patients with imaginary halitosis tell other people to cover their mouth. This nuance helps differentiate halitophobia from imaginary forms.

Question 17: In some cases, psychogenic halitosis may be a part of

pre-existing psychopathologic disorders. Familial forms of mental diseases are not uncommon. In one study, 24% of subjects with subjective halitosis answered “yes” to having a family history of psychiatric disorders.⁷ This question is intended to unveil such a condition.

Question 18: When the mouth cavity is cooled with ice, odorous gases, if any exist, collapse, thus becoming nonvolatile, and, based on the authors’ clinical experience, the oral malodor suddenly disappears briefly. While a piece of ice is present in the mouth cavity, taste and olfactory receptors dispersed in the mouth or throat are cooled by the ice, chemical stimulus of odorous gases on receptors decreases, or less information is transported to the brain. Cooling the mouth is a useful tool for distinguishing chemosensory dysfunctions or type 1 halitosis from the other types.

Question 19: The question of whether the patient has trouble smelling has been validated on patients (N = 93) with chemosensory dysfunction. Sensitivity and specificity of this question was calculated at 0.95 and 0.64, respectively, with standard deviation of 0.09. Predictivity value for a negative answer was estimated to be 0.99.¹⁸

Question 20: This question has been validated by asking it of patients with olfactory disorders, most of whom have psycho-olfactory sensitivity, eg, smell ability is reduced (hyposmia) or completely disappeared (anosmia). A total of 111 (60%) of 184 subjects who had previously seen a physician reported they received unclear, unsatisfactory, or no information about their disorder. Thirty percent (n = 55) reported they did not receive any information about their prognosis.¹⁹ Patients both with

neurogenic halitosis and subjective halitosis usually think practitioners are incompetent.^{17,20}

Most healthy people can rationally dismiss halitosis concerns. This normal level of concern for halitosis constitutes the physiologic aspect of psychogenic halitosis.¹ Criteria for recognizing the pathologic aspects of subjective halitosis, as described here, help determine how patients are affected within their social interactions or how their comfort is distorted by the halitosis. These 20 questions are aimed at helping clinicians determine whether the patient should be referred for a psychiatric consultation.

Some authors advise scattering psychologic questions among medical questions so that they are less obvious.²² However, this may confuse patients. Asking psychologic questions in a successive and systematic manner will expedite patients' thinking or help them focus their memories. Thus, their answers may be more clear, concise, and consistent.

Case Examples

Today, halitosis examination schema is applied as follows: If halitosis cannot be detected by instruments or if the patient's complaints continue despite improvements in his or her oral hygiene, then the patient should be referred to other health professionals, such as psychiatrists, due to the possibility of the case being psychologic halitosis.

However, halitosis is not a simple disorder; virtually any case could contain objective or subjective components intertwined. Subjective halitosis and its clinical forms should be distinguished during the first stage of the halitosis examination, not the last. Halitosis treatment should be pursued together with immediate psychotherapy when or if needed.

Two example cases are presented here. A 30-year-old woman complained about having five different bad odors in her mouth since she was 18, and the odors had been uninterrupted. She answered "yes" to questions 1 and 5, and answered "no" to questions 8, 11, and 13 through 16. Halitometrically organic ammonia (NH₃), sulfur dioxide (SO₂), hydrogen sulfide (H₂S), and hydrogen (H₂) gases were measured under normal levels in the mouth and nose cavities using a previously described method.¹³ The patient's oral health was excellent, but she was constantly fearful of halitosis. The patient was prediagnosed with halitophobia and referred to a psychiatrist. After receiving treatment for social phobia with clomipramine, she completely healed within 11 months. The patient has not received oral therapy.

In another case, a 55-year-old man said he had seven or eight malodors in his breath since childhood without interruption. He complained that other people avoided him because of his perceived bad odor. He answered "yes" to questions 1, 2, 9, and 13 through 16, and "no" to questions 5, 8, 10, 11, and 18. Oral, nasal, and alveolar halitosis measurement with a described method¹³ showed increased sulfur gases in his mouth cavity. Upon clinical examination, a poor dental restoration (nonhygienic bridge) and periodontal problems were found. He was given a diagnosis of type 1+5 halitosis. Thereafter, a psychiatrist diagnosed schizophrenia and immediately began medical treatment. After 2 months, the patient received dental treatment in which dental restorations were renewed, and his oral malodor halitometrically disappeared, though the patient's halitosis complaints continued before finally ending after 16 months.

Conclusion

The halitosis-related questions described above may help clinicians determine if a psychiatric consultation is necessary. Because patients with subjective halitosis tend to visit dentists first to address their concerns, dentists should be well-trained in and aware of subjective halitosis. Otherwise, misdiagnosis and unsuccessful treatments may occur. Furthermore, subjective halitosis patients may insistently continue to appeal to dental or medical clinics to get cured of what they think is objective halitosis, though it is not actually present.

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