



## NIDCD Fact Sheet | Taste and Smell

# Smell Disorders

### How common are smell disorders?

Your sense of smell helps you enjoy life. You may delight in the aromas of your favorite foods or the fragrance of flowers. Your sense of smell is also a warning system, alerting you to danger signals such as a gas leak, spoiled food, or a fire. Any loss in your sense of smell can have a negative effect on your quality of life. It can also be a sign of more serious health problems.

One to two percent of North Americans report problems with their sense of smell. Problems with the sense of smell increase as people get older, and they are more common in men than women. In one study, nearly one-quarter of men ages 60 to 69 had a smell disorder, while about 11 percent of women in that age range reported a problem.

Many people who have smell disorders also notice problems with their sense of taste. To learn more about your sense of taste, and how it relates to your sense of smell, read the NIDCD fact sheet "Taste Disorders" at <http://www.nidcd.nih.gov/health/smelltaste/pages/taste.aspx>.

### How does your sense of smell work?

Your sense of smell—like your sense of taste—is part of your chemosensory system, or the chemical senses.

Your ability to smell comes from specialized sensory cells, called olfactory sensory neurons, which are

found in a small patch of tissue high inside the nose. These cells connect directly to the brain. Each olfactory neuron has one odor receptor. Microscopic molecules released by substances around us—whether it's coffee brewing or pine trees in a forest—stimulate these receptors. Once the neurons detect the molecules, they send messages to your brain, which identifies the smell. There are more smells in the environment than there are receptors, and any given molecule may stimulate a combination of receptors, creating a unique representation in the brain. These representations are registered by the brain as a particular smell.

Smells reach the olfactory sensory neurons through two pathways. The first pathway is through your nostrils. The second pathway is through a channel that connects the roof of the throat to the nose. Chewing food releases aromas that access the olfactory sensory neurons through the second channel. If the channel is blocked, such as when your nose is stuffed up by a cold or flu, odors can't reach the sensory cells that are stimulated by smells. As a result, you lose much of your ability to enjoy a food's flavor. In this way, your senses of smell and taste work closely together.

Without the olfactory sensory neurons, familiar flavors such as chocolate or oranges would be hard to distinguish. Without smell, foods tend to taste bland and have little or no flavor. Some people who go to the

doctor because they think they've lost their sense of taste are surprised to learn that they've lost their sense of smell instead.

Your sense of smell is also influenced by something called the common chemical sense. This sense involves thousands of nerve endings, especially on the moist surfaces of the eyes, nose, mouth, and throat. These nerve endings help you sense irritating substances—such as the tear-inducing power of an onion—or the refreshing coolness of menthol.

## What are the smell disorders?

People who have a smell disorder either have a decrease in their ability to smell or changes in the way they perceive odors.

- ▶ Hyposmia [high-POSE-mee-ah] is a reduced ability to detect odors.
- ▶ Anosmia [ah-NOSE-mee-ah] is the complete inability to detect odors. In rare cases, someone may be born without a sense of smell, a condition called congenital anosmia.
- ▶ Parosmia [pah-OZE-mee-ah] is a change in the normal perception of odors, such as the smell of something familiar is distorted, or something that normally smells pleasant now smells foul.
- ▶ Phantosmia [fan-TOES-mee-ah] is the sensation of an odor that isn't there.

## What causes smell disorders?

Smell disorders have many causes, with some more obvious than others. Most people who develop a smell disorder have experienced a recent illness or injury. Common causes of smell disorders are:

- ▶ Aging
- ▶ Sinus and other upper respiratory infections
- ▶ Smoking

- ▶ Growths in the nasal cavities
- ▶ Head injury
- ▶ Hormonal disturbances
- ▶ Dental problems
- ▶ Exposure to certain chemicals, such as insecticides and solvents
- ▶ Numerous medications, including some common antibiotics and antihistamines
- ▶ Radiation for treatment of head and neck cancers
- ▶ Conditions that affect the nervous system, such as Parkinson's disease or Alzheimer's disease.

## How are smell disorders diagnosed and treated?

Both smell and taste disorders are treated by an otolaryngologist, a doctor who specializes in diseases of the ear, nose, throat, head, and neck (sometimes called an ENT). An accurate assessment of a smell disorder will include, among other things, a physical examination of the ears, nose, and throat; a review of your health history, such as exposure to toxic chemicals or injury; and a smell test supervised by a health care professional.

There are two common ways to test smell. Some tests are designed to measure the smallest amount of odor that someone can detect. Another common test consists of a paper booklet of pages that contain tiny beads filled with specific odors. People are asked to scratch each page and identify the odor. If they can't smell the odor, or identify it incorrectly, it could indicate a smell disorder or an impaired ability to smell.

Diagnosis by a doctor is important to identify and treat the underlying cause of a potential smell disorder. If your problem is caused by medications, talk to your doctor to see if lowering the dosage or changing the medicine could reduce its effect on your sense of smell. If nasal obstructions such as

polyps are restricting the airflow in your nose, you might need surgery to remove them and restore your sense of smell.

Some people recover their ability to smell when they recover from the illness causing their loss of smell. Some people recover their sense of smell spontaneously, for no obvious reason. If your smell disorder can't be successfully treated, you might want to seek counseling to help you adjust.

### **Are smell disorders serious?**

Like all of your senses, your sense of smell plays an important part in your life. Your sense of smell often serves as a first warning signal, alerting you to the smoke of a fire, spoiled food, or the odor of a natural gas leak or dangerous fumes.

When their smell is impaired, some people change their eating habits. Some may eat too little and lose weight while others may eat too much and gain weight. As food becomes less enjoyable, you might use too much salt to improve the taste. This can be a problem if you have or are at risk for certain medical conditions, such as high blood pressure or kidney disease. In severe cases, loss of smell can lead to depression.

Problems with your chemical senses may be a sign of other serious health conditions. A smell disorder can be an early sign of Parkinson's disease, Alzheimer's disease, or multiple sclerosis. It can also be related to other medical conditions, such as obesity, diabetes, hypertension, and malnutrition. If you are experiencing a smell disorder, talk with your doctor.

### **What research is being done on smell disorders?**

The NIDCD supports basic and clinical research of smell and taste disorders at its laboratories in Bethesda, Maryland, and at universities and chemosensory research

centers across the country. These chemosensory scientists are exploring how to:

- ▶ Promote the regeneration of sensory nerve cells.
- ▶ Understand the effects of the environment (such as gasoline fumes, chemicals, and extremes of humidity and temperature) on smell and taste.
- ▶ Prevent the effects of aging on smell and taste.
- ▶ Develop new diagnostic tests for taste and smell disorders.
- ▶ Understand associations between smell disorders and changes in diet and food preferences in the elderly or among people with chronic illnesses.



National Institute on  
Deafness and Other  
Communication Disorders



## Where can I find additional information about smell disorders?

The NIDCD maintains a directory of organizations that provide information on the normal and disordered processes of hearing, balance, taste, smell, voice, speech, and language. Visit the NIDCD website at <http://www.nidcd.nih.gov> to see the directory.

To find organizations with information specifically about smell disorders, click on “Taste and Smell” in the “Browse by Topic” list.

## Additional NIH publications on taste and smell disorders:

- ▶ Taste Disorders
- ▶ Problems with Taste, A Tutorial—at [NIHSeniorHealth.gov](http://NIHSeniorHealth.gov)
- ▶ Problems with Smell, A Tutorial—at [NIHSeniorHealth.gov](http://NIHSeniorHealth.gov)

Visit the NIDCD website at <http://www.nidcd.nih.gov> to read, print, or download fact sheets.

For more information, additional addresses and phone numbers, or a printed list of organizations, contact us at:

### NIDCD Information Clearinghouse

1 Communication Avenue  
Bethesda, MD 20892-3456  
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