



NIDCD Fact Sheet | Taste and Smell

Taste Disorders

How common are taste disorders?

Many of us take our sense of taste for granted, but a taste disorder can have a negative effect on your health and quality of life. If you are having a problem with your sense of taste, you are not alone. More than 200,000 people visit a doctor each year for problems with their ability to taste or smell. Scientists believe that up to 15 percent of adults might have a taste or smell problem, but many don't seek a doctor's help.

The senses of taste and smell are very closely related. Most people who go to the doctor because they think they have lost their sense of taste are surprised to learn that they have a smell disorder instead. (Read the NIDCD fact sheet "Smell Disorders" at <http://www.nidcd.nih.gov/health/smelltaste/pages/smell.aspx> for more information.)

How does your sense of taste work?

Your ability to taste comes from tiny molecules released when you chew, drink, or digest food; these molecules stimulate special sensory cells in the mouth and throat. These taste cells, or gustatory cells, are clustered within the taste buds of the tongue and roof of the mouth, and along the lining of the throat. Many of the small bumps on the tip of your tongue contain taste buds. At birth, you have about 10,000 taste buds, but after age 50, you may start to lose them.

When the taste cells are stimulated, they send messages through three specialized taste nerves to the brain, where specific tastes are identified. Taste cells have receptors that respond to one of at least five basic taste qualities: sweet, sour, bitter, salty, and umami [oo-MOM-ee]. Umami, or savory, is the taste you get from glutamate, which is found in chicken broth, meat extracts, and some cheeses. A common misconception is that taste cells that respond to different tastes are found in separate regions of the tongue. In humans, the different types of taste cells are scattered throughout the tongue.

Taste quality is just one way that you experience a certain food. Another chemosensory mechanism, called the common chemical sense, involves thousands of nerve endings, especially on the moist surfaces of the eyes, nose, mouth, and throat. These nerve endings give rise to sensations such as the coolness of mint and the burning or irritation of chili peppers. Other specialized nerves create the sensations of heat, cold, and texture. When you eat, the sensations from the five taste qualities, together with the sensations from the common chemical sense and the sensations of heat, cold, and texture, combine with a food's aroma to produce a perception of flavor. It is flavor that lets you know whether you are eating a pear or an apple.

Most people who think they have a taste disorder actually have a problem with smell. When you chew

food, aromas are released that activate your sense of smell by way of a special channel that connects the roof of the throat to the nose. If this channel is blocked, such as when your nose is stuffed up by a cold or flu, odors can't reach sensory cells in the nose that are stimulated by smells. As a result, you lose much of our enjoyment of flavor. Without smell, foods tend to taste bland and have little or no flavor.

What are the taste disorders?

The most common taste disorder is phantom taste perception: a lingering, often unpleasant taste even though there is nothing in your mouth. People can also experience a reduced ability to taste sweet, sour, bitter, salty, and umami—a condition called hypogeusia [hy-po-GYOO-zee-a]. Some people can't detect any tastes, which is called ageusia [ah-GYOO-zee-a]. True taste loss, however, is rare. Most often, people are experiencing a loss of smell instead of a loss of taste.

In other disorders of the chemical senses, an odor, a taste, or a flavor may be distorted. Dysgeusia [dis-GYOO-zee-a] is a condition in which a foul, salty, rancid, or metallic taste sensation persists in the mouth. Dysgeusia is sometimes accompanied by burning mouth syndrome, a condition in which a person experiences a painful burning sensation in the mouth. Although it can affect anyone, burning mouth syndrome is most common in middle-aged and older women.

What causes taste disorders?

Some people are born with taste disorders, but most develop them after an injury or illness. Among the causes of taste problems are:

- ▶ Upper respiratory and middle ear infections
- ▶ Radiation therapy for cancers of the head and neck
- ▶ Exposure to certain chemicals, such as insecticides and some medications, including some common antibiotics and antihistamines
- ▶ Head injury

- ▶ Some surgeries to the ear, nose, and throat (such as middle ear surgery) or extraction of the third molar (wisdom tooth)
- ▶ Poor oral hygiene and dental problems.

How are taste disorders diagnosed?

Both taste and smell disorders are diagnosed by an otolaryngologist (sometimes called an ENT), a doctor of the ear, nose, throat, head, and neck. An otolaryngologist can determine the extent of your taste disorder by measuring the lowest concentration of a taste quality that you can detect or recognize. You may be asked to compare the tastes of different substances or to note how the intensity of a taste grows when a substance's concentration is increased.

Scientists have developed taste tests in which the patient responds to different chemical concentrations. This may involve a simple "sip, spit, and rinse" test, or chemicals may be applied directly to specific areas of the tongue.

An accurate assessment of your taste loss will include, among other things, a physical examination of your ears, nose, and throat; a dental examination and assessment of oral hygiene; a review of your health history; and a taste test supervised by a health care professional.

Can taste disorders be treated?

Diagnosis by an otolaryngologist is important to identify and treat the underlying cause of your disorder. If a certain medication is the cause, stopping or changing your medicine may help eliminate the problem. (Do not stop taking your medications unless directed by your doctor, however.) Often, the correction of a general medical problem can correct the loss of taste. For example, people who lose their sense of taste because of respiratory infections or allergies may regain it when these conditions resolve. Occasionally, a person may recover his or her sense of taste spontaneously. Proper oral hygiene is important to regaining and maintaining a well-functioning sense of taste. If your taste disorder can't be successfully treated, counseling may help you adjust to your problem.

If you lose some or all of your sense of taste, here are things you can try to make your food taste better:

- ▶ Prepare foods with a variety of colors and textures.
- ▶ Use aromatic herbs and hot spices to add more flavor; however, avoid adding more sugar or salt to foods.
- ▶ If your diet permits, add small amounts of cheese, bacon bits, butter, olive oil, or toasted nuts on vegetables.
- ▶ Avoid combination dishes, such as casseroles, that can hide individual flavors and dilute taste.

Are taste disorders serious?

Taste disorders can weaken or remove an early warning system that most of us take for granted. Taste helps you detect spoiled food or liquids and, for some people, the presence of ingredients to which they are allergic.

Loss of taste can create serious health issues. A distorted sense of taste can be a risk factor for heart disease, diabetes, stroke, and other illnesses that require sticking to a specific diet. When taste is impaired, a person may change his or her eating habits. Some people may eat too little and lose weight, while others may eat too much and gain weight.

Loss of taste can cause you to add too much sugar or salt to make food taste better. This can be a problem for people with certain medical conditions, such as diabetes or high blood pressure. In severe cases, loss of taste can lead to depression. If you are experiencing a taste disorder, talk with your doctor.

What research is being done about taste disorders?

The National Institute on Deafness and Other Communication Disorders (NIDCD) supports basic and clinical investigations 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:

- ▶ Prevent the effects of aging on taste and smell.

- ▶ Develop new diagnostic tests.
- ▶ Understand associations between taste disorders and changes in diet and food preferences in the elderly or among people with chronic illnesses.
- ▶ Improve treatment methods and rehabilitation strategies.

Some recent chemosensory research focuses on identifying the key receptors expressed by taste cells and understanding how those receptors send signals to the brain. Researchers are also working to develop a better understanding of how sweet and bitter substances attach to their targeted receptors. This research holds promise for the development of sugar or salt substitutes that could help combat obesity or hypertension, as well as the development of bitter blockers that could make life-saving medicines more acceptable to children. Taste cells—as well as sensory cells that help you smell—are the only sensory cells in the human body that are regularly replaced throughout life. Researchers are exploring how and why this happens so that they might find ways to replace other damaged sensory cells.

NIDCD-funded researchers have shown that small variations in our genetic code can raise or lower our sensitivity to sweet tastes, which might influence our desire for sweets. Scientists are also working to find out why some medications and medical procedures can have a harmful effect on our senses of taste and smell. They hope to develop treatments to help restore the sense of taste to people who have lost it.

Scientists are gaining a better understanding of why the same receptor that helps your tongue detect sweet taste can also be found in the human gut. NIDCD-funded scientists have shown that the sweet receptor helps the intestine to sense and absorb sugar and turn up the production of blood sugar-regulation hormones, including the hormone that regulates insulin release. Further research may help scientists develop drugs targeting the gut taste receptors to treat obesity and diabetes.



National Institute on
Deafness and Other
Communication Disorders



Where can I find additional information about taste 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 taste disorders, click on "Taste and Smell" in the "Browse by Topic" list.

Additional NIH publications on taste and smell disorders:

- ▶ Smell Disorders
- ▶ Problems with Taste, A Tutorial—at NIHSeniorHealth.gov
- ▶ Problems with Smell, A Tutorial—at 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:

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The NIDCD supports and conducts research and research training on the normal and disordered processes of hearing, balance, taste, smell, voice, speech, and language and provides health information, based upon scientific discovery, to the public.



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