

Retrain Your Brain How to Smell Again

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STORY AT-A-GLANCE

- › Loss of sense of smell, a condition known as anosmia, is a common symptom of COVID-19 and also can be caused by aging, vitamin D deficiency, certain medications, diabetes, certain viral illnesses and many neurological conditions
- › The olfactory system is highly responsive to training; in one study, a 12-week smell training session significantly increased the sensitivity to detect odors in those with anosmia
- › The basis for smell training is that using a neural pathway, such as that used by your olfactory nerve cells, reinforces and strengthens it
- › To try it, all you need is four different fragrances, such as rose, lemon, clove and eucalyptus essential oils
- › Actively sniff each scent for about 20 seconds a couple of times a day, such as immediately after waking up and before going to bed; be sure focus your concentration on the scent while you're sniffing, trying to recall your experience of the scent

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Loss of sense of smell, a condition known as anosmia, has emerged as a hallmark symptom of COVID-19. It's estimated that 33.9% to 68% of COVID-19 patients¹ — and as high as 98%, according to one study² — experience some type of olfactory dysfunction,

which is often regarded as more of an inconvenience than an actual health threat. In reality, however, you may not realize how important your sense of smell is until it's gone.

When you lose your sense of smell, you also lose your normal sense of taste. In the case of COVID-19, anosmia often occurs alongside dysgeusia, an altered or impaired sense of taste.³ In fact, the combination of anosmia/dysgeusia was a far better predictor of COVID-19 than other common symptoms like fever/chills or respiratory difficulty.⁴

"It's mentally tough knowing the foods you used to love now simply taste like sewage. I no longer crave food or enjoy eating. It's a chore," Lucy Packman, a university student who developed COVID-19 along with anosmia in March 2020, told Medium.⁵

Beyond that, cutting off your sense of smell detaches you from the environment in ways that can be isolating – like an inability to smell your partner or your baby – or dangerous, such as missing the scent of something burning.

The silver lining in COVID-19 is that 89% of those with an altered sense of smell had complete resolution or improvement in severity after four weeks.⁶ For those whose smell impairment is ongoing, or caused by one of the many risk factors beyond COVID-19, smell training may be the key to regaining this invaluable asset.

What Causes Loss of Smell?

COVID-19 aside, there are many reasons why you may lose your sense of smell. The common cold is among the most common, along with other illnesses like influenza, sinus infections, hay fever and nonallergic rhinitis.⁷

Virtually anything that causes your nasal passageways to become obstructed, including tumors, nasal polyps or nasal deformity, can also interfere with your sense of smell, as can conditions that impair your olfactory pathways, which transmit messages between your nasal passages and brain.

A variety of neurological conditions, certain medications and even advancing age can also affect your sense of smell. As you age, especially beyond age 70, loss of nerve

endings and less mucus production in your nose may diminish smell, in part because mucus plays a role in keeping odors in the nose longer, so they can be detected by the nerve endings there.⁸

It's estimated that 62.5% of 80- to 97-year-olds have some type of olfactory impairment,⁹ while even about 12% of people over the age of 40 may have some trouble smelling, along with close to 25% of men in their 60s.¹⁰

One important side note: Those with vitamin D deficiency are more likely to have smell impairment, and researchers believe this deficiency may play a significant role in age-related smell and taste impairment.¹¹ This is especially relevant since vitamin D deficiency¹² is also linked to COVID-19. The following health conditions can also cause a dulling or diminishment of the sense of smell:¹³

Alzheimer's disease	Brain aneurysm	Brain surgery
Cancer	Chemical exposures to insecticides or solvents	Diabetes
Huntington's disease	Kallmann's syndrome	Klinefelter's syndrome
Korsakoff's psychosis	Malnutrition	Multiple sclerosis
Multiple system atrophy (MSA)	Paget's disease	Parkinson's disease
Pick's disease	Radiation therapy	Rhinoplasty
Schizophrenia	Sjorgren's syndrome	Traumatic brain injury
Zinc deficiency		

Lost Your Ability to Taste? It Could Be Anosmia

As mentioned, when you lose your sense of smell, your taste goes along with it. Ann-Sophie Barwich, a cognitive scientist and assistant professor in the department of history and philosophy of science and medicine at Indiana University Bloomington, explained in STAT:¹⁴

"Many people don't immediately recognize they've lost their sense of smell, but instead report they've lost their sense of taste. Most of what you think of as the taste of your food and drink, however, is actually due to smelling. When you chew, aromatic molecules are released from your food. These molecules travel up to your nose via the pharynx, the opening at the back of the throat that connects the mouth with the nasal cavity.

Think about it for minute. Your tongue detects salty and sweet, bitter and sour, umami (savory) and, according to recent research, fatty. There are no taste buds for mint or strawberry or vanilla. These flavors are created via 'mouth-smelling,' a process known as retronasal olfaction. It acts as a second sense of smell."

This is one reason why anosmia is far more than an inconvenience or minor annoyance. Not only can you no longer detect if you've eaten something spoiled, which would prompt you to quickly spit it out, you can no longer enjoy your favorite foods and the scents that go along with them.

Odor-evoked memories also come along with powerful emotions and are known to activate the "neurobiological substrates of emotional processing," according to neuroscientist Rachel S. Herz, an adjunct assistant professor of psychiatry and human behavior at Brown University.¹⁵

Research published in Learning and Memory even suggests that odors may modulate the dynamics of memory consolidation,¹⁶ and, by boosting mood, lowering stress and reducing inflammation, it's likely that the powerful emotions elicited by positive odor-evoked memories can influence psychological and physiological health.¹⁷

Without your sense of smell, however, you miss out on experiencing those powerful, odor-evoked memories. "Two of the great joys in people's lives are the sensations of

smell and taste," says Dr. R. Peter Manes, an ear, nose and throat specialist at Yale Medicine. "When these senses are altered or absent, people lose that pleasure and can feel isolated from those around them who are not afflicted."¹⁸

Losing Your Sense of Smell Is Linked to Serious Health Risks

In a study of 3,005 community-dwelling adults, those who had a dysfunctional sense of smell were more likely to die in the next five years than those with a good sense of smell. Olfactory function was deemed to be one of the strongest predictors of five-year mortality, and researchers suggested it may "serve as a bellwether for slowed cellular regeneration or as a marker of cumulative toxic environmental exposures."¹⁹

Another study of adults aged 71 to 82 also found those with "poor olfaction had a 46% higher cumulative risk for death after 10 years" compared to those with a good sense of smell, and poor olfaction was associated with a higher risk of death from neurodegenerative and cardiovascular diseases.²⁰

An inability to identify odors is also an early symptom of neurological disorders, including Alzheimer's disease and Parkinson's disease.²¹ Beyond the physical risks, losing your sense of smell can cause psychological distress. People with smell and taste disorders often report a negative emotional impact, including feelings of isolation and problems with relationships and day-to-day functioning.²²

Among COVID-19 patients, smell and taste loss were associated with depressed mood and anxiety, while fever, cough and shortness of breath were not, even though the latter may be harbingers of more dire COVID-19 outcomes,²³ highlighting the power that these senses have over your emotional well-being. In a Harvard Health Blog post detailing his own experience with loss of smell and taste, Leo Newhouse, LICSW noted:²⁴

"Our senses — smell, vision, hearing, taste, and touch — are bridges that connect us to the world we live in, to life itself. Knock out two of the five bridges, and 40% of our sensory input is gone. Senses add richness and texture to everyday life; they are intricately tied in with our emotions."

Retraining Your Nose How to Smell

Treating anosmia involves identifying its underlying cause and addressing it at the foundational level. Loss of smell due to a cold or influenza, for instance, should resolve along with the viral infection. In some cases, however, the cause of the olfactory dysfunction is unknown, making treatment difficult.

AbScent, an organization providing support to those affected by anosmia and other smell disorders, has developed the Sense of Smell Project in collaboration with patients with smell disorders and scientists.²⁵ They've developed a smell training app for members of the project, and also a simple smell training protocol designed to help those who have lost their sense of smell for two weeks or more to regain the sense.

The training is based on the protocol first described by professor Thomas Hummel of the Universitätsklinikum Carl Gustav Carus in Dresden, Germany.²⁶ He published research in 2009 showing that olfactory training involving exposure to four intense odors (rose, eucalyptus, lemon and clove) twice daily for 12 weeks led to an increase in olfactory function.²⁷

To try it, all you need is four different fragrances, such as those Hummel used – rose, lemon, clove and eucalyptus essential oils. Essential oils are ideal for scent training due to their highly concentrated scents. Once you've gathered your fragrances, actively sniff each scent for about 20 seconds a couple of times a day, such as immediately after waking up and before going to bed. AbScent explains:²⁸

"Open a jar and hold it close to your nose. Take some gentle sniffs for 20 seconds. During this time, concentrate on what you are doing. Keep your mind on lemon for instance, or one of the other smell training smells. Try to block out any intrusive thoughts. Be as attentive as you can and try to recall what your experience of lemon was. Close the jar after 20 seconds and take a few breaths. Then go on to the next jar."

Smell Training May Strengthen Neural Pathways

The basis for smell training is that using a neural pathway, such as that used by your olfactory nerve cells, reinforces and strengthens it.

According to cell biologist Nancy Rawson, associate director at the Monell Center in Philadelphia, in an interview with AbScent founder Chris Kelly, "... Not only is smell training helping the olfactory receptor cells, but it also is helping to create pathways in the brain that will be better able to receive, interpret and remember the information that it is getting."²⁹

Research trials suggest smell training is beneficial in many cases,³⁰ and, when used in people with a normal sense of smell, can enhance the sense to the level of a high-performing group of wine professionals. This suggests "the olfactory system is highly responsive to training," according to researchers in the journal *Chemical Senses*.³¹

In another study involving 10 anosmic patients and 14 healthy controls, a 12-week smell training session significantly increased the sensitivity to detect odors in the anosmic group, and modifications in the functional connections of networks used to process chemosensory input were also noted.³²

Another study in adults aged 50 to 84 found significant improvement in olfactory function after olfactory training (OT), along with improved verbal function and well-being, and decreased depressive symptoms, with researchers concluding, "OT may constitute an inexpensive, simple way to improve quality of life in older people."³³

Even if you feel it's too soon to try retraining your sense of smell, it's important to give the training a try. AbScent notes that "the earlier you begin, the greater the benefit to you in the long run."³⁴

Considering there's no risk involved to giving it a try, and the process takes only a few minutes a day using scents that are easily accessible, there's every reason to give scent training a try if you're experiencing any level of anosmia.

Also, as noted, since vitamin D deficiency is associated with smell and taste impairment, be sure to get your vitamin D levels tested and optimized. An overall healthy lifestyle will also support healthy olfaction, and exercising even one time a week – long

enough to break a sweat — may reduce your risk of losing your sense of smell as you age.³⁵

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