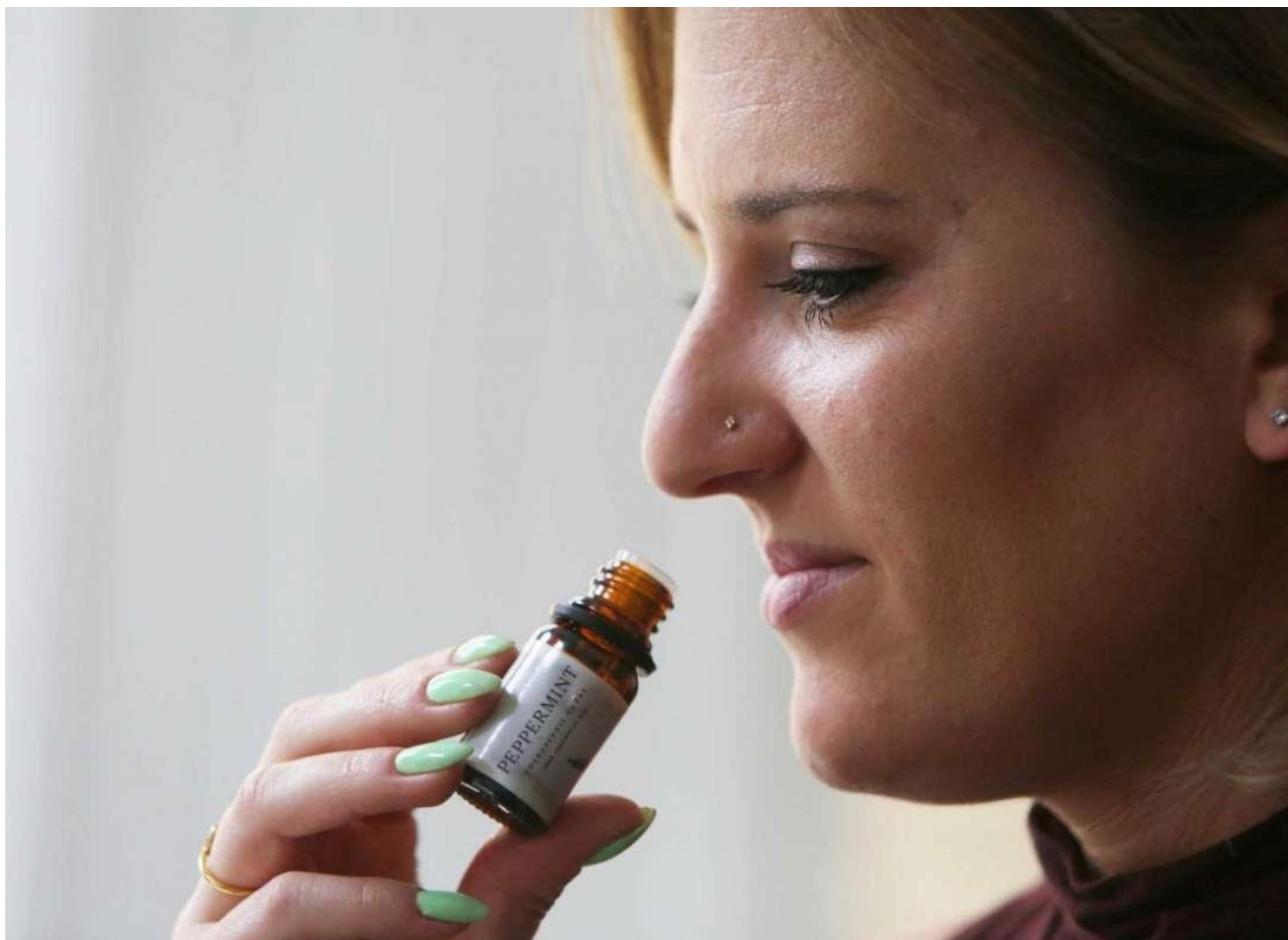


Can 'sniff training' restore COVID survivors' sense of smell?

[Nanette Asimov](#)

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Cat Berner of San Francisco, who lost her sense of smell when she got COVID-19 in October, smells an essential oil while conducting scent training.



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Cat Berner slid a chicken into the oven in November and turned to chopping vegetables. It didn't take long for her roommate to come running into the kitchen of their San Francisco flat, crying, "What's burning?"

Berner whirled around. "What are you talking about?"

Berner, 31, an executive assistant for a venture capital firm, remembers that day as a turning point in her continuing effort to regain the sense of smell stolen by the coronavirus. It happened a few days after she and her friends, who had pledged to socialize only with each other, had a Halloween party and gave each other COVID-19.

"It was a big wake-up call for me," Berner said of the day she charred the chicken and couldn't smell it scorching. "Losing your sense of smell seems like it could be taken lightheartedly, but it's very serious in some situations."

Now, with a persistent symptom that places her in the company of [CO VID long-haulers](#), Berner is undergoing the only known strategy doctors recommend to try to fix the problem: "sniff training."

Anosmia — a vanished sense of smell — is one of the most common [COVID side effects](#), affecting an estimated 60% of sufferers. In the U.S. alone, that's roughly 20 million people.

The good news is that the ability to recognize odors returns for [about 95% of them within six months](#), said Dr. Patricia Loftus, an otolaryngologist at UCSF who treats patients with post-COVID smell loss.

But that leaves about 1 million people in the U.S. alone with a lingering impairment — and little data to show what happens after that. A very small study of 51 COVID survivors published in June in the medical journal JAMA found that [4% of participants](#) — two people — had not regained their sense of smell eight months to a year after infection.

They are people with persistent anosmia, like Berner, who still can't smell whether the chicken is burning — or if the gas is on, or whether the milk is bad — long after recovering from COVID.

For some, including Berner, anosmia is only one of the lingering, COVID-induced olfactory dysfunctions. There is also parosmia, in which a whiff of perfume may instead smell like the inside of a kennel — highly distorted. And hyposmia, where smells are perceived only faintly. And phantosmia, phantom odors, like smelling burning chicken when it's just a salad for dinner.

At first, researchers wondered if the coronavirus was infecting nerves in the olfactory epithelium, a patch of tissue high in the nose near the base of the brain that helps people to smell.

But that's not quite what's going on.

"What we and others found was that the viral effects are mediated more through impact on support cells for the nerves," said Dr. Jonathan Overdevest, a rhinology expert at Columbia University Irving Medical Center in New York.

In other words, smell-perceiving nerves are like cell phone towers with antennas, he said. And support cells are like scaffolding around the towers.

The coronavirus appears to disrupt the scaffolding and the antennas, not the cell phone towers themselves.

"The loss of that scaffolding can make the towers more vulnerable," Overdevest said. "The towers still exist, but the antennas are being lost," reducing the ability to perceive odors. That can also change what things smell like.

Overdevest and a colleague, Stavros Lomvardas, have a grant from the National Institutes of Health to learn more about how the process works and what to do about it.

Still unclear is why most people who lose their smell from COVID recover, and why others don't, Overdevest said.

Clues to the mystery lie at the molecular level, beyond the reach of X-rays and MRIs. So the more researchers can understand what's happening at that level, the better chance they'll have at learning how to fix it, Overdevest said.

For now, sniff training is how people with long-term olfactory challenges most commonly try to strengthen the scaffolding around the cell phone towers of their nose, and perhaps restore the antennas.

"We like to say that sniff training is physical therapy for your smell," said Loftus, of UCSF.

One of her patients, Berner, prepared for her nasal workout the other day in her sunny San Francisco apartment, setting out four small bottles of concentrated plant liquids called essential oils.

Any strong fragrance will do, the thinking goes, from cologne to kitchen spices. But the prescription is generally the same: Sniff each for 15 seconds, twice a day. Avoid inhaling deeply. Instead, little "bunny sniffs" will aim the aromas at the right nasal receptors.

Berner unscrewed the first bottle and bunny sniffed for 15 seconds, taking about 20 tiny inhalations. Setting that bottle down, she opened the second and repeated the process, then did the same with the third and fourth.

The scents Berner chose were lemongrass, peppermint, lavender and tea tree. What she smelled were wet dog, smoke, rotten sweet and good sweet.

"It's pretty disheartening not to have huge improvement," Berner said, acknowledging that after so many months she can only bring herself to sniff train once a day.

Whether sniff training helps is unclear. Conclusive data is lacking, even though people have been losing their sense of smell from other viruses and from head trauma long before COVID-19 showed up.

Several research projects are under way, however, including a [clinical trial](#) with 240 participants with COVID-induced olfactory dysfunction. Researchers at the Washington University School of Medicine in Missouri hope to learn whether sniff training might work better if people simultaneously look at a picture of the aromatic object — a rose or a lemon, for example. They also want to test whether outcomes improve if the sniffers smell something they particularly enjoy, such as coffee, instead of a scent they dislike or have no connection with.

Some experts are also looking at whether steroids delivered to specific regions in the nose can improve symptoms.

“There are anecdotal reports of steroids helping, but there are a couple of well-done studies that didn’t see any benefit,” said Nancy Rawson, a cell biologist and vice president of the Monell Chemical Senses Center in Philadelphia, a nonprofit scientific research institute. “The balance right now is against it.”

Steroids are powerful anti-inflammatories. But if inflammation isn’t causing the loss of smell — if it’s caused by the loss of supporting cells, for example, that scaffolding for the nose’s cell phone towers — “a steroid may not be the right thing,” Rawson said.

In fact, it may be the wrong thing if the tissue is trying to regenerate, she said.

While excess inflammation can harm the body, “a little bit of inflammation actually helps promote regeneration,” Rawson said, because it sends the signal to tissues to begin healing.

The overall lack of certainty and solutions is frustrating, not only to people like Berner who have an impaired sense of smell, but to those whose job is to help them.

Doctors can provide glasses for the visually impaired and hearing aids or cochlear implants for people with hearing loss.

“But I don’t know anyone working on an olfactory simulator,” UCSF’s Loftus said. “We’re nowhere near that.”

“But I’m hopeful because COVID has started the conversation about it.”

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Nanette covers California's public universities - the University of California and California State University - as well as community colleges and private universities. She's written about sexual misconduct at UC and Stanford, the precarious state of accreditation at City College of San Francisco, and what happens when the UC Berkeley student government discovers a gay rights opponent in its midst. She has exposed a private art college where students rack up massive levels of debt (one student's topped \$400k), and covered audits peering into UC finances, education lawsuits and countless student protests.

But writing about higher education also means getting a look at the brainy creations of students and faculty: Robotic suits that help paralyzed people walk. Online collections of folk songs going back hundreds of years. And innovations touching on everything from virtual reality to baseball.

Nanette is also covering the COVID-19 pandemic and served as health editor during the first six months of the crisis, which quickly ended her brief tenure as interim investigations editor.

Previously, Nanette covered K-12 education. Her stories led to changes in charter school laws, prompted a ban on Scientology in California public schools, and exposed cheating and censorship in testing.

A past president of the Society of Professional Journalists' Northern California chapter, Nanette has a master's degree in journalism from Columbia University and a B.A. in sociology from Queens College. She speaks English and Spanish.