Post-COVID, Many Patients Try Smell Therapy. But Does it Work?

The once obscure approach to smell loss has captured the public's attention. Evidence that it works, however, is thin.

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In a recent episode of the popular New York Times podcast The Daily, restaurant critic Tejal Rao described her experience losing her sense of smell after having COVID-19. "Any kind of meat made me feel a little bit queasy," she said, noting the close connection between smell and taste. For Rao, popcorn felt "like foam, but with sharp bits in it." Like many others who have lost their sense of smell to the disease, Rao set off on a journey to recover her ability to detect scent, ultimately landing on an approach known as smell therapy. In Rao's case, it entailed repeatedly sniffing from jars of four spices — cardamom, cloves, cinnamon, and cumin. When it comes to treating olfactory dysfunction, according to the podcast notes, smell therapy is "the only therapy proven to work."

The episode is part of a growing landscape of press coverage reporting on a very real problem: Approximately 5 percent of the global population lives with a significantly reduced ability to smell, and an estimated 13.3 million Americans report living with some type of smell dysfunction. These numbers are growing as a small percentage of otherwise recovered COVID-19 patients report ongoing loss of smell. In response, some researchers are revisiting the concept of physical therapy for the nose in order to help restore what COVID-19 and other ailments have taken away. The only problem: nasal physiology is incredibly difficult to study, and the experimental therapy — while helpful to some — doesn't provide the kind of evidence doctors normally need to adopt a new treatment widely.

"Smell training is somewhat questionable, frankly," says Richard Doty, director of the University of Pennsylvania's Smell and Taste Center. While the therapy has "caught the imagination of laypeople as well as scientists," he says, the evidence is "pretty weak that it has any effect." Doty, a physician who has published widely on olfactory dysfunction, suggests that smell training "doesn't work if you compare to spontaneous resolution" of smell in the absence of training. In other words, any improvements may have occurred naturally over time. And other researchers note that it isn't yet clear which, if any, patients might benefit from the intervention.

People with smell loss — or anosmia — are twice as likely to experience a smell-related hazardous event when compared to those with a normal sense of smell, according to a 2014 study published

in the Journal of the American Medical Association Otolaryngology. And smell is not only a survival tool that helps detect fire and spoiled food, it also influences quality of life. Despite this, most people didn't care much about olfaction prior to the pandemic, says Shima Moein, a neuroscientist at the Institute for Research in Fundamental Sciences in Tehran, Iran. "COVID started to show people that it really matters," she says.

Of course, people did experience long-term smell loss from a variety of causes prior to the current pandemic: other viral infections, nasal polyps that obstruct odors from reaching smell receptors, neurodegenerative diseases, physical injury to the brain or face — all can wreak havoc on the olfactory system. Aside from a controversial steroid nasal spray, this leaves people just one treatment option with any supporting studies: smell training.

Thomas Hummel, an ear, nose, and throat doctor and a researcher at the Smell and Taste Clinic in Dresden, Germany, was the first person to test the intervention on patients in a clinic. Based on what was already known about perfumers and sommeliers, who undergo rigorous training to hone their craft, Hummel hypothesized that regular exposure to discrete scents could help patients regain their olfactory abilities.

To select the study's scents, Hummel turned to the odor prism. Developed by a German psychologist in 1916, each of the prism's six corners represent a category of scent: flowery, fruity, spicy, resinous, putrid, and burnt. Much like a color wheel, every odor should fit somewhere on the prism. It's a simplistic model, admits Hummel, and in reality some odors are quite difficult to classify. Nevertheless, he found it a useful starting point for his study. The goal was to stimulate different types of smell receptors, so he selected scents from four different corners. Over a 12-week period, study participants sniffed rose, eucalyptus, lemon, and cloves for ten seconds each, twice a day, morning and evening.

In the study published by Hummel and his colleagues in 2009, about 30 percent of those who underwent smell training reported an improvement in their smell, compared to only six percent — just one person — in the control group. By the end of the study, those who experienced improvement were able to perceive scents at lower concentrations, though even they did not get any better at discriminating one scent from another.

Since that initial trial, more than 20 studies have demonstrated some improvement with smell training. In an interview — parts of which were published last month by the digital magazine Neo.Life — London, Ontario-based ear, nose, and throat surgeon Brian Rotenberg characterized the evidence as compelling. "There is fairly strong evidence behind smell training as an effective means of improving sense of smell," he said.

But Leigh Sowerby, also an ear, nose, and throat specialist in Ontario and Rotenberg's research colleague, noted that the degree of recovery in studies that compare to a placebo was modest. "The improvement was clinically significant, but it was just barely," Sowerby says. Both Sowerby and Rotenberg added that incremental benefits can still have an impact on a patient's quality of life.

Sowerby says he has seen smell therapy take patients from having no sense of smell to having a little. For example, one patient who initially described pizza as tasting like cardboard eventually came to detect hints of pepperoni and tomato. The pizza still doesn't taste like it used to, explains Sowerby, but the patient is at least "getting something."

The original smell training technique includes only four odors, but according to Sowerby, adding additional scents can improve the approach's effectiveness — as can training over a longer period of time. "The longer you do it, the better your outcome," he says. "That is the most frustrating thing for patients." In 2015, Hummel proposed a modified smell training regimen with a wider range of odors including menthol, thyme, tangerine, jasmine, green tea, rosemary, bergamot, and gardenia. The modified regimen was shown to be more effective than the original technique.

But even these modest claims of benefits related to smell training have detractors. Doty of the University of Pennsylvania says it's possible that smell therapy could have some "minute" effect for patients, but "the studies have been so poor" that they have failed to show to what degree smell therapy helps patients improve over and above the passage of time. For example, while Hummel's 2009 study employed a validated test of olfactory function, other studies have relied on patients' subjective assessments of their ability to smell. This can lead to inaccurate results, says Doty, because smell loss is often underreported and without objective testing, people are likely to underestimate the degree of their smell loss.

According to Moein, the Institute for Research in Fundamental Sciences neuroscientist, an additional limitation is that in many smell studies, patients and researchers know at the outset which patients are and are not receiving the treatment — a study design that can bias the results. "This has been problematic for many of the papers about smell loss," she says.

Moein notes that smell training "might have some effect for some people" but it likely depends upon the reason why the smell loss has occurred. Some of the studies have lumped together people whose smell loss is due to various causes, making it difficult to identify why some improved and some didn't after the training. For example, a person who has lost their smell from dementia may struggle to recall an odor's name or memories associated with the odor; in this case, olfactory training may improve their memory of the odor. On the other hand, if there is something wrong with the cells lining the inside of a person's nose, Moein is not sure how smell training would help. (This is why comparisons to perfumers don't always apply to patients, says Moein — these workers use smell training to refine an ability that they already have.)

Doty also points out that other sensory systems can't be trained. "The cochlea has some regenerative properties" he explains, "but whether bombarding the cochlea with sounds or bombarding the olfactory system with smells actually improves the system is debatable."

Moein, too, notes that when you have vision problems, doctors tell you to wear glasses. "They never tell you to look at different lines, vertical or horizontal, several times a day to recover your eyesight."

For his part, Hummel acknowledges that most people with post-viral anosmia will recover without

training, and that smell therapy might not be appropriate for everyone. For example, when patients have had loss of smell for a very long time, “it’s a little bit problematic to recommend it.” By this point, he says, people have often adapted to life with olfactory dysfunction and smell training may have a negative psychological effect by reminding them that they can’t smell. Hummel is more likely to recommend the intervention to patients who are suffering from post-viral or post-traumatic anosmia. For these groups, Hummel maintains, the research shows that “when people do smell training, then they recover faster,” and probably more completely by amplifying the natural recovery process.

Plus, said Hummel, many patients struggling with smell loss welcome the opportunity to try an intervention, particularly one without side effects or major drawbacks. “Most patients like it because they feel that they’re in charge,” he says. “They can do something.”

Maeve Gamble is a physician specializing in rheumatology and a current fellow in the Dalla Lana Global Journalism program.

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