



## Scents and sensibility: Aromatherapy is being used to reduce pain, boost mood and more

At UPMC Shadyside, patients heading into surgery might notice something unexpected on their hospital gown — a small patch infused with lavender or orange essence



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Pumpkin spice, cinnamon, clove, pine — the scents of fall can instantly stir nostalgia, warmth and comfort.

But those familiar aromas may be doing more than reminding us of cozy sweaters and flickering candles. A growing body of research suggests that what we smell can actually influence how we feel — emotionally and even physically.

That's something Marian "Marnie" Reven, an assistant professor at West

Virginia University's School of Nursing and a licensed aromatherapist, knows firsthand.

She's spent years studying how essential oils can support people dealing with pain, stress and substance use recovery. When she worked with people in substance use treatment, participants kept small aroma inhalers — about the size of a lip balm — filled with bergamot oil.

“They would just open it and take some sniffs on it, especially for those that were trying to quit smoking, to just become more healthy,” Reven said.

Reven's research explores how scent-based therapies might offer another way to support healing. She emphasizes that aromatherapy isn't meant to replace medical treatment but to enhance healing and modulate mood and behavior.

The idea, she said, is that scent can help reinforce positive habits and provide small moments of calm in stressful situations — even, for example, in Pittsburgh traffic. A favorite aroma might help ease the stress of lane merges at the Fort Pitt Tunnel or daily Route 28 backups near Etna and Millvale — as long as the sniffer is willing to believe it can, she said.

## **Modern twist on an ancient practice**

The use of aromatic plants stretches back roughly 3,500 to 4,000 years ago, according to the University of Pittsburgh [Center for Innovation in Pain Care](#). Ancient records from China and India describe early methods of distilling or extracting essential oils, suggesting the practice has deep roots across cultures.

In Egypt, scented botanicals served many purposes — from disinfecting homes and preserving mummies to crafting cosmetics. The Romans turned herbs into fatty ointments for therapeutic use, while, in the Middle Ages, aromatic substances, then believed to help ward off disease, were prized for their ability to mask foul odors.

At UPMC Shadyside, patients heading into surgery might notice something unexpected on their hospital gown — a small patch infused with lavender or orange essence.

For anesthesiologist and pain specialist Jacques Chelly, the use of scent in

surgical care isn't about spa-like ambiance — it's about measurable outcomes.

Patients who are especially nervous about their upcoming surgery are offered a 12-hour patch once they check in for their surgery, explained Chelly, who is a professor of anesthesiology in perioperative medicine and orthopedic surgery at Pitt and the founder and acute pain physician-in-chief in acute interventional perioperative pain service at UPMC Presbyterian and Shadyside hospitals. “It helps them relax and, in some cases, it reduces the amount of pain medication they need afterward.”

Chelly and colleagues from Pitt's anesthesiology department conducted a randomized, placebo-controlled [study](#) examining whether aromatherapy reduces anxiety. Their research, published in the *Journal of Pain Relief* in 2023, indicated that when hip replacement patients who were anxious before their operation received aromatherapy, their need for postsurgical opioid pain relief decreased by half.

[Previous research](#) had shown that anxiety, depression and catastrophizing — when patients believe they are going to die during surgery — increase postoperative pain and opioid use by up to 50%.

The individual response, Chelly explained, is part of what makes aromatherapy so intriguing, and so difficult to study.

“The limbic system is certainly involved,” he said, referring to the brain's emotional and memory center. “But the transmission of the signal — from smelling to the actual effect — still needs to be fully established.”

Still, he and his team have seen tangible results among patients who used aromatherapy before and after surgery and reported less pain and required fewer opioids. That's no small success amid the ongoing opioid crisis.

Finding alternative methods — via soft, non-medication ways — to reduce pain, that's “money in the bank,” Chelly said.

## **A direct route to emotion**

Scent, Reven explained, has a unique shortcut to the brain's emotional center.

“It bypasses the thalamus, goes straight into the limbic area, and it impacts

the amygdala ... Our most basic of reactions,” she said. Aroma, she noted, has been found to trigger stronger associations than all other senses, meaning that smell has the potential to trigger a stronger memory response than even a photo.

That helps explain why the smell of a certain shampoo or holiday dish can evoke vivid memories in an instant. It also underscores why the loss of smell — experienced by many during the COVID-19 pandemic — can be devastating.

“It took a lot of joy from people,” Reven said. “People are still buying kits that they can use to retrain their sense of smell.”

## Science behind the scents

Lavender, Reven said, is the most widely studied essential oil for pain relief and relaxation, in both aromatic and topical forms.

Other oils, such as black pepper, [copaiba](#) (a tree native to South America) and lemongrass, have shown anti-inflammatory or mood-boosting potential. Bergamot, the focus of Reven’s [study](#) published in April in the International Journal of Nursing Sciences, also has been linked to improved mental health in [Italian research](#).

In Reven’s clinical trial, 100 adults who were already in outpatient treatment for substance use disorder were randomly divided into two groups. One received standard care, while the other group got the same care plus a bergamot essential oil inhaler, which they used three times a day for a week.

After those seven days, the group using the bergamot inhalers reported meaningful improvements in psychological measures: They felt less mental tension and showed lower scores on tests for depression and anxiety. The authors also found the intervention was well accepted, with many participants intending to keep using the inhaler after the trial.

Chelly’s study and personal observations of patients echo these findings, indicating that aromatherapy can aid in both mental and physical well-being and healing. Through Pitt’s Center for Complementary and Alternative Medicine, which he directs, patients receive integrative care that may include hypnosis, relaxation, acupuncture and even virtual reality

alongside aromatherapy.

Addressing the psychological components of anxiety, depression, catastrophizing and more, he said, can make all the difference in recovery from surgery.

“Pain is the result of a very complex combination of factors,” he explained. But more and more, patients are requesting non-medication ways to treat pain as well as the anxiety that can come along with it — and which can often exacerbate it.

“There’s more demand from patients for something else,” Chelly added. “They want to treat anxiety, not just the physical pain.”

## Using aromatherapy safely

While diffusers and scented patches are popular ways to enjoy essential oils, Reven cautioned against overuse.

“We love a whiff of pumpkin spice. We love a whiff of cinnamon. But if your head was stuck in a bag with cinnamon, you would hate it,” she said. “It’s all about the dose, right?”

For example, one drop of jasmine in 30 milliliters of coconut oil is plenty. Two or three drops could induce a nasty headache, she said.

Even with diffusers, moderation matters.

“You won’t notice it after 10 minutes — you’ll go nose blind,” Reven said. “Turn it off then. Turn it back on in 20 minutes.”

Chelly shares a similar view on balance. “It’s a multimodal approach — a little bit of this, a little bit of that,” he said. “And when you put them together, you end up with a major effect.”

Despite its popularity, aromatherapy often suffers from misconceptions — especially because of its ties to multilevel marketing business models.

“It’s a myth that you can just use essential oils for everything,” Reven said. “I don’t think that’s sustainable or responsible. But when used in conjunction with many other lifestyle changes ... I think you have a recipe to be successful.”

Chelly hopes more rigorous research will help bridge the gap between skepticism and science.

“At the NIH, there is a lot of interest in studying these techniques,” he said. “We’re trying to assess and give rational explanations and real outcomes.”

Ultimately, both experts see aromatherapy as part of a larger movement toward whole-person care — one that acknowledges the link between body and mind.

“Even in conditions we think of as purely physical — like cardiac disease — more and more people find that what you eat, the way you think and how you manage stress all play roles,” he said. “It makes us look at the whole body, not just one part.”

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