

# Essential Oils and Aromatherapy: Worth the Hype?

Gayle Nicholas Scott, PharmD | September 15, 2015

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## Question

What is the evidence for essential oils and aromatherapy? Do they really work?



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## Essential Oils

All plants contain oils (eg, corn oil, peanut oil, coconut oil), but only about 3000 contain essential oils, also called "volatile oils" or "aromatic oils," in their flowers, leaves, bark, wood, fruit, or peel. Essential oils probably developed in flowers to attract insects for pollination and in other plant parts as deterrents to predators.

The term "essential" refers to the essence or fragrance of a plant rather than a necessary component of the oil or something biologically vital. Essential oils are usually extracted by distillation and typically contain such chemicals as terpenes, quinines, benzene compounds, and aromatic/aliphatic esters and alcohols. Oils produced with the aid of chemical solvents are not considered true essential oils.<sup>[1-3]</sup>

In theory, chemical components of essential oils may bind to receptors in the olfactory bulb and have an effect on the limbic system, which governs emotions.

Topical application of some aromatic oils may exert antibacterial, anti-inflammatory, and analgesic effects.<sup>[1]</sup> Essential oils are found commercially as odorants in cosmetics, perfumes, soaps, detergents, and various other products ranging from insecticides to paints.

Essential oils are used in dental products and occasionally as flavoring in medicine.<sup>[2,3]</sup> Some well-known nonprescription products contain essential oils; for example, Vicks® VapoRub™ contains camphor, eucalyptus, and menthol.

Penetration enhancers, often an oil (sometimes termed "carrier oil"), are mixed with essential oils to enhance absorption through the skin. Some essential oils, alone or with a penetration enhancer, can increase drug absorption through the skin. Commonly used carrier oils include grapeseed, sweet almond, and sesame oils.<sup>[3]</sup>

Essential oils also have been used as flavoring in food products. The US Food and Drug Administration (FDA) regulates essential oils in food and pharmaceutical products.

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## Aromatherapy

Essential oils also are used in aromatherapy, where the oil is heated or added to bathwater,

applied to the skin, and occasionally taken by mouth. Essential oils used for aromatherapy do not need FDA approval, and they cannot legally be promoted to prevent, treat, or cure disease.<sup>[1]</sup>

Yet, they are promoted for a variety of conditions, even though the therapeutic effects are not well supported by clinical research. Many available studies are marred by poor methodological quality, including bias, small sample sizes, and inherent difficulties with masking active vs placebo controls.

In addition, personal expectation of the effect of aromatherapy appears to play a role in responsiveness.<sup>[4,5]</sup> To further confound determination of efficacy, essential oils are often used in massage therapy.

Systematic reviews of aromatherapy have been published for such conditions as anxiety, dementia, hypertension, nausea and vomiting, pain, sleep, and stress.

**Anxiety.** A review of 15 randomized controlled trials that were characterized as poor-quality concluded that aromatherapy could be useful for anxiety symptoms, but more research with better-quality methodology should be conducted.<sup>[6]</sup> In a review of interventions to reduce anxiety in healthcare waiting areas, the research on aromatherapy was deemed inconclusive.<sup>[7]</sup> Lavender aromatherapy is often used to relieve anxiety.<sup>[8]</sup>

**Dementia.** A Cochrane review included seven studies with a total of 428 patients, although only two studies had usable results. The results were equivocal, with the authors citing the need for more results from large-scale, well-designed, randomized, controlled trials to draw clear conclusions.<sup>[9]</sup>

Another review included 11 studies and suggested that aromatherapy shows potential for reducing behavioral and psychosocial symptoms of dementia. Again the authors mentioned the need for better-designed randomized, controlled trials.<sup>[10]</sup>

**Hypertension.** One randomized controlled trial and four nonrandomized controlled trials were included in a review of aromatherapy for hypertension. All five trials reported a beneficial effect on hypertension; however, study quality was judged to be poor, with a high risk for bias. The authors concluded that available research has not shown convincingly that aromatherapy is effective for hypertension.<sup>[11]</sup>

**Nausea and vomiting.** A Cochrane review included nine studies (six randomized controlled trials and three nonrandomized controlled clinical trials) with a total of 402 patients of postoperative nausea and vomiting. Two of the studies used peppermint oil; the others used isopropyl alcohol as aromatherapy. Inhaled isopropyl alcohol was more effective than saline placebo for reducing postoperative nausea and vomiting but less effective than standard antiemetic medications. Peppermint oil was ineffective in two studies reviewed.<sup>[12]</sup>

Another more favorable review included five studies of 328 patients with nausea and vomiting related to a variety of conditions, including postoperative nausea and vomiting. Concluding that inhaled peppermint or ginger essential oils reduced the incidence and severity of nausea and vomiting and also reduced the need for antiemetic medications, the authors described the evidence as encouraging but not compelling, owing to methodological flaws in existing research.<sup>[13]</sup>

**Pain.** A Cochrane review included two studies using aromatherapy for pain in childbirth. One of the studies offered women a choice of five essential oils (Roman chamomile, clary sage,

frankincense, lavender, and mandarin), and the other randomly assigned women to use ginger or lemongrass essential oil. No difference was observed in pain intensity or the use of pharmacologic pain relief.<sup>[14]</sup>

**Sleep.** One review reported on 15 quantitative studies, including 11 randomized controlled trials. A majority of the studies suggested a positive effect of essential oils, most frequently lavender, on sleep.<sup>[15]</sup>

A meta-analysis of 12 studies found the use of aromatherapy effective for improving sleep quality. All except one study used lavender essential oils alone or in addition to one or two other essential oils. Inhalation aromatherapy was more effective than massage application.<sup>[16]</sup>

**Stress.** A review of aromatherapy for stress reduction in healthy adults reported on five randomized controlled trials, most with a high risk for bias. Three of the studies used lavender essential oil, and the other two studies used lavender or peppermint essential oil or a combination of lavender, clary sage, and bergamot essential oils. The meta-analysis suggested that aroma inhalation has favorable effects on stress, but the authors judged the size and quality of available randomized controlled trials to be too low to draw firm conclusions.<sup>[17]</sup>

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## Are Essential Oils Safe to Use?

The use of essential oils appears to be safe for most people, on the basis of the low frequency of adverse effects reported in the medical literature.

Most adverse effects have been skin irritation and contact dermatitis after application of essential oils to the skin. The most frequently implicated essential oils are bergamot, laurel, lavender, peppermint, tea tree oil, and ylang-ylang.

Inhalation has been associated with adverse effects more rarely.<sup>[18]</sup>

Patients with broken skin, poor circulation, epilepsy, and asthma should use essential oils with caution.

Very little information is available about the oral use of essential oils as aromatherapy.

Safety in pregnant women or children has not been established. In the limited research available, aromatherapy does not seem to have adverse effects on the mother (eg, duration of labor, mode of delivery) or the baby.<sup>[14]</sup>

Two studies have used topical lavender essential oil applied directly or in bathwater for colicky<sup>[19]</sup> or crying<sup>[20]</sup> infants, but adverse events were not addressed in either report. Given the higher surface area-to-weight ratio of infants, caution is advised with topical application.<sup>[21]</sup>

In summary, more large-scale, well-designed, randomized, controlled trials are needed to define the role of essential oils in medical care. Essential oils should not be used in place of established medical therapy to treat, cure, or prevent disease.

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