

# Best Practices for Diffusing Essential Oils in the Health Care Environment.

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I've worked as an anesthesia provider for over 25 years, and in that time I had grown frustrated with the lack of effective remedies to treat nausea, one of anesthesia's more common and distressing side effects.

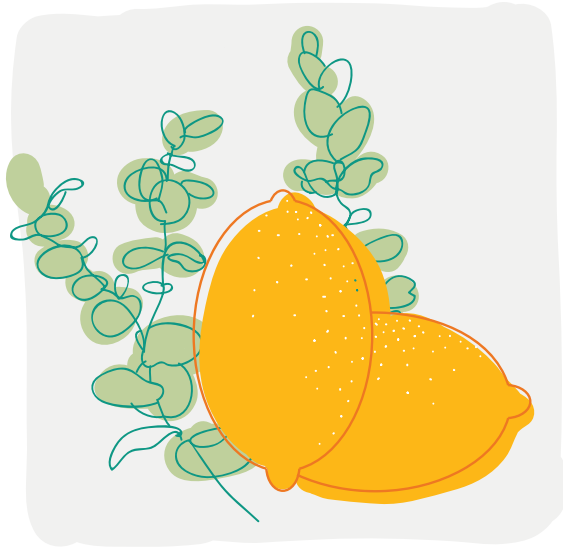
What was needed was a product that worked quickly, was safe and easy for a patient to self-administer, and could be used in an OR, the recovery room, and all the way through to patient discharge.

*Wendy Nichols*

Founder of Soothing Scents



# Introduction



As the saying goes, what is old is new again, and nothing could be truer for essential oil therapy.

For several thousand years, across the world, plant-based therapies had a leading role in maintaining a person's health and well-being. But with the advent of conventional medical technology and chemically-derived drugs, natural remedies like essential oils became under-utilized in western societies.

Today, the balance is returning: The advancement of new delivery systems and policies in hospitals, combined with a fast-growing public interest in integrative therapies, has led to a revival of the medical world's relationship with non-pharmacological care modalities. One such method is the use of inhaled essential oil (EO) vapor, which is becoming an increasingly popular intervention option in hospitals, surgery centers, hospices, and chemotherapy centers to manage nausea and anxiety.<sup>(2)</sup>

**Therapeutic inhaled essential oil use, or TIEO** (pronounced Tie-Oh), is a designated, independent nursing intervention that works by inhaling an EO scent that has specific healing properties. By traveling directly to the olfactory system via the nose and into the limbic system, TIEO can assist with symptoms like nausea, anxiety, fatigue and distress. TIEO does not require a doctor's prescription and if dispensed through an appropriate delivery system, can be safely self-administered.



# Introduction *(cont.)*

## Key benefits of TIEO in health care:

- 01 It is low-risk, with no risk of drug interactions
- 02 It significantly decreases patient nausea <sup>(3)</sup>
- 03 It increases patient satisfaction with care <sup>(3)</sup>
- 04 It has a pleasant aroma, which is advantageous to patients with scent bias
- 05 It does not cause drowsiness or other side effects

The term “aromatherapy” is often used interchangeably with “TIEO”, but many health care professionals prefer the designator “TIEO” since it involves the exclusive use of high-quality EOs as opposed to fragrances that can contain chemical or synthetic constituents. Secondly, TIEO works via inhalation-only EO delivery, which is a safer and simpler way to employ EOs in the medical setting.

The purpose of this mini eBook is to provide health care practitioners with a brief but comprehensive set of evidence-based best practices needed to safely utilize TIEO in the hospital setting. It includes:

- + Different routes of administration and why inhalation is the recommended route for hospital use.
- + Key features of a successful essential oil-based nursing intervention.
- + Best practices and tips on how to use essential oils for maximum effect.







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# Routes of administration

EOs can be taken into the body by several different routes – they can be ingested orally, absorbed through the skin or, when in vapor form, inhaled through the nose and mouth. Each route has its own risks and benefits.

## Oral intake

This is a highly-specialized area that requires a thorough knowledge of EO composition as well as safe dosing and administration practices. When utilized with precision and skill, studies have shown that oral EOs can favorably impact conditions such as irritable bowel syndrome<sup>(4)</sup> and urinary tract infections<sup>(5)</sup>. In the health care setting, however, patients are often NPO, nauseated, sedated or otherwise cognitively impaired, and are therefore not candidates for any oral interventions. And although uncommon, adverse effects from oral intake have been reported in the literature, primarily related to ingesting copious amounts of undiluted EOs, i.e. overdosing.

## Skin absorption

EOs are lipid-soluble, which enables them to be easily absorbed through the skin and into the bloodstream. When combined with massage, this method has shown to produce many physical benefits, such as decreases in pain, stress, blood pressure and heart rate<sup>(6)</sup>. Since most undiluted EOs can cause dermal irritation, they are combined with carrier oils, such as almond or jojoba oil, which acts to dilute and slow down their absorption rate. Other factors such as skin thickness, number of hair follicles and the presence of skin damage all contribute to unpredictable absorptions rates. Careful skin patch testing should be conducted even when diluted in carrier oils, and great care must be taken to prevent EOs from contacting delicate mucus membranes in the eyes, nose and mouth. In a typical acute health care environment, such as a surgical or emergency department, administering EOs via this route would be highly impractical. In addition, of the EO adverse effects reported in the literature – skin irritation, photosensitization, rashes and allergic reaction – almost all have been from the skin route of administration.



# Routes of administration *(cont.)*

## Inhalation

EO molecules are rapidly transported to both the bloodstream and the central nervous system when inhaled. Upon entering the nasal cavity, EO vapor encounters olfactory receptors where it is quickly taken up and transported to the olfactory bulb in the cerebrum. Due to the proximity of the nostrils to the base of the brain (just above the bridge of the nose), an EO can elicit central physiological effects quite rapidly via this route.

EO vapor also accesses the pulmonary system by entering the lungs via the nasopharynx and trachea. Traveling through the bronchus to the bronchioles, the EO vapor ultimately encounters the alveoli - millions of thin-walled, grape-like structures - which permits rapid diffusion into surrounding capillaries. From there, they are transported through the circulatory system to appropriate receptor sites in the body.





# Routes of administration *(cont.)*

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## ***Recommended Methods for Hospital Use***

For the health care environment, inhalation provides the safest, fastest, and most effective method of EO delivery. When diffused in an appropriate delivery system, TIEO can be safe for any patient, regardless of age or medical condition. Benefits can be obtained when they are sedated, or at home, after they have been discharged.

Additionally, some EO vapors, such as peppermint and eucalyptus, have been found to be beneficial to the airway when inhaled. From soothing irritated airways, decreasing mucous production and suppressing the urge to cough, TIEO is a safe and useful treatment modality for patients who have a history of reactive airways and/or asthma <sup>(7)</sup>.

## **Which Diffusion Methods NOT to Use in Health Care**

EOs are highly volatile, meaning once they are exposed to air, they turn to vapor. From a few drops placed on a cotton ball to a whole-room electric diffuser, getting EOs to vaporize is as simple as removing the lid of the bottle. While these casual methods may have their place for home use, they do not provide the level of patient protection required in facilities.

The most important caveat about EO diffusion is that undiluted EOs cannot contact the eyes, skin or nasal and oral mucosa, where painful and debilitating irritation could occur. Most notably in the case of high-risk patients - whose level of consciousness or whose physical impairments require a higher level of monitoring vigilance - placing undiluted EOs near their faces with no protective barrier can present unnecessary safety risks.

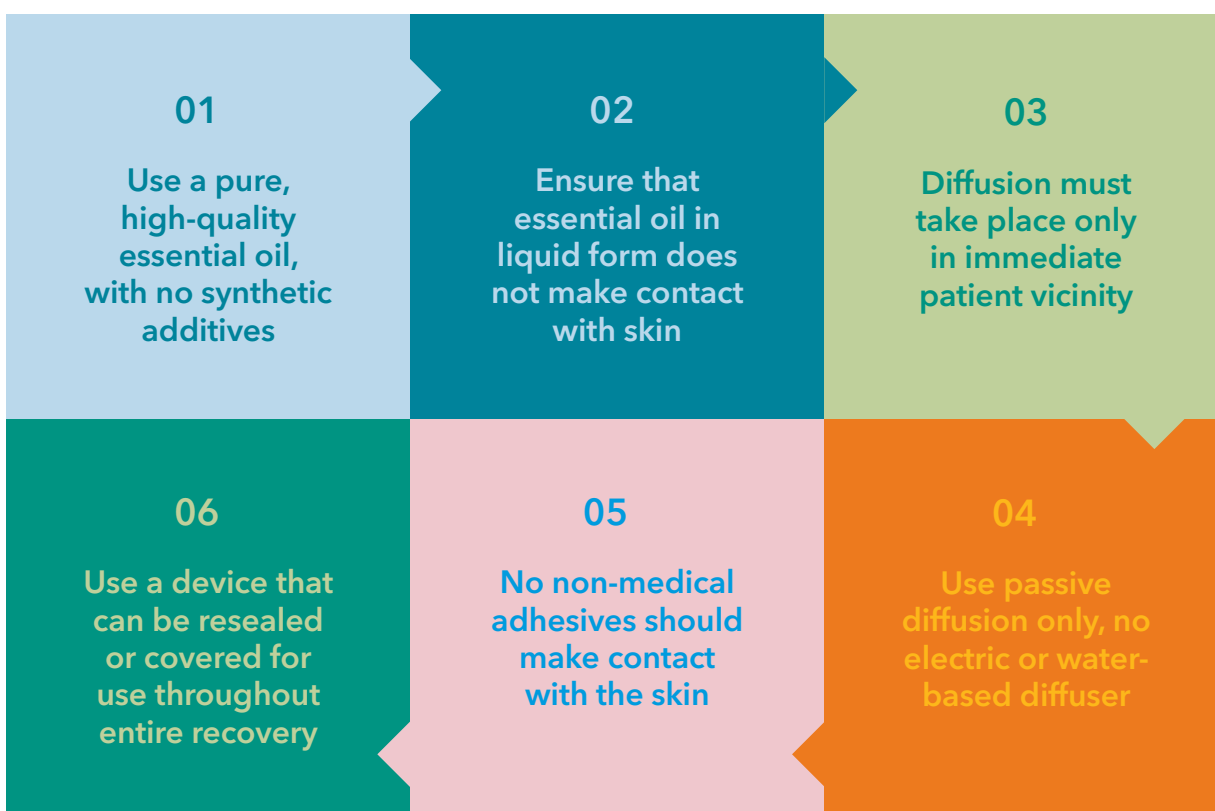


“Placing cotton balls or gauze soaked with essential oils near a patients’ face is just not appropriate, especially when patients are recovering from anesthesia. The last thing we want is to harm a patient in our care. That’s why we exerted so much time and effort to design a safe delivery system that can be used throughout their perioperative course, including use at home.”

– **Wendy Nichols, CRNA, MS, BSN creative director Soothing Scents.**



# Essential oil diffusion practices and delivery features recommended for the health care use



## 01 Use a pure, high-quality essential oil, with no synthetic additives

While EOs are naturally bactericidal, fungicidal and viricidal (meaning they do not support the growth of most organisms, even with inoculation), it is still important to ensure you are using a high-quality EO that has been sourced and distilled with ethical and sustainable practices. With increasing demand worldwide, the EO industry has seen a proliferation of adulterated products sold as pure, whole EOs. These compromised products include cheaply produced volume extenders such as cottonseed oil or the addition of synthetic perfume derivatives to make the EO “smell right”, such as linalyl acetate to give it the distinctive lavender aroma. To choose the best EO, use the criteria below:

# Essential oil diffusion practices and delivery features recommended for the health care use *(cont.)*

- a. They provide organic or wildcrafted products that adopt best practices to harvest, distill, press, bottle and store their EOs. Their containers are composed of appropriate materials that prevent oxidation, degradation or migration of the EOs.
- b. They don't make claims that have no basis, such as "certified therapeutic", as there is no certifying body that can authorize this designation.
- c. They are not the cheapest product. Sourcing high-quality oils for use with vulnerable patients is costly. Diffusers composed of EO compatible material with safety features designed for the health care environment are not simple or cheap to manufacture.
- d. They have strict quality assurance practices such as microbial, gas chromatography and mass spectroscopy testing (GC/MS testing), and they assemble their products in facilities that comply with best manufacturing practices.

## 02 **Ensure no liquid essential oil contact with the skin/mucous membranes/eyes**

A delivery device for patient use must provide a leak-proof barrier that protects the patient from exposure to undiluted EOs, which could, in turn, cause painful skin irritation or eye injury.

## 03 **Aroma must be restricted to the immediate vicinity of the user**

When treating symptoms such as nausea and anxiety in a health care setting, the most effective route is restricting the aroma to the immediate vicinity of the user via a personal passive inhalation device. The lowest effective ambient concentration to achieve relief is the safest and best practice to employ. This is because aromas can trigger psychological and physical odor processing reactions that can negatively impact staff members and patients. These include:



# Essential oil diffusion practices and delivery features recommended for the health care use *(cont.)*

a.

**Scent biases** - Bias occurs when an experience or attitude connected to a scent creates a positive or negative association with that smell. Scents are stored in the brain as both a memory and an emotion, most likely as an ancient survival mechanism. An example of a negative bias seen in health care is the smell of isopropyl alcohol (IO), a product commonly used to disinfect skin prior to injection. Even though inhaling the vapor of IO has been shown to decrease nausea, patients routinely refuse the intervention due to their previous negative associations with the smell. Conversely, when nauseated and inhaling a scent they find pleasing, they report a higher satisfaction with their care, even if the nausea is not completely relieved.

b.

**Environmental sensitivities** - This is a chronic medical condition characterized by symptoms that the affected person attributes to chemical exposure, including scents. Symptoms can include dizziness, headaches, and inflammation of the airways and GI tract. Clinical trials have shown that patients with this syndrome can react as often and as strongly to placebos as they do to chemical stimuli; the existence and severity of symptoms are related to the perception that a chemical stimulus is present. While a history of environmental sensitivities is not a contraindication to TIEO, cautious introduction and careful monitoring is essential. Because staff members and adjacent patients may be sensitive, using a delivery system that limits EO diffusion to the immediate vicinity of the user is the best practice in a health care setting.

c.

**Conditioned aversion** - This is when the mind develops a strong resistance towards something, such as a taste or smell, after associating it with feeling physically sick. This is important when using scents to treat physical symptoms such as nausea. As many a pediatric chemo nurse has observed, using a common single EO such as peppermint for relieving nausea, resulted in their patients becoming nauseated when they encountered peppermint, rendering them unable to use peppermint flavored items such as toothpaste. Best practices suggest blending three to four EOs to prevent conditioned aversion <sup>(9)</sup>.





# Essential oil diffusion practices and delivery features recommended for the health care use *(cont.)*

## 04 Choose non-electric, non-water-based passive diffusion

Usually, electric diffusers are perfectly fine to use to fill a room with EO vapor, in the case of disciplines like massage therapy. In health care, however, it can lead to unwanted aroma triggers in patients and staff, or, if not cleaned correctly, the risk of fungal and bacteria growth that might harm immunosuppressed patients. There are also strict safety standards for electrical equipment used in patient care areas\*: The National Fire Protection Association establishes safety criteria, like leakage current testing and certain insulation standards, for health care facilities in order to minimize fire and electrical hazards.

## 05 No non-medical adhesives should make contact with the skin

Medical adhesive-related injuries, like allergic or contact dermatitis, skin tears and blisters, etc., are common, and can occur across all health care settings and patient groups. When layers of the skin are removed along with an adhesive product, it can cause scarring and infection along with pain. So when using a TIEO product that has attached adhesives, nurses should only apply the product to a non-skin area such as a gown, oxygen device or article of clothing to prevent complication.

## 06 Use a device that can be resealed or covered for use throughout recovery

A re-sealable device works best to preserve the scent so it can be utilized throughout the recovery phase, including at home. Although most EO do not support microbial growth, this is not always the case. In 2016, an intensive care unit in Austria traced a drug-resistant *Pseudomonas aeruginosa* outbreak to the same bottle of EO that the nursing staff shared between seven affected patients. Through testing, it was determined the bottle was not contaminated during manufacturing. As a result, it is recommended that EO products be delivered in a single-use format assigned to a single patient. Having the ability to reseal the delivery system adds a practical as well as an ethical benefit. Nausea often comes in cycles, especially in the postoperative and chemotherapy settings.



Having the ability to reseal the delivery system adds a practical as well as an ethical benefit. Nausea often comes in cycles, especially in the postoperative and chemotherapy settings. A product that only lasts a few hours can't always provide effective relief on the car ride home, or when nausea returns after the first oral intake. A re-sealable inhaler will allow patients control over their symptoms for days, allowing enhanced surgical recovery and reducing the need for hospital readmission.

Moreover, high-quality EO production is a labor-intensive, multi-step process that requires copious plant material to produce a mere ounce of distilled EO, so using a resealable and long-lasting device can help conserve the product's benefits and the environment.



# How much is too much?

## Assessing correct dose

Since EOs are different from drugs, there is no established recommended inhalation “dose”. The Food and Drug Administration has designated certain EOs as “generally recognized as safe” (GRAS) when used as a food additive, but no official “safe” ambient concentrations for EOs have been established.

Dr. Jane Buckle, a recognized expert in the field of critical care nursing, states that “Inhaled EOs are unlikely to produce a toxic reaction. Hypothetically, a toxic reaction could occur if a person was confined in a non-ventilated room, the temperature was very high, and there was a constant diffusion of EO until the air was saturated. This would be more akin to suffocation than a reaction to the EO.” <sup>(10)</sup>


When one looks at the amount of vapor produced in a personal diffuser relative to an extreme scenario such as this, it is clear that reasonable safety parameters are not only met, but also greatly exceeded when using an appropriate device designed for clinical TIEO therapy.

## Moving forward

The genuine desire of nurses to alleviate their patients’ discomfort has made them the earliest and most passionate champions of EO use in medical sector.

By using best practices, health care providers can confidently manage patient discomfort safely and naturally.

# Key takeaways

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- + Ensure that EOs are given to patients through **inhalation** measures, as topical or ingestion methods pose health risks and can lead to irritations
  - + **Undiluted EOs** should never be used in contact with patients. Avoid deploying undiluted essential oils onto a cotton ball or swab as this can still **pose risks** to the patient.
  - + When used on patients, EOs should be utilized in delivery systems tailored to hospital standards: this includes using inhaler systems that are **leak proof**, are not water based, and are sealed to prevent direct contact. It is also advised to use a **resealable inhaler** to preserve the oils.
  - + For **best results**, ensure that EOs are diffused in a **personalized inhaler system**, as this uses low effective ambient EO concentrations that are ideal for **safety and efficacy**.
  - + Be aware that room diffusers can trigger psychological and physical responses in some patients and staff, including **scent bias, environmental sensitives, and conditioned aversion**.
  - + Inhaled EOs, because they are not considered a drug as designated by the FDA, are not bound to dosage requirements, and thus can be used liberally as long as they adhere to correct diffusion methods mentioned above.



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