



## Aromatherapy: The Clinical Use of Essential Oils

April, 2017

### **NURSING PRACTICE GUIDELINE SCOPE**

#### **Disease/Condition(s)**

Symptom relief from:

- post-operative nausea and vomiting,
- pain,

and to promote:

- sleep,
- and well-being.

#### **Clinical Specialty**

Nursing

#### **Intended Users**

- Registered Nurses
- All disciplines are encouraged to consider the use of these practice recommendations

#### **Target Population**

All patients cared for within the UW Health system (pediatric, adult, inpatients and outpatients) seeking symptom reduction and do not have contraindications for aromatherapy.

#### **Nursing Practice Guideline Objective(s)**

This guideline aims to provide evidence-based nursing practice interventions for using aromatherapy to aid in the reduction of the symptoms of post-operative nausea and vomiting, pain, and to promote sleep and well-being.

## Clinical Questions Considered

Specifically, this nursing practice guideline aims to provide practice recommendations that answer:

- In multiple patient populations, how does the use of aromatherapy help to alleviate:
  - post-operative nausea and vomiting?
  - pain?
- In multiple patient populations, how does the use of aromatherapy promote:
  - Sleep?
  - Well-being?
- When using aromatherapy for these clinical indications:
  - What are the safety considerations when using essential oils?
  - Which essential oils should be used?
  - What is the method of administration?

## Major Outcomes Considered

Registered Nurses have evidence-based recommendations to guide safe and clinically appropriate use of aromatherapy to reduce the symptoms of post-operative nausea and vomiting, pain, and to promote sleep and well-being in pediatric and adult patients across the continuum of care.

## METHODOLOGY

### Description Of Methods Used To Collect/Select the Evidence

The literature search began with a search of external, pre-existing guidelines using the National Guideline Clearinghouse maintained by the Agency for Healthcare Research and Quality (AHRQ) using the term “aromatherapy.” A guideline focused on the use of aromatherapy was not discovered.

A systematic literature search was initiated by searching Cochrane Library using the search term “aromatherapy.” The search yielded 12 reviews; two were relevant, one related to sleep and one related to post-operative nausea and vomiting. Members of the workgroup continued the literature search using PubMed to search for articles addressing aromatherapy and each of the 4 clinical areas of interest (post-operative nausea and vomiting; pain; sleep promoting; promotion of well-being). The original search focused on stress as a clinical area of interest; based on the available literature, the focus shifted to the promotion of well-being. Key terms and MESH terms were searched individually and in combinations: *essential oils; aromatherapy; aromatherapy (MESH); insomnia; sleep; well-being; relaxation; stress, psychological (MESH); relaxation therapy (MESH); stress disorders; traumatic, acute (MESH); pain (MESH); pain management (MESH), acute pain (MESH), breakthrough pain (MESH), pain perception (MESH).*

Articles were included in the review when they addressed the use of inhaled or topical aromatherapy with participants with all diagnoses and conditions and focus on symptom reduction. Articles were excluded if they studied the use of internally administered essential oils, dietary interventions, or herbal treatments. In addition, articles focused on other populations besides patients (i.e. clinicians) were excluded.

Additional articles were discovered via hand searches of reference lists.

## Methods Used To Assess The Quality And Strength Of The Evidence

The following rating scheme was utilized to identify the strength of each individual study.

### Rating Scheme For The Strength Of The Evidence

Strongest (I) – Weakest (VII) as follows:	
I	A systematic review of meta-analysis of all relevant Randomized Clinical Trials (RCT) or Evidence Based Practice (EBP) Clinical Guidelines on systematic reviews of RCTs
II	At least one properly designed RCT of appropriate size
III	Well designed trials without randomization
IV	Well designed single group pre-post cohort, time series, or matched case-control studies
V	Systematic review of well-designed descriptive and qualitative studies
VI	Single experimental, quasi-experimental, non-experimental (descriptive or qualitative) study
VII	Opinion of respected authorities, based on clinical evidence, descriptive studies or reports of expert committees.

### Description Of Methods Used To Formulate The Recommendations

Guideline developers reviewed the tables of evidence developed by individual workgroup members. These tables of evidence guided the writing of recommendations based on the best available evidence. Guideline recommendations addressed the use of aromatherapy to reduce the symptoms of post-operative nausea and vomiting; pain; and to promote sleep and well-being in pediatric and adult patients. The guideline group reviewed the evidence and developed recommendations by consensus.

### Rating Scheme For The Strength Of The Recommendations

<u>Category</u>	<u>Description</u>
Recommended for Practice:	Interventions for which effectiveness has been demonstrated by strong evidence from rigorously designed studies, meta-analysis, or systematic reviews, and for which expectation of harm is small compared to the benefits.
Likely to be Effective:	Interventions for which effectiveness has been demonstrated from single rigorously conducted controlled trial, consistent supportive evidence from well-designed controlled trials using small samples, or guidelines developed from evidence and supported by expert opinion.
Benefits Balanced with Harm:	Interventions for which clinicians and patients should weight the beneficial and harmful effects according to individual circumstances and priorities.
Effectiveness Not Established:	Interventions for which insufficient or conflicting data or data of inadequate quality currently exist, with no clear indication of harm.

<b>Effectiveness Unlikely:</b>	Interventions for which lack of effectiveness has been demonstrated by negative evidence from a single rigorously conducted controlled trial, consistent negative evidence from well-designed controlled trials using small samples, or guidelines developed from evidence and supported by expert opinion.
<b>Not recommended for Practice:</b>	Interventions for which lack of effectiveness or harmfulness has been demonstrated by strong evidence from rigorously conducted studies, meta-analyses, or systematic reviews, or interventions where the costs, burden, or harm associated with the intervention exceed anticipated benefit.

### Description Of Method Of Guideline Validation

This guideline was reviewed by all the members of the workgroup for clarity and consistency of recommendations with the literature reviewed. The Nursing Practice Guideline Committee and the Nursing Practice Council members provided insight and feedback to the content and the clinical relevance. The Pharmacy and Therapeutics approved the addition of essential oils on formulary for use at UW Health as guided by this document.

### DEFINITIONS

*Extracted verbatim from Buckle, 2016, p. 345*

**Aromatherapy:** the use of essential oils for therapeutic purposes

**Clinical Aromatherapy:** the use of essential oils for specific, measurable outcomes

**Essential Oils:** the distillate from an aromatic plant, or the oil expressed from the peel of a citrus fruit

**Learned Memory:** the ability of the mind to condition the response to an aroma based on previous experience

### INTRODUCTION

Aromatherapy, coined before World War I by a French chemist, was first used in healthcare (Buckle, 2015). Clinical aromatherapy was used by a physician, a nurse and a chemist to help in wound healing and treating infections (Buckle, 2016). Today, aromatherapy is used for the pleasure of its aroma itself, for specific clinical symptoms, and to holistically treat clients (Buckle, 2015).

Aromatherapy is “the use of essential oils for therapeutic purposes” (Buckle, 2016, p. 345) and has been used holistically to improve the bio-psycho-social-spiritual being (Buckle, 2015; Buckle, 2016). Aromatherapy is used by nurses around the world, including those in Europe, Africa, Australia, New Zealand, and Asia (Buckle, 2016). In some European countries, aromatherapy is used as part of standard care by the healthcare team, including physicians and pharmacists (Buckle, 2015; Buckle, 2016). They use essential oils for stress management, grief, insomnia, anxiety, depression, post-operative nausea and vomiting, constipation, dementia and infection (Buckle, 2016).

Essential oils can be used three ways: through inhalation, the skin, and ingestion (Buckle, 2015); however ingestion is not an accepted method of administration for nursing care (Buckle, 2016).

The fastest way for aromatherapy to work is through olfaction, or smelling the aroma via inhalation, which stimulates responses in the central nervous system, specifically the limbic system (Buckle, 2016; Buckle, 2015). In topical application, essential oils are absorbed through the skin and the skin will hold the essential oils before it enters the blood stream (Buckle, 2015; Buckle, 2016).

Aromatherapy has an established historical (Buckle, 2015; Buckle, 2016) and current (ASPAN, 2006; UW Health, 2015) use in healthcare. Aromatherapy can be linked to nursing theories, such as Watson's Theory of Human Caring, as aromatherapy is a method that illustrates nurses' ability to be present and authentic with their patients (Buckle, 2016). Likely consistent with the use in the general population, "aromatherapy is the fastest growing therapy among nurses in the United States" (Buckle, 2016, p. 349).

Overall, aromatherapy has been described as safe, with few side effects; effective; and cost efficient (Buckle, 2015; Buckle, 2016). The use of aromatherapy, which holistically promotes health, is congruent with nursing care and the definition of nursing (ANA, 2016). As the research evidence for the clinical use of aromatherapy continues to grow (Maddocks-Jennings & Wilkinson, 2004) and the use of essential oils becomes more prevalent in society (Buckle, 2015), it is critical to provide this comprehensive nursing practice guideline to guide nurses and other healthcare professionals to safely and effectively integrate aromatherapy into their clinical care.

## RECOMMENDATIONS

### I. General Practice Recommendations

#### Likely to Be Effective

#### 1. Clinicians should select essential oils based on patients' preferences. <sup>3, 4, 5, 7</sup>

- It is important to use a scent and oil that is pleasing to the patient. Learned memory will impact how patients respond to the aromas of essential oils (Buckle, 2015). For optimal results, essential oils should be selected to match the indication and patient's preference (Buckle, 2015; Lillehei & Halcon, 2014).

#### 2. Essential oils should be administered in a way to minimize the risk of inducing side effects. <sup>2, 3, 5, 8, 9, 37, 111</sup>

- Side effects are minimally reported with aromatherapy; "Pure essential oils rarely produce an allergic effect" (Buckle, 2016, p. 348). Essential oils are often reported as safe to use (Buckle, 2015) and not having any known side effects (Anderson & Gross, 2004; Dehkordi, Baharanchi, & Bekhradi, 2014). One systematic review indicated that while "no adverse effects were reported in any of the studies reviewed...neither did the studies report the lack of adverse effects" (Lillehei & Halcon, 2014, p. 448). The most commonly reported side effect from essential oils is contact dermatitis (Lillehei, Halcon, Savik & Reis, 2015). Before essential oils are administered, clinicians should assess for patient's history of hypersensitivities and experiences with using essential oils (Tisserand & Young, 2014).

#### 3. Clinicians should receive training for aromatherapy administration. <sup>6</sup>

- A literature review explored aromatherapy in nursing practice indicates that essential oils should be used in nursing practice only when they are guided by institutional standards, guidelines, and with an understanding of essential oils (Maddocks-Jennings & Wilkinson, 2004).

## II. Recommendations to Reduce Post-Operative Nausea and Vomiting (PONV)

Post-operative nausea and vomiting (PONV) is the most common postoperative complication affecting 20 to 35% of surgical patients (Chiravalle & McCaffrey, 2005; Golembiewski & O'Brien, 2002; Hines, Steels, Chang & Gibbons, 2012) and upwards of 70% to 80% of high risk patients (ASPAN, 2006). Additionally, patient's commonly report fear of PONV before surgery (ASPAN, 2006; Golembiewski & O'Brien, 2002). While PONV is an unpleasant feeling for patients, it can also potentially lead to prolonged hospital stays or unplanned hospital admissions (ASPAN, 2006), the inability to return to normal daily activities at home (Golembiewski & O'Brien, 2002), and physiological sequelae, such as dehydration and electrolyte imbalances (Chiravalle & McCaffrey). Traditionally, PONV is treated with pharmacologic interventions and yet even with these interventions, the incidence of PONV remains; the use of aromatherapy may help to augment interventions to decrease symptoms of PONV.

### Likely to Be Effective

#### 4. Clinicians may consider aromatherapy, as a part of multimodal interventions, to decrease PONV. <sup>9-20, 21-27</sup>

- Aromatherapy has been shown to decrease PONV (ASPAN, 2006; Chiravalle & McCaffrey, 2005; Cotton, Rowell, Hood & Pellegrini, 2007; Geiger, 2005; Hodge, McCarthy & Pierce, 2014; Hunt et al., 2013; Lua & Zakaria, 2012; Mamaril, Windle & Burkard, 2006; Pellegrini, DeLodge, Bennett & Kelly, 2009) and authors recommend using aromatherapy as part of multimodal interventions to reduce PONV (Ferruggiari, Ragione, Rich & Lock, 2012; Sites et al., 2014; UW Health, 2015). Across the studies that investigated the impact of aromatherapy on PONV, some studies showed statistically significant improvement (Hodge et al., 2014; Hunt et al., 2013) while others did not achieve statistical significance (Hines et al., 2012; Sites et al., 2014; Tate, 1997).
- Two systematic reviews recommend that aromatherapy be considered in conjunction with conventional pharmacologic interventions to reduce PONV (ASPAN, 2006) and support a systematic multimodal approach to treating PONV (Golembiewski & O'Brien, 2002).
- In addition to aromatherapy decreasing the symptoms of PONV, the literature suggests that it may also improve patient satisfaction (Anderson & Gross, 2004; Ferruggiari et al., 2012; Radford, Fuller, Bushey, Daniel & Pellegrini, 2011; Sites et al., 2014), decrease the length of time to reduce the symptoms of PONV (Cotton et al., 2007; Pellegrini et al., 2009) and decrease the use of rescue antiemetics (Anderson & Gross, 2004; Cotton et al., 2007; Hines et al., 2012; Hunt et al., 2013).

Improving patient satisfaction:

- The use of aromatherapy was associated with increased patient satisfaction with their overall post-operative care (Anderson & Gross, 2004; Ferruggiari et

al., 2012; Radford, Fuller, Bushey, Daniel & Pellegrini, 2011; Sites et al., 2014). Authors noted patient reports of wanting to try aromatherapy again in the future if they needed an additional surgery (Anderson & Gross, 2004). Another study noted that those patients who were consented to participate but did not display symptoms of nausea were disappointed they did not have a chance to receive the aromatherapy intervention (Ferruggiari et al., 2012). This evidence suggests that aromatherapy in the postoperative period may improve the patient experience in addition to positively impacting PONV.

Decreasing the length of time to reduce PONV symptoms:

- o Two studies showed a statistically significant reduction in the length of time to achieve a 50% reduction in PONV symptoms using the Verbal Numeric Rating Scale (VRNS) when the aromatherapy group was compared to the control group (Cotton et al., 2007) and the pharmacologic intervention group (Pellegrini et al., 2009). Pellegrini and colleagues (2009) documented this reduction in PONV symptoms in multiple settings; the PACU ( $p = 0.045$ ), the same day surgical unit ( $p = 0.32$ ) and in the home setting ( $p = 0.017$ ).

Decreased use of rescue antiemetics:

- o A few studies explored the relationship between the use of aromatherapy and the amount of antiemetic medication used. In a published Cochrane systematic review (Hines et al., 2012), the proportion of participants that required rescue anti-emetics, when isopropyl alcohol was compared to placebo, was less. However, when isopropyl alcohol was compared to standard anti-emetic treatment, the proportion of participants requiring antiemetics did not decrease (Hines et al., 2012). Cotton et al. (2007) and Hunt et al. (2013) reported that patients used fewer rescue antiemetics when they used aromatherapy to decrease PONV. Anderson & Gross (2004) indicate a nearly 50% reduction in the use of IV antiemetics in the PACU.

### Effectiveness Not Established

#### 5. Clinicians may consider using isopropyl alcohol (IPA) as an inhaled aroma; however it may or may not reduce the symptoms of post-operative nausea and vomiting.<sup>9, 12, 16, 18, 20, 21, 22, 23</sup>

- IPA is not considered aromatherapy, as IPA is not an essential oil; however it is a known folk remedy used for nausea (Mamaril et al., 2006). Based on the current evidence, it is difficult to conclude if IPA can conclusively decrease PONV; however it is not likely to cause harm to patients (Hines et al., 2012) and is a low cost intervention (Merritt, Okyere & Jasinski, 2002).
- To understand the scientific evidence of this intervention, Mamaril et al., (2006) conducted a review of the literature and identified three studies that explored the use of IPA; two of these studies noted faster and transient relief of PONV symptoms, one study (Merritt et al, 2002) did not reveal a significant difference in PONV with IPA and standard pharmacologic interventions. The Cochrane Collaboration's systematic review (Hines et al., 2012) summarizes their review by stating that IPA may have

impact on decreasing PONV; however when compared to pharmacologic interventions, it is less effective.

- Hunt and colleagues' (2013) prospective randomized trial, using four arms (aromatherapy using ginger, aromatherapy with an oil blend, 70% IPA, and a placebo of normal saline) with 301 participants, did not reveal that IPA group had a significant reduction in nausea ( $p < 0.76$ ). However, the participants with reported postoperative nausea in the ginger group and the oil blend group reported a statistically significant reduction in nausea ( $p = 0.002$  and  $p < 0.001$  respectively).
- Similarly, four other studies were reviewed to explore the impact of IPA on PONV, two (Anderson & Gross, 2004; Radford et al., 2011) did not show that IPA decreased the symptoms of PONV and yet two other studies (Cotton et al, 2007; Pellegrini et al., 2009) reported a decrease in symptoms.

### Oils recommended to decrease symptoms of PONV:

Essential Oil	Method of administration	References
<i>Mentha piperita</i> Peppermint	Inhalation	Anderson & Gross, 2004; Chiravalle & McCaffrey, 2005; Ferruggiari et al., 2012; Sites et al., 2014; Tate 1997
<i>Zingiber officinale</i> Ginger	Inhalation	Hunt et al., 2013; Geiger, 2005

### III. Recommendations to Reduce Pain

Pain is an unpleasant sensation that is a unique individual experience (Buckle, 2015) and can result from a variety of procedures, events, and diseases (Townsend, Bonham, Chase, Dunscomb & McAlister, 2014). Pain is traditionally treated with pharmacological interventions, such as opioids and anti-inflammatory medications; however, aromatherapy's impact on the nervous system may help to decrease the perception and experience of pain (Buckle, 2015).

#### Likely to Be Effective

#### 6. Clinicians may consider aromatherapy as an adjuvant therapy to decrease patients' pain score. 29, 30, 32, 33, 34, 35, 38, 39, 40, 43, 45, 46, 50, 53, 54, 56, 57, 58, 59, 60, 61

- The available literature explores a variety of clinical conditions that are associated with pain. RCTs have explored this relationship spanning surgical interventions, including CABG (Goriji et al., 2015), episiotomy (Vakilian, Atarha, Bekhradi, & Chaman, 2011), tonsillectomy (Soltani et al., 2013), gastric banding (Kim et al., 2007) and open heart surgery (Salamat, Mashouf, Sahbaei, & Mojab, 2014). Medical conditions included: headache (Gobel, Schmidt, & Soyka, 1994) and migraine (Sassannejad et al., 2012), neck pain (Ou, Lee, Li & Wu, 2014; Yip & Tse, 2006), back pain (Sritoomma, Moyle, Cooke, & O'Dwyer, 2014), shoulder pain (Shin & Lee, 2007), renal colic (Ayan et al., 2013; Irmak et al., 2015), musculoskeletal pain (Taylor et al., 2012) and painful procedures including hemodialysis (HD) needle insertion (Bagheri-Nesami et al., 2014; Ghods, Abforosh, Ghorbani & Asgari, 2015) and breast biopsy (Kim et al., 2006). Expert opinions (Buckle, 1999; Buckle, 2001; Ching, 1999) support the use of aromatherapy to decrease pain for a variety of



conditions. The impact of aromatherapy on cancer related pain, based on two systematic reviews, is inconclusive (Chen et al., 2016; Shin et al., 2016).

**7. Clinicians may consider aromatherapy, specifically lavender oil, with or without the use of massage to decrease the pain and symptoms of dysmenorrhea.** <sup>28, 31, 37, 42, 49</sup>

- Aromatherapy, specifically lavender used alone or as a blend, is shown to decrease participants pain associated with dysmenorrhea (Apay, Arslan, Akpinar & Celebioglu, 2012; Bakhtshirin, Abedi, Yusefizoq & Razmjooee, 2015; Dehkordi, Baharanchi & Bekhradi, 2014; Han, Hur, Buckle, Choi & Lee, 2006; Ou, Hsu, Lai, Lin & Lin, 2012) either with (Apay et al., 2012; Bakhtshirin et al., 2015; Han et al., 2006; Ou et al., 2012) or without massage (Dehkordi et al., 2014). A statistically significant decrease in pain was found in the aromatherapy groups compared to placebo (Apay et al., 2012; Bakhtshirin et al., 2015; Han et al., 2006).

**Effectiveness Not Established**

**8. Clinicians could consider the use of a familiar scent to help decrease neonatal distress during minor painful procedures.** <sup>41, 51, 52</sup>

- Neonatal distress has been studied exploring the association between familiar scents, either maternal or non-maternal, and neonatal distress (Goubet, Strasbaugh & Chesney, 2007; Sadathosseini, Negarandeh, & Movahedi, 2013). Authors report that familiar scents are associated with decreased neonatal distress. Familiar scents are those that have been introduced to the neonate during routine life experience, such as the scent of their mother’s breast milk or skin. In other studies, the scents of vanilla or vanillian have been introduced to the neonate either in their crib or while in their mother’s arms (Goubet et al., 2007).
- When neonatal distress was assessed during painful procedure using vanilla (not as a familiar scent) compared to water “scent”; no difference was noted. (Romantsik, Porter & Varendi, 2014).
- When vanilla was used as a familiar scent – the neonates were familiarized to the scent in advance of the painful procedure – the neonates who had vanilla during the painful procedure displayed less distress (Goubet et al., 2007; Sadathosseini et al, 2013).

**Oils recommended to decrease pain scores:**

Essential Oil	Method of administration	References
<i>Lavandula angustifolia</i> Lavender	Inhalation, massage, ‘M’ technique®	Apay et al., 2012; Bakhtshirin et al., 2015; Cino, 2014; Dehkordi et al., 2014; Ghods et al., 2015; Gorji et al., 2015; Irmak, 2015; Kane et al., 2004; Kim et al., 2007; Louis & Kowalski, 2002; Salamati et al., 2014; Sassannejad et al., 2012; Shin & Lee, 2007; Soltani et al., 2013; Vakilian et al., 2011; Yip & Tse, 2006

<i>Rosa damascena</i> Rose	Inhalation, massage	Ayan et al., 2013; Marofi et al., 2015
<i>Citrus nobilis</i> Mandarin	Inhalation, 'M' technique®	Buckle, 1999; Buckle, 2001
<i>Zingiber officinale</i> Ginger	Inhalation	Sritoomma et al., 2014

#### IV. Recommendations to Promote Well-being

The experience of being a patient can be stressful and anxiety provoking. Stress and anxiety appear to negatively impact health and well-being (Biddiss, Knibbe, & McPherson, 2014). The way a person reacts to and copes with stress affects health (Buckle, 2015). The stress response leads to elevated levels of hormones such as cortisol and cytokines which may lower the immune response (Biddiss et al., 2014). Aromatherapy has been studied as a method that may reduce stress and promote well-being. Some essential oil constituents such as lavender, mandarin, frankincense, and rose, have relaxing properties (Buckle, 2015). The current knowledge suggests that when an essential oil is inhaled, messages are sent to the limbic system, including the amygdala; a part of the brain that plays an important role in emotional responses (Buckle, 2015).

#### Likely to Be Effective

##### 9. Clinicians may consider using aromatherapy to promote well-being. <sup>6, 62 – 96</sup>

- One systematic review (Boehm, Büssing & Ostermann, 2012), reviewed 19 studies exploring aromatherapy's use in cancer patients. The authors conclude that aromatherapy may provide short term benefits for anxiety, depression, improved sleep, and well-being for cancer patients (Boehm et al., 2012). Another systematic review (Biddiss, Knibbe & McPherson, 2014) examined studies that explored the impact of essential oils' use in adults before having a procedure. Three out of the six studies noted a significant decrease in anxiety (Biddiss et al., 2014). A third systematic review found empirical evidence to support the use of aromatherapy in nursing practice to enhance patient relaxation (Maddock-Jennings & Wilkinson, 2004).
- 22 RCTs were included in this review. These studies spanned individuals experiencing high levels of stress (Bikmoradi et al., 2015; Corner, Cawley, & Hildebrand, 1995; Dunn, Sleep, & Collett, 1995; Oyama et al., 2000; Serfaty et al., 2012; Westcombe et al., 2003; Wilkinson et al., 2007), and exposed to stressful situations (Burnett, Solterbeck, & Strapp, 2004; Kritsidma, Newton, & Asimakopoulou, 2010; Lehrner, Marwinski, Lehr, Jöhren & Deecke, 2005; Motomura, Sakurai, & Yotsuya, 2001; Wiegand et al., 2010). Cancer patients experienced decreased anxiety, depression (Corner, Cawley, & Hildebrand, 1995; Westcombe et al., 2003; Wilkinson et al., 2007), emesis and fatigue (Oyama et al., 2000) and improvement in mood (Serfaty et al., 2012). Patients in the Intensive Care Unit (ICU) reported improved mood and decreased anxiety (Dunn et al., 1995). Women with high levels of stress who received aromatherapy experienced a decrease in levels of stress (Wiegand et al., 2010; Wu et al., 2014). Dental patients reported

- significant decreases in anxiety during dental treatment using inhaled lavender (Kritsidma et al., 2010) and inhaled lavender and orange (Lehrner et al., 2005).
- Eight RCTs included in this review results showed mixed or nonsignificant results. (deJong et al., 2012; Dyer, Thomas, Sandsund, & Shaw, 2013; Holm & Fitzmaurice, 2008; Jafarzadeh, Arman & Pour, 2013; Nord & Belew, 2009; Peng, Koo & Zer-Ran, 2009; Schellhammer, Ostermann, Kruger, Berger, & Heusser, 2013; Wilcock et al., 2004). Inhaled lavender decreased mean mental stress scores after coronary artery bypass (CABG) surgery compared to the control group, however the differences between the groups were not statistically significant (Bikmoradi et al., 2015). Essential oils did not significantly lower distress for patients in a perianesthesia setting (Nord & Belew, 2009), children during dental treatment (Jafarzadeh et al., 2013) or infants post craniofacial surgery; however, salivary cortisol was noted to significantly decrease in infants post-craniofacial surgery (deJong et al., 2012).
  - In addition to the RCTs, other levels of evidence also indicate that aromatherapy may promote well-being. Qualitative data analysis from four studies indicated that aromatherapy was associated with the following themes: inspiring calm relaxation, softening effect, humanizing technology and enhancing connectedness (Brown et al., 1999); de- stressing, a reward for self, empowering, connection, communication through touch (Dunwoody, Smyth, & Davidson, 2002); relaxation, helped with coping, and muscle tension, (Papadopoulous, Wright, & Ensor, 1999); relaxed and relieved (Mousley, 2015). Five articles reviewed presented experts' opinions (Buckley, 2002; Gatlin & Schulmeister, 2007; Keegan, 2000; Keegan, 2003; Lis-Balchin, 1997) and all supported the use of aromatherapy to reduce stress and promote relaxation and well-being.

**Oils recommended to promote well-being:**

Essential Oil	Method of administration	References
<i>Lavandula angustifolia</i> Lavender	Inhalation, massage and 'M' technique®	Bikmoradi et al., 2015; Burnett, Solterbeck, & Strapp, 2004; Dunn, Sleep, & Collett, 1995; Field et al., 2008, Kritsidma, Newton, & Asimakopoulou, 2010; Motomura, Sakurai, & Yotsuya, 2001; Seol et al., 2013, Wu et al., 2014; Nord & Belew, 2009
<i>Citrus nobilis</i> Mandarin	Inhalation and 'M' technique®	Lehrner, Marwinski, Lehr, Jhren & Deecke, 2005; deJong et al., 2012; Jafarzadeh, Arman & Pour, 2013
<i>Rosa damascena</i> Rose	Inhalation	Mousley, 2015

## V. Recommendations to Promote Sleep

Promoting sleep is important for health maintenance (Hwang & Shin, 2015) as sleep deprivation has been linked to delayed recovery in hospitalized patients (Lytle, Mwatha, & Davins, 2014), impaired performance, daytime sleepiness and long-term effects like inflammation that can lead chronic diseases (Lillehei & Halcon, 2014). Approximately 30 years ago the idea was introduced that aromatherapy could be useful in minimizing insomnia (Lewith, 2015). Insomnia is traditionally treated with pharmacologic interventions; however to avoid the possible side-effects of these medications, non-pharmacological interventions have become the preferred treatment (Fismer & Pilkington, 2012).

### Likely to Be Effective

#### 10. Clinicians may consider using aromatherapy, specifically using lavender, to promote sleep and enhance the perception of quality of sleep. <sup>97 – 120</sup>

- a. Four systematic reviews were included in this review, three of which concluded that aromatherapy may improve or enhance sleep (Fismer & Pilkington, 2012; Hwang & Shin, 2015; Lillehei & Halcon, 2014). Hwang & Shin (2015) reported in their meta-analysis that those participants with a disease had a greater effect size from aromatherapy than healthy individuals. One systematic review, with a focus on critical care, suggested a need for more information about safety of aromatherapy before use in critically ill patients in the ICU (Richards, Nagel, Markie, Elweel & Barone, 2003). Two other systematic reviews report on the benefits of aromatherapy for sleep and included studies conducted in the hospital setting (Fismer & Pilkington, 2012; Lillehei & Halcon, 2014).
- b. The majority of the studies included in this review explored the impact of the essential oil lavender on sleep; a few studies used rose (Buckle, 2001; Jahangir, Urooj, Shah, Ishaq & Habib, 2008; Vitinius et al, 2014). Lavender has been highlighted in this practice recommendation because the literature suggests that it has promoted rest and relaxation in a variety of settings (Fismer & Pilkington, 2012; Lillehei & Halcon, 2014; Lytle et al., 2014). While the exact mechanism of action of lavender is not known (Fismer & Pilkington, 2012; Lillehei & Halcon, 2014), historical medical texts reference lavenders' sedative properties (Fismer & Pilkington, 2012). The impact of lavender is likely multifaceted and its chemical properties are thought to act on neurotransmitters and receptors to induce sedative or hypnotic effects (Fismer & Pilkington, 2012; Lillehei & Halcon, 2014).
- c. Three RCTs studied the effectiveness of aromatherapy using the essential oil lavender. Lytle and colleagues (2014) found that lavender was associated with decreased blood pressure and improved overall sleep scores in IMC patients, compared to the control group. The other two RCTs indicated that lavender intervention groups showed improved sleep quality (Lillehei, Halcon, Savik & Reis, 2015) and improved quality of sleepiness at awakening (Hirokawa, Nishimoto & Taniguichi, 2012). Goel, Kim & Lao (2005) found that lavender oil inhalation increases the amount of deep sleep.
- d. The use of aromatherapy, specifically lavender, may help to promote calmness which may, in turn, promote sleep. The chemical properties of lavender (as well as other essential oils) seem to be linked to sedative effects to foster sleep (Fismer & Pilkington, 2012; Lillehei & Halcon, 2014). Broadly stated, "aromatherapy may have some merits in inducing a state of mind conducive to sleep" (Wheatley, 2005, p.

419). Lavender, specifically, may aid in general calming, relaxing (Mayo Foundation, 2003), and promoting sleep (Wheatley, 2005).

### Oils recommended to promote sleep:

Essential Oil	Method of administration	References
<i>Lavandula angustifolia</i> Lavender	Inhaled	Chien et al., 2012; Goel et al., 2005; Hudson, 1996; Johannessen, 2013; Lewith et al., 2005; Lillehei et al., 2015; Lytle et al., 2014; Moeini et al., 2010; Robinson et al., 2005
<i>Rosa damascena</i> Rose	Inhaled	Jahangir et al., 2008

### Companion Documents (such as algorithms, tables, and forms)

1. Delegation Protocol: Aromatherapy Administration in Clinical Areas – Adult/Pediatric – Inpatient/Ambulatory
2. Aromatherapy: The Clinical Use of Essential Oils – Administration Algorithm

### Availability Of Companion Documents

1. Nursing Practice Guideline with accompanying Administration Algorithm is available on U-Connect
2. Delegation Protocol is available on U-Connect
3. Aromatherapy Computer Based Training (CBT) is offered electronically

### Patient Resources

Clinical Use of Aromatherapy – Health Facts for You #7973

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## POTENTIAL BENEFITS/HARMS OF IMPLEMENTATION

### Potential Benefits

This guideline was developed with the intention of providing an additional, complementary way to care for patients across the UW Health system, through the use of essential oils as an aromatherapy. Aromatherapy may decrease the symptoms as described in this guideline. Overall, aromatherapy may positively contribute to the patients' experience during their healthcare encounter.

### Potential Harms

This guideline is intended to guide practice in a way that mitigates the potential harms or side effects to patients who receive aromatherapy in clinical settings. There is a minimal risk of hypersensitivity reactions to essential oils; this risk can be minimized with proper assessment of the patient and administration.

## IMPLEMENTATION OF THE GUIDELINE

### Description of Implementation Strategy

This guideline will be implemented using a combination of passive and active strategies. Nursing groups, such as the Nursing Practice Guideline Committee and the Nursing Practice Council, during the approval process will become aware of the guideline and will be asked to disseminate information about the document. In addition, an educational program will be offered to all nurses at UW Health to provide an overview of how to use aromatherapy safely in clinical settings. Additionally, Clinical Nurse Specialists will have the opportunity to attend an advanced training with a certified aromatherapist. The delegation protocol will support the ordering and documentation of the essential oils. The administration algorithm, along with this Nursing Practice Guideline will be used to guide the use of essential oils in clinical settings.

### Implementation Tools

Utilization of the Evidence-Based Practice Implementation Model copyright by Laura Cullen and The University of Iowa Hospital & Clinics; see full article: Cullen, L. & Adams, S. (2012). Planning for implementation of evidence-based practice. *Journal of Nursing Administration*, 42(4), 222-230. doi: 10.1097/NNA.0b013e31824ccd0a

## IDENTIFYING INFORMATION AND AVAILABILITY

### Date Released (Revised)

Developed and initial approval for pilot units: April, 2017

Released for general use: June, 2019

### Guideline Sponsor

UW Health – American Family Children’s Hospital, Vice President of Clinical Operations

UW Health – Nursing Director who oversees Nursing Research & Evidence-Based Practice

### **Guideline Authors**

Registered Nurse & Certified Aromatherapist, Independent Contractor, UW Health’s Integrative Medicine Program

Clinical Nurse Specialist, Research & Evidence-Based Practice

Clinical Nurse Specialists for Surgical Services

Clinical Nurse Specialist, Inpatient General Surgery and Transplant

Clinical Nurse Specialist, Pediatric Pain

Nurse Practitioner, Pediatric Palliative Care

### **Guideline Status**

Initial guideline, 2017

### **DISCLAIMER:**

Guidelines are designed to assist clinicians by providing a framework for the evaluation and treatment of patients. This guideline outlines the preferred approach for most patients. It is not intended to replace a clinician’s judgment or to establish a protocol for all patients. It is understood that some patients will not fit the clinical condition contemplated by a guideline and that a guideline will rarely establish the only appropriate approach to a problem.