# Intractable Peripheral Edema in Hospice: A Clinical Aromatherapy Case Study and Review of the Literature

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# Disclosure Statement

I have the following financial relationships to disclose:

- As Faculty, I received financial assistance for conference attendance from Augusta University College of Nursing.
- As a PhD student, I received a Travel Grant for conference attendance from The Graduate School at Augusta University.
- As a Clinical Aromatherapist, I received a Research/Travel Grant for conference attendance from the National Association for Holistic Aromatherapy (NAHA).
- I am the sole proprietor of Aromatherapeutic Solutions in Martinez, GA, USA.

# Learning Objectives

The learner will be able to:

1. Describe peripheral edema as an adverse effect of certain pharmacological approaches to pain management at end-of-life.
2. Discuss the role of clinical aromatherapy to reduce intractable edema at end-of-life.

# Peripheral Edema at End-of-Life

Peripheral edema at end-of-life effects  approximately 10% of patients and has significant impact on quality of life, but is estimated to be grossly underreported (ILF, 2010).

Peripheral edema at end-of-life can be related to:

- Adverse effects of pharmacological approaches to palliation
- Co-morbid conditions
- Metastasis
- Surgeries
- Terminal diagnosis

# Management of Peripheral Edema

## Pharmacological

- **Loop diuretics:**
  - Lasix (Furosemide)
  - Bumex (Bumetanide)
  - Demadex (Torsemide)
- **$K^+$ Sparing Diuretics:**
  - Aldactone (Spironolactone)
  - Amiloride
- **Thiazide & Like Diuretics:**
  - Zaroxlyn (Metolazone)
  - HCTZ or CT

## Non-Pharmacological

- Compression
- Elevation
- Exercise/Physical Therapy
- Fluid Intake Restriction
- Manual Lymph Drainage
- Sodium Restricted Diet

(Trayes & Studdiford, 2013)

# Opioid & Gabapentenoid-Related Peripheral Edema

The exact cause of opioid & gabapentenoid-induced peripheral edema is unknown. After initiation of opioid or gabapentenoid therapy, some patients develop peripheral edema which can be severe.

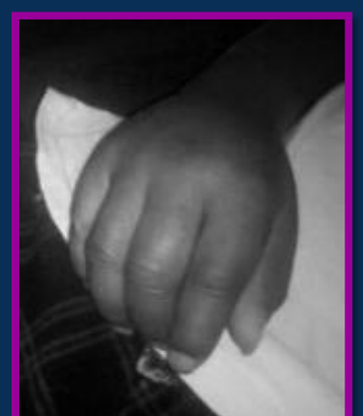
For these patients, switching opioids may reverse their peripheral edema. For others, peripheral edema will not resolve until opioids or gabapentanoids are discontinued (Gardner-Nix, 2002; Ruan et. Al., 2008; Dawson, et. Al, 2014).

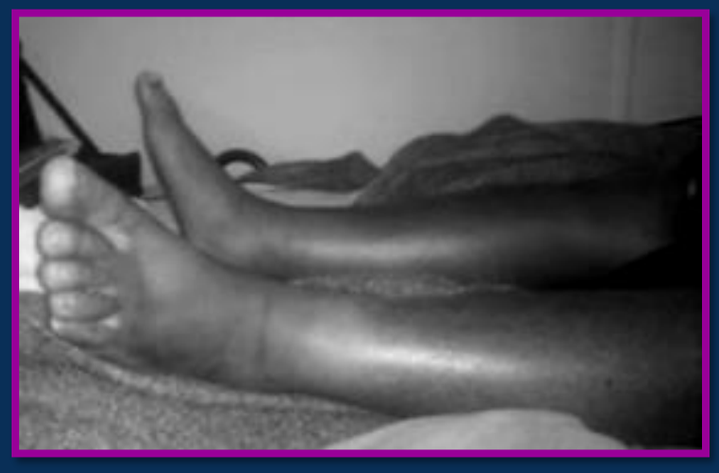
# Case Study Participant

African American male in his mid-fifties diagnosed with familial adenomatous polyposis and terminal colon cancer. He began having intermittent edema in his face and scrotum, which resolved with both pharmacological and non-pharmacological approaches. He then developed intractable bilateral peripheral edema. He had difficulty holding objects and became non-ambulatory due to the edema. He was taking Lasix, Aldactone, Zaroxyln, Bumex, and Potassium orally, limiting salt/fluid intake and elevating his extremities daily, but without success.

# Case Study Visits

## Pre-Treatment





## 1 Week

No Change / Lower Extremities Not Photographed

## 2 Weeks

# Clinical Aromatherapy Blend

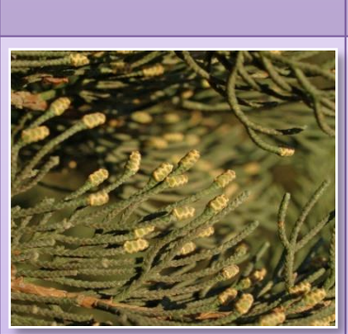
| Genus and species | *Cupressus sempervirens* | *Foeniculum vulgare* | *Zingiber officinale* | *Lavendula angustifolia* | *Simmondsia chinensis* |
|---|---|---|---|---|---|
| **Common name** | **Cypress** | **Fennel** | **Ginger** | **Lavender** | **Jojoba** |
| **Plant Image** |  |  |  |  |  |
| Reference | www.prota4u.info | www.commons.wikimedia.org | © Dawn Langley-Brady, 2016 | © Dawn Langley-Brady, 2012 | www.thejojobaoil.com |

Table 1. Clinical aromatherapy blend including: genus, species, common name, and image of essential oils and carrier.

# Primary Chemical Constituents

| *Cupressus sempervirens* (Cypress) | *Foeniculum vulgare* (Sweet Fennel) | *Zingiber officinale* (Ginger) | Lavendula angustifolia (Lavender) |
|---|---|---|---|
| *α-Pinene* | *(E)-Anethole* | *Zingiberene* | *Linalool* |
| *δ -3- Carene* | *(+) – Limonene* | *ar-Curcumene* | *Linalyl acetate* |
| *Cedrol* | *Fenchone* | *β-Sesquiphellandrene* | *Lavandulyl acetate* |
| *α-Terpinyl acetate* | *Estragole* | *Camphene* | *β-Caryophyllene* |
| *Terpinolene* | *α-Pinene* | *β-Bisabolene* | *Terpinen-4-ol* |
| *(+) - Limonene* | *α-Phellandrene* | *β-Phellandrene* | *Borneol* |
| *β-Pinene* | *(Z)-Anethole* | *Borneol* | *α-Terpineol* |
| *Sabinene* | | *1,8-Cineole* | *(Z)-β-Ocimene* |

Table 2. Primary chemical constituents in select essential oils are listed by percentage from highest to lowest (Tisserand & Young, 2014).

# Chemical Group Mechanisms of Action

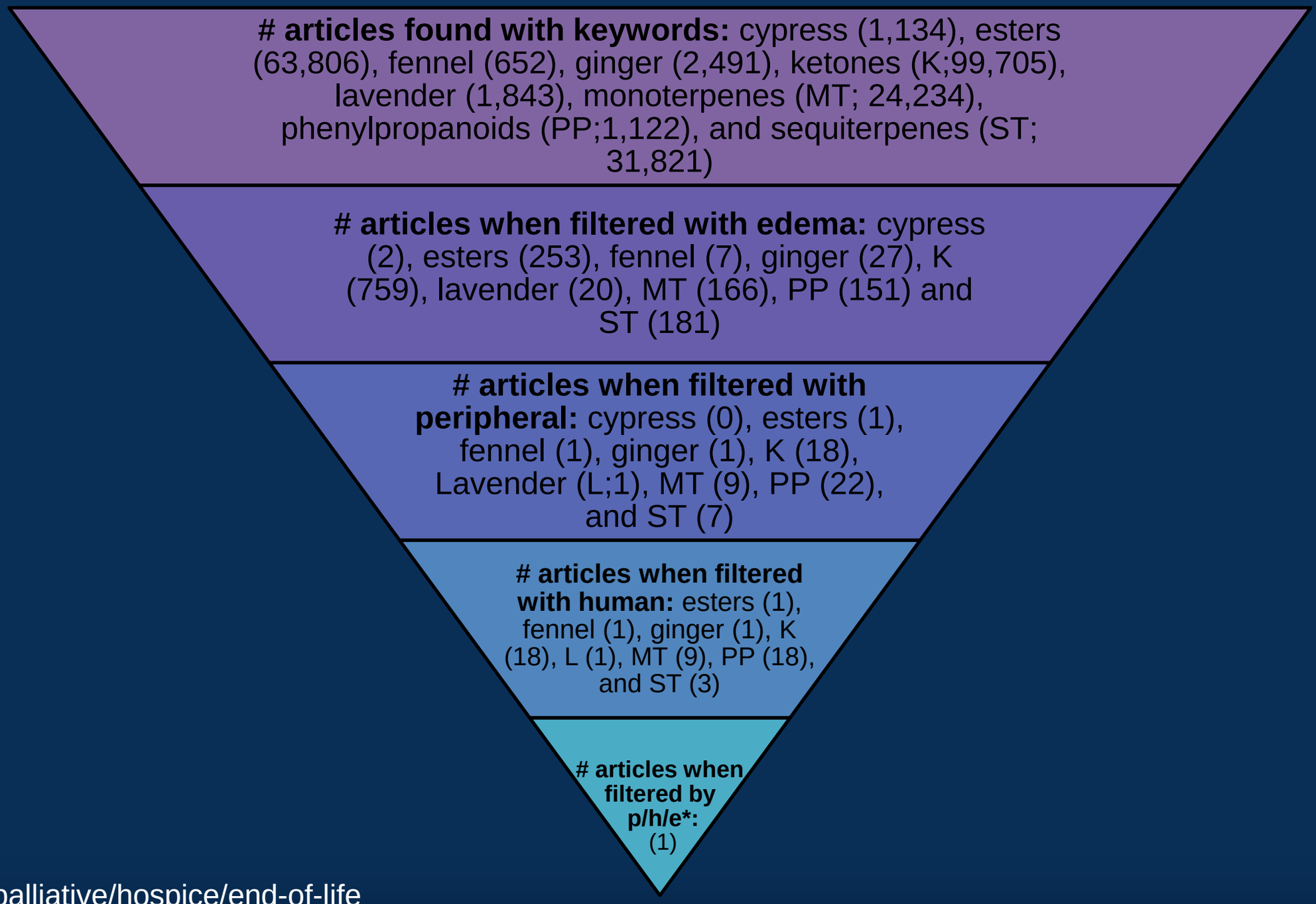
| Esters | Ketones | Monoterpene Alcohols | Monoterpene Hydrocarbons | Phenyl-propanoids | Sesquiterpines |
|---|---|---|---|---|---|
| anti-inflammatory, antispasmodic, immuno-modulatory, myorelaxant, CNS relaxant | analgesic, anti-inflammatory, anti-nociceptive | analgesic, anti-inflammatory, antispasmodic, immunomodulatory, vasorelaxant, motor relaxant | acetylcholinesterase inhibitor, analgesic, anti-inflammatory, antispasmodic, enhances transdermal penetration, immunomodulatory, motor relaxant | anti-inflammatory, antispasmodic, vasorelaxant | Anesthetic, anti-inflammatory, antispasmodic, anxiolytic, |

Table 3. Chemical group mechanisms of action are listed only for primary chemical constituents of select essential oils (Shutes, 2013).

# Literature Review

PubMed, CINAHL, OvidMedline, and ProQuest databases were searched for peer-reviewed journal articles in English with the following keywords: cypress, esters, fennel, ginger, ketones, lavender, monoterpenes, phenylpropinoids, peripheral edema, and sequiterpenes.

**Figure 1. Filter used to identify appropriate research articles written in English**




* p/h/e: palliative/hospice/end-of-life

# Results

One study was found:

A case report of an end-of-life patient started on methadone for uncontrolled pain. He quickly developed bilateral peripheral edema that resolved within a few days after methadone discontinuation (Dawson, et Al., 2014).

# Conclusion

- The literature review found insufficient evidence-based knowledge on the use of cypress, fennel, ginger, and lavender essential oils and their key chemical groups for reducing peripheral edema in patients at end-of-life (Figure 1).
- Two animal studies were found using chemical constituents of these essential oils for myorelaxation and vasorelaxation (Silvo-Filho, et. AL., 2011; Pino-da-Dilva, et. AL., 2012).
- Patients at end-of-life can experience immense pain. The use of opioids and gabapentenoids can result in adverse effects such as peripheral edema and related complications.
- The use of essential oils to reduce peripheral edema may allow patients to continue needed pain medications without the added burden of peripheral edema. Further study is needed.

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