A Pediatrician’s Panoramic View of Essential Oils
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Hutchinson Kansas

“Smell is a potent wizard that transports you across thousands of miles and all the years you’ve lived.”

Helen Keller

The Power of Smell

Essential Oils

1. What are Essential Oils?
2. Are Essential Oils safe?
3. Are Essential Oils effective?
4. Why are they so popular?
5. Counseling the EO parent.

What are Essential Oils?
Complex mixture of “aromatic” (olfaction) hydrocarbons. Derived from specific botanically defined raw materials.

Two methods of production:
1. **Steam Distillation**
   Essential Oil
   Hydrosol (Aromatic waters)
2. **Cold Press**
   Mechanical process without heating
   Exclusive to citrus oils.

The composition of EO’s is variable:
Composition is dependent upon
<table>
<thead>
<tr>
<th>Geographical location</th>
<th>Growing conditions</th>
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<tbody>
<tr>
<td>Age of the plant</td>
<td>Fertilizer usage</td>
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<tr>
<td>Amount of watering</td>
<td>Time of year or season of harvest</td>
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Example of variation: Lavender

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<tr>
<th></th>
<th><strong>French</strong></th>
<th><strong>Ukrainian</strong></th>
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<td>Linalyl acetate</td>
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<td>43.3 %</td>
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<td>Lavandulyl</td>
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<tr>
<td>B-caryophyllene</td>
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<td>5.9 %</td>
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<td>Terpinen-4-ol</td>
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<tr>
<td>a-Terpinol</td>
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<tr>
<td>(Z)-B-Ocimene</td>
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<tr>
<td>3-Octanone</td>
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<tr>
<td>(E)-B-Ocimene</td>
<td>0.1 %</td>
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</table>
EO’s function in plants:
- Repel predators (deer, rabbits) and insects
- Antimicrobial effect:
  - Bacterial, fungi, mold
- Attract insects for pollination purposes.
- Add aroma and flavor to the plant.

Historical Perspective:

5000 BC to 9th Century AD:
- Spices, Herbs, and oils (not essential oils)
- Medicinally (healings / spirituality)
- Perfumery
- Embalming
- Flavoring

9th Century to the 20th Century:
- Steam distillation was introduced
  - Medicinally
  - Perfumery
  - Cosmetics/cosmetology
  - Food industry

20th Century:
- 1920’s Maurice Rene Gattefosse
  - Considered the father of aromatherapy
  - Coined the term aromatherapy
- 1940’s – 1970’s Dr. Jean Valnet
  - Treated French soldiers with EO’s in WWII
  - Presented as an alternative to modern medicine.
  - Influenced the spread and availability of EO’s in Europe.

Mid-1990’s to present:
- Large increase in the use of essential oils
- Use of EO’s align with personal philosophy
- Increase access to unfiltered information
- Multi-level Marketing
  - Young Living
  - doTerra

Are Essential Oils Safe?

Human safety Data is hard to find.
- Little funding for plant derived chemicals
- Hard to standardize EO’s: High variability
- Purity questions (adulteration)
- Study designs are complicated or misleading

Considerations for safety/toxicity:
- Route of Administration:
  1. Ingestion
  2. Topical
  3. Inhalation
Ingestion:
Most acute toxic reactions are
CNS
Hepatic
Renal
The vast majority are accidental.
Aromatherapists do not recommend internal ingestion.

List of known common toxic agents:
- Camphor Oil
- Melaleuka (TTO)
- Eucalyptus Oil
- Citonella Oil
- Cinnamon Oil
- Clove Oil
- Wintergreen Oil
- Pennyroyal

- 2-Camphanone
- Monoterpenes
- 1,8-Cineole (Eucalyptol)
- Geraniol
- Eugenol
- Eugenol
- Methylsalicylate
- Pulegone

Common OTC products containing camphor:
- Campho-phenique: Camphor 10.8%
- Vicks Vapor Rub: Camphor 5%
  - Eucalyptus 1.75%
  - Menthol 2.75%
- Caladryl Lotion: Non active amount

TOPICAL TOXICITY:
Factors
1. Composition of the oil.
2. Dilution of the oil.
3. Skin Absorption:
   Infant Normal vs. Abnormal
Topical Application: Adverse Reactions:
1. CONTACT DERMATITIS
   - EO dependent
   - Dilution Dependent
   - Carrier oils
     - Fractionated coconut oil
     - Olive oil
     - Almond Oil
     - Avocado Oil
DILUTION TABLE:

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<th>Carrier Oil Volume (ml)</th>
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<td>8.9%</td>
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<td>3.3%</td>
<td>2.2%</td>
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Topical Application: Adverse Reactions:

2. **Allergic Dermatitis**
   EO Dependent

3. **Photo-dermatitis/Phototoxic**
   Almost exclusive to Citrus oils (Cold Press)
   Culprit: psoralen constituent
   Can occur at very dilute concentrations
   Not seen in distilled citrus oils

Inhalation:

1. **Incidental**
   Flowers
   Personal care products.
   Household Products
   Vaporization: Candles, Aromatic diffusers, Steam inhalation

2. **Intentional**:
   Balms or rubbing ointments
   Steam inhalation

**Inhalation Toxicity: Adverse Reactions**

Primary Reactions:
- Bronchial hyper-reactivity
- Sensory Irritation
- Sensory Hyperactivity

**Bronchial Hyper-reactivity:**
- Multiple triggers
- Dust mites, Pollen, molds etc.
- Evidence that EO’s can trigger BHR:
  - a-limonene, a-pinene, d-3-Carene, Eugenol
**Inhalation Toxicity: Sensory Irritation:**

- Stimulation of the trigeminal and vagus nerve afferent C fibers (in the nose, mouth, and throat.)
- Distinct from olfaction
- Able to detect non-odorous chemicals
- Tear gas, capsaicin
- Evokes sensations: Irritation, tickling, burning, stinging, cooling, warming.

**Inhalation Toxicity: Sensory Hyper-reactivity**

Reaction to aromatics that cause upper and lower airway symptoms.

- Rhinitis
- Sneezing
- Hoarseness,
- Coughing - Phlegm production
- Dypneus
- Eye irritation.

No Ig-E mediated allergies.
No bronchial obstruction on provocation,
Little or no response to anti-histamines.
Thought to be Trigeminal and Vagus nerve sensitization.
Commonly triggered by perfumes and flowers.

Karmin, W (2007)
3060 participants: Exposed to Pinimenthol
20% Eucalyptus
18% Pine needle Oil
3% Menthol
Report: Well tolerated
10 Skin Reactions
6 developed cough
5 Developed Obstructive Respiratory Tract Symptoms
4 Hyper-sensitivity of mucous membranes.

**Vicks Vapor Rub:**

- Applied to the upper lip of an 18 mo. old.
- Developed Severe Respiratory distress.
- Hospitalized in ICU for 5 days / Supportive care
- Discharged on 6th Hospital day. Made full recovery

(Package label cautions against use in children less than 2 years of age.)

**Are Essential Oils Effective?**

**Popular Views**

1. Abundance of anecdotal reports and feelings in support of EO effectiveness.
2. Abundance of anecdotal information and feelings denying EO effectiveness.
3. Abundance of anecdotal reports and opinion in support of EO effectiveness.

Confused? What does science tell us?
What do studies show?
“Systematic reviews have been published. Due to the caveats, the evidence is not sufficiently convincing that aromatherapy is an effective therapy for any disease.

1. Agricultural studies:
   May hold some promise as minimal risk pesticides.

2. Animal and *in vitro* studies:
   Evidence of anti microbial activity
   EO’s In Acute Otitis Media in Rats
   Cure rates were 50-81% vs placebo.
   If the toxicity studies confirm the safety of microbiological EO components in the ear, then a significant advance can be made in the treatment of AOM. (*J Inf. Dis* 2005: 191 (1 June).

Efficacy studies are difficult to design:
   Small sample size
   Lack of adequate controls.
   Aromatic compounds
   Poor study designs
   Lack of standardized of EO’s

**Comparison of Ciprofloxacin and Lamigex in the treatment of Acute Otitis Externa. (Iran)**
70 Seventy patients were randomly
   Ciprofloxacin 0.3% (*n* = 35)
   Lamigex (*n* = 35) drop.
AGE: 18-60 years.
Administration: 3 drops every 12 hrs. x 1 week
Patients were examined
   1. For AEO symptoms. (tenderness, itching, erythema, edema and discharge)
   2. Ear discharge cultures at baseline as well as the end of trial.
   3. Pain severity was recorded days 3 and 7.
Results: No significant Difference:
   1. Improvement of assessed symptoms:
   2. The rate of pain improvement.
   3. The numbers of positive cultures were reduced by the trials end for all tested microorganisms were not significantly different between the groups.
Conclusion
   The herbal combination drop that was investigated in the present study exhibited good efficacy in reducing the burden of infection as well as AEO symptoms.

Is it enough to recommend or change clinical practices? Not Yet
Catnip Oil: Insect repellant
Report by Iowa State University
Repellant activity against Aedes aegypti
Active ingredient: Nepetalactone
Results: More effective than DEET at lower concentrations.

Why small number of products:
Paucity of human toxicity data.
Catnip has a offensive odor.
Usually combined with other EO’s:
Lemongrass, Lemon, Citronella, Castor, Rosemary, Clove, Cedar,
Hard to find an oil that will attach to skin: Vegetable Glycerin Oil

SO WHY DO PEOPLE USE ESSENTIAL OILS?
WHY DO INDIVIDUALS USE EO’S?
1. Some don’t care about scientific research?
2. People want options not orders.
3. Parent’s want to control their medicine cabinets.
4. There is a cultural dissatisfaction with conventional medicine.
   - Ineffective
   - Adverse Effects
   - Impersonal
   - Costly

How do we respond?
We need to be able to credibly discuss the use, effectiveness and safety of EO’s
1. Basic understanding of EO’s
2. Realize generalizing is not appropriate.
3. Engage in the conversation.

The Decision Making Process:

<table>
<thead>
<tr>
<th>Essential Oil</th>
<th>Effective</th>
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<tr>
<td></td>
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<tr>
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<td>Discourage</td>
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2. As a Substitute Therapy

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<th>Essential Oil</th>
<th>Effective</th>
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<td>Strongly</td>
<td>Strongly</td>
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<tr>
<td>Discourage</td>
<td>Discourage</td>
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</table>

Takeaway Thoughts:
1. First, do no harm!!
2. Ask about the use of complimentary or alternative medicine when appropriate.
3. Engage in a dialogue about CAM usage
   A. Don’t be judgmental
4. There is no situation where recommendation of an essential oils is warranted.
5. If the patient/parent is going to use essential oils:
   A. As an compliment to convention medicine:
      If the essential oils is safe-Tolerate
      If the essential oils is unsafe: Strongly discourage
   B: As a substitute for conventional medicine: Strongly discourage.
A GUIDE FOR ESSENTIAL OIL USE IN CHILDREN

Avoid Using All routes on Children
Birch (sweet) *Betula lenta*
Wintergreen *Gaultheria fragrantissima, Gaultheria procumbens* –
    (due to methyl salicylate content)

Avoid using (all routes) on children under 2
Hyssop *Hyssopus officinalis* (pinocamphone chemtype) -
Massoia *Cryptocarya massoy, Cryptocaria massoia, Massoia aromatica*

Avoid using (all routes) on children under 6
Anise/Aniseed *Pimpinella anisum*
Anise (Star) *Illicium verum*
*Cajuput* *Melaleuca cajuputi, Melaleuca leucadendron*
Cardamon *Elettaria cardamomum*
*Cornmint* *Mentha arvensis, Mentha canadensis*
Fennel (bitter), Fennel (sweet) *Foeniculum vulgare*
*Galangal (lesser) Alpinia officinarum, Languas officinarum*
*Ho Leaf/Ravintsara Cinnamomum camphora* (cineole chemotype)
*Marjoram (Spanish) Thymus mastichina*
Bay Laurel *Laurus nobilis avoid*
*Cornmint* *Mentha arvensis, Mentha canadensis*
*Myrtle (red) Myrtus communis*
Myrtle (aniseed) *Backhousia anisata*
*Niaouli* (cineole chemotype) *Melaleuca quinquenervia*
Peppermint *Mentha x Piperita*
*Rosemary* (1,8-cineole chemotype) *Rosmarinus officinalis*
*Rambiazana Helichrysum gymnocephalum*
*Sage (Greek), Salvia fruiticosa, Salvia triloba* Sage (White)
*Sage (White) Salvia apiana*
*Sanna Hedychium spicatum*
*Saro Cinnamosma fragrans*

Avoid topical use on children under 2
Basil (lemon) *Ocimum x citriodorum –*
Benzoin *Styrax benzoin, Styrax paralleloneurus and Styrax tonkinensis*
Black Seed *Nigella sativa*
Cassia *Cinnamomum cassia, Cinnamomum aromaticum*
Clove Bud, Clove Leaf, Clove Stem *Syzygium aromaticum, Eugenia caryophyllata, Eugenia aromatica*
Ginger Lily *Hedychium coronarium*
Garlic *Allium sativum*

*Laurel Leaf*Laurus nobilis

Lemongrass *Cymbopogon flexuosus, Andropogon flexuosus, Cymbopogon citratus, Andropogon citratus*

Lemon Leaf/Lemon Petitgrain *Citrus x limon, Citrus limonum*

May Chang Litsea cubeba, Litsea citrata, Laura

Melissa/Lemon Balm Melissa officinalis –

Myrtle (honey) *Melaleuca teretifolia*

Myrtle (lemon)/Sweet Verbena Backhousia citriodora

Oak moss *Evernia prunastri*

Opopanax *Commiphora guidottii*

Oregano *Origanum onites, Origanum smyrneum, Origanum vulgare, Origanum compactum, Origanum hirtum, Thymbra capitata, Thymus capitatus, Coridothymus capitatus, Satureja capitata*

Peru Balsam *Myroxylon balsamum, Myroxylon pereirae, Myroxylon peruiferum, Myrosernum pereirae, Toluifera pereirae*

Saffron *Crocus sativus - avoid topical use on children under 2*

Sage (Wild Mountain) *Hemizygia petiolata*

Savory *Satureia hortensis, Satureia montana*

Tea Leaf/Black Tea *Camellia sinensis, Thea sinensis*

Tea Tree (lemon-scented) *Leptospermum petersonii, Leptospermum citratum, Leptospermum liversedgei*

Treemoss *Pseudevernia furfuracea*

Tuberose *Polianthes tuberosa*

Turpentine *Pinus ayacahuite, Pinus caribaea, Pinus contorta, Pinus elliottii, Pinus halepensis, Pinus insularis, Pinus kesiya, Pinus merkusii, Pinus palustris, Pinus pinaster, Pinus radiata, Pinus roxburghii, Pinus tabulaeformis, Verbena (Lemon) Aloysia triphylla, Aloysia citriodora, Lippa citriodora, Lippa triphylla*

Ylang-Ylang *Cananga odorata Styrax Liquidambar orientalis, Liquidambar styraciflua*

Avoid using (all routes) on children under 10

*Eucalyptus Eucalyptus camaldulensis, Eucalyptus globulus, Eucalyptus maidenii, Eucalyptus plenissima, Eucalyptus kochii, Eucalyptus polybractea, Eucalyptus radiata, Eucalyptus Australiana, Eucalyptus phellandra, Eucalyptus smithii*

Avoid using (all routes) on prepubertal children

Chaste Tree *Vitex agnus castus -*

* indicates essential oils that are high in 1,8-cineole and can potentially cause respiration to slow in children.
Safe Essential Oil Use With Babies & Children

1. Babies and Children should never ingest essential oils
   Keep all essential oils out of reach of children and babies.
   Certain essential oils could be toxic if ingested.

   According to Robert Tisserand, Essential Oil Safety;
   *The majority of cases of essential oil poisoning involve accidents with young children, often between 1 and 3 years of age. Approximately 75% of cases in the USA are in children up to 6 years old.*

   Accidental ingestion: Do not induce vomiting. Consult poison control for treatment advice.

2. Dilution is very important for ALL essential oils
   There is no exception in this category.
   No matter what brand you use, what essential oil it is, or how much you are using, it is not safe to use ANY essential oil neat (without a carrier oil or some other dilution material).

   It is also important to note that when adding essential oils to baths of children, they must first be diluted in a water soluble carrier, such as raw unfiltered honey or vegetable glycerin. Adding essential oils straight to bath water, without a carrier, runs you the risk of causing irritation to the skin.

   Essential Oils should be kept away from the child’s face.

3. Essential oils should not be used in or around the nose in children.
   Suggest massaging the feet with young children rather than the chest and back, for the safest application of essential oils.

4. Slowly introduce one essential oil at a time
   Allergies are no fun. When introducing essential oils to babies, you have to remember that you haven’t yet discovered the things they are allergic to. It’s important to introduce essential oils one at a time and sparingly, to both watch your baby for any sort of reaction and to allow your baby’s body to slowly become introduced to that essential oil.

   Do not introduce more than one essential oil in one day. If your baby is going to have a reaction to an essential oil they will likely show signs of a reaction in the first 15-30 minutes after inhalation or dermal application.

5. What age is safe to use what oils?
   *Essential Oil Safety – By Robert Tisserand and Rodney Young.*

   It is not advised to use essential oils on babies less than 3 months of age because their skin is not mature yet and therefore more permeable and sensitive to essential oils.

   Hydrosols are a much gentler and safer option for babies, where essential oils can’t be used.
Essential oils safe for topical use/diffusion on babies 3+ months
The maximum recommended amount of essential oils not exceed .2% of the recipe, or 1-2 drops of essential oil per ounce of carrier oil.

Chamomile, Roman and German (*Anthemis nobilis*, *Matricaria recutita*)
Dill (*Anthemum graveolens*)
Lavender - (*Lavendula angustifolia*)
Yarrow, Blue (*Achillea millefolium*)

Essential oils safe for topical use/diffusion on babies 6+ months
The maximum recommended amount of essential oils used on should not exceed .5% of the recipe, or 3-5 drops of essential oil per ounce of carrier oil.

Bergamot (*Citrus bergamia*) bergamot essential oil is a phototoxic oil and can cause phototoxic reactions on your skin, if used before going out in the sunshine. Diffusion and wash-off products are safe from this though.
Carrot Seed (*Daucus carota*)
Cedarwood, Atlas/Virginia (*Cedrus atlantica*, *Cedrus deodora*, *Juniperus virginiana*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.
Cinnamon bark (*Cinnamomum verum*) this is safe for diffusion ONLY.
Cinnamon leaf (*Cinnamomum verum*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.
Citronella (*Cymbopogon nardus*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.
Coriander (*Coriandrum sativum*)
Cypress (*Cupressus sempervires*)
Fir needle (*Abies sibirica*)
Geranium (*Pelargonium graveolens*)
Grapefruit (*Citrus paradisi*)
Helichrysum (*Helichrysum angustifolium*)
Lemon (*Citrus limon*) this is safe for diffusion. Though this is safe for topical application, sweet orange is suggested instead, because it’s less harsh on the skin. If cold pressed rather than steam distilled, this essential oil is a potential photosensitizer.
Mandarin (*Citrus reticulata*)
Neroli (*Citrus aurantium*)
Palma Rosa (*Cymbopogon martinii*)
Petitgrain (*Citrus aurantium*)
Pine (*Pinus divaricata*, *Pinus resinosa*, *Pinus strobus*, *Pinus sylvestris*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.
Ravensara (*Ravensara aromatica*)
Rosalina (*Melaleuca ericifolia*)
Rose Otto (*Rosa damascena*)
Sandalwood (*Santalum spicatum*)
Spruce (*Picea abies*, *Picea glauca*, *Picea mariana*, *Picea rubens*)
Sweet Orange (*Citrus sinensis*)
Tangerine (*Citrus reticulata*)
Tea Tree (*Melaleuca alternifolia*)
Essential oils safe for topical use/diffusion on children 2+ years

should not exceed 1% of the recipe, or 10 drops of essential oil per ounce of carrier oil.

Basil, Lemon (*Ocimum x citriodorum*)
Basil, Sweet (*Ocimum basilicum*)
Benzoin (*Styrax benzoin, Styrax paralleloneurus*)
Cassia (*Cinnamomum cassia*) this is safe ONLY for diffusion. Cinnamon cassia is not safe for use on anyone's skin, as it is too irritating. Use Cinnamon leaf instead, for topical preparations
Clary Sage (*Salvia sclarea*)
Clove Bud/Clove Leaf (*Syzygium aromaticum, Eugenia aromatica, Eugenia caryophyllata*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.
Copaiba Basalm (* Copaifera officinalis*)
Frankincense (* Boswellia carterii*)
Garlic (*Allium sativum*) this is better use for diffusion as it can cause skin irritations when applied topically.
Ginger (*Zingiber officinalis*) use a smaller amount of this topically as it can cause skin irritation if not Properly diluted.
Hyssop (*Hyssopus officinalis*)
Juniper Berry (*Juniperus communis*)
Lemongrass (*Andropogon citratus, Andropogon flexuosus, Cymbopogon citratus, Cymbopogon flexuosus*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.
Lime (*Citrus x aurantifolia*)
Melissa/Lemon Balm (*Melissa officinalis*)
Myrrh (*Commiphora myrrha*)
Oregano (*Origanum onites, Origanum Smyrnaeum, Origanum vulgare, Origanum Compactum, Origanum hirtum, Thymbra capitata, Thymus capitus, Coridothymus capitatus, Satureja capitata*)
Sweet Marjoram (*Marjorana hortensis*)
Patchouli (*Pogostemon cablin*)
Spearmint (*Mentha Spicata, Mentha Canadensis*)
Tea Tree, Lemon (*Leptospermum petersonii, Leptospermum citratum, Leptospermum Liversidgei*)
Thyme (*Thymus vulgaris, Thymus Zygis*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.
Tumeric (*Cucuma longa*)
Verbena, Lemon (*Aloysia triphylla, Aloysia citriodora, Lippa citriodora, Lippa triphylla*)
Vetiver (*Vetiveria zizanoides*)
Valarian (*Valeriana officinalis*)
Ylang Ylang (*Cananga odorata*) this can be diffused for children under 2 years

Essential oils safe for topical use/diffusion on children 6+ years

The maximum recommended amount of essential oils used on children 6+ years topically, should not exceed 2% of the recipe, or 20 drops of essential oil per ounce of carrier oil.

Anise/Aniseed (*Pimpinella anisum*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.

Anise, Star (*Illicium verum*) use a smaller amount of this topically as it can cause skin irritation if not Properly diluted.

Cajuput (*Melaleuca cajuputi, Melaleuca leucadendron*)
Cardamom (*Elettaria cardamomum*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.
Cormmint (*Mentha arvensis, Mentha canadensis*)
Fennel, sweet and bitter (*Foeniculum vulgare*)
Laurel Leaf/Bay Laurel (*Laurus nobilis*)

Marjoram, Spanish (*Thymus mastichina*)

Niaouli (cineole chemotype)

Nutmeg (*Myristica fragrans*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.

Peppermint (*Mentha x piperita*) use a smaller amount of this topically as it can cause skin irritation if not properly diluted.

Sage, Greek/White (*Salvia officinalis, Salvia fruticosa, Salvia tribola, Salvia apiana*)

**Essential oils safe for topical use/diffusion on children 10+ years**

Peppermint, Eucalyptus, and Rosemary essential oils are all avoided in younger children because they contain a chemical constituent called 1,8-cineol and menthol.

Peppermint is safe to use at 6+ years but ALL eucalyptus and rosemary essential oils should be avoided until 10+ years of age. It's important to note that the brand of essential oil you choose to use does not change this recommendation.

Eucalyptus (*Eucalyptus camaldulensis, Eucalyptus globulus, Eucalyptus maidenii, Eucalyptus plenissima, Eucalyptus kochii, Eucalyptus polybractea, Eucalyptus radiata, Eucalyptus australiana, Eucalyptus phellandria, Eucalyptus smithii*)

Rosemary (*Rosmarinus officinalis*)

**Thieves blends should be avoided in children under 10 years**

All of the anti-germ type Thieves blends of essential oils contain eucalyptus, rosemary, clove, cinnamon bark, and lemon.

The eucalyptus and rosemary essential oils should be avoided in children under ten years of age. The clove essential oil shouldn't be used topically on children under 2 years of age. Cinnamon bark essential oil should be avoided for dermal use in all ages, as it is too irritating to the skin, instead cinnamon leaf is recommended.