



# TOXTALKS

A BULLETIN FOR HEALTHCARE PROFESSIONALS WHO MANAGE POISONED PATIENTS

Blue Ridge Poison Center

University of Virginia Health

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## DEADLY SWALLOWS: THE TOXICITY OF ESSENTIAL OILS

Essential oils are often marketed as natural remedies for common ailments. Their use dates back thousands of years to ancient civilizations, when the Egyptians and the Greeks used them for religious, cosmetic, and medicinal purposes. Essential oils are derived from many different plants and come in numerous varieties. For example, camphor is derived from the camphor tree, and eucalyptus is derived from the eucalyptus plant. However, it is important to remember that natural does not necessarily mean safe! Essential oils are not regulated by the US Food and Drug Administration (FDA) and thus there are no regulation standards for these products. Therefore factors like concentration of toxic ingredients or contamination by unknown chemicals may vary from product to product. At the Blue Ridge Poison Center we frequently receive calls when essential oils are used improperly or accidentally ingested by children. Prior to having these oils in one's home, it is crucial to understand what essential oils are and how they can be dangerous.

### CAMPBOR

Camphor oil originates from the bark of the camphor tree (*Cinnamomum camphora*). Currently, it is commonly found in nonprescription products for topical relief of muscle ailments and cold sores. When ingested it is absorbed rapidly in the body causing gastrointestinal signs and symptoms soon after. Ataxia, drowsiness, dizziness, confusion, hallucinations, restlessness, delirium, and coma may follow, and seizures can occur abruptly within minutes. Death can result from respiratory arrest or complications of status epilepticus. Pediatric ingestions of as little as 1 g have resulted in death. Many over the counter products contain camphor, such as BenGay, Vicks Vapo-Rub, Biofreeze, Tiger Balm, and Campho-Phenique. In 1983, the FDA placed a regulation on camphor-containing products mandating they contain

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### NEWS AND NOTES:



Congratulations to Scott Wiley, BSN, CSPI on his retirement after 40 years of service at the Blue Ridge Poison Center! We estimate Scott has answered nearly 200,000 calls to the PoisonHelp Hotline during his career. His wisdom, knowledge, and experience handling poisoning cases no doubt affected the lives of thousands of callers. It was also invaluable in helping to train numerous new nurses and fellows. We will miss him, but we know how much he will enjoy spending more time visiting his grandsons and renovating his cabin retreat with his wife Christy and their two dogs Sable and Olivia. Best wishes, Scott!

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less than an 11% camphor concentration, but unfortunately there are many camphor-containing products being sold that do not abide by these restrictions. There are around 13,000 exposures to camphor-containing products annually, with the majority of these exposures involving children.

## **EUCALYPTUS**

Eucalyptus oil is derived from the Eucalyptus tree (*Eucalyptus*). Products typically contain 70% eucalyptol. It is often promoted as a household remedy for cough and other respiratory infections. If ingested, eucalyptus oil can cause epigastric burning, vomiting, slurred speech, drowsiness, ataxia, and seizures, and can lead to hypoventilation and rapid CNS depression. Due to the potential for altered mental status and inability to protect their airway, these patients may require intubation. Coma has been reported in pediatric ingestions of as little as 1 mL, with ingestions of 4-5 mL leading to death.

## **PENNYROYAL**

Pennyroyal oil typically is derived from the pennyroyal plant (*Mentha pulegium*). It contains pulegone which is converted to several toxic metabolites. Pulegone depletes glutathione, leading to hepatotoxicity. It was initially used as a flea repellent. It has also been used as an abortifacient. Since 1994, all manufactured pennyroyal products must carry a warning label against its use by pregnant women. Today it is often used as a fragrance agent in foods and herbal teas and promoted as a treatment for the common cold.

After ingestion of pennyroyal, symptoms can include vomiting, abdominal pain, syncope, and coma, with the potential to develop hypoglycemia, hepatotoxicity, and disseminated intravascular coagulation. Due to the risk of multiple organ failure, pediatric ingestions are often admitted to the hospital for 24 hours with close monitoring of glucose. If an ingestion occurs, treatment with N-acetylcysteine has been advocated to replete the body's glutathione stores. Coma and seizures have been reported in ingestions of as little as 5 mL of pennyroyal oil, with reports of 10-15 mL resulting in death.

## **OIL OF WINTERGREEN**

Oil of wintergreen is derived from one of two plants, *Gaultheria procumbens* (native to North America) or *Gaultheria fragrantissima* (native to Asia). Oil of wintergreen contains methyl salicylate, often in concentrations as high as 98 to 100%. This is equivalent to about 1.4 g of aspirin per mL! Methyl salicylate can also be found in lotions, creams, and ointments used to treat musculoskeletal pains, such as IcyHot®

and BenGay®. In ingestions, methyl salicylate produces toxicity similar to aspirin poisoning, and patients may develop tachypnea, dehydration, tinnitus (ringing in the ears), coma, and seizures. Oil of wintergreen has been associated with deaths in ingestions as small as 5 mL, usually secondary to pulmonary or cerebral edema.

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## **FOR PHYSICIANS**

If a child ingests an essential oil containing camphor, eucalyptus, pennyroyal, or oil of wintergreen, they should be immediately referred to the emergency department. If they are already symptomatic at home, instruct the parent to immediately call 911. As essential oils are absorbed quickly, symptoms can occur rapidly and potentially lead to sudden decompensation. There is no role for GI decontamination as the oils are absorbed too quickly for activated charcoal to be of benefit.

Please call the Blue Ridge Poison Center (1-800-222-1222) to report ANY essential oil ingestions/exposures and we are happy to provide further guidance on next steps. Healthcare providers may also call the dedicated HCP hotline: 1-800-451-1428.

## **FOR PARENTS**

- Please only use essential oils according to the directions on the label.
- Store essential oils away from children: out of sight, out of reach, and locked up.
- Immediately and safely discard of used essential oil containers. Do not reuse them for another purpose.
- Check the labels: many common over-the-counter products can contain essential oils, and these products must also be used with caution and stored appropriately away from children.
- Please call the Blue Ridge Poison Center (1-800-222-1222) if you or your child is exposed to an essential oil. Do not make the person vomit. Do not wait for any symptoms.

The Blue Ridge Poison Center receives funding from University of Virginia Health, the Virginia Department of Health, and the U.S. Health Resources Services Administration (HRSA). We are accredited by the American Association of Poison Control Centers. We've been proudly serving the Commonwealth since 1978.

Poison safety tips, free materials, & more:

