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Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

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The Maryland Poison Center's Monthly Update: News, Advances, Information

Essential Oils

Essential oils are volatile oils extracted by distillation from plants. They are called "essential" not because they are necessary, but because they contain the "essence" of the plant's fragrance. Essential oils have been used therapeutically for thousands of years for a wide variety of ailments. They have become particularly popular in recent years for aromatherapy and are also used topically or ingested as alternatives to traditional medicines. There are hundreds of essential oils that may produce toxicity if misused or overused, or when ingested by small children. In 2016, there were more than 20,000 calls to U.S. poison centers involving essential oils; more than 13,000 of the exposures were in children < 6 years old.

Essential oils, especially those designed specifically for aromatherapy, may produce dermal irritation or allergic reactions when applied to the skin. Some (e.g. orange peel oil) are photosensitizers. Irritation, pain, erythema and conjunctivitis may occur when splashed or rubbed in the eye. When ingested, most essential oils cause oral irritation or numbness, nausea, vomiting and abdominal pain. If the oils are aspirated, a chemical pneumonitis with respiratory distress, tachypnea and hypoxia may result. Regardless of the route and extent of the exposure, most patients have good outcomes with symptomatic and supportive care. Selected essential oils are described below:

Tea tree oil (melaleuca oil) has antibacterial, antifungal, and anti-inflammatory activity, and is commonly found in products for topical use. Skin irritation and allergic dermatitis have been reported. Ingestions have resulted in rapid onset (within 30 minutes) of drowsiness, confusion, ataxia, and coma.

Eucalyptus oil is used by inhalation for the treatment of upper respiratory infections and topically for muscle pain. As little as 5 mL ingested by a child resulted in lethargy and apnea. Other reported effects after ingestion include coma, dyspnea, tachycardia, bronchospasm, hypotension, and seizures.

Camphor oil is used as a moth repellent, in vaporizers and as a topical analgesic. It is a neurotoxin, causing seizures with ingestion of as little as a teaspoonful. Hepatotoxicity has also been reported.

Clove oil (eugenol) is used to alleviate tooth pain and as a topical analgesic and anesthetic. Allergic reactions have occurred when used for dental procedures, and ingestions have caused lethargy, anion gap metabolic acidosis and hepatotoxicity.

Peppermint oil (menthol) is a common flavoring agent that is also used for pruritus, GI disorders, coughs, colds, and as a topical analgesic. Cases with toxic effects are rare, but ataxia, coma and bronchospasm have been reported with ingestion and inhalation.

Pennyroyal oil has been used for centuries as an abortifacient. It contains pulegone, which is metabolized to a hepatotoxin. As little as 5-10 mL ingested has produced dizziness, lethargy and coma. Hepatic and renal failure, disseminated intravascular coagulation and death have been reported with 15 mL.

Oil of wintergreen (methyl salicylate) is in topical products for inflammation and myalgias. Five mL of oil of wintergreen is equivalent to 7 grams of aspirin, a potentially fatal dose in a child. The toxic effects when ingested are similar to that of aspirin.

Did you know?

Most essential oil products are not regulated?

In general, essential oils are not regulated by the FDA. As such, products may contain varying potencies, ingredients and impurities. If claims are made for preventing or treating disease, the FDA may consider the product to be a drug and require approval. Some essential oils are ingredients in household products such as air fresheners and detergents and are regulated by the Consumer Product Safety Commission.

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