

DEET Insect Repellents

History / Background:

Insect repellents containing DEET (N, N-diethyl-M-toluamide) are the most widely used and the most effective insect repellants used today. DEET can be safely used to repel biting pests such as mosquitoes, blackflies, fleas and ticks carrying lyme disease. DEET was developed and patented by the U.S. Army in 1946 for use by military personnel in insect infested areas. Because it is one of the few products effective against mosquitoes and biting fleas, it was registered for use by the general public in 1957. The U.S. Army routinely used >75% solution until 1987, but now uses the 35% time-released polymer based formulation.

Commercial DEET containing products range in concentration from 4% to 100%.

DEET may be applied to skin, pets, clothing, tents, bedrolls and screens.

Although DEET insect repellants pose no significant health risks when used properly, a few simple guidelines should be followed:

- Read and follow all directions and precautions on the product label.
- Avoid applying DEET products to infants less than 2 months old.
- The American Academy of Pediatrics recommends using formulations containing 30% or less DEET on children.
- DEET insect repellents should not be used on children's bedding or bedclothes.
- A maximum concentration of 30% is recommended for adults.
- Avoid wounds, scratches, irritated skin and the areas around the eyes and mouth when applying
- Do not allow young children to apply this product.
- Do not use under clothing.
- Use just enough repellent to cover exposed skin and/or clothing: avoid over saturation.
- Wash treated clothing before next use.
- Do not spray in enclosed areas.
- To apply to face, spray or rub on hands first. Then rub onto the face. Do not spray directly into the face.
- Cleanse treated skin with soap and water after returning indoors.

Mechanism of Action/Metabolism:

DEET has a very rapid absorption after ingestion. Ingestion of large amounts of DEET may result in severe symptoms within 30 minutes. Peak plasma concentration is achieved within 1 hour. Dermal, 50% of each topically applied dose of DEET is absorbed within 6 hours. DEET is metabolized by oxidative enzymes in the liver and is rapidly eliminated mainly in the urine and to a lesser extent in the feces. DEET is primarily toxic to the CNS, although the mechanism of action is unknown. Severe toxicity has resulted in children after having ingested 25mL of a 50% DEET solution, and in adults after having ingesting 50mL of 100% DEET solution.

Clinical Symptoms:

Clinical effects include:

CV- Hypotension and rarely bradycardia;

CNS – Confusion, ataxia, hypertonicity, drowsiness and seizures;

GI – Abdominal pain, nausea and vomiting;

Dermatologic – Rash and contact urticaria;

Psychiatric – Acute paranoid psychosis from repeated dermal applications;

Reproductive – Non-teratogenic

Treatment:

Syrup of ipecac-induced emesis is not recommended for DEET ingestion. Use of activated charcoal, if administered soon after an ingestion of DEET, is effective. Food containing milk or oil should be avoided until the GI tract has been emptied. If inhaled, move patient from exposure environment to fresh air. Monitor for respiratory distress. For eye exposures, remove contact lenses (if applicable) and irrigate eyes with copious amounts of room temperature normal saline or water for at least 15 minutes.

If you have any questions regarding exposure to and/or treatment for DEET, please call the poison center at 1-800-222-1222...24 hours a day, 7 days a week.

References:

1. *ToxFAQs™ for DEET*, (August 2003). Agency for Toxic Substances and Disease Registry. <http://www.atsdr.cdc.gov/tfacts185.html>
2. AAP Committee on Environmental Health. Pesticides. In Etzel RA, ed. *Pediatric Environmental Health. 2nd edition*. Elk Grove Village, IL. American Academy of Pediatrics; 2003:350.
3. *The Insect Repellent DEET, Pesticides: Topical and Chemical Fact Sheets*, (September, 2005). U.S. Environmental Protection Agency. <http://www.epa.gov/pesticides/factsheets/chemicals/deet.htm>

4. *R.E.D. Facts*, DEET, (April, 1998.) U.S. Environmental Protection Agency.
<http://www.epa.gov>
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