



# Health Risks and Environmental Issues

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## DEET Alert!!

protect themselves and their children from biting insects. The most widely used insect repellents are those containing DEET. Their ability to interfere with some life form, makes *all* pesticides toxic to humans and pets at varying dosages, and frequency of exposure. It behooves us to treat all pesticide products with utmost respect, adhere strictly to directions, and avoid their use as much as possible.

### History

DEET was originally developed by US Department of Agriculture (USDA) as an insect repellent, and patented by the US Army in 1946 for military personnel serving in insect infested areas. Previously N,N-diethyl-m-toluamide, now N,N-diethyl-3-methylbenzamide, more commonly recognized as DEET, is the active ingredient in most insect repellents.<sup>1</sup>

Classified as a pesticide, DEET did not come under the purview of the US Food & Drug Administration (FDA). When the US Environmental Protection Agency (EPA) was formed in 1970 and given authority over pesticides, thousands of toxic products already in use were "grandfathered" without any testing. DEET was among them.<sup>2</sup>

The US Army previously allowed use of products containing 75% DEET concentration, but has since restricted use to no more than 35% concentration to reduce potential harmful side effects.

### Toxicity

The EPA lists DEET as generally of low *acute* toxicity, and based on *available* data, the agency believes normal use of DEET products "does not present a health concern to the general US population..."<sup>3</sup> (*italics added*). A 1998 EPA publication claims the data linking DEET to children's seizures are insufficient to establish DEET as the cause of the reported effects.<sup>4</sup> Health advocates believe there is insufficient data studying the chronic effects from long term exposure.

A 1999 EPA publication acknowledges serious effects including rare toxic encephalopathic reactions following intensely treated skin application in some children causing behavioral disorder, ataxia, rapid loss of consciousness, hypotension, seizures, flaccid paralysis areflexia and death.

According to physician, Dr. Marion Moses, "DEET is very toxic to the brain and nervous system, (can cause) slurred speech, tremor, convulsions, coma," and "death in children from absorption through skin when...applied repeatedly, or in high concentrations." "[H]eadaches, restlessness, irritability, crying

spells in children and other changes in behavior may result from mild poisoning."<sup>6</sup>

Many parents are not likely to make the connection between mild symptoms or behavior problems to DEET exposure, and are less likely to report it, even if they suspect an association. Is it any wonder the EPA has *insufficient* data on this product?

DEET is irritating to the eyes and skin, and may cause tingling, contact dermatitis, and scaling. When used in tropical conditions it has been reported to cause blistering, erosion, and painful weeping, denuding areas in elbow creases and back of knee that were occluded during sleep.<sup>7</sup>

"DEET is a chemical solvent and plasticizer...it causes rapid deterioration of plastics...builds up readily in small bodies, especially during summer (when) heat causes pores to open more readily."<sup>8</sup>

DEET is capable of damaging plastic eyeglass frames, watch crystals, synthetic fabrics (rayons, spandex), leather, painted or varnished surfaces.<sup>9</sup>

DEET is absorbed across the skin and by the gut. Absorption increases proportionate to the concentration. Many commercial formulas contain ethanols as a solvent, further increasing absorption.<sup>10</sup>

Laboratory testing for toxicity is done only with the active ingredient DEET, and not in formulation. So, in reality there is no scientific testing of consumer products with the active ingredient combined with various solvents or other so-called "inert" ingredients, making the public the true guinea pigs of this and all pesticide products.

Thorough, comprehensive testing might explain why allergies, listlessness, behavior and learning problems are so common among our youth exposed not only to this product, but to a veritable soup of chemicals beginning in utero.

Sensitization to a pesticide can develop after repeated exposures. Once a person has become sensitized to a chemical, it takes a much smaller amount to cause future allergic reactions. Repeated exposures can bring on attacks sooner, make them last longer, and increase their severity.<sup>11</sup>

### Use Profile

DEET insect repellents are used in homes, domestic dwellings, on the human body, on clothing, on cats, dogs, horses, and pet sleeping areas. DEET formulations are used to control flies, midges, chiggers, fleas, deer flies, gnats, horse flies, mosquitoes, ticks, no-see-ums, and other biting insects.

### Registration and Labeling

In 1972 Congress ordered EPA to reregister all active ingredients in pesticide products for their human health effects. Reregistration for DEET was completed in September,

1998. There are currently over 200 DEET products registered with the EPA in numerous formulations, varying in concentrations from as low as 4% to as high as 100%.

Because DEET products are applied directly to skin and clothing and have been implicated in causing childhood seizures, EPA now requires clear, commonsense directions with improved label warnings and restrictions on all DEET product labels.

Reregistration requires that child safety claims must be eliminated from all end-use product labels. The EPA determined child safety claims were misleading and irreconcilable with the intended use of pesticidal ingredients of DEET products.

New labels for DEET products must inform consumers on the method of application, special precautions for children, and directions for medical attention. Labels on aerosol and pump spray products must warn consumers not to spray in enclosed areas, *even though the EPA classifies DEET products "as pesticides with exclusive indoor use patterns."*<sup>13</sup>

No need to rush out in search of the new labels. EPA will allow old formulas and labels to remain in the market place for 50 months (four years and two months).

### Risk Reduction

DEET is widely used by adults and children as a personal insect repellent. It is one of the few residential use pesticides that is applied directly to the skin.<sup>14</sup> EPA recommends using great caution when using DEET on children. Application should be limited to exposed areas of skin, using as little as possible of the lowest concentrations, 5% - 6%, and washing off after use.

Avoid applying to eyes, mouth or hands. Avoid repeated applications day after day. For continuous protection DEET products should be alternated with repellents that have different active ingredients. People with skin sensitivity - acne, psoriasis, or other chronic skin conditions should exercise discretion in using any repellents.

EPA warns, "if headache or any kind of emotional or behavioral change occurs, use of DEET should be discontinued immediately. If a child is having an adverse reaction to a DEET product discontinue use, wash treated skin, and call your local poison control number, or physician for help."<sup>15</sup>

### What's a Consumer to Do?

Conflicting information regarding use of DEET should steer the cautious consumer towards more benign products. EPA classifies DEET as an *indoor/household* repellent, but says it should not be applied in an *enclosed* area.

Hikers, bikers, joggers, climbers, picnickers, and kids are more likely to use repellents *outdoors*. Why does EPA classify DEET as an *indoor* repellent?

Biting insects are out during warm weather when people are most likely to use repellents. However, summer heat enlarges pores increasing absorption of toxic chemicals. Prudent avoidance warrants minimizing use of DEET repellents, but fear of disease from vector insects causes people to misuse and overuse these products. Buyer beware.

### More Information

For more information on health effects of pesticides, or for assistance in recognizing and managing pesticide poisoning symptoms, contact the National Pesticide Telecommunication Network (NPTN) at 1-800-858-7378.

### Safer Alternative Repellents

There are a number of alternative products available with less toxic or nontoxic ingredients. They may require more frequent applications, but generally pose less risk to the user. A few products are as follows:

- GONE - safe and natural insect deterrent spray with powerful herbal oils 1-800-282-7394  
WWW.AUBREY-ORGANICS.com
- All Terrain Herbal Armor Insect Repellent at sport shops and health food stores, or 1-800-2-INSECT
- BUZZ AWAY spray, stick-on-squares, wrist band (safe for kids), citronella towelettes Penn Herb Co. 1-800-523-9971
- Outdoor Herbal Spray (The Bug Disenchanter) with neem leaf extract - really works! 1-800-677-8577 IMHOTEP, Inc.
- BiteBlocker works up to 10 hours, available over the counter in drugstores.

### Update on Lindane

In the April, 2000 issue of *TL/DP*, #201, this column discussed the toxic effects of lindane, particularly as used in anti-lice shampoos for children and adults. It now seems the state of California is leading the way to *ban lindane* for treating head lice and scabies.

AB 2318 would protect human health and the environment by prohibiting use of lindane in products for the treatment of head lice and scabies to begin January 1, 2002. The Assembly Environmental Safety and Toxic Materials committee will hear a discussion on AB2318 and public comment is encouraged.

Letters of support should be sent to The Honorable Alan Lowenthal, State Capitol, Rm. 4139, Sacramento, CA 95814. For more information on the bill check out [www.safe2use.com/alerts/california/lindane-AB2318.htm](http://www.safe2use.com/alerts/california/lindane-AB2318.htm).

A quick recap - lindane is a highly potent nerve toxin, absorbed through the skin and can cause seizures, liver and kidney damage, immune system damage and death.

Not effectively removed at waste treatment plants; when lindane shampoos and creams are rinsed off, lindane eventually winds up in creeks, rivers, lakes and the ocean. A single treatment of lindane to kill head lice pollutes 6 million gallons of water. Lindane is so toxic that the allowable limit for lindane in drinking water is 19 parts per trillion!

### References

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5. Reigart, J.R., MD, Roberts, J.R., MD, *EPA Recognition of Management of Pesticide Poisoning*, 5th Edition, 1999. [www.epa.gov/pesticides/safety/healthcare](http://www.epa.gov/pesticides/safety/healthcare)
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