

## Using Insect Repellents Safely

Repellents are an important tool to help people protect themselves from mosquito-borne diseases. Three active ingredients, for application directly to human skin, are recommended for use as repellents. The active repellent ingredients include DEET, picaridin, and oil of lemon eucalyptus. In testing, DEET and picaridin have demonstrated a higher degree of effectiveness and generally provide longer-lasting protection than other products on the market. Oil of eucalyptus (a plant based repellent) provides similar protection against mosquitoes to that of repellents with low concentrations of DEET, though it is not recommended for use on children under three years of age. Repellents containing any one of these three ingredients are approved by the U.S. Environmental Protection Agency, indicating that they are effective and are safe for application to human skin when applied according to label instructions. However, oil of lemon eucalyptus has not yet been tested internationally against the kinds of mosquitoes that carry foreign diseases such as malaria.

### **DEET (N,N-diethyl-m-toluamide)**

Products which contain DEET can be applied directly on skin and on clothing. Below is a breakdown of how the percentage of DEET in a product relates to protection time against mosquito bites:

23.8% DEET provides approx. 5 hours of protection

20% DEET provides approx. 4 hours of protection

6.65% of DEET provides approx. 2 hours of protection

4.75% of DEET and 2% soybean oil provide approx. 1 ½ hours of protection

Select a repellent that provides protection for the amount of time that you will be outdoors, and re-apply a product if your outdoor stay is longer than expected and you begin to get bitten by mosquitoes.

The following precautions should be taken when using insect repellents containing any of the above mentioned active ingredients:

- . Repellents should be applied only to exposed skin and/or clothing (as directed on the product label). Do not use under clothing.
- . Never use repellents over cuts, wounds, or irritated skin.
- . Do not apply to eyes and mouth, and apply sparingly around ears. When using sprays do not spray directly onto face; spray on hands first and then apply to face.
- . Do not allow children to handle repellents, and do not apply repellents to children's hands. When using on children, apply the repellent to your own hands and then put it on the child.
- . Use just enough repellent to cover exposed skin and/or clothing. Heavy application and saturation is unnecessary for effectiveness; if biting insects do not

respond to a thin film of repellent, apply a bit more.

Do not apply spray repellents in enclosed areas. Avoid breathing a repellent sprays, and do not use near food.

After returning indoors, wash treated skin with soap and water or bathe. This is particularly important when repellents are used repeatedly in a day or on consecutive days. Also, wash treated clothing before wearing it again.

If you suspect that you or your child is reacting to an insect repellent, discontinue use, wash treated skin and then call your local poison control center. If/when you go to a doctor, take the repellent with you.

### Specific recommendations regarding the safe use of repellents containing DEET

The use of DEET-based repellents on children - The American Academy of Pediatrics (AAP) Committee on Environmental Health recommends using products containing no greater than 30% DEET on children. The AAP and other experts suggest that lower concentrations be used on very young children that are over two months of age. Other guidelines recommend not using DEET repellents on children until after they are two years old. Non-DEET repellents have not necessarily been as thoroughly studied as DEET, and may not be safer for use on children. Parents should decide whether or not to use repellents on their children and choose the type and concentration of repellent to be used by taking into account the amount of time that a child will be outdoors, their potential for exposure to mosquitoes, and the risk from mosquito-transmitted disease in the area. There have been no reported adverse events following use of DEET-based repellents in pregnant or nursing women.

Longevity of DEET-based repellents - Studies have shown that higher concentrations of DEET (up to 50%) give the longest period of protection, and lower concentrations give shorter periods of protection. Use of DEET in concentrations greater than 50% will not increase the level of mosquito repellency or the length of the protection period.

Use of DEET-based repellents in combination with sunscreens - DEET-based repellents may be applied effectively and safely in combination with sunscreen products. There are no data available at this time regarding the use of repellents containing other active ingredients in combination with sunscreen.

### Repellent Products Not for Use on Skin

Products containing the insecticide permethrin may be applied to clothing, shoes, bed nets and camping gear (e.g. the interior surfaces of tents) as a repellent. Permethrin is an insecticide and should **never** be applied as a repellent to skin because of its potential toxicity to humans. The only permethrin-based products that should be used as repellents on clothing or gear are those that have label

instructions specifically for such use. Clothing treated with the proper formulations of permethrin insecticides will repel mosquitoes, ticks, and other biting arthropods for long periods of time, even after repeated laundering of the treated objects.

You and your doctor can get specific medical information about the active ingredients in repellents and other pesticides by calling the National Pesticide Telecommunications Network (NPTN) at 1-800-858-7378 (the NPTN operates 9:30 a.m. to 7:30 p.m. [Eastern Time] seven days a week) or the National Office of Pesticide programs (OPP) at 703-305-5017.

For additional information regarding the use of repellent products on children, please see CDC's "Frequently Asked Questions about Repellent Use" Web site at:

[http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect\\_repellent.htm](http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm)

For additional information on using EPA-registered repellents visit the EPA repellent website at:

<http://www.epa.gov/pesticides/factsheets/insectrp.htm>.

In addition to wearing repellent, you can protect yourself and your family by wearing light-colored, loose clothing with long pants and long sleeves while outdoors, utilizing mosquito netting over infant carriers, and by ridding your area of containers with standing water which are breeding grounds for mosquitoes.