

Insect Repellent Fact Sheet



Maine Center for Disease
Control and Prevention
An Office of the
Department of Health and Human Services

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Why should I use insect repellent?

Insect repellents are an important tool to assist people in protecting themselves from mosquito-borne diseases such as Eastern Equine Encephalitis (EEE) and West Nile Virus (WNV), which can cause serious illness and even death. Using insect repellent allows you to continue to play and work outdoors with a reduced risk of mosquito bites.

What are some general considerations to remember when using insect repellents?

Always follow the recommendations appearing on the product label.

- Apply repellents only to exposed skin and/or clothing (as directed on the product label) Do not use repellents under clothing.
- Never use repellents over cuts, wounds or irritated skin.
- Do not apply to eyes or mouth, and apply sparingly around ears. When using sprays, do not spray directly on face—spray on hands first and then apply to face.
- Do not allow children to handle the product. When using on children, apply to your own hands first and then put it on the child. You may not want to apply to children's hands.
- Use just enough repellent to cover exposed skin and/or clothing. Heavy application and saturation are generally unnecessary for effectiveness. If biting insects do not respond to a thin film of repellent, then apply a bit more.
- 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. (This precaution may vary with different repellents—check the product label.)
- If you or your child gets a rash or other bad reaction from an insect repellent, stop using the repellent, wash the repellent off with mild soap and water, and call a local poison control center for further guidance. If you go to a doctor because of the repellent, take the repellent with you to show the doctor.

What are some reactions to be aware of when using insect repellents?

Use of repellents products may cause skin reactions in rare cases. Most products also note that eye irritation can occur if product gets in the eye. If you suspect a reaction to a product, discontinue use, wash the treated skin, and call a poison control center. If product gets in the eyes flush with water and consult health care provider or poison control center. If you go to a doctor, take the product with you.

There is a national number to reach a Poison Control Center near you: 1-800-222-1222.

How often should repellent be reapplied?

In general you should re-apply repellent if mosquitoes are biting you. Always follow the directions on the product you are using. Sweating, perspiration or getting wet may mean that you need to re-apply repellent more frequently.

Which mosquito repellents work best?

CDC recommends using products that have been shown to work in scientific trials and that contain active ingredients which have been registered with the Environmental Protection Agency (EPA) for use as insect repellents on skin or clothing. When the EPA registers a repellent, they evaluate the product for efficacy and potential effects on human beings and the environment. EPA registration means that EPA does not expect a product, when used according to the instructions on the label, to cause unreasonable adverse effects to human health or the environment.

CDC has identified several EPA registered products that provide repellent activity sufficient to help people avoid the bites of disease carrying mosquitoes. Products containing these active ingredients typically provide reasonably long-lasting protection:

- DEET
- Picaridin
- Oil of Lemon Eucalyptus or PMD
- IR3535 (Chemical Name: 3-[N-Butyl-N-acetyl]-aminopropionic acid, ethyl ester)

EPA characterizes the active ingredients DEET and Picaridin as “conventional repellents” and Oil of Lemon Eucalyptus, PMD, and IR3535 as “biopesticide repellents”, which are derived from natural materials.

How does the amount of DEET in an insect repellent relate to how well and for how long the insect repellent will work for me?

In general, higher concentrations of active ingredient provide longer duration of protection, regardless of the active ingredient, although concentrations above ~50% do not offer a marked increase in protection time. Products with <10% active ingredient may offer only limited protection, often from 1-2 hours.

CDC recommends selecting the lowest concentration effective for the amount of time spent outdoors. A product with a higher percentage of DEET is a good choice if you will be outdoors for several hours while a product with a lower concentration can be used if time outdoors will be limited. Regardless of what product you use, if you start to get mosquito bites reapply the repellent according to the label instructions or remove yourself from the area with biting insects if possible.

Why does CDC recommend certain types of insect repellent?

CDC recommends products containing active ingredients which have been registered with the Environmental Protection Agency (EPA) for use as insect repellents on skin or clothing. All of the EPA-registered active ingredients have demonstrated repellency however some provide longer lasting protection than others.

People who are concerned about using repellents may wish to consult their health care provider for advice. The National Pesticide Information Center (NPIC) can also provide information through a toll-free number, 1-800-858-7378 or npic.orst.edu

How can you know which active ingredient a product contains?

Check the product label if you have questions—repellents must specify their active ingredients. In some cases you will note the chemical name in addition to/instead of the “common” name:

- DEET is N,N-diethyl-m-toulamide or N,N-diethyl-3-methyl-benzamide
- Picaridin is KBR 3023, sometimes known as “Bayrepel” outside the US

- The active ingredient in oil of lemon eucalyptus is p-menthane 3,8-diol (PMD)
- IR3535 is 3-[N-Butyl-N-acetyl]-aminopropionic acid, ethyl ester

What is permethrin?

Products that contain permethrin are recommended for use on **clothing, shoes, bed nets, and camping gear**, and are registered with EPA for this use. Permethrin is highly effective as an insecticide and as a repellent. Permethrin-treated clothing repels and kills ticks, mosquitoes, and other arthropods and retains this effect after repeated laundering. The permethrin insecticide should be reapplied following the label instructions. Some commercial products are available pretreated with permethrin.

Where can I find these repellents?

Most of these repellents are sold at multiple retail, discount and drug stores. A wider selection may be available at “outdoor” stores or in hunting and camping sections. At this time picaridin is not yet registered with the state pesticide programs in NY and CA, and thus is not available in those areas.

Are there special guidelines available for using a repellent on children?

Always follow the recommendations appearing on the product label when using repellent:

- Note that the label for products containing oil of lemon eucalyptus specifies that they should not be used on children under the age of three years.
- When using repellent on a child, apply it to your own hands and then rub them on your child. Avoid children's eyes and mouth and use it sparingly around their ears.
- Do not apply repellent to children's hands. (Children may tend to put their hands in their mouths)
- Do not allow young children to apply insect repellent to themselves; have an adult do it for them.
- Keep repellents out of reach of children.

How else can I protect children from mosquito bites?

Using repellents on the skin is not the only way to avoid mosquito bites. Children (and adults) can wear clothing with long pants and long sleeves while outdoors. DEET or other repellents such as permethrin can also be applied to clothing (but is not registered for use on skin), as mosquitoes may

bite through thin fabric. Mosquito netting can be used over infant carriers.

It also may be possible to reduce the number of mosquitoes in the area by getting rid of containers with standing water that provide breeding places for mosquitoes.

Can insect repellents be used by pregnant or nursing women?

Other than the routine precautions noted earlier, the EPA does not recommend any additional precautions for using registered repellents on pregnant or lactating women. Consult your health care provider if you have questions.