PUBLIC HEALTH FACT SHEET

Mosquito Repellents

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What is a mosquito repellent?

A mosquito repellent is a substance put on skin, clothing, or other surfaces which discourages mosquitoes from landing or crawling on that surface.

Why should I use a mosquito repellent?

Mosquitoes can spread viruses that cause serious diseases. In Massachusetts, the diseases spread by mosquitoes are West Nile virus (WNV) and eastern equine encephalitis (EEE). Mosquito repellents can reduce your chances of being bitten by a mosquito and can reduce the risk that you will get one of these diseases.

When should I use a mosquito repellent?

Use a mosquito repellent when you are outside and exposed to mosquitoes. Mosquitoes are generally most active between dusk and dawn, though some types may also be out during the day. Mosquitoes usually start to become active during early or mid-spring and remain active until the first hard frost (when the ground freezes).

Did you know?

Every year from approximately late May until the first hard frost, mosquito samples are collected from various locations around the state and tested for WNV and EEE virus. Visit the MDPH website at www.mass.gov/dph/cdc/wnv/wnv1.htm during the mosquito season to see where positive mosquito samples have been found.

Which repellent should I use?

Different repellents work against different bugs. It is important to look at the active ingredient on the product label. Repellents that contain **DEET** (N, N-diethyl-m-toluamide), **permethrin, IR3535** (3-[N-butyl-N-acetyl]-aminopropionic acid) or **picaridin** (KBR 3023) provide protection against mosquitoes. In addition, **oil of lemon eucalyptus** [p-menthane 3, 8-diol (PMD)] has been found to provide as much protection as low concentrations of DEET when tested against mosquitoes found in the United States.

DEET products should not be used on infants under 2 months of age. Children older than two months should use products with DEET concentrations of 30% or less. DEET products are available in formulations up to 100% DEET, so always read the product label to determine the percentage of DEET included. Products with DEET concentrations higher than 30% do not confer much additional protection, but do last longer. In a study that looked at how long different concentrations of DEET worked against mosquitoes, the results ranged from 1½ to 5 hours. However, the length of protection time will vary widely depending on temperature, perspiration, and water exposure.

DEET%:	4.75%	6.65%	20%	23.8%
Protection time in hours:	1 ½	2	4	5

Permethrin products are intended for use on items such as clothing, shoes, bed nets and camping gear and should not be applied to skin. Apply the permethrin to your clothes before you put them on and follow the product's instructions.

Oil of lemon eucalyptus products should not be used on children under the age of three years.

Always Use Repellents Safely

- Follow the instructions given on the product label. If you have questions after reading the label, such as how many hours does the product work for, or if and how often it should be reapplied, contact the manufacturer.
- Don't use repellents under clothing.
- Don't use repellents on cuts or irritated skin.
- Don't use repellents near the mouth or eyes and use them sparingly around the ears. When using spray products, spray the product onto your hands first, and then apply it to your face.
- Use just enough product to lightly cover exposed skin and/or clothing. Putting on a larger amount does not make the product work any better.
- Don't let children handle the product. When using repellents on children, put some on your hands first, and then apply it to the child. Don't put repellents on a child's hands.
- When you come inside, wash your skin and the clothes that had repellent on them.
- **If you develop a rash or other symptoms you think were caused by using a repellent,** stop using the product, wash the affected area with soap and water, and contact your doctor or local poison control center. If you go to the doctor, bring the product with you to show him or her.

Do "natural" repellents work?

A number of plant-derived products are available for use as mosquito repellents, including oil of lemon eucalyptus and IR3535. Limited information is available regarding how well most of these products work and how safe they are. The information that is available shows that most of these products generally do not provide the same level or duration of protection as products like DEET or permethrin, except for oil of lemon eucalyptus and IR3535, which have been found to provide as much protection as low concentrations of DEET.

I'm concerned about using repellents on my infant. What else can I do to protect my infant from mosquitoes?

Mosquitoes are most active between dusk and dawn, so try to avoid outdoor activities with your infant during these times. When your infant is outside, use mosquito netting on baby carriages or playpens and consider going indoors if you notice a lot of mosquito activity.

Where can I get more information?

- **For more information on repellents (such as choosing the right repellent, using repellents on children or pregnant women, or detailed toxicology information),** contact the National Pesticide Information Center (NPIC) toll free at 1-800-858-7378 or online at npic.orst.edu/wnv/pesticideinfo.htm#repellents.
- **For questions on health effects of pesticides**, contact the MDPH, Center for Environmental Health at 617-624-5757.
- **For questions on diseases spread by mosquitoes**, contact the MDPH, Division of Epidemiology and Immunization at 617-983-6800 or online at www.mass.gov/dph.

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