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Mosquito Protection: What the Evidence Shows

Post

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With two new options available and mosquito season approaching, experts say they want consumers to understand what's available to them. Below are the choices, as well as a roundup of evidence.

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

Has generally been found to be safe for human use; few adverse effects from exposure to DEET have been found, according to the National Pesticide Information Center. The maximum DEET concentration suggested for infants and children is 30 percent, according to recommendations issued by the American Academy of Pediatrics.

A 2002 study published in the New England Journal of Medicine found that higher concentrations of DEET worked for longer periods than lower concentrations. For example, a product containing 6.65 percent DEET lasted about two hours, while one with 23.8 percent DEET lasted about five hours. The authors concluded that DEET provided "complete protection for the longest duration" compared with 12 non-DEET products.

Oil of lemon eucalyptus (p-menthane 3,8-diol or PMD)

A plant-based ingredient that protects as effectively as low-concentration DEET repellents, according to the Centers for Disease Control and Prevention (CDC). Not approved for children under 3. Has a more pleasant odor than DEET. The evidence backing oil of lemon eucalyptus as a repellent is not as strong as the data supporting picaridin and DEET. It may need to be reapplied every few hours.

A 2003 study published in Phytotherapy Research comparing the effectiveness of oil of lemon eucalyptus and DEET with other ingredients found that the plant repellent and DEET performed better at 75 percent concentration than two others.

Picaridin (KBR 3023)

Has been used in Europe, Australia, Latin America and Asia for several years. One U.S. product, Cutter Advanced Insect Repellent, contains 7 percent picaridin. Is considered as safe and effective as DEET products at similar concentrations, according to the CDC. Doesn't have an odor.

A University of Rome study, published in the Transactions of the Royal Society of Tropical Medicine and Hygiene last year, found that picaridin outperformed DEET repellents after 10 hours of exposure to four

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species of mosquitoes. An Australian study published last year in the *Journal of Medical Entomology* found that 19.2 percent picaridin performed nearly as well as a gel containing 35 percent DEET and a solution with 20 percent DEET.

CDC Tips for Using Repellents

- Use just enough to cover all exposed skin and clothing, but don't apply to skin underneath clothing.
- Don't apply to wounds, cuts or irritated skin.
- Don't apply to mouth or eyes, and use lightly around the ears.
- When you return indoors, wash repellent-covered skin with soap and water. Wash clothing that has repellent on it before wearing again.
- Don't spray pump or aerosol repellents in enclosed areas.
- Don't apply pump or aerosol products directly onto your face. Instead, spray hands and then rub the product onto your face, avoiding the mouth and eyes.
- When applying to children, put on your own hands first and then use your hands to apply the repellent on to the child.

-- **January W. Payne**

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CORRECTION TO THIS ARTICLE

A photo credit with a May 10 Health article about mosquito repellents was incorrect. The picture was provided by Cutter Advanced.

More Repellant

CDC Lets In Two New Bug Sprays

By January W. Payne
Washington Post Staff Writer
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The Centers for Disease Control and Prevention (CDC) recently recommended two new ingredients as mosquito repellents, picaridin and oil of lemon eucalyptus, marking the first time the agency has suggested anything other than the chemical DEET for mosquito bite prevention.

"We hope by giving people a wider range of options, that some nonusers might become interested in using repellents," said Emily Zielinski-Gutierrez, a behavioral scientist at the CDC's division of vector-borne infectious diseases.

DEET, in use for more than 40 years, has long been the standard in mosquito protection, but many Americans have not been buying products that contain the chemical. This is due partly to lingering consumer fears -- largely unwarranted, the agency says -- about the safety of DEET. Only 40 percent of Americans report regularly using mosquito repellents, says the CDC -- even though West Nile Virus has been found in 47 of the 48 continental states and the District of Columbia.

West Nile virus and other mosquito-borne infections can result in serious illness or death; those over age 50 are more vulnerable to the severe effects of West Nile. The virus can also cause milder illness, and many people show no effects when bitten by an infected mosquito.

The CDC recorded 2,535 West Nile cases for last year, according to numbers that are not yet finalized, down from 9,862 in 2003. The number of deaths also dropped, from 264 in 2003 to 98 in 2004, according to the most updated reports. Locally, there were 22 reported cases and one death from West Nile in Maryland, Virginia and the District last year. That's down from 102 reported cases and nine deaths in 2003.

CDC officials said they chose to act now because recent studies have reassured them of the safety and effectiveness of the two ingredients. Agency scientists reviewed existing literature and concluded there was sufficient evidence to safely recommend picaridin, a chemical used in other countries and sold in one U.S. product, and oil of lemon eucalyptus, a natural ingredient found in various lotions and sprays.

Both ingredients had previously been registered with the Environmental Protection Agency (EPA), which means that the EPA has evaluated them for safety and efficacy. The CDC recommends that people use repellents whenever they go outdoors during warm-weather months, particularly between dusk and dawn.

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The CDC also reaffirmed its recommendation for DEET, calling it a "highly effective repellent option" in a statement.

"DEET is very safe and effective, but some people just can't use it" because of its powerful smell and, in some cases, skin irritation, said Noah Scheinfeld, assistant professor of dermatology at Columbia University. Scheinfeld wrote an article examining the research into picaridin that was published last year in the Journal of Drugs in Dermatology.

Another repellent option is permethrin, which the CDC recommends only for use on clothing -- particularly clothes so thin that a mosquito might be able to bite through them, said Zielinski-Gutierrez. It is not to be sprayed directly onto skin, she said.

CDC officials emphasized the need for consumers to read product labels when selecting mosquito repellents. Some work longer than others and many need to be reapplied every few hours. You may also need to reapply the repellent if you perspire or get wet. A general rule of thumb is to reapply the product if you start getting bitten, Zielinski-Gutierrez said.

If you intend to use a repellent on children, be sure to confirm the product is okay for their age group. And infants under 2 months old shouldn't use any repellents, Zielinski-Gutierrez said.

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