

Insect Repellent and Insect Bite Prevention

Insect repellents may be used to decrease the chances of insect bites. There are multiple repellents available as detailed below:

- DEET is the most widely used repellent with the most data on effectiveness and safety.
- Other repellents include picaridin, IR3535, oil of lemon eucalyptus, citronella and other essential oils. It is unclear if they protect against ticks. They have been shown to prevent mosquito bites. Citronella and oils do not work as well as DEET, IR3535 and picaridin.
- DEET - Children may use products containing 10%-30% DEET
 - In general, the more DEET a repellent contains, the longer time it can protect against mosquitos, ticks, chiggers, fleas, gnats and some flies.
 - Recommendations for *international* travelers are different and may include DEET concentrations as high as 50%. There is no added benefit for concentrations above 50%
- Picaridin is available in concentrations of 5%-20%. It is odor free, generally causes little irritation, does not damage clothing and has not been shown to cause toxicity. The American Academy of Pediatrics recommends using products that contain up to 10% picaridin.
- IR3535 is available in concentrations of 7.5%-20%. Studies have shown that higher concentrations are necessary to protect against mosquitos. Also, many products containing IR3535 contain sunscreen. It is recommended not using these combination products (see below).
- Citronella protects against mosquitos for usually less than 1 hour.
- Oil of lemon eucalyptus has been shown to protect against mosquitos for up to 6 hours. It is not recommended for use in children under 3 years old.
- Catmint and other essential oils (cedar, geranium, peppermint and soybean) give limited protection against mosquitos. They are safe but can cause skin irritation.
- Insect repellents should not be used for babies under two months of age (under 3 years for oil of lemon eucalyptus). Instead, protect infants two months of age and under by using a carrier draped with mosquito netting with an elastic edge for a tight fit.
- Insect repellents should not be applied more than once per day.
- Use enough repellent to cover exposed skin or clothing. Do not apply repellent to skin that is under clothing. Heavy application is not necessary to achieve protection. If repellent is applied to clothing, wash treated clothing before wearing again.
- The child should be bathed once outdoor exposure is ended for the day.
- Insect repellents should not be applied near the mouth, mucus membranes, or the fingers
 - Do not spray aerosol or pump products in enclosed areas; do not breathe in.
 - Do not apply aerosol or pump products directly to the face. Spray your hands and then rub them carefully over the face, avoiding eyes and mouth.
 - Do not apply repellent to children's fingers. (Children tend to put their hands in their mouths).
 - Do not allow children under ten years old to apply insect repellent to themselves; have an adult do it for them. Keep repellents out of reach of children.
 - Do not apply repellent to cuts, wounds, or irritated skin.

- Combination products with insect repellent and sunscreen should be avoided. Instead: use separate products.
- Apply sunscreen with SPF 15-30 (with UVA and UVB protection) 30 minutes before outdoor activity; reapply every 90 minutes.
- Apply insect repellent just prior to outdoor activity.

Additional Measures

Avoid outdoor activity during dawn and dusk. Wearing long-sleeved shirts, long pants, and hats minimizes areas of exposed skin. Shirts should be tucked in. Repellents applied to clothing, shoes, tents, mosquito nets, and other gear will enhance protection. Wear closed shoes instead of sandals. Inspect your child and yourself for ticks at the end of each day.

For **camping or international travel**, special considerations are necessary for insect bite prevention. When accommodations are not adequately screened or air conditioned, bed nets are essential to provide protection and comfort. Bed nets should be tucked under mattresses and can be sprayed with a repellent, such as permethrin. (e.g., Permanone or deltamethrin); permethrin may be used on clothing, shoes and camping gear as well. The permethrin will be effective for several months if the bed net is not washed. Aerosol insecticides can help clear rooms of mosquitoes. Permethrin-treated clothing repels and kills ticks, mosquitoes, and other arthropods and retains this effect for up to 5 launderings. There appears to be little potential for toxicity from permethrin-treated clothing. Bed nets, repellents containing DEET, and permethrin should be purchased before travel. Visit the website cdc.gov/travel