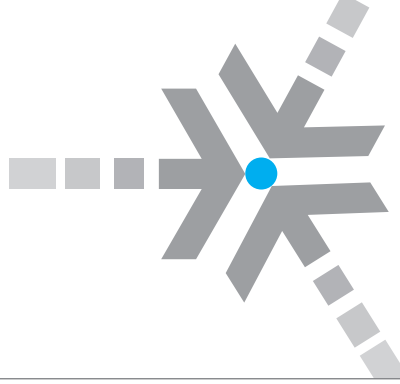


# CONCENTRATION



“**Concentration**” is the amount of active ingredient found in insect repellent products. Often, consumers assume “more” means “better,” but that’s not the case. Lower concentration products work just as well as those with higher concentrations. The higher concentrations work longer, when used according to label directions.

## So which concentration is best for mosquitoes?

The amount of active ingredient in repellents ranges from 5% to 100%. Lower concentration products help repel mosquitoes for an hour or so. But, there are many variables that affect the duration of efficacy—including product formulation, gender, body chemistry, level of activity/perspiration, humidity and other factors.

For exposures in the U.S., most experts suggest products ranging up to and including 30% concentration for duration of efficacy for up to about eight hours. Formulation can be important, however, because a sustained release DEET-based product with 34.5% concentration lasts up to 12 hours, which is comparable to 100% DEET. For guidance, read product labels and/or visit <https://www.epa.gov/insect-repellents/find-insect-repellent-right-you>

Whenever possible, match the product with the length of time you’ll be exposed. For a backyard barbecue, a 10% product containing an EPA-registered active ingredient should provide up to two hours of protection from bites. When hiking, fishing or engaging in other activities that mean being outside for several hours in areas where mosquitoes are active, consider using a 15% sweat-resistant formulation or other products with up to a 30% DEET-based concentration. These provide approximately five to eight hours of repellent efficacy, respectively. Experts who have published comparative studies on repellent efficacy recommend a minimum 25% concentration DEET-based product if you’ll be exposed to *Aedes aegypti* mosquitoes. These mosquitoes can transmit Zika virus, dengue, and/or chikungunya.

## What happens if mosquitoes start biting again?

Reapply the product, according to label directions.

## What about protection from ticks?

For mosquitoes, each of the six EPA-registered active ingredients offers similar periods of protection at similar concentrations. Generally, the higher the concentration of active ingredient in the product, the longer the protection time. So, more is not ‘better’, it’s ‘longer’. Keep in mind, however, that protection times may be shorter for repelling ticks than for mosquitoes.

## What concentration should be used on children?

The EPA does not impose age restrictions on repellent products except for oil of lemon eucalyptus, noting that children must be three years of age or older to use products with this active ingredient. Guidance from the American Academy of Pediatrics (AAP) issued in 2003 is that DEET-based products with up to a 30% concentration can be used on children as young as two months of age. The EPA and CDC both cite this AAP guidance for DEET on their websites.

## What about pregnant women or those contemplating becoming pregnant?

The CDC and EPA recommend using repellents containing EPA-registered active ingredients on exposed skin according to label directions in areas in the U.S. where West Nile virus is endemic and for travel to areas where Zika virus is active.

## What are the EPA-registered active ingredients?

They are: DEET, picaridin, IR3535, oil of lemon eucalyptus, catnip oil and 2-undecanone.

## How do you determine what the active ingredient is in a given repellent product?

Look on the front panel for the name of the active ingredient. The concentration will be shown opposite the ingredient name.



*Disclaimer: Provided for information only. Content does not indicate any form of endorsement or approval of products from the AAP, CDC, or EPA.*

For additional questions on repellents and their use, contact:

**DEET**  
EDUCATION  
PROGRAM  
**(800) 789-3300**  
[www.repellentinfo.org](http://www.repellentinfo.org)

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