



## why use insect repellent?

Insect repellents help reduce exposure to mosquito bites that may spread illnesses such as dengue and malaria.

## which insect repellent should i use?

We recommend using repellents that have been shown to be effective in scientific trials. Of the insect repellents widely available in Singapore DEET is the repellent that is most effective.

## what is DEET?

N, N-diethyl-meta-toluamide, DEET, is an effective insect repellent. It is applied to the skin or to clothing to protect against insect bites. In particular, it protects against mosquitoes and tick bites.

### Other alternatives

Other insect repellents such as ethyl butylacetylaminopropionate (contained in Johnson's baby clear lotion anti-mosquito). Oil of lemon eucalyptus had also been shown to be effective.

Ethyl butylacetylaminopropionate is thought to be safe except for potential skin and eye irritation. It has been in use for 20 years in Europe and there are no reports of substantial adverse effects.

Reports on length of effectiveness are inconsistent and range from 23 minutes to several hours.

Oil of lemon eucalyptus provides protection for 1-2 hours. There is also no safety data on its use on children - the product label says not for use under three years of age.

Citronella has also been shown to be effective but only for much shorter periods of time, 30 minutes. Citronella shows little toxicity but may cause skin irritation. Permethrin products can be used to treat mosquito nets **only**. It is effective as both an insecticide and a repellent. It should **not** be applied directly to skin.

## DEET side effects?

DEET has been in use for over 50 years. Using insect repellents containing DEET are not considered harmful if the label directions are followed and the product is used safely. In rare cases DEET products may produce skin rashes, blisters and mucous membrane irritation if products are used with a high concentration of DEET or by exposure to excessive amounts.

In very rare circumstances, slurred speech, confusion and seizures have been associated with the use of DEET, particularly in children. However, some of these had a history of long term, excessive or improper use. The Environmental Protection Agency (EPA) of the USA analysis of these cases concluded that they don't support a link between DEET and seizure incidence. Even if a link does exist the observed risk based on DEET usage patterns would be less than 1 per 100 million users (EPA 1999).

## DEET use in children

The CDC (USA), the American Academy of Paediatrics, and the EPA (USA) have issued guidelines to ensure safe use of DEET-based repellents. Careful product choice (most often of a DEET concentration of 30% or less), judicious use, and common sense application will greatly reduce the possibility of toxicity.

When used as directed, products containing DEET are safe and appropriate for expectant mothers. Conservative use of low-concentration DEET products is most appropriate when applying repellents to children, and DEET should not be used on children younger than 2 months of age. The American Academy of Paediatrics Committee on Environmental Health in 2003 recommended that insect repellents containing DEET with a concentration of 10% appear as safe as those containing 30% when used according to directions and provided they are not used on children under two years of age.

General guidelines include:

- Safe for expectant mothers when used as directed
- Conservative use of low concentration DEET for children
- Do not use on children younger than 2 months of age
- Parents should choose a type and concentration of repellent, taking into account the amount of time a child will be outdoors, exposure to mosquitoes and risk in the area

- Always apply the lowest effective concentration

## how to use DEET

DEET is safe to use for children from 2 months of age, provided it is not stronger than 30% (see DEET fact sheet). 10% DEET will provide protection for two hours, 20% DEET will provide protection for approximately 4 hours. It is best with children to apply the lowest effective concentration for the amount of time spent outdoors.

General instructions for DEET use include:

- Apply DEET sparingly on exposed skin. Do not use under clothing
- Do not apply DEET to cuts, wounds or irritated skin
- After returning indoors wash treated skin with soap and water
- Do not spray directly on your face. Spray on hands and then apply to face avoiding mouth & eyes
- When applying repellent on children, apply on your own hands and then rub it on your child. Do not apply to children's hands (as they put them in their mouth)
- Do not allow children to apply the insect repellent to themselves
- Keep out of reach of children
- Avoid spraying in enclosed areas and do not spray near food