



## INSECT PROTECTION

**Mosquitoes, flies, ticks, midges, chiggers and fleas can transmit various bacterial, viral, protozoal, parasitic and rickettsial infections to humans. Many diseases have no vaccines available for prevention or specific medications for treatment. The best way to protect against these diseases is to prevent insect bites using a variety of techniques.**

## HABITAT AVOIDANCE

- Remain indoors at dusk
- Avoid areas with standing or stagnant water
- Campsites should ideally be situated in areas that are high, dry, and as free from vegetation as possible
- Be Aware of Peak Exposure Times:
  - Mosquitoes which cause Dengue, Zika, yellow fever, West Nile, and chikungunya bite mainly during the day
  - Mosquitoes causing Malaria and Japanese encephalitis bite primarily from dusk to dawn

## USE APPROPRIATE CLOTHING/PRODUCTS

- Wear a long-sleeved shirt, long pants and socks.
- Wear closed shoes instead of sandals.
- Treat clothing with permethrin insecticide, or purchase pretreated clothing.
- Wear neutral or light colored clothing on safari. The tsetse fly is attracted to bright colors, very dark colors, metallic fabric, and the color blue.
- Clothing fabric should be at least medium weight, because the tsetse fly can bite through thin fabric.
- Use bed nets at night if appropriate.
- Check for ticks when returning indoors.
- In traveling to areas of the world where the risk of insect borne disease is a considerable threat, a 20% or greater DEET based insect repellent is recommended. If DEET is not tolerated, then a 20% picaridin based product is recommended. Other chemical and botanical repellents are considered effective against only mosquitoes, and have only short lasting protection, from minutes to two hours.

## INSECT REPELLENTS

### DEET

- Gold standard of insect repellents for 50 years.
- Remarkable safety profile; rare reports of toxicity only when used inappropriately.
- Safe in children <2 months and pregnant/lactating women.
- Protective against crawling and flying insects, such as mosquitoes, biting flies, midges, chiggers, fleas and ticks.
- DEET efficacy tends to plateau at about 50%.
- **Extended-release formulations by 3M (Ultrathon®) and Sawyer deliver longer lasting protection without using high concentrations of DEET.** These products are also less absorbed into skin like ethanol based products, such as DEET sprays.
- DEET can damage plastics (watch crystals, glasses, lenses), as well as rayon, spandex, leather, or painted/varnished surfaces. Does not damage cotton, wool, or nylon.
- May be sticky or oily feeling, compared to picaridin.

## Picaridin

- Higher concentrations of picaridin (20%) offer comparable efficacy to DEET.
- Natrapel or Sawyer 20% picaridin recommended
- Picaridin is odorless, non-sticky, and non-greasy.
- Does not irritate skin or damage plastics or fabrics.

## Using Insect Repellents Safely

- Read and follow all directions and precautions on the product label.
- Do not apply over cuts, wounds or irritated skin.
- Do not apply to hands or near eyes or mouths of young children.
- Do not allow young children to apply this product themselves
- Use just enough repellent to cover exposed skin and/or clothing.
- Do not use under clothing.
- Avoid over-application of this product.
- After returning indoors, wash treated skin with soap and water.
- Insect repellent loses effectiveness on clothing after laundering.
- Use of this product may cause skin reactions in rare cases.
- Do not use sprays in enclosed areas.
- To apply to face, spray on hands first and then rub on face. Do not spray directly onto face.
- Insect repellents can be used safely as directed by pregnant or nursing women.

## Sunscreens and Insect Repellents

- Do not use combined sunscreen/DEET preparations, because sunscreen needs to be applied often and liberally, whereas DEET is applied sparingly.
- When using sunscreen and repellent together, apply sunscreen first, and then insect repellent.
- DEET can reduce a sunscreen's SPF by 33% when used together.

# INSECTICIDES

## Permethrin

- Highly effective contact insecticide for mosquitoes, flies, fleas, ticks, and chiggers.
- Can be applied to clothing, hats, shoes, bed nets, jackets, and camping gear.
- **Do not apply to skin.**
- Apply 24-48 hours in advance of travel to allow time to dry.
- Do not spray in enclosed areas.
- Pretreated clothing and gear is commercially available (Buzz Off™ and Insect Shield™).
- Effectiveness of permethrin treated material is retained after repeated launderings (unlike clothing treated with other insect repellents, which will not last through washing).