



Protection from insect borne disease.

Risk factor

Those who are in contact with known mosquito habitats such as, warm, humid climates near bodies of water, are most at risk of infection. In the aftermath of a flood there is extensive pooling of water which may increase the capacity for insects to breed and therefore increase potential exposure.

Environmental conditions are a dominant risk factor in relation to mosquito borne disease. Summer is the likely time for mosquitoes to be present in NSW and is their breeding season. Outbreaks can occur when local conditions of rainfall, tides and temperature promote mosquito breeding.

Mosquito Borne diseases include:

- Barmah Forest;
- Japanese encephalitis virus;
- Kunjin virus
- Murray Valley encephalitis virus; and
- Ross River Fever.

Some parts of northern Queensland have a type of mosquito that can transmit dengue fever, chikungunya and zika infections however mainland Australia remains free of malaria.

Specific information about each condition can be accessed via - [Diseases \(nsw.gov.au\)](https://www.nsw.gov.au/health-and-safety/topics/diseases)

Medical attention

Diagnosis and treatment of these diseases must be provided by a registered medical practitioner. In severe cases the patient may have to be admitted to hospital.

Symptoms

Most people when stung develop a tiny, itchy red bump that appears hours to couple of days after they have been bitten and may last a few days.

If you are infected with a mosquito borne disease a few days or up to a week after being bitten some people will feel generally unwell, and may develop:

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| • encephalitis (swelling of the brain); | • rash; |
| • fever - particularly sudden onset; | • sore joints; |
| • headache; | • tiredness; and |
| • muscle aches; | • vomiting. |

Personal Protective Equipment

To keeping the mosquitos from making contact with your skin is your best protection. The following would be of assistance to reduce skin contact by biting insects:

- ✓ Apply ample insect repellent as frequently as recommended by the manufacturer, effectiveness may vary from 2 – 15 hours depending on the product used;
- ✓ Avoid being outside around dawn and dusk when mosquitos are most active;
- ✓ Wear long pants tucked into your socks or boots;
- ✓ Wear loose fitting long sleeved shirt with an additional layer underneath, if possible.



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Insect repellent

The active ingredient in personal insect repellents are listed on the container with some more effective at repelling mosquitoes than others. Effective repellents will include active ingredients such as:

- N,N-diethyl-m-tolu amide (DEET);
- picaridin (piperidine)

Theoretically the effectiveness of a 20% product is the same as an 80% product, just not for as long. It may therefore be more appropriate and economical to use repellents with a higher concentration of active ingredient, when rostered on an operational shift.

These products are intended for application to the skin. Avoid contact with the eyes, ingesting or inhaling large quantities of these active ingredients in the repellent products. If used excessively for long periods or if an individual has a sensitivity to the active ingredient in insect repellent, it may cause mild skin irritation. It is recommended the repellent is washed off with soap and water each day.

Also note DEET softens many plastics so face shields/goggles/sunglasses may be damaged if they consistently come into contact with DEET. Wash items with soap and water to remove repellent.

Application of insect repellent

Mosquitoes attach to unprotected areas of skin, ensure all exposed skin is protected. If you wade through water, get caught in the rain or engage in high intensity exercise you should reapply the repellent as they are generally water soluble.

Apply insect repellent **prior** to stepping outside.

- If wearing sunscreen it should be applied before the repellent and allowed to dry.
- Repellent may be in the form of a cream, gel, roll-on or spray.
- Apply repellent liberally, as directed on packaging, over all areas of the body not completely covered by clothes.
- Where ever possible, it is recommended you wear multiple layers of clothing with repellent under the clothing as well as on all uncovered skin, to reduce the likelihood of insects getting up sleeves or under collars.
- Tuck all clothing in to reduce chances of insects getting between layers on clothing.
- Some brands of repellent can be sprayed over clothing however check the one you are using as others can damage fabric.
- Some repellents are “water resistant” but most require frequent reapplication if you are getting wet or become sweaty, as they are water soluble.

Applying insect repellent to the face

- ✓ Apply sunscreen and let dry on the skin prior to applying repellent.
- ✓ Apply ample repellent product (cream, gel, roll-on, spray) to the palm of the hand.
- ✓ Avoid contact with eyes and mouth when applying by closing them.



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- ✓ Rub repellent from the hands against the skin, thoroughly applying to the face/neck/ears/forehead/décolleté/chest etc.

Clothing

Thicker garments make it more difficult for an insect to penetrate, but lightweight fabrics, particularly sports fabrics are no barrier to a mosquito. Mosquitos can sting through lightweight fabrics.

The MRNSW uniform includes a heavy drill fabric shirt and cargo pants which are recommended to reduce the likelihood of contact with insects including mosquitoes. Shorts and short sleeved shirts/polo shirts will not give you the best protection from insects and will require you to apply larger volumes of insect repellent to your arms, legs and ankles.

Hats or helmets will reduce the likely exposure to insects via the scalp so are also recommended whilst on operational duties.

Safety Data Sheet (SDS)

To get information in relation to the chemicals in insect repellent refer to the SDS provided by the manufacturer. The SDS should be accessible from the manufacturer's website.

Some common brands of repellent and their Safety Data Sheets:

Brand name	Active ingredient	Protects for up to	link	Expiry Date
Aero guard Body Max	DEET 40%	12 hours	Aerogard Body Max 40 DEET_D8209122 v4.0L.pdf (rb-msds.com.au)	18/09/2020
Bushman Dry Gel	DEET 80%	12 – 15 hours	1 Identification (bushman-repellent.com)	29/09/2021
Bushman Naturals	Oil of eucalyptus	9 hours	203a11_12423b930ad34081b477a720f3efcbe1.pdf (bushman-naturals.com)	30/07/2020
Rid Workforce aerosol	DEET	6 hours	RID-Workforce-Aerosol-GHS-2020-06-25.pdf	25/06/2020

Storage of repellent

Read specific directions on the packaging for the repellent being used but generally:

- Do not store repellent near food or food containers.
- Protect containers from excessive exposure to sunlight.
- Do not expose to temperatures exceeding 50 °C.

Incompatible materials: Oxidising or reducing agents, strong acids and strong alkalis.



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Reducing the likelihood of mosquitoes.

Mosquitoes need water to breed but some mosquitoes only need very small amounts of water, such as in the water that collects in a discarded soft-drink can. To reduce the risk of mosquitoes breeding in and around MRNSW properties:

- Clean up the yard and remove all water-holding rubbish and containers.
- Cover or securely screen the openings to tanks, including rainwater and septic tanks.
- Flush and wipe out any bird baths or water features once a week.
- Flush out the leaves of water-holding plants such as bromeliads once a week.
- Fill pot plant bases with sand to avoid standing water.
- Keep drains and roof guttering clear to avoid standing water.
- Keep lawns mowed.
- Screen doors, windows and vents with small mesh fly screen.
- Sleep using a bed net if where you are sleeping may be infested by mosquitoes.
- Stay in screened or air-conditioned rooms.
- Store anything that can hold water undercover or in a dry place, and keep bins covered.
- Use insecticide sprays, vapour dispensing units (indoors) and mosquito coils (outdoors) to clear rooms or repel mosquitoes from an area.

Spread of disease

Viruses can be spread by contact with certain types of insects. Mostly these viruses are not spread directly from one person to another.

Mosquitoes may feed on animals and people. If they feed on the blood of an infected animal, the mosquito may become infected. The virus then multiplies within the mosquito and is passed to other animals or people when the mosquito feeds again on them.

The number of infections tends to peak in the summer and autumn months.

Resources

NSW Health - [Advice on mosquito control during floods and public events - Fact sheets \(nsw.gov.au\)](https://www.nsw.gov.au/health-and-safety/docs/Advice-on-mosquito-control-during-floods-and-public-events-Fact-sheets.pdf)

NSW Health - [fight-the-bite.pdf \(nsw.gov.au\)](https://www.nsw.gov.au/health-and-safety/docs/fight-the-bite.pdf)

NSW Health - [Mosquito Information - Dr. Stephen Doggett - YouTube](https://www.youtube.com/watch?v=...)

Arthropod pests of public health significance in Australia – www.eh.org.au/documents/item/501

References

Environmental Health: [Pest Management - Environmental Health Australia Ltd. \(eh.org.au\)](http://www.eh.org.au)

NSW Health: [Diseases \(nsw.gov.au\)](https://www.nsw.gov.au/health-and-safety/docs/Diseases.pdf)

NSW Health: [Resources - Vector Borne Diseases \(nsw.gov.au\)](https://www.nsw.gov.au/health-and-safety/docs/Resources-Vector-Borne-Diseases.pdf)

Service NSW: [Recovery centres | Service NSW](https://www.service.nsw.gov.au/recovery-centres)

Bushman [Bushman - SDS \(bushman-repellent.com\)](http://bushman-repellent.com)

SCJohnson: [Mosquito Education & Prevention \(scjohnson.com\)](http://www.scjohnson.com/mosquito-education)