FOCUS ON

MOSQUITO-BORNE DISEASES

phn MURRAY
An Australian Government Initiative

January 2024

While most mosquitoes are just annoying, some also carry disease some of which can be life-threatening illnesses. Recent weather events particularly flooding, and warm summer conditions are the perfect environmental recipe for breeding.

Mosquito-borne diseases are transmitted by mosquito bites and avoiding these, and vaccination are the most important ways to prevent mosquito-borne diseases. All mosquito-borne diseases are notifiable to the department.

Japanese Encephalitis	Japanese Encephalitis (JE) is a rare but potentially serious infection of the brain caused by a virus that is transmitted by mosquitoes. The best way to prevent mosquito borne diseases – including JE is to avoid mosquito bites and to be vaccinated if you are eligible. • Japanese encephalitis virus (health.vic.gov.au) • japanese-encephalitis-vaccine-information-for-providers.docx.docx (live.com) • Authorised immunisation providers in Victoria can now order the JE vaccine via the Onelink Australia (onelinkonline.net) (order limits apply). Imojev is the prioritized vaccine in the Victorian JE program. • japanese-encephalitis-vaccine-information-for-providers.docx.docx (live.com) • 20231128-gp-pharmacist-jev-alert.pdf (nsw.gov.au)	
Notifiable infectious diseases	Notification of an infectious disease or medical condition applies to medical practitioners and/or pathology services. Notification requirements vary depending on the severity of the infectious diseases. The link below contains information regarding the notification process for infectious diseases including mosquito-borne diseases: • Notifiable infectious diseases, conditions and micro-organisms | health.vic.gov.au	
Prevention	Bites	Simple actions to prevent mosquito bites reduce the risk of mosquito-borne diseases. Protect yourself from getting bitten by: • Limiting time outside at dusk and in the evening when mosquitoes are likely to be about. • Wear mosquito repellent containing picaridin or DEET on all exposed skin. For kids and babies, apply repellent to their clothes rather than their skin. • Cover up by wearing long loose-fitting clothing. • Use ‘knockdown’ insect spray, mosquito coils or plug-in repellent when outdoors. • Use ‘knockdown’ insect spray, mosquito coils or plug-in repellent when outdoors.

	Around your home	• Remove stagnant water where mosquitoes can breed. • Make sure your home is mosquito proof by installing insect screens. • On holidays, make sure your accommodation is fitted with mosquito netting or screens. • Cover or overturn trailers, wheelbarrows, boats, tools and children's toys to avoid water pooling. • Clean up your yard and remove anything that can hold water, such as unused pots, and containers or tyres • Keep lawns and gardens trimmed back to reduce the areas where mosquitoes rest.
What is being done to manage mosquitoes	Local councils are undertaking routine prevention activities in areas known to be favourable for mosquito breeding. When a particular species of mosquito that spreads disease is found in very high numbers, or a virus is detected in mosquitoes, additional control measures are implemented by government agencies to protect impacted communities. In Victoria, the *Public Health and Wellbeing Regulations 2019* outline responsibilities for mosquito management. The Department of Health manage a state-wide program to reduce the impact of disease transmitted by mosquitoes. This program funds: • Councils in key areas to undertake weekly mosquito surveillance. Mosquitoes are trapped and then sent to a specialised lab for testing where the results determine the level of risk for that community and guide our recommendations for interventions. • Specialised teams which can be deployed to areas where diseases like Ross River virus or Japanese Encephalitis virus are circulating and use specific control activities to help reduce the risk to the nearby communities	
Where to find more information	• Mosquito-borne diseases | health.vic.gov.au • Protect yourself from mosquito-borne disease - Better Health Channel • Mosquitoes - protect your home checklist - Better Health Channel • Mosquito-borne diseases | healthdirect • Mosquito borne diseases (nsw.gov.au) • Keep mozzies away – campaign resources - Mosquito borne diseases (nsw.gov.au) • Mosquito reduction - Mosquito borne diseases (nsw.gov.au) • Bite prevention - Mosquito borne diseases (nsw.gov.au) • Mosquito control during floods and public events - Mosquito borne diseases (nsw.gov.au) • Mosquito-borne disease resources - Mosquito borne diseases (nsw.gov.au) • Quick comparison table for GPs – Mosquito Borne Infections in Victoria – symptoms, vectors, hosts, clinical presentation courtesy of North Western Melbourne PHN (nwmphn.org.au) • Are floods and La Niña changing disease patterns in Victoria? - North Western Melbourne Primary Health Network (nwmphn.org.au)	

Vaccinations	There are two safe and effective vaccines for JE: • Imojev®: live attenuated vaccine given by subcutaneous injection. Registered for use in people aged ≥9 months. Primary course is one dose. • JEspect®/Ixiaro: inactivated JE vaccine given by intramuscular injection. Available for use in infants and children aged ≥2 months, immunocompromised people, and pregnant or breastfeeding women. Primary course is two doses. *Imojev® vaccine is prioritised in Victoria's current public health response.* **How to order JE vaccine:** Immunisation providers are required to send orders directly to the Immunisation Unit: immunisation@health.vic.gov.au with the following information: • health service name, address and Onelink account number • current JE vaccine brand stock on hand • number and brand of JE vaccine required • confirmation that client meets the JE vaccination program eligibility criteria and the clinical criteria. **Ordering vaccines in NSW:** Vaccine doses can be ordered through the State Vaccine Centre: https://nsw.tollhealthcare.com/ For larger orders that exceed current order restrictions, please contact the local public health unit. • JE Vaccine Eligibility Criteria JE elearning module • Japanese encephalitis | The Australian Immunisation Handbook (health.gov.au) • Japanese encephalitis vaccination - Japanese encephalitis virus (nsw.gov.au)
Keep up-to-date with HealthPathways information	• Mosquito-borne Diseases in Victoria • Notifiable Conditions in Victoria
Update your emergency response documents	Preferably use the Emergency Response Planning Tool (ERPT) available to general practices until December 2024 and ensure staff are familiar with it. If using a paper system, store a copy off site. This will not only help you to stay focused and respond under pressure but get your business back up and running more quickly.
Ensure emergency contact details are up-to-date	So that Murray PHN can assist in coordinating support with government agencies during an emergency, make sure to let us know who your emergency contacts are via your Quality Improvement Consultant or: primarycareresponse@murrayphn.org.au

Communicate service closures or impacts	Use social media and other platforms. Prepare a message or email to patients using appointment confirmation system or Pen CS if needed. Consider sending other important alerts, for example: to patients with asthma during epidemic thunderstorm asthma days. Use Pen CS and CAT Plus recipes to identify relevant patient groups and send an SMS message to those patients who have not opted out. You will need to set up your account and ensure you have enough credits in the system to send the messages. **Inform Murray PHN of service closures or impacts: primarycareresponse@murrayphn.org.au**
Plan staffing	In the event of no or reduced access to your site or staff absences, consider alternate models of work, alternate sites and equipment needs (ERPT can guide you through these considerations): • Are the practitioners set up with ePrescribing so patients can obtain scripts immediately and remotely? Ensure paper scripts/prescribing pads are also available if no internet is available. • Does the practice have an alternate contact number, or can you temporarily divert your practice number, so patients can call if the building is closed, and the phone system is inaccessible? • Can admin and clinical staff access your practice management and clinical software systems off site to facilitate remote models of care? • Ensure clinicians can create pathology and imaging requests if working remotely. • Have information available for VVED to share with patients.
Protect your data	Ensure that your practice software is backed up, ideally to the cloud, to reduce the risk of data loss. Upload patient information to My Health Record.
Join the emergency volunteer list	If you have capacity to support in an emergency event, register your interest using the online form.
Do emergency exercise training	Undertake mock training incidents to ensure staff are competent and aware of their roles in the event of an emergency.

Other useful links and resources to share with patients

- My Health Record
- Alternative after hours and emergency care options

Mosquito-borne infections in Victoria: quick comparison table for GPs (valid 29 November 2023)

By Dr Jeannie Knapp, GP and Primary Health Care Improvement GP Adviser, North Western Melbourne PHN.

	Japanese Encephalitis	Ross River Fever	Murray Valley Encephalitis	Barmah Forest Fever	Buruli Ulcer
Type of causative agent	Flavivirus	Alphavirus	Flavirus	Alphavirus	Mycobacterium ulcerans
Hosts	Pigs and wading birds	Mammals	Water birds	Mammals - probably marsupials	Possibly mosquitos and possums (unconfirmed)
Mosquito vector to humans	*Culex tritaeniorhynchus*	Multiple including *Culex annulirostris* (common banded mosquito), *Aedes vigilax* (salt marsh mosquito) and *Aedes notoscriptus* (Australian backyard mosquito)	*Culex annulirostris* (common banded mosquito)	*Culex annulirostris* (common banded mosquito) in inland areas, *Ochlerotatus camptorhynchus* (southern parts of Victoria and Tasmania) and *Ochlerotatus vigilax* (New South Wales) are the major vectors in coastal regions	Still being researched but evidence points to *Aedes notoscriptus* (Australian backyard mosquito)
Current at-risk areas	• **Benalla** • **Buloke** • **Campaspe** • **Gannawarra** • **Greater Bendigo** • **Greater Shepparton** • Hindmarsh • Horsham • **Indigo** • **Loddon** • **Mildura** • **Moira** • Northern Grampians • **Strathbogie** • **Swan Hill** • **Towong** • **Wangaratta** • West Wimmera • **Wodonga** • Yarriambiack	Most of Victoria including around waterways and coastal areas - not currently metro Melbourne	Northern Australia but outbreaks have occurred in south eastern Australia when heavy rainfall, flooding and hot weather favour bird and mosquito breeding	Endemic throughout Victoria, especially the Murray Valley and Gippsland area	In Victoria, the disease is being identified in an increasing number of geographic areas, both coastal and non-coastal. These locations include: • Mornington peninsula region • Bellarine peninsula region • Westernport region • Frankston/Langwarrin region • South eastern Bayside suburbs • East Gippsland • Phillip Island (particularly Cowes), although much less common now • Aireys Inlet and the Surf Coast • Several suburbs of Greater Geelong, in particular Belmont, Highton, Newtown, Wandana Heights, Grovedale and Marshall • Inner Melbourne suburbs including Essendon, Moonee Ponds, Brunswick West, Pascoe Vale South and Strathmore

	Japanese Encephalitis	Ross River Fever	Murray Valley Encephalitis	Barmah Forest Fever	Buruli Ulcer
Incubation period	5-15 days	3 to 9 days but can range up to 21 days	7 to 12 days, but can be as short as 5 days or as long as 28 days.	7 to 10 days but can range from 3 to 21 days	4 weeks to 9 months, with a median of 4 to 5 months
Clinical syndrome	Sudden onset of fever, headache and vomiting and risk of acute encephalitis	Fever, rash, fatigue, arthralgia and can be persistent Less than 1% develop clinical illness	Fever, headache, nausea, vomiting and loss of appetite, diarrhoea and muscle aches. Rarely encephalitis	Fever, arthralgia, fatigue and rash, similar to Ross River Fever and can also be persistent	Non-healing ulcer
Diagnosis	Serology and PCR testing. For more information visit the Victorian Department of Health's website	Serological testing	Serological testing or PCR of cerebrospinal fluid	Serological testing	2 dry swabs for AFB and PCR and culture. For more information visit the Victorian Department of Health's website
Notifiable?	Yes – urgent	Yes – routine	Yes – urgent	Yes – routine	Yes - routine
Vaccine?	Yes - for high-risk groups and high risk LGAs, as above	No	No	No	No
More information can be found on the Victorian Department of Health's website	Link	Link	Link	Link	Link

For further information or support please contact your local Quality Improvement Consultant, email: gpsupport@murrayphn.org.au or visit the general practice support page on our website