JAPANESE ENCEPHALITIS

Japanese encephalitis virus (JEV) is preventable, with effective vaccines approved in Australia. This mosquito-borne viral disease can cause severe illness but may be prevented by avoiding mosquito bites and through the receipt of a Japanese Encephalitis vaccination. The virus occurs in rural regions of Asia and the Pacific region, although through increased urbanisation, cases are being reported more often in peri-urban and urban areas.

JAPANESE ENCEPHALITIS VIRUS IN AUSTRALIA

The Japanese encephalitis virus (JEV) and its vectors are found in many parts of Asia, the Torres Strait, Papua New Guinea and more recently in Australia's south, east and in QLD. The first Australian outbreaks occurred on pig farms in Queensland, NSW and Victoria in February 2022, and by June, Japanese encephalitis had affected over 70 farms throughout temperate regions of the country and human cases and deaths had been reported.

Japanese Encephalitis belongs to the flavivirus family of viruses, the genus responsible for infections such as yellow fever, dengue fever and Zika virus. In Australia, flaviviruses are the cause of Murray Valley Encephalitis and Kunjin virus, among others. JEV endemic regions are most often those where rice is cultivated using flooding irrigation or in swampy areas, however, seasonal rainfall and high temperatures play a part in differing patterns of risk within some countries. The cycle of transmission for Japanese encephalitis involves the virus' hosts (wading birds and pigs) and the mosquito that feeds on them (night-feeding Culex species), becoming infected and transmitting the virus between the hosts and occasionally to humans (and horses).

Humans are considered dead-end virus hosts as mosquitoes are unlikely to become infected through feeding on the low levels of virus circulating in a person during an infection (unlike pigs which are known as virus amplifiers).

THE SYMPTOMS OF JAPANESE ENCEPHALITIS

Only 1 in 250 infections among vulnerable individuals in endemic areas lead to symptoms of Japanese encephalitis. The disease begins as a flu-like illness with headache, fever and gastrointestinal symptoms; confusion and disturbances in behaviour may also occur at this early stage. The illness can in some cases progress to a serious infection of the brain that can prove fatal in 5-30% of cases. Another one-third of cases survive with serious neurological effects, such as paralysis, and the remaining third will recover without further problems.

The elderly and pregnant women are at the highest risk of developing symptomatic infections, while children under age 10 with severe disease are more likely to die or have permanent disabilities if they survive. A Japanese encephalitis vaccination schedule is recommended if any of those in this cohort travel to infected areas.

COMMON JAPANESE ENCEPHALITIS LOCATIONS

Japanese encephalitis is found in many parts of Asia, the Indian subcontinent, Southeast Asia and China, however the virus, its reservoirs/hosts and vectors have become more widespread, with cases also occurring in Indonesia, Torres Strait, Papua New Guinea and in the past, in North QLD.

On March 4, 2022, the detection of JEV in piggeries in Qld, NSW and Victoria, and subsequent human cases and deaths, led to the declaration of a Communicable Disease Incident of National Significance by the Federal Department of Health. Read more

While JE infections are more commonly found in rural areas of Asia, around rice paddies where pigs, wading birds, and humans live close together, they can occur in or near many Asian cities. The occurrence has greatly diminished or even disappeared in some areas such as Singapore, Japan and Korea due to urbanisation and the use of vaccines. However, in other areas, the incidence is increasing due to deforestation, population growth, the spread of agricultural irrigation and

global warming.

Transmission occurs in the northern regions of China, Siberia, Korea and Japan in the warmer months of May to October; further south, the peak season is from March to October. In some tropical areas of Southeast Asia and India, transmission depends on the monsoonal rain and bird migration patterns, whereas in areas where there are abundant pigs, rice paddies and birds, transmission can be year-round.

RISK TO TRAVELLERS

The risk to short-term travellers and people who confine their travel to urban centres and use appropriate insect-bite prevention measures is very low. Expatriates, travellers living for prolonged periods (over 30 days) in rural, particularly agricultural areas and repeat travellers to locations where Japanese encephalitis is endemic or epidemic are at greater risk. Japanese encephalitis vaccination for travel is highly recommended if you intend to tour these regions.

Travellers with extensive unprotected outdoor exposure in rural areas, particularly during the evening and at night - especially those engaging in activities such as bicycling, camping or engaging in certain occupational activities in rural areas - may be at high risk, even if their trip is brief. We recommend a Japanese encephalitis vaccination schedule for anyone planning to travel to these areas.

Travellers are also advised to stay in screened or air-conditioned rooms or to use bed nets impregnated with a contact insecticide such as Permethrin when such accommodation is unavailable. Bite avoidance measures such as the use of insecticide, repellents and protective clothing to avoid mosquito bites should be employed.

TREATING JAPANESE ENCEPHALITIS

There is no cure for Japanese encephalitis: treatment is focused on relieving severe clinical signs and supporting the patient to overcome the infection. As with any illness, prevention is better than cure and the way to avoid this disease is by using insect bite avoidance measures and, if recommended, via the Japanese encephalitis vaccination schedule which, depending on available supplies, you can receive at any of our Travelvax clinics.

ABOUT JAPANESE ENCEPHALITIS VACCINATION

Type: Injectable

- Attenuated live viral vaccine
- Inactivated virus vaccine

Contraindications: Japanese encephalitis vaccination should not be administered to individuals who have previously experienced a serious reaction to this vaccine or who are known to be hypersensitive to any of the vaccine components. The attenuated live viral vaccine should not be administered to anyone who is unable to receive this type of vaccine.

JAPANESE ENCEPHALITIS VACCINATION SCHEDULE

Attenuated live viral Japanese encephalitis vaccination schedule:

- Children ?9 months to <18 years, one dose is given on day 0. Currently a booster dose can be given after 1 to 2 years if at continued risk of infection.
- Adults over 18 years of age, a single dose. Boosters not required.

Inactivated virus vaccine:

- Children aged ?3 years and adults have 2 doses 28 days apart.

The inactivated virus vaccine can be used in children aged ?2 months to <18 years, but for infants aged ?2 months to <9 months, only in circumstances where an alternative is not available or is contraindicated. In these cases, the schedule for the ?2 months to <3 years age group is to receive 2 doses (of 0.25 ml) 28 days apart. Data is lacking on boosters for

infants and children under 18 years, so for continuing risk of JE infection, have a discussion with the medical practitioner.

A booster of the inactivated virus vaccine is recommended for adults aged over 18 years who are at continued risk of exposure to the JE virus 1–2 years after the primary dose.

SCHEDULE (ACCELERATED)

Adults aged 18 years and over can receive 2 doses of Inactivated virus vaccine, 7 days apart if they are at imminent risk of exposure to JE virus.

LEVEL OF PROTECTION

Attenuated live viral vaccine:

- 94% after 14 days

Inactivated virus vaccine:

- 96% after 2 doses (28 days apart)

POSSIBLE JAPANESE ENCEPHALITIS VACCINATION SIDE EFFECTS

Attenuated live viral vaccine**:** Approximately 40-50 per cent of subjects reported one or more of the following Japanese encephalitis vaccination side effects or adverse reactions, most of which resolved within 3 days:

Generally mild but may include:

- Gastrointestinal upset, nausea, vomiting and/or diarrhoea, abdominal cramps and pain,
- Headache, muscular and/or joint pain,
- Fatigue, feeling unwell, hot, chills and dizziness.
- Throat pain, shortness of breath, runny nose, cough, wheezing, nasal congestion, rash.
- As with all vaccines, there is a small risk of an allergic reaction.

Inactivated virus vaccine**:** Approximately 40 per cent of subjects experience adverse reactions or Japanese encephalitis vaccination side effects, and they usually occur in the first 3 days following vaccination. Side effects are usually mild and only in the first few days. They may include:

- Pain, tenderness or swelling at injection site,
- Headaches, muscle aches and pains,
- Flu-like illness, fatigue.

Fever is more common in children.

References:

Australian Immunisation Handbook https://immunisationhandbook.health.gov.au/vaccine-preventable-diseases/japanese-encephalitis

Tropical Medicine and Infectious Diseases Japanese Encephalitis Virus in Australia: From Known Known to Known Unknown https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6473502/

US Centers for Disease Control & Prevention (CDC) https://www.cdc.gov/japaneseencephalitis/index.html

World Health Organization https://www.who.int/ith/diseases/japanese_encephalitis/en/

FAQS

WHAT IS JAPANESE ENCEPHALITIS?

Japanese Encephalitis (JEV) is a viral disease transmitted to humans by the bite of an infected mosquito. The mosquito becomes infected after having a blood meal on infected pigs and aquatic birds, which are the virus' principal hosts. Pigs and aquatic birds are known as 'amplifying hosts', wherein they can have high circulating levels of JE virus without becoming sick and so readily infect a biting mosquito. Other animals (such as horses) can be infected with JE virus but generally are not a 'reservoir' or source of infection to humans.

HOW DO YOU CATCH JAPANESE ENCEPHALITIS?

Japanese encephalitis (JEV) in humans occurs through the bite of an infected mosquito and transmission does not occur from human to humans, nor can it be transmitted through the consumption of pork or pig products. An infected human is not likely to have sufficient viral loads in the blood to infect biting mosquitoes. So humans are known as 'dead-end' hosts of the transmission cycle.

WHERE DOES JAPANESE ENCEPHALITIS OCCUR?

Japanese encephalitis is found in many parts of Asia, the Indian subcontinent, Southeast Asia and China. However, it has become more widespread, with cases also occurring in Indonesia, Torres Strait, Papua New Guinea and, in the past, in North QLD.

JEV has now been found in pigs in the eastern and southern states of Australia, and there has been onward spread to humans, resulting in several deaths, via mosquitoes in those areas. These events resulted on March 4, 2022, in the declaration of a Communicable Disease Incident of National Significance by the Federal Department of Health.Read more

DO I NEED JAPANESE ENCEPHALITIS VACCINE?

You may be advised to have the Japanese encephalitis vaccine if you work, live or plan to travel to a piggery, work in a lab or in the field studying mosquitoes, or a location where the disease is endemic or where an outbreak is occurring.

HOW IS JAPANESE ENCEPHALITIS VIRUS SPREAD?

JE's cycle of transmission involves the virus' hosts (wading birds and pigs) and the mosquito that feeds on them (Culex species which feeds at night), becoming infected and transmitting the virus between the hosts and occasionally to humans and horses (both considered dead-end virus hosts, unlike pigs which are known as virus amplifiers).

CAN I CATCH JAPANESE ENCEPHALITIS FROM EATING PIGS OR OTHER ANIMAL PRODUCTS?

You cannot catch the virus by eating pig or other animal products.

WHAT ARE THE PEAK RISK TIMES FOR CONTRACTING JAPANESE ENCEPHALITIS VIRUS?

Potentially JEV-carrying mosquitoes (some Culex spp.) are night-time biters, in particular around dusk and dawn. In temperate endemic areas, humans are more commonly infected in summer and autumn however in tropical areas, JEV circulates more or less continuously between mosquitoes, birds, and pigs.

Transmission occurs in the northern regions of China, Siberia, Korea and Japan in the warmer months of May to October; further south, the peak season is from March to October. In some tropical areas of Southeast Asia and India, transmission depends on the monsoonal rain and bird migration patterns, whereas in areas where there are abundant pigs, rice paddies and birds, transmission can be year-round.

HOW SOON DO PEOPLE GET SICK AFTER BEING BITTEN BY A JE-INFECTED MOSQUITO?

JEV symptoms appear between 5 to 15 days after the bite of an infected mosquito.

WHAT ARE THE SYMPTOMS OF JAPANESE ENCEPHALITIS VIRUS?

About 99 per cent of JEV infections will have no symptoms. Of those people who do get symptoms, most will be mild, cold and flu-like, such as fever, chills, headaches, fatigue, nausea and vomiting.

Symptoms to be aware of are severe headache, neck stiffness, movement difficulties and sensitivity to light and sound,

as these may be due to brain inflammation (encephalitis).

In severe cases, the disease can progress to inflammation and swelling of the brain (encephalitis) and often causes seizures that may result in paralysis and coma. The death rate in serious cases is 25-30 per cent, with 30-50 per cent of survivors of a serious infection having ongoing complications. Elderly people, the immuno-compromised and children under five are particularly vulnerable to serious disease.

HOW IS JAPANESE ENCEPHALITIS DIAGNOSED?

Diagnosis is based on a combination of clinical signs and symptoms and pathology testing of blood or spinal fluid.

WHAT IS THE TREATMENT FOR JAPANESE ENCEPHALITIS VIRUS?

There is no specific treatment for JE. Serious illness is treated with supportive medical therapies and management in hospital.

HOW CAN YOU PROTECT YOURSELF FROM JAPANESE ENCEPHALITIS?

Mosquito bite prevention is paramount to reducing the risk of infection.

- Use insect repellent containing picaridin, oil of lemon eucalyptus, or DEET on all exposed skin and wear long pants and long sleeves – Read: TRAVELVAX Insect bite prevention measures
- Sleep in air-conditioned or well-screened rooms or tents, or use bed nets impregnated with permethrin
- Vaccines against JE virus are available. Whether a Japanese encephalitis vaccine is recommended or not should be discussed with a travel health professional – See: TRAVELVAX.

Through the Federal Government, the Communicable Diseases Network Australia (CDNA) has prioritised the groups of people who should be vaccinated against JE using current supplies of vaccine. They include those who work at piggeries/related abattoirs and personnel working directly or indirectly with mosquitoes (surveillance, control etc). Read more. On Aug 4, 2020, NSW Health revised its advice regarding Japanese encephalitis vaccination for nine LGAs in the state's south to include those 'aged between 50-65 AND are employed in an occupation that is largely or totally outdoors (defined as spending at least 4 hours per day outdoors).' Read more. And in Qld, residents of several local government areas were advised that they were considered an at risk group when they participated in 'occupational or recreational outdoor activities undertaken near potentially productive mosquito habitat, such as areas near rivers, ponds and marshes, including flood zones and wherever there are bodies of standing water' and also 'people who live or work in the Torres Strait and/or Northern Peninsula Area of Cape York'. Read more

WHAT IS THE JAPANESE ENCEPHALITIS VACCINE?

There are two types of Japanese encephalitis vaccines.

Type: Injectable

- Attenuated live viral vaccine
- Inactivated virus vaccine

Contraindications: Should not be administered to individuals who have previously experienced side effects or a serious reaction to this vaccine or who are known to be hypersensitive to any of the vaccine components. The attenuated live viral vaccine should not be administered to anyone who is unable to receive this type of vaccine.

For vaccine details, see the **Australian Immunisation Handbook** and consult with your GP or Travel Medicine Clinic.

HOW LONG DOES THE JAPANESE ENCEPHALITIS VACCINE'S PROTECTION LAST?

The duration of protection will depend on which vaccine was received in the primary course of vaccination and at what age. Whether boosters are recommended should be discussed with your GP or Travel Medicine Clinic.

WHO SHOULD GET THE JAPANESE ENCEPHALITIS VACCINE?

The risk to short-term travellers and people who confine their travel to urban centres and use appropriate insect bite prevention measures is very low. Expatriates, travellers living for prolonged periods (over 30 days) in rural, particularly agricultural areas and repeat travellers to locations where JE is endemic or epidemic are at greater risk. Travellers with extensive unprotected outdoor exposure in rural areas, particularly during the evening and at night - especially those engaging in activities such as bicycling, camping or engaging in certain occupational activities in rural areas - may be at high risk, even if their trip is brief.

Travellers are advised to stay in screened or air-conditioned rooms or to use impregnated bed nets when such accommodation is unavailable. Bite avoidance measures such as insecticide, repellents and protective clothing to avoid mosquito bites should be employed.

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IS THE JAPANESE ENCEPHALITIS VACCINE SAFE TO HAVE IF I AM PREGNANT OR BREASTFEEDING?

JE vaccine is not routinely recommended for pregnant or breastfeeding women. However, pregnant women at risk of acquiring JE are recommended to receive JEspect as JEV infection contracted during the 1st and 2nd trimesters has been associated with miscarriage. No adverse outcomes of pregnancy have been attributed to vaccination with JEspect. See the: Australian Immunisation Handbook. The live attenuated vaccine is contraindicated in pregnant women (and in the immuno-compromised), and women should avoid pregnancy for 28 days after vaccination with the attenuated virus vaccine.

The CDC states: "Benefits of vaccinating pregnant women usually outweigh potential risks when the likelihood of disease exposure is high, when infection would pose a risk to the mother or fetus, and when the vaccine is unlikely to cause harm."

Breastfeeding women who are at increased risk of acquiring JE are recommended to receive JEspect. Australian government and other health professional organisations state that, in general, inactivated vaccines given to nursing mothers are safe for both the mother and child. For details, READ: Vaccination Safety for Breastfeeding Mothers

WHERE IS JAPANESE ENCEPHALITIS IN AUSTRALIA?

The Japanese encephalitis virus (JEV) has been detected in more than 70 piggeries across Victoria, New South Wales, Queensland and South Australia, and human cases (and deaths) have been reported.

WHY IS JAPANESE ENCEPHALITIS SPREADING IN AUSTRALIA?

The occurrence of Japanese encephalitis (JE) virus infections in pigs and people in mainland Australia has been of significant concern at the national level, leading to the Australian Acting Chief Medical Officer's declaration of a Communicable Disease Incident of National Significance in consultation with the Australian Health Protection Principal Committee. The formation of an interdisciplinary working group and collaboration with the state and territory officials is a timely response. Read more

WHO IS AT RISK OF CATCHING JAPANESE ENCEPHALITIS IN AUSTRALIA?

Pig farmers and people who work around piggeries or partake in occupational or recreational outdoor activities near mosquito habitat in affected regions are at the highest risk of infection, particularly if no mosquito bite avoidance

measures are taken.

HOW MUCH DOES THE JAPANESE ENCEPHALITIS VACCINATION COST IN AUSTRALIA?

The effective and widely-used Japanese encephalitis vaccines used in Australia (dependent on supplies) have costs ranging up to $300 for travellers.

However, as of September 14, 2022, and after the recent outbreaks, NSW has expanded free access for Japanese encephalitis vaccine to people considered at risk and living in affected regional areas. NSW Health conducted a survey in several of the towns, and of those residents who took part, one in 11 showed evidence of past infection.

IS JAPANESE ENCEPHALITIS VACCINE FOR LIFE?

The duration of the Japanese encephalitis vaccination is not known.

More information on Japanese Encephalitis is available during your pre-travel consultation with Travelvax. Call 1300 360 164 for the location of the clinic nearest to you.