

## Powassan Virus

### What is Powassan virus?

Powassan (POW) virus is a flavivirus that is related to some mosquito-borne viruses such as West Nile virus. The virus is named after Powassan, Ontario where it was first discovered in 1958. Two types of Powassan virus have been found in North America including lineage 1 and lineage 2 (deer tick virus) POW viruses. Physician-diagnosed Powassan virus disease is very rare in Minnesota and the United States.

### How do people get Powassan virus?

People can get POW virus through the bite of a tick that is infected with the virus. Not all ticks carry these viruses and not all people bitten by a tick will get sick. A tick needs to be attached to a person for a certain length of time before it can cause disease. This time interval is not known for POW virus, but it is likely much shorter than the time needed for other tickborne disease agents.

One type of POW virus (lineage 2) is carried by the blacklegged tick (deer tick), the same tick that spreads Lyme disease, human anaplasmosis, and babesiosis. The blacklegged tick can be found in many wooded areas of Minnesota. Blacklegged ticks live on the ground in areas that are wooded or with lots of brush. The ticks search for hosts at or near ground level and grab onto a person or animal as they walk by. Ticks do not jump, fly, or fall from trees.

In Minnesota, the months of April - July and September - October are the greatest risk for being bitten by a blacklegged tick. Risk peaks

in June every year. Blacklegged ticks are small; adults are about the size of a sesame seed and nymphs (young ticks) are about the size of a poppy seed. Due to their small size, a person may not know they have been bitten by a tick.

Another type of POW virus (lineage 1) is carried by similar tick species that usually feed on woodchucks and squirrels instead of humans. These ticks have also been found in wooded areas in Minnesota, but humans rarely come into contact with them.

### What are the symptoms of Powassan virus?

Many people infected with Powassan virus may have no symptoms or only mild symptoms. Symptoms of Powassan virus usually appear within 1-4 weeks of a tick bite. Signs and symptoms may include:

- **Fever**
- **Headache**
- **Vomiting**
- **Weakness**
- **Seizures**
- **Encephalitis** (swelling of the brain)
- **Meningitis** (swelling of the membranes that surround the brain and spinal cord)

Patients with severe disease may suffer long-term neurologic symptoms such as headaches and memory problems. The proportion of persons who die as a result of encephalitis is approximately 10%.

## How is Powassan virus diagnosed?

If a person suspects Powassan virus disease, they should contact a doctor immediately for diagnosis and treatment. The diagnosis of Powassan virus is based on:

- History of exposure to blacklegged ticks or tick habitat
- Physical exam
- Laboratory tests of blood and/or spinal fluid will need to be performed to confirm the diagnosis

## How is Powassan virus treated?

There is no specific medicine to cure or treat Powassan virus disease. Patients with severe illness may need supportive care such as hospitalization and respiratory support.

## How can I reduce my risk?

There is currently no human vaccine available for Powassan virus. Reducing exposure to ticks is the best defense against tickborne diseases.

### Protect yourself from tick bites:

- Know where ticks live and when they are active. Blacklegged ticks live in wooded or brushy areas. In Minnesota, blacklegged tick activity is greatest from April-July and September-October.
- Use a safe and effective tick repellent if you spend time in areas where ticks live. Follow the product label and reapply as directed.
  - Use DEET-based repellents (up to 30%) on skin or clothing. Do not use DEET on infants under two months of age.

- Pre-treat clothing and gear with permethrin-based repellents to protect against tick bites for at least two weeks without reapplication. Do not apply permethrin to your skin.
- Wear light-colored clothing to help you spot ticks more easily. Wear long-sleeved shirts and pants to cover exposed skin.
- Talk with your veterinarian about safe and effective products you can use to protect your pet from ticks.

### Check for ticks at least once a day after spending time in areas where ticks live:

- Inspect your entire body closely for ticks, especially hard-to-see areas such as the groin and armpits.
- Remove ticks as soon as you find one.
- Use tweezers and grasp the tick close to its mouth and pull the tick outward slowly and gently. Clean the area with soap and water.
- Examine your gear and pets for ticks too.

### Manage areas where ticks live:

- Keep lawns and trails mowed short.
- Remove leaves and brush.
- Create a landscape barrier of wood chips or rocks between mowed lawns and woods.

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