

Powassan Virus Disease

What is Powassan virus disease?

Powassan virus is a tickborne 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 and include lineage 1 and lineage 2 Powassan viruses. Physician-diagnosed Powassan virus disease is very rare in Minnesota and the United States.

How do people get Powassan virus disease?

People can get Powassan virus disease 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 Powassan virus disease, but it is likely shorter than 12-24 hours.

One type of Powassan virus (lineage 2 or “deer tick virus”) is carried by the blacklegged tick (deer tick), the same tick that spreads Lyme disease, 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 have 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 through July and September through October are

the greatest risk for being bitten by a blacklegged tick. Risk peaks in June or July 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 Powassan virus (lineage 1) is carried by a similar tick species that usually feeds 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 disease?

Many people infected with Powassan virus have no symptoms or only mild symptoms. Symptoms of Powassan virus disease 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 surrounding the brain and spinal cord)

Patients with severe disease may suffer long-term neurologic symptoms such as headaches and memory problems. Death is possible but rare (approximately 10% of cases with encephalitis).

How is Powassan virus disease diagnosed?

If a person suspects Powassan virus disease, they should contact a doctor immediately for diagnosis and treatment. The diagnosis of Powassan virus disease is based on a history of exposure to tick habitat, a physical examination, and laboratory tests to confirm the diagnosis.

How is Powassan virus disease treated?

There is no specific medicine to 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 disease. 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 or near 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.
- Tumble dry clothing and gear on high heat for at least 60 minutes after spending time in areas where ticks live.
- Talk with your veterinarian about safe and effective products you can use to protect your pet.

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

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

Manage areas where ticks live:

- Mow lawns and trails frequently.
- Remove leaves and brush.
- Create a barrier of wood chips or rocks between mowed lawns and woods.

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