

6.12 Zika

Etiology

Zika virus is a mosquito-associated flaviviral disease caused by Zika virus (ZIKV). It is related to other *Flaviviridae*, including Japanese Encephalitis, West Nile, Yellow Fever, St. Louis, Encephalitis and Dengue viruses.

Case Definitions

Clinical Criteria

A person with one or more of the following:

- acute onset of fever (measured or reported)
- maculopapular rash
- arthralgia
- conjunctivitis
- complication of pregnancy
 - fetal loss in a mother with compatible illness and/or epidemiologic risk factors;

OR

- in utero findings of microcephaly and/or intracranial calcifications with maternal risk factors
- Guillain-Barré syndrome not known to be associated with another diagnosed etiology.

Epidemiologic Linkage

- Travel to a country or region with known ZIKV transmission, OR
- Sexual contact with a laboratory confirmed case of ZIKV infection, OR
- Receipt of blood or blood products within 30 days of symptom onset; OR
- Organ transplant recipient within 30 days of symptom onset; OR
- Association in time and place with a confirmed or probable case.

Case Classification

Probable

Meets clinical criteria

AND

- resides in or has recently traveled to an area with ongoing ZIKV transmission, **OR**

- has direct epidemiologic linkage to a person with laboratory evidence of recent ZIKV infection (e.g. sexual contact, in utero or perinatal transmission, blood transfusion, organ transplantation),

- OR-

- association in time and place with a confirmed or probable case.

AND meets the following laboratory criteria:

- positive ZIKV-specific IgM antibodies in serum or cerebrospinal fluid (CSF);

- **AND**

- negative dengue virus-specific immunoglobulin M (IgM) antibodies;

- **AND**

- No neutralizing antibody testing performed;
- **OR**
- Less than four-fold difference in neutralizing antibody titers between ZIKV and dengue or other flaviviruses endemic to the region where exposure occurred.

Confirmed

Meets clinical criteria

AND

Has laboratory evidence of recent ZIKV infection by:

- Detection of ZIKV by culture, viral antigen or viral ribonucleic acid (RNA) in serum, CSF, tissue, or other specimen (e.g. amniotic fluid, urine, semen, saliva); **OR**
- ZIKV IgM antibodies in serum or CSF with ZIKV neutralizing antibody titers 4-fold or greater than neutralizing antibody titers against dengue or other flaviviruses endemic to the region where exposure occurred.

Zika Virus, Congenital Infection

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Clinical Criteria

An infant with microcephaly or intracranial calcifications or central nervous system abnormalities.

Case Classification

Probable : An infant meets the clinical criteria **AND**:

- Mother lived in or traveled to a country or area with ongoing ZIKV transmission during the pregnancy;
- **OR**

- Mother has laboratory evidence of ZIKV or unspecified flavivirus infection during pregnancy;

AND the infant meets the following laboratory criteria:

- ZIKV IgM antibodies detected in serum or CSF;
- **AND**
- Tests negative for dengue or other endemic flavivirus-specific IgM antibodies; **AND**
 - No neutralizing antibody testing performed; OR
 - Less than four-fold difference in neutralizing antibody titers between ZIKV and dengue or other flaviviruses endemic to the region where exposure occurred.

Confirmed

An infant meets the clinical criteria AND meets one of the following laboratory criteria:

- ZIKV detection by culture, antigen test, or polymerase chain reaction (PCR) in serum, CSF, amniotic fluid, urine, placenta, umbilical cord, or fetal tissue; OR
- ZIKV IgM antibodies present in serum or CSF with ZIKV neutralizing antibody titers 4-fold or greater than neutralizing antibodies against dengue or other flaviviruses endemic to the region where exposure occurred.

Clinical Features

The disease symptoms are usually mild and last for 2 to 7 days. An estimated 80% of Zika virus infections are asymptomatic. Most people fully recover without severe complications and require only simple supportive care. Hospitalization rates are low. Symptoms include:

- fever (often less than 38.5°C)
- nonpurulent conjunctivitis
- maculopapular rash (face and body)
- arthralgias

Diagnosis

See case definitions. Preliminary diagnosis is based on clinical features and a history of travel to an area with Zika virus transmission. Include on the laboratory requisition travel dates and destination and description and date of onset of symptoms.

Investigations

Who should be tested?

- Any patient with:
 - a history of travel to an area with Zika virus transmission
 - AND-**
 - two or more symptoms consistent with Zika virus infection during or within 2 weeks of travel
- Pregnant women with:
 - a history of travel to an area with Zika virus transmission
 - AND-**
 - two or more symptoms consistent with Zika virus infection during or within 2 weeks of travel
 - OR-**
 - ultrasound findings of fetal microcephaly or intracranial calcification
 - Consider testing asymptomatic pregnant women with a history of travel to an endemic area if it will influence clinical decision making. Screening of asymptomatic pregnant women should be discussed on a case-by-case basis between the woman and her health care provider.
- Mothers of newborns with microcephaly who have a history of travel to an area with Zika virus transmission
- Infants:
 - with microcephaly or intracranial calcifications born to women who traveled to or resided in an area with Zika virus transmission while pregnant
 - OR-**
 - born to mothers with positive or inconclusive test results for Zika virus infection.
- Obtain travel history from all pregnant women.
- Serial obstetrical ultrasounds are recommended every three to four weeks for all pregnant women returning from an area with Zika virus transmission.
- Test for Dengue and Chikungunya as well.
- Testing is generally not warranted for returning male travelers who remain asymptomatic. Please see the section on **Prevention: male travelers** for advice on preventing sexual transmission of Zika

Table 1: Laboratory Testing for Suspected Zika Virus

Clinical Presentation	Recommended Tests	Required Information on Requisition
Asymptomatic:		<ol style="list-style-type: none"> Country(-ies) visited Date of arrival in affected area Date of return to NL Indicate whether asymptomatic Date of symptom onset Clinical symptoms <ul style="list-style-type: none"> -fever -conjunctivitis -rash -arthralgias Pregnancy status and gestational age
Asymptomatic, non-pregnant	No testing	
Asymptomatic pregnant <ul style="list-style-type: none"> No symptoms during or within 2 weeks of travel 	<ul style="list-style-type: none"> Zika serology Collect sample \geq 1 month after return from affected area 	
Symptomatic:		
Acutely ill <ul style="list-style-type: none"> \geq2 symptoms Symptom onset during or within 2 weeks of travel Onset of symptoms within last 10 days 	<ol style="list-style-type: none"> 5ml gold top serum separator tube for RT-PCR Urine in sterile container for RT-PCR 1 ml CSF (as indicated) 	
Recovered <ul style="list-style-type: none"> \geq2 symptoms Symptom onset during or within 2 weeks of travel Not currently symptomatic and onset of symptoms was >10 days ago 	<ol style="list-style-type: none"> 5ml gold top serum separator tube for Zika virus serology Collect sample > 2 weeks after return from affected area 	

Diagnostic tests for Zika virus infection are available through the NL Public Health Laboratory via the National Microbiology Laboratory in Winnipeg. For information on testing visit the Public Health Laboratory website: <http://publichealthlab.ca/laboratory-guidance-for-zika-virus-testing/>

There are two types of testing currently available:

- Zika virus RT-PCR
 - The test of choice for direct detection of viral RNA
 - Recommended in suspected cases within 7 days of onset of symptoms
 - Submit serum and urine, and, if indicated, cerebrospinal fluid (CSF)

- Viral RNA in urine may persist up to 10 days or more after symptoms are noted. This may be considered an alternative or additional sample for RT-PCR testing.
 - Serum is submitted in the yellow/gold serum separator tube (SST)
 - Urine can be submitted in any sterile container
 - CSF (1.0 ml) is in a sterile container (usually the specific CSF tube).
 - Turnaround time for RT PCR is about 2 days.
2. Serology
- Detection of Zika virus IgG and IgM antibodies at least 4 days after symptom onset
 - Serum samples collected after 7 days can be tested for Zika virus antibody

Confirmation of Zika virus-specific antibody in serum samples can be challenging, particularly in the case of previous infection with a related *Flavivirus*, such as dengue. This is due to the cross-reactivity

Epidemiology

Zika virus, first described in Rhesus monkeys in the Zika forest, Uganda in 1947, has led to outbreaks in Africa, Asia and the Oceanic Pacific region. In late 2015, Zika virus was reported for the first time in a number of countries in Central and South America with a concomitant 20-fold increase in microcephaly rates in affected parts of Brazil. This association is currently under investigation. The list of countries reporting transmission is evolving and now includes many Caribbean nations.

The PHAC website has an up to date list of affected nations:

<http://www.healthycanadians.gc.ca/diseases-conditions-maladies-affectations/disease-maladie/zika-virus/risks-countries-pays-risques-eng.php>

Occurrence

- As of August 25, 2016, 232 travel related cases, 2 sexually transmitted cases and 3 reports of maternal-to-fetal transmission have been detected in Canada. There's ongoing low risk to Canadians .If you're pregnant or planning a pregnancy, you should avoid travel to [countries or areas in the U.S. with reported mosquito-borne Zika virus](#)
- Travel related cases of Zika virus have been reported in Canada , for up to date information please visit Public Health Agency of Canada (PHAC) website :
<http://www.healthycanadians.gc.ca/diseases-conditions-maladies-affectations/disease-maladie/zika-virus/risks-countries-pays-risques-eng.php>

Reservoir

The main source of Zika virus is infected mosquitoes – mainly *Aedes* mosquitoes. A secondary source of Zika virus are infected humans.

Incubation

The incubation period ranges from 3 to 12 days. The disease symptoms are usually mild and last for 2 to 7 days.

Transmission

Zika virus is a mosquito-borne single-strand RNA flavivirus transmitted by *Aedes* mosquitoes. This species also transmits dengue and Chikungunya viruses. It is a day-biting mosquito with highest activity in the hours just after sunrise and just before sunset. This vector is established in subtropical, tropical, and temperate regions but not in Canada, therefore local transmission here is highly unlikely.

The natural cycle of ZIKV involves mosquito vectors and vertebrate hosts. In the current outbreak the vertebrate hosts are humans. Aside from mosquitos, blood transfusion-associated and sexual transmission have been documented.

A significant concern with the current ZIKA outbreak is the potential for vertical transmission from mother to infant which can cause microcephaly and other congenital abnormalities.

There is evidence of Zika virus transmission through sexual intercourse. It is recommended that men who have travelled to an area with Zika virus transmission: (1) use condoms with a partner who could become pregnant for six months after their return and use condoms for the duration of an established pregnancy (2) use condoms with any partner for 6 months.

Control Measures**Management of the case**

Hospitalized individuals should be managed on Routine Practices.

Treatment

There is no specific treatment for Zika virus infection. Symptomatic treatment with analgesics and fluids will suffice in most cases. Avoidance of acetylsalicylic acid and other nonsteroidal anti-inflammatory drugs is recommended until dengue infection has been excluded.

Management of contacts

- Identify close contacts
- Provide education on the signs and symptoms of Zika Virus
- Arrange follow up for pregnant contacts as necessary.

Prevention

- There is no prophylaxis or treatment so postponement of travel or avoidance of mosquito bites is advised. **Pregnant women and those planning a pregnancy should avoid travel to countries with ongoing Zika virus outbreaks.**

If travel cannot be avoided or postponed strict mosquito bite prevention measures should be followed due to the association between Zika virus infection and increased risk of serious health effects on their developing fetus.

- **Travelers returning from countries and areas in the United States with reported mosquito-borne Zika virus:**
 - **For pregnant women, if you develop symptoms that could be consistent with Zika virus infection, you should consult a health care provider.**
 - **For women planning a pregnancy**, it is strongly recommended that you wait **at least 2 months** before trying to conceive to ensure that any possible Zika virus infection has cleared your body.
 - **For male travelers**, Zika virus can persist for an extended period of time in the semen of infected males, therefore:
 - It is strongly recommended that, if you have a pregnant partner, you should use condoms or avoid having sex for the **duration of the pregnancy**.
 - It is strongly recommended that you and your partner wait to conceive **for 6 months** by using a condom or by avoiding having sex.
 - It is recommended that you should consider using condoms or avoid having sex with **any** partner for **6 months**.
- Delay donating cells, blood, tissues, or organs for a minimum of **21 days**.
- Men should postpone semen donations for **6 months**.
- <http://www.who.int/csr/disease/zika/information-for-travelers/en/>

Notifiable Disease

Zika virus is a notifiable disease in NL. As of May 25, 2016 there has been one case of Zika virus identified in NL, which was travel related.