Zika Virus Infection Update, Wisconsin, 2016

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Presentation Overview

- Characteristics of Zika virus infection
- Transmission
- Diagnosis and testing
- Treatment and prevention
- Wisconsin response and preparedness
- Surveillance
- Disease reporting and investigation

Zika Virus

- Mosquito-borne single-stranded RNA flavivirus.
  - Closely related to dengue, yellow fever, Japanese encephalitis and West Nile viruses.
  - Transmitted to humans by *Aedes* species mosquitoes.
- First identified in Uganda in 1947.
  - Prior to 2007, only sporadic cases were reported in countries in Africa and Asia.
  - During May 2015, the World Health Organization (WHO) reported the first local transmission of Zika virus in the Americas.

Areas with Active Zika Virus Transmission

Current map: http://www.cdc.gov/zika/geo/

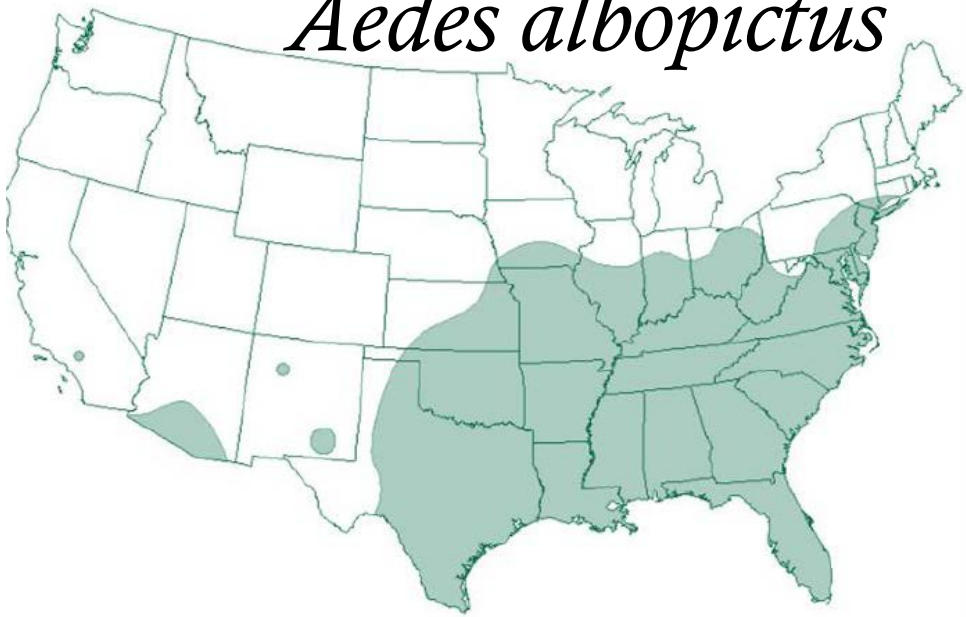
Zika Virus Vectors

- *Aedes* species mosquitoes.
  - *Aedes aegypti* – more efficient vector for humans.
  - *Aedes albopictus* – possible vector.
- Also transmit dengue and chikungunya viruses.
- Aggressive biters with peak feeding at daytime.
- Lay eggs in and around standing water.
- Live indoors and outdoors near households.
- Humans are the primary amplifying host during outbreaks.

Geographic Distribution of *Aedes* Mosquitoes in the United States

Aedes aegypti

Aedes albopictus



Other Modes of Transmission

- Maternal-fetal: during pregnancy and time of birth.
- Other documented modes of transmission: rare
  - Sexual
  - Blood transfusion
  - Laboratory exposure
- Theoretical concerns:
  - Organ or tissue transplantation
  - Breast milk

Clinical Course and Outcomes

- Incubation period: likely several days to a week.
- Estimated 80% of infections are asymptomatic.
- Among symptomatic individuals, illness is usually mild and can commonly include:
  - Acute onset of fever, headache, myalgia (muscle aches), arthralgia (joint pain), rash, photophobia (light sensitivity), conjunctivitis (red eyes).
- Symptoms generally last several days to a week.
- Hospitalizations are uncommon and fatalities are rare.
  - Guillain-Barré syndrome reported among patients following suspected Zika virus infection but relationship to virus is not known.

Zika and Microcephaly in Brazil

- Zika virus infections may be associated with microcephaly:
  - Considerable increase in the number of infants born with microcephaly has been observed in outbreak in Brazil during 2015.
  - True baseline rate of microcephaly and the association with Zika virus is unknown at this time.
    - Zika virus RNA isolated from several babies born with microcephaly and from fetal losses among women infected during pregnancy.
    - Some of the infants with microcephaly have tested negative for Zika virus.
- Investigations are ongoing: Incidence of microcephaly among fetuses with congenital Zika infection is unknown.

Diagnosis and Testing, Wisconsin

- Since symptoms of Zika virus infection are similar to dengue and chikungunya (and mosquito vectors are the same), blood tests may be ordered for all three.
- Currently, there are no commercially available tests for Zika virus.
- Testing is performed at the CDC through assistance from the Wisconsin State Laboratory of Hygiene (WSLH).
- All requests for fee-exempt Zika virus testing must be approved by the DHS Vectorborne Epidemiologist. Phone 608-267-0249, email diep.hoangjohnson@dhs.wisconsin.gov

Zika Virus Testing

- **History of travel** to Zika virus affected areas within 2 weeks from illness onset, and
- At least **two of the following** signs and symptoms:
  - Fever, headache, myalgia (muscle aches), arthralgia (joint pain), rash, photophobia (light sensitivity), conjunctivitis (red eyes).

Note: Additional information required for approval of fee-exempt testing: onset and specimen collection dates, dates of travel to Zika-affected area(s), patient demographics, and healthcare provider contact information.

Zika Virus Screening for Asymptomatic Pregnant Patients

- History of travel to Zika virus affected areas and performed within 2 to 12 weeks after travel.
- Testing will include Zika virus IgM serology and confirmatory testing if positive (plaque reduction neutralization testing).

Note: Additional information required for approval of fee-exempt testing: specimen collection date, date of travel to Zika-affected area(s), patient demographics, and healthcare provider contact information.

CDC Tests for Zika virus

- Reverse transcriptase-polymerase chain reaction (RT-PCR) detection of viral RNA in serum specimens collected within the first week of illness.
- Serologic tests for detection of IgM and neutralizing antibodies in serum specimens collected ≥4 days after illness onset.
  - Note: Cross-reactivity with yellow fever and dengue viruses.
- Plaque reduction neutralization test (PRNT) in paired sera.
- Immunohistochemical (IHC) staining for viral antigen detection or RT-PCR on fixed tissue samples.

Types of Specimens for Zika Virus Testing

- Serum
- CSF
- Amniotic fluid (collected after 15 weeks gestation)
- Placental and umbilical cord tissues (fixed staining or frozen)
- Cord blood

Treatment

- No specific antiviral treatment is available.
- Treatment is supportive: rest, fluids, and supportive care.
  - Assess for dengue and chikungunya viruses and avoid use of aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs) until dengue is ruled out (to reduce the risk of hemorrhage).
  - Treat pregnant women with acetaminophen.

Prevention

- No vaccine available at this time.
- Avoid exposure to mosquitoes: use air conditioning or window/door screens; wear long sleeves and pants; use permethrin-treated clothing and gear, and Environmental Protection Agency (EPA)–registered repellents when outdoors.
- Pregnant women should consider postponing travel to any area where Zika virus transmission is ongoing.
- Persons infected with Zika, dengue, or chikungunya viruses should be protected from further exposure to mosquitoes during illness to reduce the risk of local transmission.

Wisconsin Response

- Update the Zika virus website at the Department of Health Services on a daily basis or as needed to share CDC guidelines and new important information.
- Answer phone calls and emails from providers requesting fee-exempt approval of Zika virus testing.
- Add Zika virus to the reportable list of diseases in the Wisconsin Disease Electronic Surveillance System (WEDSS).
- Provide outreach education to local health departments, laboratory network, infection preventionists, and other interest groups.
- Create and update talking points to assist with phone calls and media interviews.

Surveillance in Wisconsin

- Provide fee-exempt testing of Zika virus (also chikungunya and dengue) in travelers with appropriate signs and symptoms within 2 weeks after returning from areas with localized Zika virus transmission. Provide testing for asymptomatic pregnant women.
- Provide funding to assist the Wisconsin State Laboratory of Hygiene to bring on testing.
- Support mosquito surveillance for possible emerging *Aedes* species by collaborating with the University of Wisconsin-Madison, Medical Entomology Laboratory.
- Report all Zika virus confirmed and probable cases in real time to CDC ArboNet via WEDSS and National Electronic Disease Surveillance System (NEDSS).

Disease Reporting and Investigation

- Suspected Zika virus and other arboviral infections are Category II diseases and must be reported to public health within 72 hours: https://www.dhs.wisconsin.gov/disease/diseasereporting.htm
- Follow arboviral management protocol posted on the DHS website. https://www.dhs.wisconsin.gov/publications/p0/p00894.pdf
- Use Arboviral case report form for investigation.
- Disease reported category in WEDSS: Arboviral diseases, Zika virus.
- **Reminder:** when investigation is completed for all arboviral diseases, the local health department should "send to state" for review, leaving the resolution status as "suspect". The DHS epidemiologist will determine if it meets the case definition for confirmed or probable case. Once the case is submitted as a confirmed or probable, it will be sent to CDC via NEDSS within 15-20 minutes.

References and Resources

- CDC COCA. Zika Virus — What Clinicians Need to Know: http://emergency.cdc.gov/coca/calls/2016/callinfo_012616.asp
- CDC MMWR. Zika Virus Spreads to New Areas — Region of the Americas, May 2015–January 2016: http://www.cdc.gov/mmwr/volumes/65/wr/mm6503e1.htm
- CDC MMWR. Interim Guidelines for Pregnant Women During a Zika Virus Outbreak — United States, 2016: http://www.cdc.gov/mmwr/volumes/65/wr/mm6502e1.htm
- Wisconsin Division of Public Health – Zika Virus Webpage:
- https://www.dhs.wisconsin.gov/arboviral/zika.htm
- CDC Zika Virus Webpage: http://www.cdc.gov/zika/index.html

Questions?

Thank you!

CDC posters and fact sheets:
http://www.cdc.gov/zika/fs-posters/index.html