DEFENSE HEALTH AGENCY
Armed Forces Health Surveillance Branch (AFHSB)

Detecting & Reporting DoD Cases of Congenital and Non-congenital Zika Virus Disease and Infection Guidance as of 7 DEC 2016

BACKGROUND

This detecting and reporting guidance provides information to assist with the identification, diagnosis, and reporting of non-congenital and congenital Zika virus (ZIKV) disease and infection. CDC has detailed clinical and laboratory guidance available for healthcare providers.

ZIKV disease is usually a mild illness with symptoms lasting for several days to a week. Severe disease requiring hospitalization is uncommon and fatalities are rare. Only about one in five people infected with ZIKV become symptomatic. There is no vaccine or specific treatment.

A significant increase in reported microcephaly cases followed the discovery of ZIKV circulation in French Polynesia in 2013-2015 and Brazil in 2015. CDC has determined that there is a causal relationship between ZIKV congenital infections and neurological birth defects. These birth defects can include microcephaly, intracranial calcifications, and/or other central nervous system abnormalities.

Due to the risk of ZIKV microcephaly associated with maternal ZIKV infection, fetuses and infants of women infected with ZIKV during pregnancy should be evaluated for possible congenital infection and/or neurologic abnormalities. CDC has issued updated guidance for advising and caring for pregnant women and for evaluating and testing infants with possible ZIKV infection.

ZIKV infection may increase the risk of developing Guillain-Barré syndrome (GBS). Several countries of the Pacific region and the Americas have reported an increased incidence of GBS in association with an increase in ZIKV infection.

Consider dengue and chikungunya infection, including co-infections. Dengue, chikungunya, and ZIKV are all transmitted by the same mosquitoes (*Aedes* species) and can have similar clinical features. These viruses often circulate in the same area and can occasionally cause co-infections in the same patient.

Differential diagnoses may also include malaria, leptospirosis, rickettsia, group A streptococcus, rubella, measles, parvovirus, enterovirus, adenovirus, and other flavivirus, and alphavirus infections (e.g. Mayaro, Ross River, Barmah Forest, O'nyong-nyong, and Sindbis viruses).

CLINICAL DIAGNOSTIC TESTING

- Diagnosis of ZIKV infection based on clinical presentation alone is not reliable; confirmation requires appropriate laboratory testing. CDC has issued updated Guidance for U.S. Laboratories Testing for Zika Virus Infection. Additionally, CDC has released a "when to test for ZIKV" infographic and guidance for interpretation of ZIKV antibody test results to aid healthcare providers in deciding when to test and what the test results mean.
- Clinical diagnostic testing is available through DoD, state labs, and CDC using nucleic acid tests and serologic tests approved for clinical testing under FDA Emergency Use Authorizations. Testing should be coordinated with state or local health departments.
- The Trioplex Real Time RT-PCR Assay for Zika, dengue, and chikungunya viruses and serologic testing using the ZIKA MAC_ELISA IgM assay and ZIKV Detect™ IgM Capture ELISA are available at DoD labs.
- Providers should consult with clinical labs for information on acceptable specimens, specimen collection and shipping, and interpretation of test results.
    - The Trioplex EUA assay is available at BAMC, Brian Allgood ACH, CRDAMC, EAMC, LRMC, MAMC, NAMRU-3, NAMRU-6, NIDDL, NHRC, TAMC, USAFSAM, USAMRIID, WAMC, WBAMC, and WRNMMC.

    - The IgM assays are currently available at six DoD Laboratory Response Network (LRN)-participating laboratories: BAMC, EAMC, NIDDL, USAFSAM, USAMRIID, and WBAMC.
    - The NIDDL can also perform the confirmatory PRNT assay.
- Additional information is available through CDC's Zika Diagnostic Testing webpage, CDC's updated Guidance for U.S. Laboratories Testing for Zika Virus Infection, and FDA's Emergency Use Authorizations webpage.

CASE DETECTION

Detection of acute ZIKV disease or ZIKV infection is based on the patient's clinical presentation, epidemiologic factors, and laboratory evidence of a recent infection.

Clinical criteria for non-congenital ZIKV disease:

- Acute onset of fever (measured or reported)
- Maculopapular rash
- Arthralgia
- Conjunctivitis
- Complications 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.
- GBS not known to be associated with another diagnosed etiology.

Clinical criteria for congenital ZIKV disease:

- Liveborn infant with congenital microcephaly, or intracranial calcifications, **OR**
- structural brain or eye abnormalities, **OR**
- other congenital central nervous system-related abnormalities not explained by another etiology.

Epidemiological criteria for ZIKV disease or infection:

- Resides in or recent travel to an area with known ZIKV transmission, **OR**
- likely vector exposure in an area with suitable seasonal and ecological conditions for potential local vector-borne transmission, **OR**
- sexual contact with a confirmed or probable case within the infection transmission risk window of ZIKV infection or person with recent travel to an area with known ZIKV transmission, **OR**
- receipt of blood or blood products within 30 days of symptom onset, **OR**
- organ or tissue transplant recipient within 30 days of symptom onset, **OR**
- association in time and place with a confirmed or probable case.

Laboratory criteria for ZIKV disease or infection:

- Probable cases
    - Positive ZIKV IgM antibody test on an appropriate specimen **AND**
        - negative dengue IgM antibody test and no neutralizing antibody testing performed, **OR**
        - positive neutralizing antibody titers against ZIKV and dengue or other flaviviruses endemic to the region where exposure occurred.
- Confirmed cases

- Detection of ZIKV by culture, viral antigen, or viral RNA in an appropriate specimen; **OR**
- positive ZIKV IgM antibody test in an appropriate specimen **with** positive ZIKV neutralizing antibody titers and negative neutralizing antibody titers against dengue or other flaviviruses endemic to the region where exposure occurred.

- Additional information is available through CDC's Zika Diagnostic Testing webpage, CDC's updated Guidance for U.S. Laboratories Testing for Zika Virus Infection, and FDA's Emergency Use Authorizations webpage.

CASE DEFINITIONS

Non-Congenital ZIKV Disease

- **Suspect:** Patient who meets clinical and epidemiological criteria above but is negative on Zika immunoglobulin M (IgM) and/or RT-PCR; or no testing conducted.
- **Probable:** Patient who meets clinical, epidemiological, and laboratory criteria for probable cases above.
- **Confirmed:** Patient who meets clinical, epidemiological, and laboratory criteria above.

Congenital ZIKV Disease

- **Suspect:** Neonate who meets clinical and epidemiological criteria above and negative on Zika immunoglobulin M (IgM) and/or RT-PCR; or no testing conducted.
- **Probable:** Neonate who meets clinical, epidemiological, and laboratory criteria for probable cases above.
- **Confirmed:** Neonate who meets clinical, epidemiological, and laboratory criteria above.

Non-Congenital ZIKV Infection

- **Suspect:** Patient who meets epidemiological criteria above but is negative on Zika immunoglobulin M (IgM) and/or RT-PCR; or no testing conducted.
- **Probable:** Patient who meets epidemiological and laboratory criteria for probable cases above.
- **Confirmed:** Patient who meets epidemiological and laboratory criteria above.

Congenital ZIKV Infection

- **Suspect**: Neonate who does not meet clinical criteria for a congenital disease case but meets epidemiological criteria above and negative on Zika immunoglobulin M (IgM) and/or RT-PCR; or no testing conducted.
- **Probable:** Neonate who does not meet clinical criteria for a congenital disease case but meets epidemiological and laboratory criteria for probable cases above.
- **Confirmed:** Neonate who does not meet clinical criteria for a congenital disease case but meets epidemiological and laboratory criteria above.

REPORTING AND SURVEILLANCE

Reporting

- ZIKV disease and congenital infections are not currently reportable medical events (RME) in DoD but are conditions of concern. As of 29 JAN 2016, CDC added ZIKV disease and ZIKV congenital infections to the National Notifiable Diseases Surveillance System (NNDSS).
- Report ZIKV disease and congenital infections to state and local health departments per local civilian reporting requirements to improve cross-communication, mitigate the risk of local transmission, and enhance reporting through ArboNET.

- **Non-congenital ZIKV Disease or Infection:** Both confirmed and probable cases Zika virus disease and infections should be reported in DRSi as "Any Other Unusual Condition Not Listed," with "Zika" entered in the comment field along with a pertinent travel history and recent travel by their sexual partners. For female patients, pregnancy status should be recorded.
- **Congenital ZIKV Disease or Infection:** Neonates with confirmed or probable laboratory evidence of congenital ZIKV infection with or without evidence of congenital disease should be reported in DRSi as "Any Other Unusual Condition Not Listed," with "Zika Virus Congenital Infection" entered in the comment field.
- **Pregnancy Registries:** Follow local or Service-specific guidance for reporting pregnant women in the U.S. with laboratory evidence of ZIKV infection and infants with laboratory evidence of congenital ZIKV infection to the U.S. Zika Pregnancy Registry or, in Puerto Rico, the Zika Active Pregnancy Surveillance System (PASS).
- Direct questions on reporting to the appropriate Service-specific public health POCs:
    - Navy - Contact your relevant Navy Environmental and Preventive Medicine Unit (NEPMU) or the DRSi helpdesk:
        - Navy Environmental and Preventive Medicine Unit Two
          Naval Station Norfolk, VA
          COMM: (757) 953-6600; DSN: (312) 377-6600
        - Navy Environmental and Preventive Medicine Unit Five
          Naval Base San Diego, CA
          COMM: (619) 556-7070; DSN: (312) 526-7070
        - Navy Environmental and Preventive Medicine Unit Six
          Joint Base Pearl Harbor-Hickam, HI
          COMM: (808) 471-0237; DSN: (315) 471-0237
        - Navy Environmental and Preventive Medicine Unit Seven
          Naval Station, Rota, Spain
          COMM (international): 011-34-956-82-2230 (local: 727-2230); DSN: 94-314-727-2230
        - Navy and Marine Corps Public Health Center DRSi Helpdesk
          usn.hampton-roads.navmcpubhlthcenpors.list.nmcphc-ndrs@mail.mil
          COMM: (757) 953-0700; DSN: (312) 377-0700
    - U.S. Air Force School of Aerospace Medicine (USAFSAM)
      Epidemiology Consult Service Division
      usafsam.phrepiservic@us.af.mil
      COMM: (937) 938-3207; DSN: 798-3207
    - Army Public Health Center (APHC)
      Disease Epidemiology Program
      usarmy.apg.medcom-phc.mbx.disease-epidemiologyprogram13@mail.mil
      COMM: (410) 417-2377; DSN: 867-2377

Surveillance

- Use the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) or Medical Situational Awareness in Theater (MSAT) to monitor febrile illnesses and rash in the population for any increases. An ESSENCE account can be created here. Create an ESSENCE or MSAT syndrome group with the appropriate ICD-10 code, A92.8 (Other specified mosquito-borne viral fevers), and investigate increases in potential Zika risk factors.
- Since ESSENCE captures only outpatient data, evaluate hospitalized individuals with acute febrile disease and travel to endemic areas. For theater medical data, MSAT can be used to monitor both outpatient and inpatient

populations.

LABORATORY AND ENTOMOLOGY POCs

Clinical Diagnostic Testing

The following POCs can be consulted for information on clinical diagnostic testing for ZIKV infection in the DoD. DoD medical personnel requiring clinical diagnostic laboratory testing for suspected ZIKV infections should follow Service-specific requirements for coordinating with their state or local laboratories.

Army LRN Laboratories – Service POC

Dr. Bill Nauschuetz, PhD
Program Manager for US Army Lab Response Network, and
Clinical Laboratory Coordinator for Biopreparedness
william.f.nauschuetz.civ@mail.mil
Civ: (210) 808-2794 (desk)
Cell: (210) 438-7482

LTC Robert Nace
Laboratory Program Manager
robert.l.nace.mil@mail.mil
Civ: (210) 808-2795 (desk)
Cell: (210) 501-7593

Navy LRN Laboratories – Service POC

LCDR Dustin J Harrison, PhD, MT(ASCP)
Navy Laboratory Response Network Gatekeeper
dustin.j.harrison3.mil@mail.mil
Civ: (301) 619-1505
Cell: (240) 595-3905

U.S. Air Force School of Aerospace Medicine (USAFSAM)

Wright-Patterson AFB, Dayton, OH
Dr. Elizabeth Macias
elizabeth.macias@us.af.mil
Civ: (937) 938-3175
DSN: 798-3175
Cell: (937) 581-8552

LRMC Infectious Disease Laboratory

Landstuhl, Germany
CPT Ronald Woodbury
ronald.l.woodbury.mil@mail.mil
Civ: 49-6371-867513
DSN: (314) 590-5888

Naval Health Research Center (NHRC)

San Diego, CA

Dr. Chris Myers
christopher.a.myers48.civ@mail.mil
Civ: (619) 553-0891

Mr. Tony Hawksworth
anthony.w.hawksworth.ctr@mail.mil
Civ: (619) 553-7607

Ms. Larivhie Falaminiano
larivhie.c.falaminiano.civ@mail.mil
Civ: (619) 553-9105

Naval Medical Research Unit – 3

Cairo, Egypt
LT Nathaniel Christy
Nathaniel.c.christy.mil@mail.mil
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Naval Medical Research Unit – 6
Lima, Peru

Dr. Chris Mores
Chair, Virology Department
christopher.n.mores.ctr@mail.mil

Dr. Marita Silva
Virology Lab Manager
maria.e.silva19.fn@mail.mil

Ms. Cecilia Gonzales
Shipping and Recieving
gonzales.cecilia.fn@mail.mil

Naval Infectious Disease Diagnostic Laboratory (NIDDL)
Naval Medical Research Center, Silver Spring, MD

LCDR Mark Simmons
mark.p.simmons.mil@mail.mil
Civ: (301) 319-7428

Ms. Susana Widjaja
susana.widjaja.ctr@mail.mil
Civ: (301) 319-3113

Walter Reed National Military Medical Center (WRNMMC)
Bethesda, MD

Ms. Patricia Arrieta
patricia.r.arrieta.civ@mail.mil
Civ: (301) 319-2463

MAJ Edwin Kamau
Edwin.kamau.mil@mail.mil
Civ: (301) 298-8655 / -2043
Cell: (301) 732-0705

Mosquito Surveillance, Entomology, and Environmental Lab Support POCs:

- The Armed Forces Pest Management Board (AFPMB) develops guidance and policy and coordinates pest management activities throughout the DoD. It maintains professional and technical liaison in the area of entomology and integrated pest management with appropriate DoD components, Federal agencies, and other entities. AFPMB approves all pest management products for use in the DoD. Guidance and information on ZIKV vector control and surveillance are available at the AFPMB's web site.

    - COL Jamie A. Blow
      Director, Armed Forces Pest Management Board
      Jamie.A.Blow.mil@mail.mil
      (301) 295-8307/8315

- The Army Medical Command has four regional commands, all of which have Entomological Sciences Divisions that perform mosquito-borne disease surveillance. In total, six Army public health laboratories have arboviral testing capability that includes ZIKV testing.

    - For environmental laboratory support:
      LTC Robert Richards
      robert.s.richards.mil@mail.mil
      (410) 436-5060 (DSN 584-5060)

      Mr. Thomas Burroughs
      Manager, Entomological Sciences Program
      thomas.m.burroughs.civ@mail.mil
      (410) 436-3613 (DSN 584-3613)

- The U.S. Air Force School of Aerospace Medicine (USAFSAM) identifies and tests mosquitoes worldwide for many arboviruses, including Zika and dengue. In addition, USAFSAM provides expertise for operational disease vector surveillance, control, and training.

    - USAFSAM
      Epidemiology Consult Service Division
      usafsam.phrepiservic@us.af.mil
      (937) 938-3207 (DSN: 798-3207)

- Navy and Marine Corps Public Health Center has the above four regional NEPMUs, which provide operational services in entomology. Additionally, the Navy Entomology Center of Excellence provides expertise for operational disease vector surveillance, control, and training.
    - CDR Jeffrey Stancil
      Officer in Charge, Navy Entomology Center of Excellence
      jeffrey.d.stancil.mil@mail.mil
      (904) 542-4626

RISK COMMUNICATION AND PREPARATION CONSIDERATIONS

- CDC has prepared a response plan that focuses on activities that occur when locally acquired ZIKV transmission is identified in the continental U.S. and Hawaii.
- CDC has issued Alert, Level 2 – Practice Enhanced Precautions travel notices for countries and territories with ongoing ZIKV transmission. Travelers should consult these before visiting tropical or subtropical areas of the Americas, Africa, and Asia. Guidelines for travelers visiting friends and family in areas with chikungunya, dengue, or Zika and for U.S. citizens and residents living in areas with ongoing ZIKV transmission are available from the CDC, with specific guidance for travelers to south Florida.
- Beneficiaries living in or traveling to higher risk areas should practice prevention methods for ZIKV, which is transmitted by *Aedes* mosquitoes. See CDC prevention guidelines.
- Pregnant beneficiaries or those planning to become pregnant while living or traveling in an area of ongoing transmission should be made aware of the possible increased risk of congenital neurologic malformations in newborns of women exposed to the virus during pregnancy.
- ZIKV can be spread by sex from an infected person (male and female) to his or her sex partners. It can be passed before, during, and after the person has symptoms. The virus may be passed from a person who never developed symptoms to his or her sex partners. The virus persists longer in semen than in blood. However, the duration of virus in semen is unknown. CDC and WHO recommend that both women and men who are returning from Zika-affected areas abstain or practice safe sex for six months, an increase from the previously recommended eight weeks. Additional information on the risk and prevention of sexual transmission of ZIKV is available from CDC.
- Spread of ZIKV through blood transfusion is possible, and the American Association of Blood Banks recommends donor self-deferral for 28 days after return from an area with ongoing ZIKV transmission.
- There is no antiviral treatment or vaccine currently available for ZIKV infection. Prevention relies on effective mosquito control and avoidance of vectors. Use insect repellent containing EPA-registered repellents, such as DEET or picaridin; wear long sleeves and long pants treated with permethrin for added protection; and limit outdoor activities in order to prevent mosquito bites, decreasing the risk of ZIKV and other mosquito-borne infections.
- Installations should be prepared to carry out necessary mosquito surveillance programs and to execute appropriate mosquito control operations to reduce the size of vector populations and prevent spread of ZIKV. The AFPMB issued updated vector control guidance for *Aedes* mosquitoes.

OTHER RESOURCES

- Publicly-shareable Surveillance Summaries for ZIKV disease are available on the AFHSB website. FOUO versions are available to USG e-mail addresses via a distribution list.
- DoD-specific documents and guidance, including a Zika Toolkit, are available from the Military Health System website.

- ZIKV disease and its possible complications are emerging threats, and clinical, laboratory, and public health guidance is evolving. Health professionals should monitor CDC's healthcare provider website for the most up-to-date information. CDC also has a general interest Zika page.
- The WHO and Pan-American Health Organization have Zika websites with links to information for healthcare providers, public health professionals, and the general public.
- CDC, with OSHA and NIOSH, has issued interim guidance for protecting workers from occupational exposure to ZIKV.

AFHSB POCs

For further information, contact AFHSB's Integrated Biosurveillance (IB) section or Global Emerging Infections Surveillance (GEIS) section:

Email: dha.ncr.health-surv.list.afhs-ib-alert-response@mail.mil
Phone:

- Dr. Stic Harris, Chief, Alert & Response Operations (IB): (301) 319-3297; BB: (202) 834-1327
- Dr. Brett Forshey, Lead, Febrile and Vector-borne Diseases Program (GEIS): (301) 319-3284