ZIKA VIRUS DISEASE

1. **Agent:** Zika virus is a mosquito-borne Flavivirus.

2. **Identification:**
   a. **Symptoms:** Most common symptoms include fever, maculopapular rash which can involve the face, trunk and extremities, joint pain (usually involving the small joints of hands and feet), or non-purulent conjunctivitis. Other symptoms include muscle pain and headache. The sickness is usually mild with symptoms lasting for several days to a week. Most of the infections remain asymptomatic (80%). Recovery is usually complete and fatalities are rare.
   
   b. **Clinical Syndromes:** Congenital Zika syndrome is a pattern of birth defects found among fetuses and babies infected with Zika virus during pregnancy. Congenital Zika syndrome is described by the following five features:
      
      - Severe microcephaly where the skull has partially collapsed
      - Decreased brain tissue with a specific pattern of brain damage
      - Damage to the back of the eye
      - Joints with limited range of motion, such as clubfoot
      - Too much muscle tone restricting body movement soon after birth

      Not all babies born with congenital Zika infection will have all of these problems.

      The risk of congenital infection and microcephaly in a pregnant woman who is infected with Zika virus is unknown.

      Guillain-Barré syndrome has been linked to patients following suspected Zika virus infection.

   c. **Differential Diagnosis:** The same type of mosquitos that transmit Zika virus also transmit dengue and chikungunya viruses. Because Zika virus symptoms are similar to those of dengue and chikungunya. Concurrent testing for chikungunya and dengue is recommended. Zika virus is closely related to dengue, yellow fever, Japanese encephalitis and West Nile virus.

   d. **Diagnosis:**

      Zika virus diagnosis is based on a combination of travel history, clinical signs and symptoms, vaccination history, history of flavivirus infection, and specialized laboratory tests of blood and urine.

     **Molecular Tests for Zika Virus**

      - For symptomatic persons, Zika virus RNA can sometimes be detected early in the course of illness using r-RT PCR testing.
      - Serum PCR testing should be performed on samples collected within the first two weeks after symptom onset.
      - Urine PCR testing should also be conducted on samples collected within the first 2 weeks after symptom onset.
      - A positive PCR result confirms Zika virus infection and no additional testing is indicated. A negative result does not exclude Zika virus infection and serum IgM antibody (serological) testing should be done.
      - For asymptomatic pregnant women who have traveled to areas with active ZIKV transmission, PCR testing is recommended on serum and urine collected within 2 weeks of the date of last possible exposure.
      - PCR testing is also indicated for pregnant women who present for care ≥ 2 weeks after exposure and have been found to be IgM positive.
      - In areas with active ZIKV transmission, asymptomatic pregnant women should undergo IgM testing as part of routine obstetric care in the 1st and 2nd trimester. Reflex rRT-PCR testing is included as a subsequent test for women who are IgM positive.
Serologic Tests for Zika Virus

- Zika virus-specific IgM levels are generally positive 4 days to 12 weeks following onset. Therefore, if PCR is negative on serum and urine, serum IgM antibody testing for Zika, dengue, and chikungunya virus infections should be performed.

- Serum samples collected >=14 days after symptom onset, with no earlier samples collected, should be tested for Zika, dengue, and chikungunya IgM antibodies.

- A positive IgM result does not always indicate Zika virus infection and can be difficult to interpret because cross-reactivity can occur with related flaviruses (e.g., dengue, Japanese encephalitis, West Nile, yellow fever).

- Confirmation Plaque-reduction neutralization testing (PRNT) is performed on positive IgM results to confirm primary Zika infections and differentiate from other flavivirus infections.

- Zika virus testing for the assessment of risk for sexual transmission is of uncertain value, because current understanding of the duration and pattern of shedding of Zika virus in the male genitourinary tract is limited. Therefore, neither serum nor semen testing of men for the purpose of assessing risk for sexual transmission is currently recommended.

3. Incubation: Evidence from case reports and experience from related flavivirus infections indicate that the incubation period for Zika virus disease is likely 3–14 days.

4. Reservoir: Unknown

5. Source: Infected Aedes species mosquito (An. aegypti (main vector) and An. albopictus) is of concern because it is found in Los Angeles County.

6. Transmission:

- Zika virus is transmitted to people primarily through the bite of an infected Aedes species mosquito (An. aegypti and An. albopictus).

- Travelers to an area with active Zika virus transmission can be infected by an infected mosquito (see CDC website for current areas of transmission: https://www.cdc.gov/zika/geo/index.html)

- Zika virus can be transmitted through sex by an infected person to his or her partners even if the infected person does not have symptoms at the time. Zika can remain in semen longer than in other body fluids, including vaginal fluids, urine, and blood.

- Zika virus can be passed from a pregnant woman to her fetus during pregnancy or at delivery. To date, there are no reports of infants getting Zika virus through breastfeeding.

- Zika can be transmitted through blood transfusion.

7. Communicability:

Zika virus usually remains in the blood of an infected person for about a week. There is no evidence that the virus will cause infection in a pregnancy that occurs after the virus is cleared from the mother’s blood. The virus can be present in semen longer than in blood.

Currently, there is no evidence to suggest that past Zika virus infection poses a risk of birth defects for future pregnancies.

8. Specific treatment: There is no vaccine or medicine to treat Zika virus. Treat symptoms with supportive care that includes: bedrest, increased fluid intake, and acetaminophen (Tylenol®) to reduce fever. Aspirin or other non-steroidal anti-inflammatory drugs are not recommended until dengue can be ruled out to reduce the risk of hemorrhage.

9. Immunity: Once a person has been infected, he or she is likely to be protected from future infections.

REPORTING PROCEDURES

1. Report any case or suspected case within 7 calendar days (Title 17, Section 2500 and 2505. California Code of Regulations) to the Acute Communicable Disease Control Program at 213-240-7941.
2. Report Forms:
   - ZIKA CASE REPORT
   - ZIKA CASE SUPPLEMENTAL FORM
   - Zika Virus Positive Blood Donor Form to CDPH

3. Epidemiologic and Clinical Data:
   a. Travel history to a Zika-affected areas within 2 weeks prior to onset of symptoms.
   b. Mosquito bite history including location (city, state, country).
   c. Sexual contact history including number of partners, and unprotected sexual contact.
   d. Household contacts with symptoms of Zika and travel history
   e. Date of onset of symptoms and signs/symptoms including Guillain-Barre Syndrome.
   f. Pregnancy status and fetal ultrasound results.
   g. Previous dengue infections, and yellow fever and Japanese B encephalitis vaccination status.
   h. Hospitalized for illness
   i. CSTE case definition

CONTROL OF CASE, CONTACTS & CARRIERS

1. ACDC will review suspect reports and cases.
2. Case investigation to be completed by ACDC staff, refer to CHS if unable to contact case.
3. Investigation should be initiated within 3 days.

CASE:

Precautions:

Avoid Mosquito bites:
1. Recommend symptomatic cases stay in air-conditioned/screened locations and take steps to prevent mosquito bites for at least 1 week, including wearing mosquito repellant, and wearing long sleeve shirts and pants.
2. Even if they do not feel sick, travelers returning from an area with Zika should take steps to prevent mosquito bites for 3 weeks.

Sexual Precautions:
1. Non-pregnant couples with a partner who traveled to areas with Zika should consider using condoms or abstaining from sex for:
   - Female: 8 weeks after travel if asymptomatic or 8 weeks after illness onset.
   - Male: 6 months after travel if asymptomatic or 6 months after illness onset
2. Pregnant couples should consider using condoms or abstain from sex for the duration of the pregnancy

Blood Donations:
1. Avoid donating blood for 4 weeks after symptom onset or 8 weeks after travel

Follow-up of Pregnant Females
1. Pregnant females will be entered into a US Zika Pregnancy Registry.
2. ACDC/Office of Reproductive Health Program (MCAH)/Maternal, Child and Adolescent Health (MCAH) Program will monitor pregnant females throughout pregnancy and the infant after delivery up to 1 year post delivery.

CONTACTS:
1. Inform household contacts to call ACDC if they develop Zika-like symptoms in next week.
2. Non-pregnant couples with a partner who traveled to area with Zika should consider using condoms or abstaining from sex for:
   - Female: 8 weeks after travel if asymptomatic or 8 weeks after illness onset.
   - Male: 6 months after travel if asymptomatic or 6 months after illness onset
3. Pregnant couples should consider using condoms or abstain from sex for the duration of
CARRIERS: Not applicable

PREVENTION-EDUCATION

- There is no vaccine to prevent Zika virus disease. The best way to prevent disease spread by mosquitos is to avoid being bitten.

Prevent Mosquito Bites

- Prevent mosquito bites by; using EPA approved mosquito repellants, using screens on windows, use air conditioning, sleep under a mosquito bed net, wear protective clothing and treat items, such as boots, pants, socks, and tents, with permethrin or buy permethrin-treated clothing and gear.

Take steps to control mosquitoes inside and outside your home

- Eliminate mosquito breeding sites by emptying containers with stagnant water (i.e., bird baths, old tires, potted plants, swimming pools, pet bowls, and other containers).

Plan for travel

- Pregnant women are advised not to travel to areas with active Zika virus transmission. If a couple is trying to get pregnant consider avoiding non-essential travel to areas with Zika.
- Pregnant women or women trying to get pregnant should consult with their healthcare provider before they or their partner travel.
- During travel to areas with Zika take steps to prevent mosquito bites and keep mosquitos outside including using mosquito repellant, using bed nets, using air conditioner and screens on windows.
- After travel, even if asymptomatic, take steps for 3 weeks to avoid mosquito bites to avoid spreading the virus to local mosquitos
- Returning travelers from Zika endemic areas should not donate blood or blood products until 8 weeks after returning from area.
- Returning travelers from Zika endemic areas should not donate organs, semen or eggs until 6 months after departure from the area.

Protection for sexual transmission

- Zika can be passed through sex even if the infected person does not have symptoms of Zika.
- Pregnant couples with possible exposure via recent travel or sex without a condom with a partner infected with Zika should consider using condoms or abstaining from sex for the duration of the pregnancy.
- Women thinking about getting pregnant should talk to their health care provider
- Non-pregnant couples with a partner who traveled to area with Zika should consider using condoms or abstaining from sex for:
  - Female: 8 weeks after travel if asymptomatic or 8 weeks after illness onset.
  - Male: 6 months after travel if asymptomatic or 6 months after illness onset.

DIAGNOSTIC PROCEDURES

Persons Eligible for Zika Testing at the Public Health Laboratory

- Any person (male or female) who traveled to an area with Zika transmission (including a U.S. location with ongoing local Zika spread) within the past 12 weeks and who has/had symptoms consistent with Zika illness (One or more symptoms of fever, arthralgia, rash, conjunctivitis).
- Any person (male or female) who has/had symptoms consistent with Zika illness (One or more symptoms of fever, arthralgia, rash, conjunctivitis) within the past 12 weeks and who had unprotected sex (i.e., not using a condom) with a partner who lives in or traveled to an area with Zika transmission (including a U.S. location with ongoing local Zika spread) during the 2 weeks before the onset of symptoms.
- A pregnant woman who traveled to an area with Zika transmission (including a
U.S. location with ongoing local Zika spread) within the past 12 weeks whether or not she had any symptoms of illness.

- **A pregnant woman** who traveled to an area with Zika transmission (including a U.S. location with ongoing local Zika spread) within the past 12 weeks who has evidence of fetal abnormality (e.g., evidence of calcification or microcephaly by ultrasound examination) that could be consistent with Zika infection.

- **A pregnant woman** who has had unprotected sex with a man who lives in or traveled to an area with Zika transmission (including a U.S. location with ongoing local Zika spread) within the previous 6 months, whether or not she had any symptoms of illness.

- **An infant** born to a mother with laboratory evidence of Zika virus infection during pregnancy.

- **An infant** who has abnormal clinical or neuroimaging findings suggestive of congenital Zika syndrome and a maternal epidemiologic link suggesting possible transmission (e.g., travel to an area with Zika transmission or sex with a traveler to such an area during pregnancy), regardless of maternal Zika virus test result.

- **Any person** who has a diagnosis of Guillain-Barre Syndrome who traveled to an area with Zika transmission (including a U.S. location with ongoing local Zika spread) or had unprotected sex with a traveler (male or female) to such an area.

**Persons Not Eligible for Zika Testing at the Public Health Laboratory**

- **Any person other than a newborn** who has not traveled to an area with Zika transmission (including a U.S. location with ongoing local Zika spread) within the past 12 weeks or had unprotected sex with a traveler.

- **Any man, non-pregnant woman, or child** who has/had no symptoms consistent with Zika illness or congenital disease.

- **Any pregnant woman** who has not traveled to an area with Zika transmission (including a U.S. location with ongoing local Zika spread) within the past 12 weeks; and who has not had unprotected sex with a man who had traveled to such an area during her pregnancy; and who has no evidence of fetal abnormality that could be consistent with Zika infection.

For laboratory consultation regarding Zika virus specimen types and collection, contact the Public Health Laboratory:

- Weekdays during business hours (8:00-5:00) call 562-658-1300
- After hours call 213-974-1234. Ask for the Public Health Laboratory Director.

Requests for testing specimens of amniotic fluid, placenta, cord blood, and/or tissue from a fetus or newborn with microcephaly or intracranial calcifications should be made by phone to PHL.

**Laboratory Test Form: Zika Virus Testing Report Form** Submit a separate test request for each specimen type. **NOTE: Specimens will not be tested if this form is incomplete or if it does not accompany the specimen(s).**

**Serology:**
(Collect from 4 days -12 weeks from symptom onset date or for asymptomatic pregnant women collect in 1st or 2nd trimester)

**Container:** Serum separator tube (SST, a red- top or gold top vacutainer tube) and test request form.

**Examination Requested:** Arbovirus serology panel.

**Material:** Whole clotted blood.

**Amount:**
- Adult: 8-10 ml.
- Infant: at least 1 ml (collect within first 2 days after birth)

**Storage:** Refrigerate. Transport on cold pack.

**rRT-PCR:**
(Collect within the first 2 weeks after onset of symptoms or for asymptomatic pregnant women within 2 weeks of last possible exposure)

**Container:** Serum separator tube (SST, a red- top or gold top vacutainer tube) and test request form.
Examination Requested: Arbovirus rRT-PCR

Material: Whole clotted blood.

Amount
Adult: 8-10 ml.
Infant: at least 1 ml (collect within first 2 days after birth)

Storage: Refrigerate. Transport on cold pack.

Urine:

(Collect within the first 2 weeks after onset of symptoms or for asymptomatic pregnant women within 2 weeks of last possible exposure)

Container: Sterile urine container

Examination Requested: Arbovirus rRT-PCR

Material: urine (infant urine can be bagged and transferred to sterile container).

Amount:
Adult: 10-20 ml.
Infant: 1-5 ml (collect within first 2 days after birth)

Storage: Refrigerate. Transport on cold pack.