ROCKY MOUNTAIN SPOTTED FEVER

1. **Agent**: *Rickettsia rickettsii*, a pleomorphic, obligate intracellular coccobacillus.

2. **Identification**:

   a. **Symptoms**: Early signs and symptoms are not specific, however, can rapidly progress to serious and life-threatening illness. Acute onset of fever, which may persist for 2-3 weeks, headache, chills, nausea, vomiting, stomach pain and conjunctival injection. A maculopapular rash usually appears on the extremities between 2-4 days after fever begins, which includes the palms and soles and involves most of the body; petechiae and hemorrhages are common.

   Delay in treatment of Rickettsial diseases may lead to severe illness or death. Case fatality rate in untreated cases is 20%. Deaths are rare once prompt treatment begins, and in recent years, have declined to below 1% of cases in the United States. Children are five times more likely than adults to die from RMSF.

   b. **Differential Diagnosis**: Measles, meningococcemia, coxsackie and echovirus infections, typhoid fever, murine typhus, and Colorado tick fever.

   c. **Diagnosis**: Rocky Mountain spotted fever group antibodies (IgG) by IFA; Cases are confirmed by positive PCR, serological evidence of a fourfold rise in IgG antibodies to *R. rickettsii, or* demonstration of spotted fever group *Rickettsiae* (SFGR) antigen in a biopsy or autopsy specimen by immunohistochemical methods (IHC).

3. **Incubation period**: 3-14 days.

4. **Reservoir**: Maintained in nature by transovarial and transstadial passage among ticks. Transmission to dogs, various rodents, and other animals possible; infection in animals is usually subclinical, although disease has been observed in dogs.

5. **Source**: *Dermacentor* species of ticks (American dog tick); possibly *Amblyomma* species. The brown dog tick (*Rhicephalus sanguineus*) has been described in southwestern United States (particularly Arizona) and Mexico. RMSF cases occur throughout the United States, but are most commonly reported from North Carolina, Tennessee, Missouri, Arkansas and Oklahoma.

6. **Transmission**: Bite of tick (several hours of attachment required); contamination of skin with crushed tissue or feces of tick.

7. **Communicability**: Not person-to-person. Tick remains infective for life.

8. **Specific Treatment**: Tetracyclines, specifically doxycycline, the preferred treatment in children and adults.

9. **Immunity**: Probably permanent.

REPORTING PROCEDURES

1. **Reportable**. Report any cases or suspected cases within 7 days to ACDC or Morbidity Unit (*California Code of Regulations,* Title 17, Section 2500).

2. **Report Form**: **SPOTTED FEVER RICKETTSIOSES CASE REPORT (CDPH 8575)**

3. **Epidemiologic Data**:

   a. Recent travel to endemic areas: eastern, central, southwest US.

   b. History of tick bite or exposure to pets with ticks.

   c. Occupational exposure.

CONTROL OF CASE, CONTACTS & CARRIERS

CASE:

Isolation: None.

CONTACTS: No restrictions.

CARRIERS: Not applicable.

PREVENTION-EDUCATION

There is no vaccine to prevent RMSF. Prevention is achieved by preventing tick bites, preventing ticks on pets, and preventing ticks in yards.

1. Use EPA-registered insect repellents in endemic areas.

2. Avoid contact with ticks by avoiding wooded and bushy areas with high grass and leaf litter. Walk in the center of trails

3. Wear protective clothing in areas where ticks are present. Treat clothing and gear with products containing 0.5% permethrin.

4. Check clothing and body for ticks after being outdoors and immediately remove any attached ticks. Shower soon after being outdoors

5. Prevent exposure of domestic animals to ticks.

DIAGNOSTIC PROCEDURES

Clinical and epidemiologic histories are required to aid the laboratory in test selection. Rickettsia serology and PCR tests are available at PHL and CDPH Viral and Rickettsial Disease Lab.

1. **Serology**: Paired sera recommended.

   At PHL:

   Laboratory Form: **Test Request Form H-3021.**

   Test requested: Rickettsia IgM & IgG IFA.

   Material: Serum or CSF

   Amount: 1 mL (minimum 0.25 mL)

   Storage: Store refrigerated at 2 to 8°C. Transport on cold packs. If submission is to be delayed longer than 5 days, store at -20°C or colder and transport on dry ice.

   Remarks: Collect first (acute) blood specimen within first 2 weeks of illness. Collect second (convalescent) blood approximately 2 weeks after the first and up to 10 weeks later. Send each specimen to Public Health Laboratory as soon as it is collected.

   At CDPH:

   Laboratory Form:
   Open the CDPH Viral and Rickettsial Disease Laboratory Webpage to download the **General Purpose Submittal Form (PDF).**

   Test requested: Rickettsia IgM & IgG IFA.

   Material: Serum or Plasma

   Amount: 1 mL

   Storage: Store refrigerated at 2 to 8°C. Transport on cold packs. If submission is to be delayed longer than 3 days, store at -70°C and transport on dry ice.

2. **PCR**: Can be performed on serum, plasma, whole blood, and eschar/scab/tissue specimens.

   At PHL:

   Laboratory Form: Test Request Form H-3021.

   Test requested: Rickettsia PCR

   Material: Whole blood preserved with purple top EDTA tube or acid citrate dextrose Solution A (ACD-A)

   Amount: 4 mL

   Storage: Store samples at 4-8°C using double biohazard specimen bags in a secondary container. Specimen should be sent on cold packs.

   At CDPH:

   Laboratory Form:
   Open the CDPH Viral and Rickettsial Disease Laboratory Webpage to download the **General Purpose Submittal Form (PDF).**

   Test requested: Rickettsia PCR.

   Material: Serum, Plasma, Whole Blood, or Eschars/Scabs/Tissue.

Amount: Serum/Plasma – 1 mL; Whole blood – 3-5 mL in serum separator tubes or in EDTA.
Storage: Store serum/plasma/whole blood refrigerated at 2 to 8°C. Transport on cold packs. If submission is to be delayed longer than 3 days, store at -70°C and transport on dry ice. DO NOT FREEZE WHOLE BLOOD. Send eschar/scabs/tissue swab and lesion samples dry and at room temperature.

3. **Immunohistochemical**: Staining of skin biopsy and autopsy specimen.