Wisconsin Department of Health Services
Division of Public Health
P-01949 (Rev 01/2020)

Communicable Disease Case Reporting and Investigation Protocol

SPOTTED FEVER RICKETTSIOSIS

(Including Rocky Mountain spotted fever)

I. IDENTIFICATION AND DEFINITION OF CASES

A. **Clinical Description:** Spotted fever group rickettsioses (SFGR) are a group of tick-borne or mite-borne diseases caused by Rickettsia bacteria. Rocky Mountain spotted fever (RMSF) is a serious illness within the SFGR caused by the bacterium *Rickettsia rickettsii*. In the United States, RMSF is transmitted by the bite of an infected tick, most commonly by *Dermacentor variabilis* (American dog tick), *Dermacentor andersoni (*Rocky Mountain wood tick), and *Rhipicephalus sanguineus* (brown dog tick) species.

RMSF is characterized by fever, headache, abdominal pain, vomiting, myalgia, and lack of appetite. Most people with RMSF develop some type of rash two to five days after the onset of fever. Rash may appear as small, flat, pink, non-itchy macules and later become a red or purple petechial rash on the wrist, arms, ankles, trunk, and may sometime spread to the palms and soles. However, some RMSF patients never develop a rash. Symptoms usually begin two to 14 days after an infected tick bite and can be severe or even fatal if not treated with antibiotics early in the infection. Long-term problems may result from RMSF disease, including damage to the blood vessels (vasculitis), bleeding or clotting in the brain or other vital organs, and neurologic deficits.

In Wisconsin, RMSF is rarely transmitted, and has been confirmed via laboratory testing in only one patient with no travel history outside of the state. RMSF can be spread in Wisconsin by the American dog tick, also called the wood tick.

In the United States, other known human illnesses associated with SFGR include *Rickettsia parkeri* rickettsiosis (*Rickettsia parkeri*), Pacific Coast tick fever (*Rickettsia philipii*), and Rickettsialpox (*Rickettsia akari*). These bacteria are transmitted by the bite of an infected tick, except for Rickettsialpox, which is spread through the bite of infected mouse mites. Aside from RMSF, none of the other SFGR are known to occur in Wisconsin; however, low-level transmission cannot be ruled out. Symptoms of the other SFGR appear to be similar to RMSF, but are typically milder and commonly include an eschar (dark scab) at the site of the tick bite.

There are several other travel-associated SFGR that can occur outside of the United States. A complete list of known SFGR, type of vector, and geographic location can be found on the CDC's Traveler's Health webpage.

Clinical Criteria: Fever as reported by the patient or a health care provider, **AND** one or more of the following: rash, eschar, headache, myalgia, anemia, thrombocytopenia, or any hepatic transaminase elevation.

B. **Laboratory Criteria:**

- **Confirmatory laboratory evidence:**
  - Detection of SFGR nucleic acid in a clinical specimen via amplification of a Rickettsia genus- or species-specific target by PCR assay, **OR**
  - Serological evidence of a four-fold increase in IgG-specific antibody titer reactive with SFGR antigen by IFA between paired serum specimens (one taken in the first two weeks after illness onset and a second taken two to ten weeks after acute specimen collection)*****, **OR**
  - Demonstration of SFGR antigen in a skin biopsy or autopsy sample by IHC, **OR**
  - Isolation of SFGR from a clinical specimen in cell culture and molecular confirmation (e.g., PCR or sequence).
- **Presumptive laboratory evidence:** Serologic evidence of elevated IgG antibody at a titer **≥1:128** reactive with SFGR antigen by IFA in a sample taken within 60 days of illness onset.******
- **Supportive laboratory evidence:** Serologic evidence of elevated IgG antibody at a titer **<1:128** reactive with SFGR antigen by IFA in a sample taken within 60 days of illness onset.

*****A four-fold rise in titer should not be excluded (as confirmatory laboratory criteria) if the acute and convalescent specimens are collected within two weeks of one another.

**This includes paired serum specimens without evidence of four-fold rise in titer, but with at least one single titer ≥1:128 in IgG-specific antibody titers reactive with SFGR antigen by IFA.
Note: ELISA tests are not quantitative and are not to be used to evaluate changes in antibody titer; therefore, they are not useful as a confirmatory test. IgM tests are not used in the serodiagnosis of acute infections because of the high possibility of false positive results due to possible persistence of antibody levels for months or years.

C. **Wisconsin Surveillance Case Definition:**
- **Confirmed:** A clinically compatible case (meets clinical criteria) that is laboratory confirmed.
- **Probable:** A clinically compatible case (meets clinical criteria) that has presumptive laboratory evidence.
- **Suspect:** A case with confirmatory or presumptive laboratory evidence of infection with no clinical information available, **OR** a clinically compatible case (meets clinical criteria) that has supportive laboratory evidence.

II. REPORTING

A. **Wisconsin Disease Surveillance Category II – Methods for Reporting:** This disease shall be reported to the patient's local health officer or to the local health officer's designee within 72 hours of recognition of a case or suspected case, per Wis. Admin. Code § DHS 145.04 (3) (b). Report electronically through the Wisconsin Electronic Disease Surveillance System (WEDSS), or mail or fax a completed Acute and Communicable Disease Case Report (F-44151) to the address on the form.

B. **Responsibility for Reporting**: According to Wis. Admin. Code § DHS 145.04(1), persons licensed under Wis. Stat. ch. 441 or 448, laboratories, health care facilities, teachers, principals, or nurses serving a school or day care center, and any person who knows or suspects that a person has a communicable disease identified in Appendix A.

C. **Clinical Criteria for Reporting:** Report any clinically compatible illness.

D. **Laboratory Criteria for Reporting:** Report any patient with laboratory evidence of Spotted Fever Rickettsiosis (including RMSF) including any of the following:
- Detection of SFGR nucleic acid in a clinical specimen via amplification of a Rickettsia genus- or species-specific target by polymerase chain reaction (PCR) assays, **OR**
- Elevated IgG antibody titer in one or more serology samples reactive with SFGR antigen by IFA, **OR**
- Demonstration of SFGR antigen in a biopsy or autopsy specimen by IHC, **OR**
- Isolation of SFGR from a clinical specimen in cell culture and molecular confirmation (e.g., PCR or sequence).

E. **Vital Records Criteria for Reporting:** Report any person whose death certificate lists Spotted Fever Rickettsiosis (including RMSF) as a cause of death or a significant condition contributing to death.

F. **Other Criteria for Reporting:** Report any illness of person whose health care record contains a diagnosis of Spotted Fever Rickettsiosis (including RMSF).

III. CASE INVESTIGATION

A. **Responsibility for case investigation**: It is the responsibility of the local health department (LHD) to investigate or arrange for investigation of suspected or confirmed cases as soon as is reasonably possible. A case investigation may include information collected by phone, in person, in writing, or through review of medical records or communicable disease report forms, as necessary and appropriate.

B. **Required Documentation:**
1. Complete the WEDSS disease incident investigation report including appropriate disease-specific tabs, and complete the Wisconsin Tickborne Rickettsial Disease Case Report form.
2. Upon completion of investigation, set WEDSS disease incident process status to "Sent to State."

IV. PUBLIC HEALTH INTERVENTIONS AND PREVENTION MEASURES

A. In accordance with Wis. Admin. Code § DHS 145.05, local public health agencies should follow the methods of control recommended in the current editions of *Control of Communicable Diseases Manual*, edited by David L. Heymann, published by the American Public Health Association, and the American Academy of Pediatrics' *Red Book: Report of the Committee on Infectious Diseases*, unless otherwise specified by the state epidemiologist.

B. Obtain travel history for the month preceding onset of symptoms to determine the site of probable exposure.

C. Educate patients to minimize future tick exposure.

V. CONTACTS FOR CONSULTATION

A. Local health departments and tribal health agencies: https://www.dhs.wisconsin.gov/lh-depts/index.htm

B. Bureau of Communicable Diseases, Communicable Diseases Epidemiology Section, Vectorborne Epidemiologists: 608-267-9003

C. Wisconsin State Laboratory of Hygiene: 1-800-862-1013

VI. RELATED REFERENCES

A. Heymann DL, ed. Rickettsioses (Spotted Fever Group). In: *Control of Communicable Diseases Manual*. 20th ed. Washington, DC: American Public Health Association, 2015: 514-521.

B. Kimberlin DW, ed. Histoplasmosis. In: *Red Book*: *2018-2021 Report of the Committee on Infectious Diseases*. 31st ed. Itasca, IL: American Academy of Pediatrics, 2018: 697-700.

C. Centers for Disease Control and Prevention website: http://www.cdc.gov/rmsf/index.html

D. Centers for Disease Control and Prevention. Diagnosis and Management of Tickborne Rickettsial Diseases: Rocky Mountain Spotted Fever and Other Spotted Fever Group Rickettsioses, Ehrlichioses, and Anaplasmosis - United States. *MMWR*. 2016;65:1-44

E. Wisconsin Tickborne Rickettsial Disease Case Report form: https://www.dhs.wisconsin.gov/forms/f0/f00336.pdf