



## Communicable Disease Case Reporting and Investigation Protocol

### **RICKETTSIOSIS**

(Other than spotted fever rickettsioses)

#### I. IDENTIFICATION AND DEFINITION OF CASES

A. **Clinical Description:** *Rickettsia* bacteria species are classically divided into the spotted fever group and typhus fever group. The most common typhus fever group diseases and their pathogenic species are murine typhus (*R. typhi*, *R. felis*), scrub typhus (*Orientia tsutsugamushi*; formerly *R. tsutsugamushi*), and epidemic typhus (*R. prowazekii*).

- **Murine (flea-borne or endemic) typhus** is spread by infected fleas and mainly occurs in tropical and subtropical climates around the world where rats and their fleas live. Cat fleas found on domestic cats and opossums have been associated with cases of murine typhus in the U.S. (mostly in California, Hawaii, and Texas). Symptoms of murine typhus begin six to 14 days after contact with an infected flea and typically include fever, chills, headache, and body aches. Nausea, vomiting, stomach pain, cough, and rash can also occur. Clinical laboratory findings may include anemia, thrombocytopenia, leukopenia, hyponatremia, or elevated liver enzymes.
- **Scrub typhus** is transmitted by larval mites (commonly known as chiggers) with most cases occurring in rural areas of Southeast Asia, Indonesia, China, Japan, India, and northern Australia. Symptoms of scrub typhus usually begin within 10 days of being bitten and may include fever, chills, headache, body aches, muscle pain, eschar at the site of the chigger bite, mental changes (ranging from confusion to coma), enlarged lymph nodes, or rash.
- **Epidemic (louse-borne) typhus** is spread to people through contact with infected body lice. Though epidemic typhus was responsible for millions of deaths in previous centuries, it is now considered a rare disease. Occasionally, cases continue to occur in areas where extreme overcrowding is common and body lice can travel from one person to another. In the U.S., rare cases of epidemic typhus, called sylvatic typhus, can occur. These cases occur when people are exposed to flying squirrels and their nests. Symptoms of epidemic typhus begin within two weeks after contact with infected body lice and include fever, chills, headache, rapid breathing, body and muscle aches, rash, cough, vomiting, and confusion.

#### B. Laboratory Criteria:

- **Confirmatory laboratory evidence includes at least one of the following:**
  1. A fourfold change in IgG antibody titer to *R. typhi*, *O. tsutsugamushi*, or *R. prowazekii* antigens by indirect fluorescent antibody (IFA) assay between two paired serum samples (one collected the first week of illness and the second collected two to four weeks later).
  2. Detection of *R. typhi*, *O. tsutsugamushi*, or *R. prowazekii* DNA in infected whole blood or skin biopsy by PCR assay.
  3. Demonstration of *R. typhi*, *O. tsutsugamushi*, or *R. prowazekii* antigens in formalin-fixed skin biopsy tissues by immunohistochemical staining (IHC).
  4. Isolation of *R. typhi*, *O. tsutsugamushi*, or *R. prowazekii* from a clinical specimen in cell culture.
- **Supportive laboratory evidence:** Serologic evidence of elevated IgG (with or without IgM) antibody reactive with *R. typhi*, *O. tsutsugamushi*, or *R. prowazekii* by IFA, enzyme-linked immunosorbent assay (ELISA), dot-ELISA, or latex agglutination test.

**Note:** ELISA tests are not quantitative and cannot 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 high likelihood of false positive results due to possible persistence of antibody levels for months or years. Cross-reactivity may be observed to antibodies to other species within the *Rickettsiaceae* family. The most common positive cutoff titer is  $\geq 1:64$ , but positive cutoffs may be different for each laboratory.

#### C. Wisconsin Surveillance Case Definition:

**Clinically compatible illness:** Any reported acute onset of fever or chills and one or more of the following: headache, myalgia, arthralgia, rash, abdominal cramps, nausea, vomiting, confusion/altered mental status, anemia, leukopenia, thrombocytopenia, or elevated liver enzymes.

- **Confirmed:** A clinically compatible illness with confirmatory laboratory evidence of infection, and an epidemiological link to vector (fleas, larval mites, lice) exposure in a rickettsial endemic region (see above).
- **Probable:** A clinically compatible illness with only supportive laboratory evidence of infection, and an epidemiological link to vector (fleas, larval mites, lice) exposure in a rickettsial endemic region (see above).
- **Suspect:** A supportive or confirmatory laboratory result in the absence of clinical information.

## II. REPORTING

- 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.
- 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](#).
- Laboratory Criteria for Reporting:** Laboratory evidence of infection by methods listed above. All positive results should be reported.

## III. CASE INVESTIGATION

- Responsibility for Case Investigation:** It is the responsibility of the local health department 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.
- Required Documentation:**
  - Complete the WEDSS disease incident investigation report including appropriate disease-specific tabs, and complete the [Wisconsin Tickborne Rickettsial Disease Case Report form](#).
  - Upon completion of investigation, set WEDSS disease incident process status to "Sent to State."

## IV. PUBLIC HEALTH INTERVENTIONS AND PREVENTION MEASURES

- 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.
- Obtain a detailed travel history for the month preceding onset of symptoms to determine site of probable exposure.
- Patient education as needed to minimize future exposure to known vectors (larval mites, fleas, body lice).

## V. CONTACTS FOR CONSULTATION

- Local health departments and tribal health agencies: <https://www.dhs.wisconsin.gov/lh-depts/index.htm>
- Bureau of Communicable Diseases, Communicable Diseases Epidemiology Section, vectorborne epidemiologists: 608-267-9003
- Wisconsin State Laboratory of Hygiene: 1-800-862-1013

## VI. RELATED REFERENCES

- Heymann DL, ed. Typhus. In: *Control of Communicable Diseases Manual*. 20th ed. Washington, DC: American Public Health Association, 2015: 661-668.

- B. Kimberlin DW, ed. Endemic Typhus (Murine Typhus) and Epidemic Typhus (Louseborne or Sylvatic Typhus). In: *Red Book: 2018-2021 Report of the Committee on Infectious Diseases*. 31<sup>st</sup> ed. Itasca, IL: American Academy of Pediatrics, 2018: 864-867.
- C. Centers for Disease Control and Prevention website: <https://www.cdc.gov/typhus/index.html>
- D. Wisconsin Tickborne Rickettsial Disease Case Report form: <https://www.dhs.wisconsin.gov/forms/f0/f00336.pdf>