

BABESIOSIS

Last revised March 25, 2011

I. IDENTIFICATION

- A. **CLINICAL DESCRIPTION:** Babesiosis is a parasitic disease caused by intraerythrocytic protozoa of the genus *Babesia* (*B. microti* most commonly in the USA). *Babesia* are transmitted in nature through the bites of infected ticks but can also be acquired through contaminated blood components from asymptomatic parasitemic donors or, more rarely, transplacentally. *Babesia* infection can range from subclinical to life-threatening. Clinical manifestations, if any, can include hemolytic anemia and nonspecific influenza-like signs and symptoms. Splenomegaly, hepatomegaly, or jaundice may be evident. In addition to signs of hemolytic anemia, laboratory findings may include thrombocytopenia, proteinuria, hemoglobinuria, and elevated levels of liver enzymes, blood urea nitrogen, and creatinine. Risk factors for severe babesiosis include asplenia, advanced age, and other causes of impaired immune function (e.g., HIV, malignancy, corticosteroid therapy). Severe cases can be associated with marked thrombocytopenia, disseminated intravascular coagulation, hemodynamic instability, acute respiratory distress, myocardial infarction, renal failure, hepatic compromise, altered mental status, and death.
- B. **REPORTING CRITERIA:** Clinical diagnosis with confirmatory or supportive laboratory findings.
- C. **LABORATORY CRITERIA FOR CONFIRMATION:**
1. Laboratory confirmatory:
 - Identification of intraerythrocytic *Babesia* organisms by light microscopy in a Giemsa, Wright, or Wright-Giemsa–stained blood smear; **or**
 - Detection of *Babesia microti* DNA in a whole blood specimen by polymerase chain reaction (PCR); **or**
 - Detection of *Babesia* spp. genomic sequences in a whole blood specimen by nucleic acid amplification; **or**
 - Isolation of *Babesia* organisms from a whole blood specimen by animal inoculation.
 2. Laboratory supportive:
 - Demonstration of a *Babesia microti* Indirect Fluorescent Antibody (IFA) total immunoglobulin (Ig) or IgG antibody titer of greater than or equal to (\geq) 1:256 (or \geq 1:64 in epidemiologically linked blood donors or recipients); **or**
 - Demonstration of a *Babesia microti* Immunoblot IgG positive result; **or**
 - Demonstration of a *Babesia divergens* IFA total Ig or IgG antibody titer of greater than or equal to (\geq) 1:256; **or**
 - Demonstration of a *Babesia duncani* IFA total Ig or IgG antibody titer of greater than or equal to (\geq) 1:512.
- D. **CLINICAL CRITERIA**
- Objective: one or more of the following: fever, anemia, or thrombocytopenia.
 - Subjective: one or more of the following: chills, sweats, headache, myalgia, or arthralgia.

E. WISCONSIN CASE DEFINITION:

1. Confirmed:

A case that has confirmatory laboratory results and meets at least one of the objective or subjective clinical criteria, regardless of the mode of transmission (can include clinically manifest cases in transfusion recipients or blood donors).

2. Probable:

- a case that has supportive laboratory results and meets at least one of the objective clinical evidence criteria (subjective criteria alone are not sufficient); **or**
- a case that is in a blood donor or recipient epidemiologically linked to a confirmed or probable babesiosis case (as defined above) **and**:
 - has confirmatory laboratory evidence but does not meet any objective or subjective clinical evidence criteria; **or**
 - has supportive laboratory evidence and may or may not meet any subjective clinical evidence criteria but does not meet any objective clinical evidence criteria.

F. COMMENT

A positive *Babesia* IFA results for immunoglobulin M (IgM) is insufficient for diagnosis and case classification of babesiosis in the absence of a positive IFA result for IgG (or total Ig). If the IgM result is positive but the IgG result is negative, a follow-up blood specimen drawn at least one week after the first should be tested. If the IgG result remains negative in the second specimen, the IgM result likely was a false positive.

Babesia microti is the most frequently identified agent of human babesiosis in the United States; most reported tick-borne cases have been acquired in parts of northeastern and north-central regions. Sporadic U.S. cases caused by other *Babesia* agents include *B. duncani* (formerly the WA1 parasite) and related organisms (CA1-type parasites) in several western states as well as parasites characterized as "*B. divergens* like" (MO1 and others) in various states. Serologic and molecular tests available for *B. microti* infection do not typically detect these other *Babesia* agents.

II. ACTIONS REQUIRED / PREVENTION MEASURES

A. WISCONSIN DISEASE SURVEILLANCE CATEGORY II:

Report to the patient's local health department either electronically through the Wisconsin Electronic Disease Surveillance System (WEDSS), by mail or fax using an Acute and Communicable Disease Case Report ([F-44151](#)), or by other means within 72 hours upon recognition of a case or suspected case.

B. EPIDEMIOLOGY REPORTS REQUIRED:

- *Electronically* – Report through WEDSS, including appropriate disease-specific tabs
or
- *Paper Copy* – Acute and Communicable Diseases Case Report ([F-44151](#)) **along with** the Babesiosis Case Report Form.

C. PUBLIC HEALTH INTERVENTIONS:

In accordance with Wisconsin Administrative rule DHS 145.05, local public health should follow the methods of control recommended in the current edition of *Control of Communicable*

Wisconsin Division of Public Health Communicable Disease Surveillance Guideline

Diseases Manual, edited by David L. Heymann, published by the American Public Health Association.

Briefly, patient education as needed to minimize future risk of exposure to infected ticks. Because *Babesia* sp. can be acquired by blood transfusion, ascertain whether patient recently received or donated blood or blood products. **If there is a history of recent blood donations, contact DPH immediately**; further investigation must be done promptly.

III. CONTACTS FOR CONSULTATION

A. LOCAL HEALTH DEPARTMENT – REGIONAL OFFICES – TRIBAL AGENCIES:

<http://www.dhs.wisconsin.gov/localhealth/index.htm>

B. BCDER / COMMUNICABLE DISEASE EPIDEMIOLOGY SECTION: (608) 267-9003

C. WISCONSIN STATE LABORATORY OF HYGIENE / Viral and Rickettsial Serology, 608/262-0248

IV. RELATED REFERENCES

- Heymann DL, ed. Babesiosis. In: *Control of Communicable Diseases Manual*. 19th ed. Washington, DC: American Public Health Association, 2008: 69-72
- Pickering LK, ed. Babesiosis. In: *Red Book: 2009 Report of the Committee on Infectious Diseases*. 28th ed. Elk Grove Village, IL: American Academy of Pediatrics, 2009:226-227