

California Department of Public Health  
 Center for Infectious Diseases  
 Division of Communicable Disease Control  
 Infectious Diseases Branch  
 Surveillance and Statistics Section  
 MS 7306, P.O. Box 997377  
 Sacramento, CA 95899-7377

Local ID Number \_\_\_\_\_

(Please use the same ID Number on the preliminary and final reports to allow linkage to the same case.)

Report Status (check one)

Preliminary  Final

## BABESIOSIS CASE REPORT

Please complete this form only for laboratory confirmed cases of babesiosis that meet at least one of the case definition clinical conditions. For case definition, see pages 5 and 6.

**Completion of this form is not required** but encouraged to improve surveillance and understanding of this disease. Jurisdictions not participating in CalREDIE should **securely** email the completed form to IDB-SSS@cdph.ca.gov; otherwise, mail the completed form to IDB-SSS at the address above. Jurisdictions participating in CalREDIE should create a CalREDIE incident and enter the information directly into the CalREDIE system.

PATIENT INFORMATION					
Last Name	First Name	Middle Name	Suffix	Primary Language	
Social Security Number (9 digits)		DOB (mm/dd/yyyy)	Age	<input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other: _____	
Address Number & Street - Residence		Apartment/Unit Number			
City/Town		State	Zip Code		
Census Tract	County of Residence		Country of Residence		
Country of Birth		If not U.S. Born - Date of Arrival in U.S. (mm/dd/yyyy)			
Home Telephone		Cellular Phone/Pager		Work/School Telephone	
E-mail Address		Other Electronic Contact Information			
Work/School Location		Work/School Contact			
Gender <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other: _____					
Pregnant? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk		If Yes, Est. Delivery Date (mm/dd/yyyy)			
Medical Record Number		Patient's Parent/Guardian Name			
Occupation Setting (see list on page 7)		Other Describe/Specify			
Occupation (see list on page 7)		Other Describe/Specify			
*Comment: self-identity or self-reporting The response to this item should be based on the patient's self-identity or self-reporting. Therefore, patients should be offered the option of selecting more than one racial designation.					
CLINICAL INFORMATION					
Physician Name - Last Name			First Name		Telephone Number

First three letters of patient's last name: 

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**SIGNS AND SYMPTOMS**

Symptomatic? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	Onset Date (mm/dd/yyyy)	Is the patient asplenic? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	If patient had splenectomy, date of surgery (mm/dd/yyyy)				
Signs / Symptoms	Yes	No	Unk	Signs / Symptoms	Yes	No	Unk
Fever				Sweats			
Anemia				Myalgia			
Thrombocytopenia				Arthralgia			
Headache				Other sign/symptom (specify)			
Chills				Other sign/symptom (specify)			

Specify any complications in the clinical course of infection (check all that apply)

Acute respiratory distress     
  Congestive heart failure     
  Renal failure     
  None  
 Disseminated intravascular coagulation (DIC)     
  Myocardial infarction     
  Other: \_\_\_\_\_

**HOSPITALIZATION**

Did patient visit emergency room for illness? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	Was patient hospitalized? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	If Yes, how many total hospital nights?
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If there were any ER or hospital stays related to this illness, specify details below.

**HOSPITALIZATION - DETAILS**

Hospital Name 1	Street Address			Admit Date (mm/dd/yyyy)			
	City			Discharge / Transfer Date (mm/dd/yyyy)			
	State	Zip Code	Telephone Number	Medical Record Number		Discharge Diagnosis	
Hospital Name 2	Street Address			Admit Date (mm/dd/yyyy)			
	City			Discharge / Transfer Date (mm/dd/yyyy)			
	State	Zip Code	Telephone Number	Medical Record Number		Discharge Diagnosis	

**TREATMENT / MANAGEMENT**

Received antimicrobial treatment? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	If Yes, which drugs? (check all that apply) <input type="checkbox"/> Clindamycin <input type="checkbox"/> Quinine <input type="checkbox"/> Atovaquone <input type="checkbox"/> Azithromycin <input type="checkbox"/> Other: _____
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**OUTCOME**

Outcome? <input type="checkbox"/> Survived <input type="checkbox"/> Died <input type="checkbox"/> Unk	If Survived, Survived as of _____ (mm/dd/yyyy)		
	If Died, Date of Death (mm/dd/yyyy)	Was the death related to the infection? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	

First three letters of patient's last name: 

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**LABORATORY INFORMATION**

**LABORATORY RESULTS SUMMARY - SEROLOGY**

IFA - total antibody (Ig)	<i>Result</i> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Indeterminate <input type="checkbox"/> Unknown <input type="checkbox"/> Pending			<i>If Positive, Babesia Species</i>	<i>Titer</i>
	<i>Collection Date (mm/dd/yyyy)</i>	<i>Laboratory Name</i>		<i>Telephone Number</i>	
IFA - IgG	<i>Result</i> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Indeterminate <input type="checkbox"/> Unknown <input type="checkbox"/> Pending			<i>If Positive, Babesia Species</i>	<i>Titer</i>
	<i>Collection Date (mm/dd/yyyy)</i>	<i>Laboratory Name</i>		<i>Telephone Number</i>	
IFA - IgM	<i>Result</i> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Indeterminate <input type="checkbox"/> Unknown <input type="checkbox"/> Pending			<i>If Positive, Babesia Species</i>	<i>Titer</i>
	<i>Collection Date (mm/dd/yyyy)</i>	<i>Laboratory Name</i>		<i>Telephone Number</i>	
Immunoblot	<i>Result</i> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Indeterminate <input type="checkbox"/> Unknown <input type="checkbox"/> Pending			<i>If Positive, Babesia Species</i>	
	<i>Collection Date (mm/dd/yyyy)</i>	<i>Laboratory Name</i>		<i>Telephone Number</i>	
Blood smear	<i>Result</i> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Indeterminate <input type="checkbox"/> Unknown <input type="checkbox"/> Pending			<i>Description</i>	
	<i>Collection Date (mm/dd/yyyy)</i>	<i>Laboratory Name</i>		<i>Telephone Number</i>	
PCR	<i>Result</i> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Indeterminate <input type="checkbox"/> Unknown <input type="checkbox"/> Pending			<i>If Positive, Babesia Species</i>	
	<i>Collection Date (mm/dd/yyyy)</i>	<i>Specimen Type</i>	<i>Laboratory Name</i>	<i>Telephone Number</i>	
Other test (specify): _____	<i>Result</i> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Indeterminate <input type="checkbox"/> Unknown <input type="checkbox"/> Pending			<i>If Positive, Babesia Species</i>	
	<i>Collection Date (mm/dd/yyyy)</i>	<i>Specimen Type</i>	<i>Laboratory Name</i>	<i>Telephone Number</i>	
Other test (specify): _____	<i>Result</i> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Indeterminate <input type="checkbox"/> Unknown <input type="checkbox"/> Pending			<i>If Positive, Babesia Species</i>	
	<i>Collection Date (mm/dd/yyyy)</i>	<i>Specimen Type</i>	<i>Laboratory Name</i>	<i>Telephone Number</i>	

**EPIDEMIOLOGIC INFORMATION**

**INCUBATION PERIOD: 8 WEEKS PRIOR TO ILLNESS ONSET**

**EXPOSURES / RISK FACTORS - TRANSFUSION**

Was patient's infusion transfusion associated? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	If Yes, describe
Was patient a blood donor identified during a transfusion investigation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	If Yes, describe

First three letters of patient's last name:

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**EPIDEMIOLOGIC INFORMATION (continued)**

**EXPOSURES / RISK FACTORS - OUTDOOR EXPOSURES**

*IN THE 8 WEEKS BEFORE SYMPTOM ONSET OR DIAGNOSIS (USE EARLIER DATE), DID THE PATIENT:*

Exposure	Yes	No	Unk	If Yes, Specify as Noted
Engage in outdoor activities				<i>Type of Activity (check all that apply)</i> <input type="checkbox"/> Camping <input type="checkbox"/> Hiking <input type="checkbox"/> Hunting <input type="checkbox"/> Yard work <input type="checkbox"/> Other: _____
Spend time outdoors in or near wooded or brushy areas				<i>Describe</i>
Notice any tick bites				<i>Date Noticed</i> <i>Approximate Duration of Attachment</i>
				<i>Where Obtained (geographic location)</i>

**TRAVEL HISTORY**

<i>Did patient travel outside of county of residence during the incubation period?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	<i>Has the patient traveled outside the U.S. during the incubation period?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk
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*If Yes for either of these questions, specify all locations and dates below.*

**TRAVEL HISTORY - DETAILS**

Location (city, county, state, country)	Date Travel Started (mm/dd/yyyy)	Date Travel Ended (mm/dd/yyyy)

**NOTES / REMARKS**

<p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p>
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**REPORTING AGENCY**

<i>Investigator Name</i>	<i>Local Health Jurisdiction</i>	<i>Telephone Number</i>	<i>Date (mm/dd/yyyy)</i>
<i>First Reported By</i> <input type="checkbox"/> Clinician <input type="checkbox"/> Laboratory <input type="checkbox"/> Other (specify): _____			

**DISEASE CASE CLASSIFICATION**

<i>Case Classification (see case definition on page 5)</i> <input type="checkbox"/> Confirmed <input type="checkbox"/> Probable <input type="checkbox"/> Suspected
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First three letters of  
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<b>OUTBREAK</b>	
<i>Part of known outbreak?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	<i>If Yes, extent of outbreak:</i> <input type="checkbox"/> One CA jurisdiction <input type="checkbox"/> Multiple CA jurisdictions <input type="checkbox"/> Multistate <input type="checkbox"/> International <input type="checkbox"/> Unk <input type="checkbox"/> Other (specify): _____
<b>STATE USE ONLY</b>	
<i>Case Classification</i> <input type="checkbox"/> Confirmed <input type="checkbox"/> Probable <input type="checkbox"/> Suspected <input type="checkbox"/> Not a case <input type="checkbox"/> Need additional information	
<b>CASE DEFINITION</b>	
<b><u>BABESIOSIS (2011)</u></b>	
<b>CLINICAL DESCRIPTION</b>	
<p>Babesiosis is a parasitic disease caused by intraerythrocytic protozoa of the <i>Babesia</i> genus (<i>Babesia microti</i> and other species). <i>Babesia</i> 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. <i>Babesia</i> infection can range from subclinical to life-threatening. Clinical manifestations, if any, can include hemolytic anemia and nonspecific influenza-like signs and symptoms (e.g., fever, chills, sweats, headache, myalgia, arthralgia, malaise, fatigue, generalized weakness). 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). Some immunosuppressive therapies or conditions may mask or modulate the clinical manifestations (e.g., the patient may be afebrile). 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.</p>	
<b>CLINICAL CRITERIA</b>	
For the purposes of surveillance:	
<ul style="list-style-type: none"> <li>• Objective: one or more of the following: fever, anemia, or thrombocytopenia.</li> <li>• Subjective: one or more of the following: chills, sweats, headache, myalgia, or arthralgia.</li> </ul>	
<b>LABORATORY CRITERIA FOR DIAGNOSIS</b>	
For the purposes of surveillance:	
Laboratory confirmatory:	
<ul style="list-style-type: none"> <li>• Identification of intraerythrocytic <i>Babesia</i> organisms by light microscopy in a Giemsa, Wright, or Wright-Giemsa–stained blood smear; OR</li> <li>• Detection of <i>Babesia microti</i> DNA in a whole blood specimen by polymerase chain reaction (PCR); OR</li> <li>• Detection of <i>Babesia</i> spp. genomic sequences in a whole blood specimen by nucleic acid amplification; OR</li> <li>• Isolation of <i>Babesia</i> organisms from a whole blood specimen by animal inoculation.</li> </ul>	
Laboratory supportive:	
<ul style="list-style-type: none"> <li>• Demonstration of a <i>Babesia microti</i> Indirect Fluorescent Antibody (IFA) total immunoglobulin (Ig) or IgG antibody titer of greater than or equal to (<math>\geq</math>) 1:256 (or <math>\geq</math>1:64 in epidemiologically linked blood donors or recipients); OR</li> <li>• Demonstration of a <i>Babesia microti</i> Immunoblot IgG positive result; OR</li> <li>• Demonstration of a <i>Babesia divergens</i> IFA total Ig or IgG antibody titer of greater than or equal to (<math>\geq</math>) 1:256; OR</li> <li>• Demonstration of a <i>Babesia duncani</i> IFA total Ig or IgG antibody titer of greater than or equal to (<math>\geq</math>) 1:512.</li> </ul>	

(continued on page 6)

First three letters of  
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**CASE DEFINITION (continued)****EPIDEMIOLOGIC LINKAGE**

Epidemiologic evidence for transfusion transmission.

For the purposes of surveillance, epidemiologic linkage between a transfusion recipient and a blood donor is demonstrated if all of the following criteria are met:

- In the transfusion recipient:
  - Received one or more red blood cell (RBC) or platelet transfusions within one year before the collection date of a specimen with laboratory evidence of *Babesia* infection; AND
  - At least one of these transfused blood components was donated by the donor described below; AND
  - Transfusion-associated infection is considered at least as plausible as tickborne transmission; AND
- In the blood donor:
  - Donated at least one of the RBC or platelet components that was transfused into the above recipient; AND
  - The plausibility that this blood component was the source of infection in the recipient is considered equal to or greater than that of blood from other involved donors. (More than one plausible donor may be linked to the same recipient.)

**CASE CLASSIFICATION****Confirmed:**

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

**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.

**Suspected:**

A case that has confirmatory or supportive laboratory results, but insufficient clinical or epidemiologic information is available for case classification (e.g., only a laboratory report was provided).

**COMMENT**

The validity of the diagnosis of babesiosis is highly dependent on the laboratory that performs the testing. For example, differentiation between Plasmodium and *Babesia* organisms on peripheral blood smears can be difficult. Confirmation of the diagnosis of babesiosis by a reference laboratory is strongly encouraged, especially for patients without residence in or travel to areas known to be endemic for babesiosis.

A positive *Babesia* IFA result 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.

When interpreting IFA IgG or total Ig results, it is helpful to consider factors that may influence the relative magnitude of *Babesia* titers (e.g., timing of specimen collection relative to exposure or illness onset, the patient's immune status, the presence of clinically manifest versus asymptomatic infection). In immunocompetent persons, active or recent *Babesia* infections that are symptomatic are generally associated with relatively high titers (although antibody levels may be below the detection threshold early in the course of infection); titers can then persist at lower levels for more than a year. In persons who are immunosuppressed or who have asymptomatic *Babesia* infections, active infections can be associated with lower titers.

*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.

Blood-borne transmission of *Babesia* is not restricted by geographic region or season. The epidemiologic linkage criteria for transfusion transmission that are described here provide a low threshold for asymptomatic donor or recipient cases to be considered probable cases for surveillance purposes and are not intended to be regulatory criteria. Transfusion investigations entail laboratory testing for evidence of *Babesia* infection in recipients and donors as well as epidemiologic assessments of the plausibilities of blood- and tick-borne transmission.

<b>RACE DESCRIPTIONS</b>	
<b>Race</b>	<b>Description</b>
American Indian or Alaska Native	Patient has origins in <b>any</b> of the original peoples of North and South America (including Central America).
Asian	Patient has origins in <b>any</b> of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent (e.g., including Bangladesh, Cambodia, China, India, Indonesia, Japan, Korea, Malaysia, Nepal, Pakistan, the Philippine Islands, Thailand, and Vietnam).
Black or African American	Patient has origins in <b>any</b> of the black racial groups of Africa.
Native Hawaiian or Other Pacific Islander	Patient has origins in <b>any</b> of the original peoples of Hawaii, Guam, American Samoa, or other Pacific Islands.
White	Patient has origins in <b>any</b> of the original peoples of Europe, the Middle East, or North Africa.
<b>OCCUPATION SETTING</b>	
<ul style="list-style-type: none"> <li>• Childcare/Preschool</li> <li>• Correctional Facility</li> <li>• Drug Treatment Center</li> <li>• Food Service</li> <li>• Health Care - Acute Care Facility</li> <li>• Health Care - Long Term Care Facility</li> <li>• Health Care - Other</li> </ul>	<ul style="list-style-type: none"> <li>• Homeless Shelter</li> <li>• Laboratory</li> <li>• Military Facility</li> <li>• Other Residential Facility</li> <li>• Place of Worship</li> <li>• School</li> <li>• Other</li> </ul>
<b>OCCUPATION</b>	
<ul style="list-style-type: none"> <li>• Adult film actor/actress</li> <li>• Agriculture - farmworker or laborer (crop, nursery, or greenhouse)</li> <li>• Agriculture - field worker</li> <li>• Agriculture - migratory/seasonal worker</li> <li>• Agriculture - other/unknown</li> <li>• Animal - animal control worker</li> <li>• Animal - farm worker or laborer (farm or ranch animals)</li> <li>• Animal - veterinarian or other animal health practitioner</li> <li>• Animal - other/unknown</li> <li>• Clerical, office, or sales worker</li> <li>• Correctional facility - employee</li> <li>• Correctional facility - inmate</li> <li>• Craftsman, foreman, or operative</li> <li>• Daycare or child care attendee</li> <li>• Daycare or child care worker</li> <li>• Dentist or other dental health worker</li> <li>• Drug dealer</li> <li>• Fire fighting or prevention worker</li> <li>• Flight attendant</li> <li>• Food service - cook or food preparation worker</li> <li>• Food service - host or hostess</li> <li>• Food service - server</li> <li>• Food service - other/unknown</li> <li>• Homemaker</li> <li>• Laboratory technologist or technician</li> <li>• Laborer - private household or unskilled worker</li> <li>• Manager, official, or proprietor</li> <li>• Manicurist or pedicurist</li> <li>• Medical - emergency medical technician or paramedic</li> <li>• Medical - health care worker</li> </ul>	<ul style="list-style-type: none"> <li>• Medical - medical assistant</li> <li>• Medical - pharmacist</li> <li>• Medical - physician assistant or nurse practitioner</li> <li>• Medical - physician or surgeon</li> <li>• Medical - nurse</li> <li>• Medical - other/unknown</li> <li>• Military</li> <li>• Police officer</li> <li>• Professional, technical, or related profession</li> <li>• Retired</li> <li>• Sex worker</li> <li>• Stay at home parent/guardian</li> <li>• Student - preschool or kindergarten</li> <li>• Student - elementary or middle school</li> <li>• Student - high school</li> <li>• Student - college or university</li> <li>• Student - other/unknown</li> <li>• Teacher/employee - preschool or kindergarten</li> <li>• Teacher/employee - elementary or middle school</li> <li>• Teacher/employee - high school</li> <li>• Teacher/instructor/employee - college or university</li> <li>• Teacher/instructor/employee - other/unknown</li> <li>• Unemployed - seeking employment</li> <li>• Unemployed - not seeking employment</li> <li>• Unemployed - other/unknown</li> <li>• Volunteer</li> <li>• Other</li> <li>• Refused</li> <li>• Unknown</li> </ul>