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2025 Case Definition  
NOTE:  
A surveillance case definition is a set of uniform criteria used to define a disease for public health surveillance. Surveillance case definitions enable public health officials to classify and count cases consistently across reporting jurisdictions. Surveillance case definitions are not intended to be used by healthcare providers for making a clinical diagnosis or determining how to meet an individual patient’s health needs.  
CSTE Position Statement(s)  
24-ID-02  
Background  
In the U.S., most cases of babesiosis are caused by  
Babesia microti  
, transmitted through the bite of the  
Ixodes scapularis  
(blacklegged) tick. In the northeastern and upper midwestern U.S.,  
B. microti  
circulates between ticks and animal reservoir hosts,  
3  
a cycle shared by the etiologic agents of Lyme disease (  
Borrelia burgdorferi  
) and anaplasmosis (  
Anaplasma phagocytophilum  
). Very rarely, U.S. cases caused by other  
Babesia  
species have been described, such as  
B. duncani  
(transmitted by  
Dermacentor albipictus  
) and  
B. divergens  
(possibly transmitted by  
I. dentatus  
).  
4-7  
Babesiosis typically presents with nonspecific symptoms (e.g., fever, chills, sweats, headache, myalgia, malaise, and fatigue) within one month of a tick bite. Additionally, laboratory anomalies such as hemolytic anemia, thrombocytopenia, and elevated levels of liver enzymes are often noted.  
1, 8  
Cases of babesiosis increased significantly between 2011 and 2019, with some northeastern states experiencing several fold increases in incidence rates.  
9  
The disease is increasingly identified in non-endemic areas as tick populations expand, following a similar pattern to Lyme disease  
7, 8  
although at a slower pace for babesiosis.  
10  
This pattern of disease emergence following vector expansion is well described  
11, 12  
and would seem to predict continued expansion in the future.  
13, 14  
Babesiosis cases are also likely underreported, as non-specific symptoms and a relatively high proportion of asymptomatic infections can make diagnosis difficult.  
7  
Due in part to the ability of people to maintain low levels of parasitemia while asymptomatic, transfusion-transmitted babesiosis has been the most frequently reported parasitic disease associated with transfusions in the U.S.  
15, 16  
In 2019, FDA issued guidance  
17  
directing blood donor screening for  
Babesia  
spp. where vectorborne transmission was known to occur (14 states and the District of Columbia). Blood collection agencies in those jurisdictions-initiated screening in 2020 using the FDA-approved nucleic acid test that detects multiple  
Babesia  
spp. (  
B. microti  
,  
B. duncani  
,  
B. divergens  
, and  
B. venatorum  
). Although the number of reported transfusion-associated cases of babesiosis decreased after the implementation of donor screening,  
2, 18  
transfusion-associated babesiosis is not restricted to regions where tickborne babesiosis is endemic. Because of donor travel and the importation of blood products, blood-borne transmission in the U.S. has been reported outside of  
Babesia  
-endemic regions,  
19  
underscoring the importance of having thorough and complete nationwide surveillance to monitor trends.  
Clinical Criteria  
Objective  
: fever as reported by patient or healthcare provider, anemia, or thrombocytopenia  
Subjective  
: chills, sweats, headache, myalgia, or arthalgia  
Laboratory Criteria  
Confirmatory Laboratory Evidence:  
Identification of intraerythrocytic  
Babesia  
organisms by light microscopy in a Giemsa, Wright, or Wright-Giemsa-stained blood smear;  
OR  
Detection of  
Babesia  
spp. DNA in a whole blood specimen through nucleic acid testing such as polymerase chain reaction (PCR) assay, nucleic acid amplification test (NAAT), or genomic sequencing that amplifies a specific target, in a sample taken within 60 days of illness onset;  
OR  
Serological evidence of a four-fold change  
^  
in IgG-specific antibody titer to  
B. microti  
antigen by indirect immunofluorescence assay (IFA) in paired serum samples (one taken within two weeks of illness onset and a second taken two to ten weeks after acute specimen collection).  
^^  
Presumptive Laboratory Evidence:  
Serologic evidence\*\* of an elevated IgG\*\*\* or total antibody reactive to  
B. microti  
antigen by IFA at a titer ≥1:256 in a sample taken within 60 days of illness onset.  
Supportive Laboratory Evidence:  
Serologic evidence\*\* of an elevated IgG\*\*\* or total antibody reactive to  
B. divergens  
antigen by IFA at a titer ≥1:256;  
OR  
Serologic evidence\*\* of an elevated IgG\*\*\* or total antibody reactive to  
B. duncani  
antigen by IFA at a titer ≥1:512.  
^  
A four-fold change in titer is equivalent to a change of two dilutions (e.g., 1:64 to 1:256).  
^^  
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.  
\* Note: The categorical labels used here to stratify laboratory evidence are intended to support the standardization of case classifications for public health surveillance. The categorical labels should not be used to interpret the utility or validity of any laboratory test methodology.  
\*\* Antibodies can be indicative of active or previously resolved infections, so it is recommended that laboratory results be evaluated in conjunction with information on symptoms and exposure whenever possible. If symptom information is available, specimens meeting supportive laboratory criteria should be collected within 60 days of illness onset.  
\*\*\* While a single IgG serologic test is adequate for surveillance purposes, molecular testing or blood smear are recommended for clinical  
diagnosis, especially in cases where species other than B. microti are suspected.  
Criteria to Distinguish a New Case from an Existing Case  
A new case is one that has not been previously enumerated within the same calendar year (January through December).  
‡  
‡  
Using calendar year allows case counting which more closely correspond with the seasonality of babesiosis than using a number of months between case reports.  
Case Classification  
Suspect  
Meets supportive laboratory evidence.  
Probable  
Meets presumptive laboratory evidence  
AND  
meets at least one of the objective clinical criteria.  
Confirmed  
Meets confirmatory laboratory evidence criteria  
AND  
at least one of the objective or subjective clinical criteria.  
References  
Waked, R., & Krause, P. J. (2022). Human Babesiosis.  
Infectious Diseases Clinics of North America, 36  
(3), 655-670.  
https://doi.org/10.1016/j.idc.2022.02.009  
Tonnetti, L., Dodd, R. Y., Foster, G., & Stramer, S. L. (2022). Babesia blood testing: The first-year experience.  
Transfusion, 62  
(1), 135-142.  
https://doi.org/10.1111/trf.16718  
Foster, E., Maes, S. A., Holcomb, K. M., & Eisen, R. J. (2023). Prevalence of five human pathogens in host-seeking  
Ixodes scapularis  
and  
Ixodes pacificus  
by region, state, and county in the contiguous United States generated through national tick surveillance.  
Ticks and Tick-Borne Diseases, 14  
(6), Article 102250.  
https://doi.org/10.1016/j.ttbdis.2023.102250  
Hunfeld, K. P., Hildebrandt, A., & Gray, J. S. (2008). Babesiosis: Recent insights into an ancient disease.  
International Journal for Parasitology, 38  
(11), 1219-1237.  
https://doi.org/10.1016/j.ijpara.2008.03.001  
Herwaldt, B. L., de Bruyn, G., Pieniazek, N. J., Homer, M., Lofy, K. H., Slemenda, S. B., Fritsche, T. R., Persing, D. H., & Limaye, A. P. (2004). Babesia divergens-like infection, Washington State.  
Emerging Infectious Diseases, 10  
(4), 622-629.  
https://doi.org/10.3201/eid1004.030377  
Ord, R. L., & Lobo, C. A. (2015). Human Babesiosis: Pathogens, prevalence, diagnosis and treatment.  
Current Clinical Microbiology Reports, 2  
(4), 173-181.  
https://doi.org/10.1007/s40588-015-0025-z  
Vannier, E. G., Diuk-Wasser, M. A., Ben Mamoun, C., & Krause, P. J. (2015). Babesiosis.  
Infectious Diseases Clinics of North America, 29  
(2), 357-370.  
https://doi.org/10.1016/j.idc.2015.02.008  
Krause, P. J. (2019). Human babesiosis.  
International Journal for Parasitology, 49  
(2), 165-174.  
https://doi.org/10.1016/j.ijpara.2018.11.007  
Swanson, M., Pickrel, A., Williamson, J., & Montgomery, S. (2023). Trends in reported babesiosis cases - United States, 2011-2019.  
MMWR Morbidity and Mortality Weekly Report, 72  
(11), 273-277.  
https://doi.org/10.15585/mmwr.mm7211a1  
Dunn, J. M., Krause, P. J., Davis, S., Vannier, E. G., Fitzpatrick, M. C., Rollend, L., Belperron, A. A., States, S. L., Stacey, A., Bockenstedt, L. K., Fish, D., & Diuk-Wasser, M. A. (2014).  
Borrelia burgdorferi  
promotes the establishment of  
Babesia microti  
in the northeastern United States.  
PLoS ONE, 9  
(12), Article e115494.  
https://doi.org/10.1371/journal.pone.0115494  
Eisen, L., & Eisen, R. J. (2023). Changes in the geographic distribution of the blacklegged tick,  
Ixodes scapularis  
, in the United States.  
Ticks and Tick-Borne Diseases, 14  
(6), Article 102233.  
https://doi.org/10.1016/j.ttbdis.2023.102233  
Ogden, N. H., Ben Beard, C., Ginsberg, H. S., & Tsao, J. I. (2021). Possible effects of climate change on Ixodid ticks and the pathogens they transmit: Predictions and observations.  
Journal of Medical Entomology, 58  
(4), 1536-1545.  
https://doi.org/10.1093/jme/tjaa220  
Gray, J. S., & Ogden, N. H. (2021). Ticks, human babesiosis and climate change.  
Pathogens, 10  
(11), Article 1430.  
https://doi.org/10.3390/pathogens10111430  
Drews, S. J., Wendel, S., Leiby, D. A., Tonnetti, L., Ushiro-Lumb, I., O'Brien, S. F., Lieshout-Krikke, R. W., Bloch, E. M., & International Society of Blood Transfusion Working Party Parasite Subgroup. (2023). Climate change and parasitic risk to the blood supply.  
Transfusion, 63  
(3), 638-645.  
https://doi.org/10.1111/trf.17234  
Bloch, E. M., Kumar, S., & Krause, P. J. (2019). Persistence of  
Babesia microti  
infection in humans.  
Pathogens, 8  
(1), 1-12.  
https://doi.org/10.3390/pathogens8010012  
Moritz, E. D., Winton, C. S., Tonnetti, L., Townsend, R. L., Berardi, V. P., & Hewins, M. E. (2016). Screening for  
Babesia microti  
in the U.S. blood supply.  
New England Journal of Medicine, 375  
, 2236-2245.  
https://doi.org/10.1056/NEJMoa1613366  
Food and Drug Administration. (2019). Recommendations for reducing the risk of transfusion-transmitted babesiosis: Guidance for industry.  
https://www.fda.gov/media/114847/download  
Tonnetti, L., Townsend, R. L., Deisting, B. M., Haynes, J. M., Dodd, R. Y., & Stramer, S. L. (2019). The impact of  
Babesia microti  
blood donation screening.  
Transfusion, 59  
, 593-600.  
https://doi.org/10.1111/trf.15156  
Drews, S. J., Kjemtrup, A. M., Krause, P. J., Lambert, G., Leiby, D. A., Lewin, A., O'Brien, S. F., Renaud, C., Tonnetti, L., & Bloch, E. M. (2023). Transfusion-transmitted  
Babesia  
spp.: A changing landscape of epidemiology, regulation, and risk mitigation.  
Journal of Clinical Microbiology, 61  
(10), Article e0126822.  
https://doi.org/10.1128/jcm.01268-22  
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