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Ehrlichiosis 2024 Case Definition | CDC  
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Ehrlichiosis  
2024 Case Definition  
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2024 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)  
23-ID-04  
Subtype(s)  
Ehrlichia chaffeensis  
Ehrlichia ewingii  
Ehrlichia muris eauclairensis  
Ehrlichia  
, other spp. or unspeciated  
Background  
Ehrlichiosis is the general name given to the diseases caused by obligate intracellular bacteria in the genus  
Ehrlichia  
within the family Anaplasmataceae.  
Ehrlichia  
species are tickborne pathogens and are the most commonly reported species transmitted by  
Amblyomma americanum,  
the lone star tick  
1  
. The majority of reported human infections are caused by either  
Ehrlichia chaffeensis  
or  
Ehrlichia ewingii  
. Most cases of ehrlichiosis occur across the south-central, southeastern, and mid-Atlantic states, although  
Ehrlichia muris eauclairensis  
, which is transmitted by  
Ixodes scapularis  
, the blacklegged tick, has been reported from travelers to, or residents of, Minnesota and Wisconsin  
2,3  
. Ehrlichiosis typically presents 5 to 14 days after a tick bite with a combination of nonspecific clinical symptoms, such as fever, fatigue, and headache. Illness is often accompanied by laboratory abnormalities including leukopenia, thrombocytopenia, and mildly elevated liver enzymes. Ehrlichiosis may result in severe illness or even death in older or immunocompromised individuals or if treatment is delayed. Serologic testing is commonly used to diagnosis ehrlichiosis, but antibodies to  
Anaplasma  
and  
Ehrlichia  
spp. can cross-react.  
Clinical Criteria  
Objective clinical evidence  
: fever as reported by patient or healthcare provider, anemia, leukopenia, thrombocytopenia, or any hepatic transaminase elevation.  
Subjective clinical evidence  
: chills/sweats, headache, myalgia, nausea/vomiting, or fatigue/malaise.  
Laboratory Criteria  
Confirmatory laboratory evidence:  
Detection of E.  
chaffeensis\*, E. ewingii\*, E. muris eauclairensis\*,  
unspeciated  
Ehrlichia  
spp., or other  
Ehrlichia  
spp. DNA in a clinical specimen via amplification of a specific target by polymerase chain reaction (PCR) assay, nucleic acid amplification tests (NAAT), or other molecular method,  
OR,  
Serological evidence of a fourfold change  
1  
in immunoglobulin G (IgG)-specific antibody titer to  
Ehrlichia  
spp. antigen by indirect immunofluorescence assay (IFA) in paired serum samples (one taken in first two weeks after illness onset and a second taken two to ten weeks after acute specimen collection)  
2  
,  
OR  
Demonstration of ehrlichial antigen in a biopsy or autopsy sample by immunohistochemical methods  
OR  
Isolation of  
E.  
chaffeensis\*, E. ewingii\*, E. muris eauclairensis\*  
, unspeciated  
Ehrlichia  
spp., or other  
Ehrlichia spp.  
from a clinical specimen in cell culture with molecular confirmation (e.g., PCR or sequence).  
Presumptive laboratory evidence:  
Serological evidence of elevated IgG antibody reactive with  
Ehrlichia  
spp. antigen by IFA at a titer ≥1:128 in a sample taken within 60 days of illness onset, OR  
Microscopic identification of intracytoplasmic morulae in leukocytes in a sample taken within 60 days of illness onset.  
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.  
\* Ehrlichia chaffeensis  
infection was formerly included in the category Human Monocytic Ehrlichiosis (HME); Ehrlichia ewingii  
infection was formerly included in the category Ehrlichiosis (unspecified, or other agent); Ehrlichia muris eauclairensis  
infection was formerly included in the category Undetermined Anaplasmosis/Ehrlichiosis.  
1  
A four-fold change in titer is equivalent to a change of two dilutions (e.g., 1:64 to 1:256).  
2  
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.  
Criteria to Distinguish a New Case from an Existing Case  
A person previously reported as a probable or confirmed case-patient may be counted as a new case-patient when there is an episode of new clinically compatible illness with confirmatory laboratory evidence.  
Case Classification  
Suspect  
Meets confirmatory or presumptive laboratory evidence with no or insufficient clinical information to classify as a confirmed or probable case (e.g., a laboratory report only).  
Probable  
Meets presumptive laboratory evidence with fever as reported by patient or healthcare provider  
AND  
at least one other objective or subjective clinical evidence criterion (excluding chills/sweats),  
OR  
Meets presumptive laboratory evidence without a reported fever but with chills/sweats  
AND  
at least one objective clinical evidence criterion,  
OR  
two other subjective clinical evidence criteria.  
Confirmed  
Meets confirmatory laboratory evidence  
AND  
at least one of the objective or subjective clinical evidence criteria.  
Case Classification Comments  
Ehrlichiosis  
is reported at the species level only if molecular testing is performed, as antibodies to closely-related species of  
Ehrlichia  
can cross-react with multiple antigens; serologic assays cannot definitively distinguish between species. Therefore,  
E. chaffeensis, E. ewingii,  
and  
E. muris eauclairensis  
ehrlichiosis reported cases should only be classified as “Confirmed.” Cases reported within the “  
Ehrlichia  
, other spp. or unspeciated” can be classified as either “Probable” or “Confirmed”.  
Patients should not be classified as cases for both anaplasmosis and ehrlichiosis based on serologic evidence alone.  
Ehrlichia  
spp. bacteria are closely related to  
A. phagocytophilum  
, and many patients are tested using serologic panels that include targets for both species. As a result, it is not uncommon for jurisdictions to receive positive antibody results for both  
Ehrlichia  
spp. and  
Anaplasma  
with the same collection date for a single patient. Public health agencies should use a combination of titer levels, information about the location of possible exposures, clinical manifestations, and the incidence of a particular disease in the geographic areas of exposure to help determine the appropriate disease type for individual patients.  
References  
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Pritt BS, Allerdice MEJ, Sloan LM, et al. Proposal to reclassify Ehrlichia muris as Ehrlichia muris subsp. muris subsp. nov. and description of Ehrlichia muris subsp. eauclairensis subsp. nov., a newly recognized tick-borne pathogen of humans. Int J Syst Evol Microbiol 2017 Jul;67(7):2121-2126.  
Lynn GE, Burkhardt NY, Felsheim RF, et al. Ehrlichia Isolate from a Minnesota Tick: Characterization and Genetic Transformation. Appl Environ Microbiol 2019 Jul;85(14).  
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