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Anthrax (Bacillus anthracis) 2018 Case Definition | CDC  
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Anthrax (  
Bacillus anthracis  
)  
2018 Case Definition  
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Bacillus anthracis  
)  
2018 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)  
17-ID-02  
Background  
Anthrax has been a notifiable condition since 1944  
1  
and has historically been caused by the organism  
B. anthracis  
. Although  
B. anthracis  
is a select agent and thus falls under the reporting requirements of both the National Select Agent Program  
2  
and the Laboratory Response Network (LRN), CDC also conducts case surveillance. Surveillance is an important aspect of case detection, and disease-specific information informs what and how additional case finding should occur.  
Clinical Description  
An illness or post-mortem examination characterized into several distinct clinical types, including:  
Cutaneous anthrax  
: It usually begins as a small, painless, pruritic papule on an exposed surface, which progresses through a vesicular stage into a depressed black eschar; the eschar is often surrounded by edema or erythema and may be accompanied by lymphadenopathy. Fever is also common.  
Ingestion anthrax  
: presents as two sub-types:  
Oropharyngeal  
: When anthrax spores germinate in the oropharynx, a mucosal lesion may be observed in the oral cavity or oropharynx. Symptoms include sore throat, difficulty swallowing, and swelling of the neck. Less specific symptoms include fever, fatigue, shortness of breath, abdominal pain, and nausea/vomiting; the symptoms may resemble a viral respiratory illness. Cervical lymphadenopathy, ascites, and altered mental status may be observed.  
Gastrointestinal  
: When anthrax spores germinate in the lower gastrointestinal tract, symptoms include abdominal pain, nausea, vomiting or diarrhea (either of which may contain blood), and abdominal swelling. Less specific symptoms such as fever, fatigue, and headache are also common. Altered mental status and ascites may be observed.  
Inhalation anthrax  
: Often described as a biphasic illness. Early nonspecific symptoms of inhalation anthrax include fever and fatigue. Localized thoracic symptoms such as cough, chest pain, and shortness of breath follow, as may non-thoracic symptoms such as nausea, vomiting, abdominal pain, headache, diaphoresis, and altered mental status. Lung sounds are often abnormal and imaging often shows pleural effusion or mediastinal widening.  
Injection anthrax  
: Usually presents as a severe soft tissue infection manifested as significant edema or bruising after an injection. No eschar is apparent, and pain is often not described. Nonspecific symptoms such as fever, shortness of breath, or nausea are sometimes the first indication of illness. Occasionally patients present with meningeal or abdominal involvement. A coagulopathy is not unusual.  
Additional considerations:  
Signs of systemic involvement from the dissemination of either the bacteria and / or its toxins can occur with all types of anthrax and include fever or hypothermia, tachycardia, tachypnea, hypotension, and leukocytosis. One or more of these signs are usually present in patients with ingestion anthrax, inhalation anthrax, and injection anthrax and may be present in up to a third of patients with cutaneous anthrax.  
Anthrax meningitis: may complicate any form of anthrax, and may also be a primary manifestation. Primary symptoms include fever, headache (which is often described as severe), nausea, vomiting, and fatigue. Meningeal signs (e.g., meningismus), altered mental status, and other neurological signs such as seizures or focal signs are usually present. Most patients with anthrax meningitis have cerebral spinal fluid (CSF) abnormalities consistent with bacterial meningitis, and the CSF is often described as hemorrhagic.  
Clinical Criteria  
For surveillance purposes, an illness with at least one specific  
OR  
two non-specific symptoms and signs that are compatible with cutaneous, ingestion, inhalation, or injection anthrax; systemic involvement; or anthrax meningitis  
3  
;  
OR  
A death of unknown cause  
AND  
organ involvement consistent with anthrax  
4  
.  
Laboratory Criteria For Diagnosis  
Presumptive laboratory criteria for  
Bacillus anthracis  
or  
Bacillus cereus  
expressing anthrax toxins:  
Gram stain demonstrating Gram-positive rods, square-ended, in pairs or short chains;  
Positive result on a test with established performance in a CLIA-accredited laboratory  
1  
;  
Confirmatory laboratory criteria for  
Bacillus anthracis  
or  
Bacillus cereus  
expressing anthrax toxins:  
Culture and identification from clinical specimens by Laboratory Response Network (LRN)  
5,6  
;  
Demonstration of  
B. anthracis  
antigens in tissues by immunohistochemical staining using both  
B. anthracis  
cell wall and capsule monoclonal antibodies;  
Evidence of a four-fold rise in antibodies to protective antigen between acute and convalescent sera or a fourfold change in antibodies to protective antigen in paired convalescent sera using Centers for Disease Control and Prevention (CDC) quantitative anti-PA immunoglobulin G (IgG) ELISA testing in an unvaccinated person;  
Detection of  
B. anthracis  
or anthrax toxin genes by the LRN-validated polymerase chain reaction and/ or sequencing in clinical specimens collected from a normally sterile site (such as blood or CSF) or lesion of other affected tissue (skin, pulmonary, reticuloendothelial, or gastrointestinal);  
Detection of lethal factor (LF) in clinical serum specimens by LF mass spectrometry.  
Epidemiologic Linkage  
Exposure to environment, food, animal, materials, or objects that is suspect or confirmed to be contaminated with  
B. anthracis  
;  
Exposure to the same environment, food, animal, materials, or objects as another person who has laboratory-confirmed anthrax;  
Consumption of the same food as another person who has laboratory-confirmed anthrax.  
Criteria to Distinguish a New Case from an Existing Case  
Case not previously reported to public health authorities.  
Case Classification  
Suspected  
A case that meets the clinical criteria  
AND  
for whom an anthrax test was ordered, but with no epidemiologic evidence relating it to anthrax.  
Probable  
A case that meets the clinical criteria  
AND  
has presumptive laboratory test results,  
OR  
A case that meets the clinical criteria  
AND  
has an epidemiologic evidence relating it to anthrax.  
Confirmed  
A case that meets the clinical criteria  
AND  
has confirmatory laboratory test results.  
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