MELIOIDOSIS

Background
Melioidosis is caused by the bacterium *Burkholderia pseudomallei*. This bacteria can be found in contaminated water and soil predominately in tropical climates, especially Southeast Asia and northern Australia. In the US, zero to five cases have been reported in previous years and have occurred among travelers and immigrants coming from places where the disease is widespread. Melioidosis has been found among troops that have served in areas with widespread disease. If the number of travelers continues to increase in countries where the disease is endemic, the likelihood of identifying imported melioidosis cases in the US might also increase.

Signs and Symptoms
There are several types of melioidosis infection. Melioidosis has a wide range of signs and symptoms that can be mistaken for other diseases such as tuberculosis or more common forms of pneumonia.

Localized Infection: localized pain or swelling, fever, ulceration, abscess, or nodule
Pulmonary Infection: cough, stomach or chest pain, high fever, headache, anorexia, general muscle soreness
Bloodstream Infection: fever, headache, respiratory distress, abdominal discomfort, joint pain, muscle tenderness and/or disorientation
Disseminated Infection: fever, weight loss, stomach or chest pain, muscle or joint pain, headache, seizures. Abscesses in the liver, lung, spleen, and prostate are often observed in patients with disseminated infections; less frequently, brain abscesses may be seen

Incubation Period
The incubation period for melioidosis generally ranges from 1 to 21 days, with a median of 9 days; however, latent infections can occur, with disease manifesting decades after exposure. In one documented case, a patient was diagnosed with reactivated disease 62 years after initial exposure.

Transmission
People can get melioidosis through direct contact with contaminated soil and surface waters. Humans and animals are believed to acquire the infection by inhalation of contaminated dust or water droplets, ingestion of contaminated water, and contact with contaminated soil, especially through skin abrasions. Person-to-person spread of melioidosis is very rare.

Animals that are susceptible to melioidosis include sheep, goats, swine, horses, cats, dogs, and cattle.

Risk Factors
People may be more at risk to get melioidosis if they have diabetes, liver disease, renal disease, thalassemia, chronic lung disease, cancer, or an immune-suppressing condition not related to HIV.

Treatment
Treatment generally starts with intravenous antimicrobial therapy for 10-14 days, followed by 3-6 months of oral antimicrobial therapy.

- Intravenous therapy: Ceftazidime administered every 6-8 hours OR Meropenem administered every 8 hours
- Oral antimicrobial therapy: Trimethoprim-sulfamethoxazole taken every 12 hours OR Doxycycline taken every 12 hours

Prevention

- Persons with open skin wounds and those with diabetes or chronic renal disease are at increased risk for melioidosis and should avoid contact with soil and standing water
- Those who perform agricultural work should wear boots, which can prevent infection through the feet and lower legs
- Health care workers can use standard contact precautions (mask, gloves, and gown) to help prevent infection

CDC/CSTE Laboratory Criteria for Diagnosis

Confirmed case: Isolation of *B. pseudomallei* from a clinical specimen of a case of severe febrile illness. Culture of the organism may be done by blood, sputum, urine, pus, throat swab, or swabs from organ abscesses or wounds.

Probable case:

- Evidence of a fourfold or greater rise in *B. pseudomallei* antibody titer by IHA between acute- and convalescent-phase serum specimens obtained greater than or equal to 2 weeks apart
- Evidence of *B. pseudomallei* DNA in a clinical specimen collected from a normally sterile site (blood) or lesion of other affected tissue (abscess, wound)

Case Classification

Probable: A clinically compatible illness, one or more of the probable lab criteria, and one of the following epidemiologic findings:

- History of travel to a melioidosis-endemic region **OR**
- Known exposure to *B. pseudomallei* as a result of intentional release or occupational risk (lab exposure)

Confirmed: A case that is laboratory confirmed, with or without clinical evidence

Select Agent Designation

Select agents are biological agents and toxins that have been determined to have the potential to pose a severe threat to public health. *Burkholderia pseudomallei* is designated as a Tier 1 select agent due to its prolonged incubation period and potential to induce a broad range of clinical manifestations making it difficult to diagnosis quickly. Additionally, *Burkholderia pseudomallei* organisms are resistant to many commonly used antibiotics making the condition difficult to treat. Without treatment, melioidosis can have a 90% case fatality rate. With appropriate treatment, case fatality rates range from 20-40%.

Once a laboratory has isolated a suspected select agent, facilities must immediately contact their designated Laboratory Response Network (LRN) reference laboratory – the Michigan Department of Health and Services Bureau of Laboratories (MDHHS BOL). The LRN provides guidance for retaining samples and submission for confirmatory testing.

Initial Public Health Response Activities

Information to collect during initial notification:

- Travel history to endemic areas both during the person's lifetime and during the previous 21 days. Endemic areas can be found at: https://www.cdc.gov/melioidosis/exposure/index.html
- Places where the patient has been locally in the previous 21 days
- Any contact with imported animals
- List of contacts, especially those with similar symptoms

Resources

- CDC Melioidosis Website: https://www.cdc.gov/melioidosis/
- CDC/CSTE Case Definition: https://wwwn.cdc.gov/nndss/conditions/melioidosis/case-definition/2012/
- Workshop on Treatment of and Postexposure Prophylaxis for *Burkholderia pseudomallei* and *B. mallei* Infection, 2010: https://wwwnc.cdc.gov/eid/article/18/12/12-0638_article
- Melioidosis Cases and Selected Reports of Occupational Exposures to *Burkholderia pseudomallei* — United States, 2008–2013, MMWR Surveillance Summaries; Vol. 64, No. 5: July 3, 2015. Available online at: https://www.cdc.gov/mmwr/preview/mmwrhtml/ss6405a1.htm