VDH VIRGINIA DEPARTMENT OF HEALTH

Virginia Department of Health
Melioidosis: Guidance for Healthcare Providers
Key Medical and Public Health Interventions after Identification of a Suspected Case

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1. Epidemiology

Melioidosis, also known as Whitmore's Disease, is caused by the bacterium *Burkholderia pseudomallei*, a saprophytic gram-negative motile rod. *B. pseudomallei* is found in contaminated soil or water and can be spread to humans or animals, including sheep, goats, swine, horses, cats, dogs, and cattle. Transmission occurs through percutaneous inoculation (e.g., through skin abrasions), inhalation of contaminated dust or water droplets, and ingestion of contaminated water or soil-contaminated food. The most common route of natural infection is through percutaneous inoculation in individuals with close and regular contact with soil in endemic areas. Person-to-person transmission is very rare but has been documented in a few cases, including two cases of human milk transmission from mothers with mastitis to their infants. Imported tropical freshwater fish in home aquariums have recently been identified as a risk factor, and a 2021 multistate outbreak of melioidosis in the United States was found to be the result of contaminated aromatherapy spray.

The global annual incidence of melioidosis is estimated to be 165,000 cases with 89,000 deaths. While sporadic infections occur, melioidosis is considered endemic in Southeast Asia (especially Malaysia, Singapore, and Thailand) and northern Australia. It also frequently occurs in other parts of Asia, South America, and the Caribbean. In areas of high endemicity, children may be exposed to *B. pseudomallei* early in life, with the highest seroconversion rates occurring between 6 months and 4 years of age. Melioidosis is seasonal in countries with endemic infection, with more than 75% of cases occurring during the rainy season.

Approximately 12 cases are reported in the United States each year. Most of these cases are related to international travel to an endemic area. However, *B. pseudomallei* has recently been identified in the environment in Mississippi, Puerto Rico, and the U.S. Virgin Islands. Modelling suggests that the environmental conditions along the Gulf Coast region of the U.S. are conducive to the growth of the bacteria.

Workers in research or clinical diagnostic laboratories may be exposed to *B. pseudomallei* before its identity has been established, and several exposures and cases have been reported in laboratory workers. Guidance has been developed specifically for this population for the Management of Accidental Laboratory Exposure to *Burkholderia pseudomallei* and *B. Mallei*.

B. pseudomallei is designated as a Category B bioterrorism agent (i.e., one with moderate ease of transmission and lower morbidity and mortality than category A agents). *B. pseudomallei* is also designated as a select agent, which means that it could be developed as a bioterrorism agent and that possession, use, or transfer of this organism requires registration with the Centers for Disease Control and Prevention (CDC) or the U.S. Department of Agriculture (USDA) through the Federal Select Agent Program.

2. Clinical Manifestations

Clinical manifestations of melioidosis have a wide range of forms, including asymptomatic, localized (e.g., cutaneous abscesses or ulcerations), pneumonia, and sepsis. Melioidosis is sometimes called "the great mimicker" because the clinical presentation looks like other diseases, especially tuberculosis, and diagnosis can be challenging.

Pneumonia is the most common manifestation in adults and may be mistaken for typhoid or tuberculosis, with pulmonary cavitations, empyema, chronic abscesses, and osteomyelitis. Localized cutaneous infection is the most common manifestation in immunocompetent children. Melioidosis can be rapidly fatal, with septic shock resulting in death within 48 hours of the onset of generalized symptoms. Approximately 50% of adults are bacteremic when admitted to the hospital with melioidosis; this is much less common in children. Other manifestations of disease include genitourinary infection (e.g., prostate abscess), septic arthritis, osteomyelitis, central nervous system disease (e.g., brain abscess), acute suppurative parotitis (especially in children in Thailand and Cambodia), and necrotizing fasciitis. Symptomatic infection can occur in children of any age, with pneumonia and parotitis reported in infants as young as 8 months of age.

Infection can be persistent, and result in latent, recurrent, and recrudescing infections. Mortality ranges from 15–40%, even with appropriate antibiotic therapy.

The incubation period for melioidosis is not well defined. The Centers for Disease Control and Prevention (CDC) reports that symptoms typically occur within 2–4 weeks after exposure but the incubation period may range from one day to many years. The American Academy of Pediatrics' Red Book also notes that the incubation period may be prolonged (years) but reports an average incubation period of 1–21 days, median 9 days.

Individuals with chronic medical conditions are at higher risk of infection, including those with diabetes, liver disease, kidney disease, thalassemia, cancer or other immunocompromising conditions (not including HIV), and chronic lung disease. *B. pseudomallei* has been reported to cause pulmonary infection in people with cystic fibrosis and septicemia in children with chronic granulomatous disease.

3. Laboratory Testing and Diagnosis

Notification when Melioidosis is Suspected

If melioidosis is suspected, the healthcare provider should immediately report the case to the local health department per Virginia's disease reporting regulations. Although melioidosis is not an explicitly reportable disease for providers in Virginia to report, VDH considers it an unusual occurrence of disease. The local

health department will discuss options for public health testing. If VDH approves public health testing, specimens may be sent to the Division of Consolidated Laboratory Services (DCLS). The health department will facilitate notification and shipment to DCLS. Specimens potentially containing *Burkholderia pseudomallei* should never be shipped to DCLS without prior approval.

Laboratory Biosafety

Laboratory personnel **must** be alerted if melioidosis is suspected so they can take appropriate precautions. Laboratory work should be performed using biosafety level (BSL) 3 laboratories, work and safety practices, or BSL-2 laboratories with BSL-3 work and safety practices, which includes personal protective equipment (PPE) consisting of gown (back-closing, fluid-impervious), gloves, face/eye protection and respiratory protection. All patient specimens and culture isolates should be handled while wearing double gloves and other PPE in a biosafety cabinet (BSC). Subcultures should be performed in a Class II BSC. Plates should be taped shut when incubating. All further testing should be performed only in the BSC while wearing respiratory protection and gloves to protect from infections through the skin. Any procedure that can generate an aerosol, such as preparing standard inoculums for identification systems, must be performed in a Class II BSC with BSL-3 work and safety practices. Centrifugation and vortexing should be avoided, if not avoidable, vortexing should be performed inside of a BSC with close containers, and centrifuge rotors/cups should only be opened inside of a BSC. It is recommended that if *B. pseudomallei* is suspected that they be transferred to a BSL-3 facility as soon as possible.

Automated bacterial identification systems used by clinical laboratories might misidentify *B. pseudomallei* as another bacteria, such as *Burkholderia cepacia,* Burkholderia thailandensis, Chromobacterium violaceum, Pseudomonas aeruginosa, Pseudomonas stutzeri, S. maltophilia*, *Ochrobactrum anthropic, Acinetobacter spp., and Aeromonas spp.* and other nonfermenting Gram negative bacilli. Therefore, the clinical laboratory should forward any isolate to DCLS (after consultation with DCLS) if it meets a combination of the criteria outlined below for suspected *B. pseudomallei* based on clinical suspicion or available laboratory testing:

- Any clinical suspicion of suspected *B. pseudomallei* infection
- Colony morphology on sheep blood agar: at 24–48 hours of incubation, there are small, smooth creamy colonies, which may change after a few days to dry, wrinkled colonies. Poor growth at 24h, good growth at 48h. Colonies are greyish white, non-hemolytic, and are without violet pigment. *B. pseudomallei* often produces a distinctive musty or earthy odor that is very pronounced on opening a Petri dish or opening an incubator door. “Sniffing” of plates is dangerous and should not be done. The odor will be apparent without sniffing. *B. pseudomallei* are resistant to polymyxin B and colistin, having no zone of inhibition around the disks.
- Gram stain morphology: A straight, or slightly curved Gram-negative rod; may demonstrate bipolar morphology in direct specimens. It measures 2 to 5 µm in length and 0.4 to 0.8 µm in diameter
- Oxidase test: positive
- Motility test: motile. Note: the motility test should only be performed if the laboratory has the appropriate motility media; a wet preparation of any suspected *B. pseudomallei* isolate should **not** be performed
- Growth at 42 degrees Celsius on sheep blood agar

Sample Collection

Sample collection instructions for testing at DCLS and CDC are shown in Table 1. Due to the highly infectious nature of this organism, consultation with DCLS about specimen collection and handling is required. The DCLS Emergency Officer can be reached 24 hours a day/7 days a week at 804-335-4617.

Table 1. Specimen Collection Instructions for Testing Suspected Melioidosis*

Test and Turnaround Time	Acceptable samples	Amount	Instructions
Burkholderia pseudomallei identification and genotyping (at DCLS and CDC) Estimated turnaround time: 5–7 business days for culture confirmation (at DCLS) upon specimen receipt and 14 days for genotyping (at CDC) upon specimen receipt.	Blood (for culture)	10 mL	Collect before antibiotic use if possible. Blood culture should be incubated on the instrument at the local lab, then the isolate should be forwarded if it "flags" positive. (DCLS cannot accept blood culture bottles.) Ship isolate at room temperature. Transport to lab within 16 hours.
	Blood (for tests other than culture)	2 mL (or more)	Collect blood in red top or purple top (EDTA) blood tube. Ship refrigerated with cold packs. Transport to lab as soon as possible.
	Abscess, tissue aspirate, or purulent discharge	3 mL, or as much material as possible (avoid swabs)	Aspirate with a syringe and transfer material to a sterile screw-capped leak-proof container, if possible. Aspirate can remain in collection syringe if needle is removed, and syringe is capped to prevent leakage. Ship refrigerated with cold packs. Transport to lab as soon as possible.
	Sputum or bronchoscopy specimens	3 mL (or more)	Collect in sterile screw-capped leak-proof container. Ship refrigerated with cold packs. Transport to lab as soon as possible.
	Culture isolate	N/A	Contact the DCLS Bioterrorism Response Coordinator or Emergency Officer directly when a suspected isolate is identified.* Send isolate on an agar slant, or a plate if slant is not available. Isolates should be shipped at room temperature. Transport to lab as soon as possible (ASAP).
Burkholderia pseudomallei molecular detection (PCR at CDC and DCLS) and serologic testing (at CDC) Estimated turnaround time at DCLS for molecular detection: 1 business day upon specimen receipt.	Testing at DCLS: Whole blood, serum or isolate. Testing at CDC: Whole blood, serum, urine, abscess, or sputum	0.5–1mL (or more)	Whole blood specimens should be collected in purple top (EDTA) tube; green top (heparin) tube is not acceptable. Other specimens should be collected as described above or below. Agar slants should be shipped at room temperature and clinical specimens should be shipped refrigerated with cold packs. Transport to lab as soon as possible.
	Serum (serologic testing is performed at CDC)	2mL (or more)	Collect acute and convalescent serum (>14 days apart) in red top or tiger top tubes. Remove serum and place in sterile tube. Acute and convalescent specimens can be shipped together (freeze acute specimen until convalescent specimen has been collected and is ready for shipment; ship both specimens on dry ice); if shipping separately, ship refrigerated with cold packs. For laboratory exposure investigations, collect serum immediately after exposure (Day 1) and at 1, 2, 4, and 6 weeks after exposure. Batch specimens from baseline (preemployment) if available and specimens from Day 1 and Week 1 in the initial shipment.
	Culture isolate	N/A	Contact the DCLS Bioterrorism Response Coordinator or Emergency Officer directly when a suspected isolate is identified.* Send culture on an agar slant, or a plate if slant is not available. Isolates should be shipped at room temperature. Transport to lab ASAP.

*Adapted from American Society for Microbiology's Sentinel Level Clinical Laboratory Guidelines for Suspected Agents of Bioterrorism and Emerging Infectious Diseases: *Burkholderia* (2016). If melioidosis is suspected, notify the local health department immediately to discuss the case. If VDH approves public health testing, specimens may be sent to Division of Consolidated Laboratory Services (DCLS) with the DCLS Test Request Form; include the name of the test on the form. For questions about collecting specimens or for notifying DCLS when submitting specimens, contact the DCLS Emergency Officer available 24/7 at 804-335-4617.

Diagnosis
The definitive diagnosis of melioidosis is based on isolating and identifying *B. pseudomallei* in a clinical sample in conjunction with clinically compatible signs and symptoms. Culture specimens should be obtained from blood, throat, urine, respiratory secretions, pus, and surface lesions as appropriate, for all patients with suspected cases. Any positive culture is considered diagnostic for melioidosis because *B. pseudomallei* is not considered to be a member of the colonizing microbiota. Of note, blood cultures often remain negative, even in patients with septicemia. PCR and other molecular tests have been developed, but they are not widely available, and PCR is less sensitive than culture.

4. Treatment

The U.S. Public Health Emergency Medical Countermeasures Enterprise held a workshop in 2010 for subject matter experts to develop consensus recommendations for treatment and postexposure prophylaxis against *B. pseudomallei* and *B. mallei* during a public health emergency (Lipsitz 2012). The recommendations focus primarily on treatment of melioidosis caused by *B. pseudomallei.* Of note, *B. pseudomallei* is naturally resistant to many antimicrobial drugs, and this resistance must be considered when selecting the appropriate treatment. Treatment of sporadic cases may also use these recommendations; however, consult with an infectious disease specialist is recommended. Further treatment guidance for sporadic cases can be found at https://www.cdc.gov/melioidosis/treatment/index.html.

Treatment of melioidosis during a public health emergency consists of both an intensive phase with intravenous therapy lasting for at least 10–14 days (Table 2) and an eradication phase with oral therapy to reduce the chances of relapse (Table 3).

The duration of intensive phase therapy is variable, typically lasting 10–14 days with intravenous ceftazidime as first line treatment. However, this may be extended to 4 weeks or longer if symptoms are not improving or severe disease is present. Patients with positive blood cultures for *B. pseudomallei* should have blood cultures repeated weekly until negative. Treatment failure is indicated by a repeat positive blood culture after >1 week of antimicrobial therapy, or deterioration of clinical condition after 48 hours of therapy. Patients with treatment failure warrant further workup to identify possible undrained abscesses and changing from ceftazidime to meropenem (or adding trimethoprim-sulfamethoxazole [TMP/SMX] if already on a carbapenem drug) may be considered. Availability of intensive care facilities has been cited to improve successful outcomes.

Transition from the intravenous intensive phase therapy to oral eradication therapy is based on clinical improvement of the patient, such as cessation of fever with negative blood cultures. Of note, *B. pseudomallei* infections resolve much slower than other bacterial infections and a lack of marked improvement within 24 hours of antimicrobial initiation is not uncommon and does not warrant changing the antimicrobial therapy. Average time for fever resolution is 9 days, however, fluctuation of the fever may occur for as long as one month.

Oral eradication therapy is necessary for a minimum of 12 weeks and is the major determinant of relapse. The relapse rate after a full eradication regime is approximately 10% and increases to 30% if oral therapy is taken for less than 8 weeks. Given the duration of therapy and potential side effects of the first-line treatment (TMP-SMX), complete blood counts and assessment of kidney function and blood electrolyte levels should be followed weekly for the first 2-3 weeks, and then biweekly thereafter. Amoxicillin/clavulanic acid is recommended as an alternative for pregnant patients, given the possibility of adverse pregnancy outcomes with TMP-SMX. However, amoxicillin/clavulanic acid is associated with a higher rate of relapse, and more frequent dosing than normal may be necessary to maintain therapeutic levels.

Table 2. Initial intensive-phase therapy for *Burkholderia pseudomallei* and *B. mallei* infections during a public health emergency*

Therapy	Drug	Regimen for Suspected or Confirmed Clinical Cases (10–14-day duration)[†]
First Line	Ceftazidime	50 mg/kg (up to 2 g) IV every 8 hours, **or** 6 g/d by continuous infusion after a 2-g bolus
Second Line[±,**,^]	Meropenem	25 mg/kg (up to 1 g) IV every 8 hours

*For additional information on dosing, please consult the package inserts and the source: Lipsitz R, Garges S, Aurigemma R, et al. Workshop on treatment of and postexposure prophylaxis for *Burkholderia pseudomallei* and *B. mallei* infection, 2010. Emerg Infect Dis. 2012; 18 (12). Available at http://wwwnc.cdc.gov/eid/article/18/12/12-0638_article.htm (Accessed September 26, 2023).

[†]Extended duration of parenteral therapy (≥4 weeks) may be necessary in cases of more severe disease (e.g., septic shock, deep seated or organ abscesses, extensive lung disease, osteomyelitis, septic arthritis, or neurologic melioidosis).

[±]May be considered first line therapy if patient has neuromelioidosis, persistent bacteremia or in intensive care unit.

[**]Switching to meropenem is indicated if patient condition worsens while receiving ceftazidime (e.g., organ failure, development of a new focus of infection during treatment, or if repeat blood cultures remain positive). Depending on the severity of infection, the dose for patients ≥3 months of age can be ≤40 mg/kg; not to exceed 2 g/dose.

[^]Consider adding trimethoprim-sulfamethoxazole for patients with severe infection involving the brain, prostate, or other privileged site (same dosing as described for eradication therapy below). Can be administered by intravenous infusion over 30–60 min every 12 hours, or nasogastric, or oral, as appropriate. If trimethoprim-sulfamethoxazole is included, continue for the entire duration of the intensive phase.

Table 3. Oral eradication-phase therapy for *Burkholderia pseudomallei* and *B. mallei* infections during a public health emergency*

Therapy	Drug, Strength, and Formulation	Patient Group	Regimen for Suspected or Confirmed Clinical Cases (minimum 12-week duration)[†]
First Line	Trimethoprim/sulfamethoxazole (TMP/SMZ) 160mg/800mg tablet	Adult, >60 kg	2 tablets every 12 hours
		Adult, 40–60 kg	1.5 tablets every 12 hours
		Adult, <40 kg	1 tablet every 12 hours
		Child	8 mg/40 mg/kg; maximum dose 2 tablets (320mg/1,600mg/dose) every 12 hours
Second Line, or First Line if Contraindicated to TMP/SMZ[§]	Amoxicillin/clavulanic acid (co-amoxiclav) 500mg/125mg tablet	Adult, ≥60 kg	3 tablets every 8 hours[¶]
		Adult, <60 kg	2 tablets every 8 hours[¶]
		Child	20 mg/5 mg/kg every 8 hours; maximum dose of 2 tablets (1,000 mg/250 mg) every 8 hours

*For additional information on dosing, please consult the package inserts and the source this was adapted from: Lipsitz R, Garges S, Aurigemma R, et al. Workshop on treatment of and postexposure prophylaxis for *Burkholderia pseudomallei* and *B. mallei* infection, 2010. Emerg Infect Dis. 2012; 18 (12). Available at http://wwwnc.cdc.gov/eid/article/18/12/12-0638_article.htm (Accessed September 26, 2023).

[†]Recommended duration of therapy is a minimum of 12 weeks.

[§]If the organism is resistant to trimethoprim-sulfamethoxazole or the patient is intolerant, the second-line choice is co-amoxiclav. Co-amoxiclav is available in different ratios and formulations, depending on the source country. Co-amoxiclav at a ratio of 4:1 is preferred to ensure there is sufficient clavulanate (Cheng AC, 2008 cited in Lipsitz R et al, 2012). Alternative preparations available.

[¶]Weight-based dosage based on 20 mg/5 mg/kg/dose.

5. Postexposure Prophylaxis

Consensus postexposure prophylaxis (PEP) recommendations for *B. mallei* and *B. pseudomallei* are based on the 2010 workshop held by the U.S. Public Health Emergency Medical Countermeasures Enterprise (Lipsitz 2012) and are summarized in Table 4. As with the treatment for the eradication phase, oral trimethoprim-sulfamethoxazole is the agent of first choice for prophylaxis, with a recommended duration of 21 days.

Guidelines for PEP are typically used in the context of a laboratory exposure. For more detailed information on preventing and responding to a *B. pseudomallei* laboratory exposure, please see the Emerging Infectious Diseases' article on Management of Accidental Laboratory Exposure to *Burkholderia pseudomallei* and *B. mallei*.

In the case of a large or intentional exposure event, providing PEP to all persons potentially exposed is problematic because it would be difficult to determine who is actually exposed and not exposed. Serologic diagnostic tools are not useful for assessing exposure immediately after the event given the need for paired samples over time, and the potential benefits of PEP must be weighed against the risks of severe adverse effects from first-line prophylaxis with TMP-SMX. Per Lipsitz et al, "devising a policy regarding PEP for persons in a large, exposed area could be difficult, considering current weaknesses in both diagnosis and treatment options."

Table 4. Postexposure prophylaxis for *Burkholderia pseudomallei* and *B. mallei* infections during a public health emergency and for sporadic exposures (e.g., laboratory exposure)*

Therapy	Drug, Strength, and Formulation	Patient Group	Regimen (21-day duration)
First Line	Trimethoprim/sulfamethoxazole (TMP/SMZ) 160mg/800mg tablet	Adult, >60 kg	2 tablets every 12 hours
		Adult, 40–60 kg	1.5 tablets every 12 hours
		Adult, <40 kg	1 tablet every 12 hours
		Child	8 mg/40 mg/kg; maximum dose 2 tablets (320mg/1,600mg/dose) every 12 hours
Second Line, or First Line if Contraindicated to TMP/SMZ†	Amoxicillin/clavulanic acid (co-amoxiclav) 500mg/125mg tablet	Adult, ≥60 kg	3 tablets every 8 hours§
		Adult, <60 kg	2 tablets every 8 hours§
		Child	20 mg/5 mg/kg every 8 hours; maximum dose of 2 tablets (1,000 mg/250 mg) every 8 hours

*For additional information on dosing, please consult the package inserts and the source: Lipsitz R, Garges S, Aurigemma R, et al. Workshop on treatment of and postexposure prophylaxis for *Burkholderia pseudomallei* and *B. mallei* infection, 2010. Emerg Infect Dis. 2012; 18 (12). Available at http://wwwnc.cdc.gov/eid/article/18/12/12-0638_article.htm (Accessed April 12, 2023).

†If the organism is resistant to trimethoprim-sulfamethoxazole or the patient is intolerant, the second-line choice is co-amoxiclav. Co-amoxiclav is available in different ratios and formulations, depending on the source country. Co-amoxiclav at a ratio of 4:1 is preferred to ensure there is sufficient clavulanate (Cheng AC, 2008 cited in Lipsitz R et al, 2012). Alternative preparations available.

§Weight-based dosage based on 20 mg/5 mg/kg/dose.

Risk Assessment for Laboratory Personnel

Laboratory personnel who handle specimens from patients suspected of having melioidosis or cultures of *B. pseudomallei* are at risk of laboratory-acquired melioidosis because some procedures required to prepare specimens for culture may aerosolize particles and release *B. pseudomallei* into the air. If a laboratory

worker is exposed to *B. pseudomallei*, immediately wash and decontaminate the inoculation site (if there is one). Report the incident to the laboratory safety manager and perform a risk assessment to determine postexposure management (Table 5).

A risk assessment for laboratory personnel is two-fold and involves evaluating the exposed person's independent risk factors (e.g., diabetes mellitus) as well as the type of laboratory activity that resulted in the exposure (e.g., splash event). Working with the occupational health program is strongly recommended to coordinate the response and protect the laboratorian's personal health information.

Independent risk factors for melioidosis include:

- Diabetes mellitus
- Excessive alcohol consumption (alcohol abuse)
- Chronic kidney disease
- Chronic liver disease
- Chronic lung disease (including cystic fibrosis)
- Hematologic malignancy
- Thalassemia
- Persons who are immunocompromised through disease (including neutropenia or neutrophil dysfunction) or prescribed drugs (including steroids)

Of note, HIV infection does not appear to constitute a risk factor. Staff with risk factors for melioidosis are at increased risk of illness with any exposure (low- or high-risk incident) and should be informed of this increased risk when they begin working with specimens that may contain *B. pseudomallei*. Alternative work options should be discussed and provided when requested. In addition to standard precautions and baseline serologic testing, **any laboratory staff member working with *B. pseudomallei* who has an identified risk factor should be investigated for *B. pseudomallei* infection if they have a febrile illness**, irrespective of history of an exposure event in the laboratory. A healthcare provider should arrange for serologic testing and appropriate cultures.

Laboratory activities that lead to an exposure may be classified as low- or high- risk incidents.

Low-risk Incidents:

- Inadvertent opening of the lid of an agar plate growing *B. pseudomallei* outside a biologic safety cabinet
- Inadvertent sniffing of agar plate growing *B. pseudomallei* in the absence of contact between worker and bacterium
- Splash event leading to visible contact of *B. pseudomallei* with gloved hand or protected body, in the absence of any evidence of aerosol
- Spillage of small volume of liquid culture (<1mL) within a functioning biologic safety cabinet
- Contamination of intact skin with culture

High-risk Incidents:

- Needlestick or other penetrating injury with an implement contaminated with *B. pseudomallei*
- Bite or scratch by experimental animal infected with *B. pseudomallei*
- Splash event leading to contamination of mouth or eyes
- Generation of aerosol outside biologic safety cabinet (e.g., sonication, centrifuge, vortexing incident)

Exposure to aerosols represents the greatest biohazard because it can result in inhalation, ingestion, and mucous membrane contact.

Table 5. Postexposure Management for Laboratory Exposures to *B. pseudomallei*

	Low-Risk Lab Exposure[†]	High-Risk Lab Exposure[‡]
Exposed Individual has Independent Risk Factors*	• Begin postexposure prophylaxis immediately • Symptom monitoring • VDH recommends serologic monitoring[§]	• Begin postexposure prophylaxis immediately • Symptom monitoring • VDH recommends serologic monitoring[§]
Exposed Individual does not have Independent Risk Factors*	• Symptom monitoring • Serologic monitoring can be considered[§]	• Begin postexposure prophylaxis immediately • Symptom monitoring • VDH recommends serologic monitoring[§]

Adapted from CDC's Healthcare Response Activities for Melioidosis and Table 1 in Management of Accidental Laboratory Exposure to Burkholderia pseudomallei and B. mallei - Volume 14, Number 7—July 2008 - Emerging Infectious Diseases journal.

***Risk Factors:** Diabetes mellitus, excessive alcohol consumption (alcohol abuse), chronic kidney disease, chronic liver disease, chronic lung disease (including cystic fibrosis), hematologic malignancy, thalassemia, persons who are immunocompromised through disease (including neutropenia or neutrophil dysfunction) or prescribed drugs (including steroids)

[†]**Low Risk:** Inadvertent opening of the lid of an agar plate growing *B. pseudomallei* outside a biologic safety cabinet, inadvertent sniffing of agar plate growing *B. pseudomallei* in the absence of contact between worker and bacterium, splash event leading to visible contact of *B. pseudomallei* with gloved hand or protected body, in the absence of any evidence of aerosol, spillage of small volume of liquid culture (<1mL) within a functioning biologic safety cabinet, contamination of intact skin with culture

[‡]**High Risk:** Needlestick or other penetrating injury with implement contaminated with *B. pseudomallei*, Bite or scratch by experimental animal infected with *B. pseudomallei*, Splash event leading to contamination of mouth or eyes, Generation of aerosol outside biologic safety cabinet (e.g., sonication, centrifuge, vortexing incident).

[§]**Serologic monitoring**: Serial serologic testing is available at CDC for people with laboratory exposures and requires preapproval. VDH encourages serologic testing for people with high-risk exposures or people with low-risk exposures and risk factors; it can be considered for other exposed persons. If pursued, collect serum immediately after exposure (Day 1) and at Weeks 1, 2, 4, and 6 after exposure; specimens from baseline (preemployment specimen if available), Day 1, and Week 1 can be batched in the initial shipment to DCLS.

Clinical Exposures

The risk to clinicians performing medical procedures is considered to be low if appropriate infection control precautions are followed and there are no obvious exposures. Collecting and handling clinical specimens is typically associated with a lower exposure risk than working with concentrated material (e.g., culture isolate) in a laboratory setting. VDH is not aware of published guidelines about potentially high-risk exposures to *B. pseudomallei* during clinical procedures (e.g., needlestick injury, splash event involving the patient's body fluids and the provider's mouth or eyes), and if such exposures occur, each situation should be discussed and assessed on a case-by-case basis.

6. Vaccination

A vaccine for melioidosis is not commercially available in the United States.

7. Infection Control

For infection control, standard precautions are recommended for patients with melioidosis. Melioidosis is not considered to be transmitted person-to-person via air or respiratory droplets in non-laboratory settings.

8. Decontamination

Current practices to disinfect and sterilize patient-care equipment and environmental surfaces are sufficient for managing areas where melioidosis patients are evaluated, admitted, and treated.

9. Postmortem Practices

If melioidosis is suspected as a cause of death, the district Office of the Chief Medical Examiner (OCME) should be immediately notified (https://www.vdh.virginia.gov/medical-examiner/district-offices-contact-us/). Consultation should occur to determine if an autopsy should be conducted, the parties responsible for conducting the autopsy, and proper personal protective procedures to follow.

10. Public Health Measures

- Suspected or confirmed melioidosis cases should be reported immediately to the local health department. See https://www.vdh.virginia.gov/health-department-locator/
- Laboratory specimens should be sent to the state public health laboratory (DCLS) for confirmation of the agent and other studies after VDH approves testing. For questions about collecting specimens, the DCLS Emergency Officer can be reached 24 hours a day/7 days a week at 804-335-4617.
- The designated public health authority should begin an epidemiologic investigation.
  - Collect detailed information from the patient to attempt to identify the source of the exposure
  - Investigate contacts of the case-patient for compatible illness to investigate a potential common exposure
  - Implement control measures to prevent disease and additional exposures. For laboratorians or others potentially exposed who might have worked with the agent before identification, postexposure prophylaxis and monitoring might be recommended based on a risk assessment.
  - VDH will work with the CDC, Federal Bureau of Investigation and other state or federal agencies as necessary

11. References and Resources

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