MELIOIDOSIS (*Burkholderia pseudomallei*)

I. DESCRIPTION AND EPIDEMIOLOGY

A. Overview

Melioidosis (formerly Whitmore's disease) is caused by the gram-negative, aerobic, motile rod-shaped bacteria, *Burkholderia pseudomallei*, which are naturally found in the soil and surface water of many tropical and subtropical regions [1]. The global burden of disease from melioidosis is poorly understood, but a modeling study from 2016 estimated 165,000 human melioidosis cases per year worldwide and 89,000 deaths [2].

Patients are infected through subcutaneous inoculation, or inhalation or ingestion of contaminated soil or water. *B. pseudomallei* is hyperendemic in Southeast Asia and northern Australia and is also found in a variety of tropical and subtropical regions including South Asia, China, and parts of South and Central America [1]. Within the United States, melioidosis is endemic to Puerto Rico and the U.S. Virgin Islands, and in 2022 it was found to be locally endemic to the Gulf Coast region of the U.S. [3]. Melioidosis is believed to be underdiagnosed around the world due to lack of laboratory diagnostic capacity and limited awareness among healthcare providers in regions of the world where people are most at risk. Although the majority of infected persons never develop clinically apparent disease, symptomatic infection is associated with high morbidity and mortality, even with appropriate antibiotic treatment. In enzootic areas, melioidosis is most commonly diagnosed in swine, sheep, and goats [1]. However, cases have been reported in a broad range of wild animals, including some non-human primates, marine mammals, birds, and reptiles. Animal-to-human transmission has been documented rarely.

Note: This CD Manual chapter focuses exclusively on B. pseudomallei and does not cover Burkholderia mallei (B. mallei), the causative agent of Glanders. Burkholderia mallei is genetically closely related to B. pseudomallei but primarily affects horses. Infection in humans is rare. Burkholderia mallei is also classified as a Tier 1 select agent by the U.S. Centers for Disease Control and Prevention (CDC) due to bioterrorism potential.

B. Melioidosis in California

From 2012 through 2023, between zero and four human cases of melioidosis were reported to CDPH each year. Cases in California have occurred in persons who were most likely exposed while traveling outside the United States, including to Southeast Asia and South and Central America.

C. Clinical manifestations

The clinical spectrum for melioidosis can vary significantly and range from localized skin infections to severe sepsis and death [4]. Clinical manifestations depend on factors such

as mode of inoculation, the presence of clinical risk factors (see **D. Risk Factors** below), host immune response, and bacterial load.

Patients with melioidosis may present with symptoms of an acute or chronic infection, or less commonly, with reactivation of a latent infection years after an initial infection. Chronic infection is defined as the presence of symptoms for greater than two months. In a 30-year, prospective, observational study of 1,148 culture confirmed cases of melioidosis from Australia, 88% were acute, 9% were chronic, and 3% were thought to be due to reactivation of latent disease [4].

Pneumonia is the most common presentation of acute infection and can present similarly to community-acquired pneumonia. Other acute manifestations include genitourinary infections (e.g., prostatic abscesses) and skin and soft tissue infections (e.g., abscesses, pustules, furuncles, and ulcerative lesions). Approximately half of all patients have bacteremia on presentation and one fifth present with septic shock. Bacteremia can lead to infection of multiple organs. Children are more likely than adults to present with skin infections. In Thailand and Cambodia, children most commonly present with suppurative parotitis, which is thought to be linked to drinking contaminated, unchlorinated water in rural areas [5].

Patients with chronic infection (symptoms lasting >2 months) most commonly have indolent pulmonary and systemic symptoms (e.g., cough, chronic purulent sputum production, hemoptysis, night sweats), which may be confused with tuberculosis. Others with chronic infection may present with non-healing skin infections. Chronic infections are often milder than acute infections.

Recurrence of infection occurs in 5–28% of patients and can be due to incomplete clearance of the original infecting strain or reinfection with a new strain [6].

The case fatality rate of acute melioidosis has been estimated at less than 10% to over 40%, with higher case fatality rates associated with regions with limited access to diagnostics, appropriate antibiotic therapy, and intensive care [4, 7].

D. Risk Factors

Residing in or traveling to areas endemic for *B. pseudomallei* are the most common scenarios for exposure. Risk factors in endemic areas include occupational or recreational exposure to soil or water (e.g., farming, gardening, working outdoors), injury or accidents involving soil or water, severe weather events that increase exposure to contaminated water or dust, and drinking unchlorinated water.

In the United States, melioidosis is generally associated with travel to countries where melioidosis is endemic, however in recent years several cases have been linked to domestic exposure. In 2019, a case of melioidosis in Maryland was attributed to contaminated water in a home aquarium that contained tropical fish and plants imported from SE Asia [8]. In 2021, four cases of melioidosis were reported in Kansas, Georgia,

Minnesota, and Texas, associated with a contaminated aromatherapy spray manufactured in India [9]. In 2022, CDC detected *B. pseudomallei* in environmental soil and water samples from the Gulf Coast region of southern Mississippi during an investigation of two human melioidosis cases [3]. This was the first time *B. pseudomallei* was detected in environmental samples from the continental United States. Environmental modeling studies suggest risk of exposure to *B. pseudomallei* may likely be more widespread in the Southern United States [10].

In regions where melioidosis is endemic, incidence is highest among persons 40 to 60 years of age, with fewer than 5% of cases occurring in children less than 5 years of age.

Risk factors for clinical melioidosis and associated poor outcomes include diabetes, excessive alcohol use, chronic lung disease, and chronic renal disease [1, 4]. Persons with Thalassemia, malignancy, immunosuppressive conditions (not related to HIV), rheumatic heart disease or congestive heart failure, chronic liver disease, or those taking immunosuppressive medications are also at increased risk. Approximately 80% of melioidosis patients have one or more underlying risk factors, most commonly diabetes [4]. Because the majority of melioidosis cases, and almost all deaths, are in individuals with underlying clinical risk factors, melioidosis is considered by many experts to be an opportunistic infection.

E. Transmission

Melioidosis is transmitted through direct skin contact with, or inhalation, aspiration, or ingestion of contaminated water or soil. Percutaneous inoculation is the most common mode of transmission. Inoculating skin injuries can cause skin infections and abscesses as well as pneumonia and infections in other organs due to spread in the bloodstream. Melioidosis shows seasonal trends, with most cases occurring during the rainy season [11]. Inhalational exposure may be associated with rainfall, supported by observations showing increased pneumonic presentation of melioidosis after rain. Drinking contaminated, unchlorinated water may be associated with development of parotitis and liver abscesses.

There have been rare reports of mother-to-infant transmission with cases documented in infants whose mothers have mastitis, or in utero [12, 13].

Burkholderia pseudomallei in culture presents a risk to laboratory workers because of a low infectious dose and ease of aerosolization [14]. It is critical that the clinician notify the laboratory that melioidosis is suspected to ensure that full laboratory safety measures are implemented, including working with culture samples in a biological safety cabinet [15].

In the event of laboratory or clinical exposure to *B. pseudomallei*, serologic monitoring is available at CDC at no cost to the clinical laboratory.

Burkholderia pseudomallei is classified by the CDC as a Tier 1 select agent because of its bioterrorism potential [16]. It is characterized as a Category B biological threat

because *B. pseudomallei* is moderately easy to disseminate, results in moderate morbidity rates and low mortality rates, and requires specific requirements for diagnostics, enhanced disease surveillance, and reporting. A biological attack could come in the form of intentional release of *B. pseudomallei* into the air, food, or water [17]. The closely related bacteria, *B. mallei*, was used as a biological weapon in World War I [18].

There are currently no licensed vaccines against melioidosis.

F. Incubation Period

The incubation period for acute melioidosis ranges from 1 to 21 days (median 4 days) [4] but may be less than 24 hours in individuals who have aspirated contaminated water, possibly due to exposure to a higher bacterial load [19]. People with reactivation of latent infection may develop symptoms many years after initial exposure.

G. Diagnosis

Culture is the gold standard for diagnosis of melioidosis. Persons suspected of having melioidosis should have blood, sputum (or specimens from bronchoscopy), and urine specimen samples collected for culture, in addition to specimen samples from any other potential site of infection (e.g., exudate from skin, biopsies, abscess aspirates, wound swabs). If initial cultures from potential locations of infection are negative but there is strong clinical suspicion for melioidosis, repeated cultures should be considered. Growth of *B. pseudomallei* should be detectable within 48 hours of incubation. Refer to American Society for Microbiology (ASM) guidelines for additional information on ruling out, recognizing, and presumptively identifying *B. pseudomallei* from clinical specimens in Sentinel Laboratories [20].

Presumptive diagnosis of melioidosis can be performed using serologic tests such as the indirect hemagglutination assay (IHA), which is only available at the CDC. Paired specimens (acute and convalescent) must be taken at least two weeks apart, and a four-fold rise in titers would indicate an acute infection. IHA alone is inadequate to confirm acute infection due to low sensitivity. In a study of 275 patients with culture-confirmed melioidosis in Northern Territory of Australia, the diagnostic sensitivity was only 56% at admission, but 68% of those with negative titers subsequently seroconverted [21]. In endemic areas, specificity is limited by high levels of background seropositivity likely due to previous subclinical infections.

Infection may also be diagnosed presumptively using polymerase chain reaction (PCR). PCR may be available for clinical specimens; PCR of clinical specimens may yield unreliable results due to poor sensitivity and specificity [22].

Confirmatory testing is performed by designated Laboratory Response Network (LRN) laboratories by both culture and PCR. Sentinel laboratories (clinical, hospital, veterinary, commercial, etc.) send presumptive samples to their designated LRN Reference

laboratory for confirmatory testing. The LRN Reference lab is notified in advance to provide guidance on specimens that may be submitted for testing.

H. Clinical Management

Melioidosis requires prolonged antibiotic therapy and treatment consists of an intensive phase and an eradication phase [23, 24]. Acute phase therapy is generally characterized by treatment with intravenous (IV) antibiotics. Eradication phase therapy is generally characterized by treatment with oral antibiotics (e.g., TMP/SMX) for 3-6 months.

Treatment failure and death has been associated with bacteremia, respiratory failure, and renal failure [25].

Individuals with melioidosis should be managed in consultation with an infectious disease specialist.

Please see **Additional Resources** for additional information.

II. COUNCIL OF STATE AND TERRITORIAL EPIDEMIOLOGISTS (CSTE) MELIOIDOSIS SURVEILLANCE CASE DEFINITION (2023) [26]

Clinical Criteria

In the absence of a more likely diagnosis, at least one of the following signs or symptoms:

- Fever (temperature >38.0°C [100.4°F])
- Muscle aches
- Skin ulcer
- Skin nodule
- Skin abscess
- Pneumonia
- Headache
- Chest pain
- Anorexia
- Respiratory distress
- Abdominal discomfort
- Joint pain
- Disorientation
- Weight loss
- Seizure
- Organ abscess (liver, lung, spleen, prostate, or brain)
- Encephalomyelitis/meningitis/extra-meningeal disease

Laboratory Criteria

Confirmatory laboratory evidence:

- Isolation of *B. pseudomallei* from a clinical specimen

Presumptive laboratory evidence:

- Evidence of a fourfold or greater rise in *B. pseudomallei* antibody titer by indirect hemagglutination assay (IHA) between acute- and convalescent-phase serum specimens obtained at least two weeks apart, **OR**
- Evidence of *B. pseudomallei* deoxyribonucleic acid (DNA) (for example, by Laboratory Response Network [LRN]-validated nucleic acid amplification test) in a clinical specimen

Supportive laboratory evidence:

- Single *B. pseudomallei* total antibody titer of greater than or equal to 1:40 by serology in one or more serum specimens

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.

Other Criteria

A person whose healthcare record contains a recent diagnosis of melioidosis.

Vital Records Criteria

A person whose death certificate lists melioidosis as a cause of death or a significant condition contributing to death.

Epidemiologic Linkage

A person with at least one of the following findings:

- History of travel to or residence in a region endemic for melioidosis, **OR**
- Known exposure to *B. pseudomallei* as a result of intentional release or known product/source exposure (outside of laboratory), **OR**
- Known exposure to *B. pseudomallei* as a result of an occupational risk (i.e., laboratory exposure)

Criteria to Distinguish a New Case from an Existing Case

An infection would be counted as a new infection if a person is culture-positive within an 18-month time period with an isolate that is distinct from the previous infection by whole genome sequencing.

Note: Recurrent melioidosis can be defined as a re-presentation with B. pseudomallei culture-positive clinical disease occurring <18 months following initial diagnosis and after the time designated for treatment completion (both intravenous and oral phases) for the previous episode, irrespective of whether the patient was adherent to the therapy or initially lost to follow-up. Recurrent cases will not be counted as a new case for surveillance purposes. Epidemiological and exposure information can be used to determine if it is a new or recurrent infection, as can whole genome sequencing, if an isolate is available.

Case Classification

Confirmed

- Meets confirmatory laboratory evidence.

Probable

- Meets clinical criteria **AND** presumptive laboratory evidence **AND** epidemiologic linkage.
- Meets vital records criteria **AND** presumptive laboratory evidence **AND** epidemiologic linkage.
- Meets other criteria **AND** presumptive laboratory evidence **AND** epidemiologic linkage.

Suspect

- Meets clinical criteria **AND** supportive laboratory evidence **AND** epidemiologic linkage.
- Meets vital records criteria **AND** supportive laboratory evidence **AND** epidemiologic linkage.
- Meets other criteria **AND** supportive laboratory evidence **AND** epidemiologic linkage.

III. CASE SURVEILLANCE, INVESTIGATION, AND REPORTING

A. Purpose of Reporting and Surveillance

- To assist in the identification and treatment of melioidosis cases and determine where, when, and how they were infected
- To identify persons at potential risk, including those exposed in clinical or laboratory settings and to provide assistance in determining post-exposure prophylaxis and monitoring
- To identify melioidosis outbreaks
- To interrupt potential sources of ongoing transmission and to rule out possible bioterrorism

- To detect and monitor epidemiologic trends

B. Local Health Department (LHD) General Case Investigation Guidelines

- Begin the investigation as soon as *B. pseudomallei* is reported from a clinical laboratory or healthcare provider.
- Investigation of melioidosis will require obtaining a history of domestic and international travel to endemic areas (e.g., countries where *B. pseudomallei* has historically been endemic, Puerto Rico, U.S. Virgin Islands, Gulf Coast region of the Southern US) in the 21 days preceding onset as well as during the person's lifetime (due to risk of latent disease reactivation).
- Consider bioterrorism. *B. pseudomallei* is a potential bioterrorism agent; if multiple cases are identified who lack an epidemiologic link (e.g., travel history to an endemic region), consider the potential for a bioterrorism act, and follow appropriate local and state procedures.
- For cases that lack a history of travel to endemic areas, consider alternate sources of exposure (e.g., products imported from endemic regions or aquariums containing tropical fish).
- Conduct an assessment to determine if any laboratory or clinical exposures occurred (**Appendix A**).
- Educate potentially exposed persons, including laboratory personnel, on the need to monitor for signs and symptoms, potential serologic monitoring, and post-exposure prophylaxis if needed (**Appendix B**). If several workers are exposed at one laboratory, consider providing the laboratory with infection prevention education; the CDPH Microbial Diseases Laboratory (MDL) is available to assist/consult with laboratory biosafety information [27].
- Facilitate transport of specimen to the public health laboratory for confirmatory testing.
- For persons who require serologic monitoring following exposure, the LHD should ensure that labs are routed to CDC and have MDL listed on the submission form (DASH form).

C. Local Health Department Reporting

- Clinical laboratories are required to report suspected positive *B. pseudomallei* detection or isolation immediately to the appropriate Laboratory Response Network laboratory (LRN B).
- Please see **VII. Summary of Action Steps** for more details.
- For each case-patient identified, complete the following actions:
  - Enter the patient information into CalREDIE upon notification of the case by the clinical laboratory or healthcare provider; select "*Burkholderia pseudomallei* (melioidosis)" as "Disease Being Reported".
  - For jurisdictions not participating in CalREDIE (Extended Data Exchange Jurisdictions or EDEJs), confidential morbidity report (CMR) and case report data must still be provided, including information requested in the forms

provided in CalREDIE; jurisdictions may contact the CDPH Infectious Diseases Branch (IDB) (510-620-3434) for necessary forms (CDPH 8554).

- There is currently no case report form specifically for melioidosis. Enter information in the comments section that is necessary to correctly classify a melioidosis case: the presence of clinically compatible symptoms, epidemiologic links to other confirmed or suspected cases, laboratory results.
- Describe the patient's travel history, past medical history including potential immunocompromising conditions, and any current treatment. CDPH will provide additional resources including interview and laboratory exposure forms provided by the CDC.
- If laboratory or other clinical exposures have occurred, report to CDPH how many persons were exposed, the type of exposure, and type of monitoring/prophylaxis required.
- If human infection is associated with aquariums containing tropical fish, or if there are any melioidosis cases in animals, include the CDPH Veterinary Public Health Section (vetph@cdph.ca.gov) in notifications and messages to CDPH.

D. Laboratory Resources

Whenever a clinical laboratory receives a sample for laboratory diagnosis of *B. pseudomallei,* they are required to communicate immediately by telephone to the Infectious Diseases Laboratory Division of the California Department of Public Health (510) 412-3700.

Animal and Plant Health Inspection Service (APHIS)/U.S. Department of Agriculture (USDA) Form 3 must be reported if a laboratory release or exposure occurs.

IV. CASE MANAGEMENT AND PUBLIC HEALTH CONTROL MEASURES

A. Management of Cases

All patients with suspected melioidosis infection should be treated with standard precautions. Cases with draining wounds should ensure appropriate infection prevention and contact precautions, otherwise, there are no specific precautions needed.

B. Management of Contacts

- Laboratory exposure (Please see **Appendix B** for more details)
  - Determine what activities were performed that led to exposure and document and identify:
    1. Persons in laboratory at time of exposures(s),
    2. Where persons were located within the lab, and

3. What procedures were performed with the isolates and which biosafety measures were in place
   - Depending upon type of exposure (minimal but not zero risk, low risk, high risk), laboratory workers may require:
     1. No follow up,
     2. Symptom watch, or
     3. Symptom watch plus post-exposure prophylaxis monitoring and serologic monitoring (Please see **Appendix A** for more information)

Clinical exposures: In general, the risk to clinicians is low if standard precautions are followed. There may be increased risk to clinicians in performing higher risk activities that include handling of tissues with potentially high concentrations of *Burkholderia* organisms (e.g., abscess fluid), or exposure to aerosolized organisms without appropriate personal protective equipment during aerosol generating procedures.

Please see **Appendix A** for more information including how to characterize exposures how to monitor workers, and options for post-exposure prophylaxis.

C. Infection Control Measures

- Stress appropriate biosafety and personal protective equipment use in laboratory and clinical settings.

D. Special Situations

- Bioterrorism: *B. pseudomallei* is classified as a potential bioterrorism agent. The organism may be deliberately disseminated or may be aerosolized. Notify CDPH immediately via the CDPH Duty Officer phone (916-328-3605) should bioterrorism be suspected.

V. APPLICABLE STATE STATUTES AND REGULATIONS

A. California Code of Regulations, Title 17, Public Health, Sections 2500 and 2505:

- 2500: All outbreaks of melioidosis in California are required to be reported immediately to the LHD where the patient resides.
  - Melioidosis will be added to Title 17, 2500 as an immediately notifiable condition in 2024.
- 2505: Clinical, public health, and veterinary laboratories are required to report suspected melioidosis cases to the LHD where the patient resides within one hour after the laboratory notifies the health care provider or within hour from the time the laboratory notifies the referring laboratory that submitted the specimen.

VI. LHD SUMMARY OF ACTIONS STEPS: MELIOIDOSIS

Action	Specific Steps
☐ Begin investigation as soon as *B. pseudomallei* is reported from a clinical laboratory or healthcare provider	• For further guidance regarding your investigation, contact CDPH IDB (510-620-3434) during business hours and ask for the melioidosis subject matter expert (SME). • Review CDPH and CDC guidance and other resources as needed. • Coordinate routing of isolate to LRN laboratory for confirmatory testing. • Obtain and review clinical documentation and lab reports as applicable. • Contact patient for interview.
☐ Begin investigation into potential laboratory exposure immediately after a clinical or LRN laboratory reports a possible positive culture or PCR	• If *B. pseudomallei* is identified in culture, work with laboratory manager to determine if any workers were exposed (Appendix B). • If persons were exposed, ensure appropriate follow up with employee health for monitoring and post-exposure prophylaxis if needed (Appendix A). • For persons who require serologic monitoring following exposure, LHD should ensure that labs are routed to CDC. • Report those exposed to CDPH.
☐ Confirm case definition	• **Confirmed case** must have a positive culture from a clinical specimen. • **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 or positive LRN-validated PCR for *B. pseudomallei* DNA.

Action	Specific Steps
☐ Attempt to identify source of exposure	• Obtain a history of travel to endemic regions outside of the U.S. (e.g., Southeast Asia, Australia), and within the U.S. (including Puerto Rico, U.S. Virgin Islands, and Gulf Coast region of the Southern U.S.). • For cases that lack a history of travel to endemic areas, consider alternate sources of exposure (e.g., exposure to aquariums containing tropical fish or products imported from endemic regions). • Consider bioterrorism if there are multiple cases who lack a history of travel to endemic regions.
☐ Report to CDPH; both confirmed and probable melioidosis cases must be reported.	• Laboratories are required to report suspected melioidosis cases immediately to CDPH (MDL). • Create a CalREDIE incident for melioidosis within one working day of identification. • External Data Exchange Jurisdictions (EDEJ) must also complete CDPH form 8554. • All outbreaks of melioidosis are immediately reportable in California.

VII. REFERENCES

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VIII. ADDITIONAL RESOURCES

A. General Information and Educational Materials

- U.S. Centers for Disease Control and Prevention (CDC). About Melioidosis. https://www.cdc.gov/melioidosis/prevention/index.html
- American Public Health Association. [Melioidosis]. In: Heymann, David L., ed. Control of Communicable Diseases Manual. 20th Ed. Washington, DC. American Public Health Association; 2015:397-401.
- CDC Clinician Outreach and Communication Activity (COCA) Webinar – Melioidosis in the United States: What clinicians need to know following newly discovered endemicity. 2022, October 3. Centers for Disease Control and Prevention. https://emergency.cdc.gov/coca/calls/2022/callinfo_101322.asp

B. Post-Exposure Prophylaxis and Treatment

- Lipsitz R, Garges S, Aurigemma R et al. *Workshop on Treatment of and Postexposure Prophylaxis for Burkholderia pseudomallei and B. mallei Infection, 2010.* EID 2012; 18(12) online only. Available at: https://wwwnc.cdc.gov/eid/article/18/12/12-0638_article.
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C. Laboratory Guidelines

- Sentinel Level Clinical Laboratory Guidelines for Suspected Agents of Bioterrorism and Emerging Infectious Diseases – Glanders: Burkholderia mallei and Melioidosis: Burkholderia pseudomallei. https://asm.org/ASM/media/Policy-and-Advocacy/LRN/Sentinel%20Files/Burkholderia-Marc2016.pdf?ACSTrackingID=USCDC_2146-DM60633&ACSTrackingLabel=Lab%20Alert%3A%20Clinical%20Laboratory%20Burkholderia%20pseudomallei%20Notification&deliveryName=USCDC_2146-DM60633

Appendix A[1]
Laboratory Risk Assessment and Post-Exposure Prophylaxis (PEP) – *Burkholderia*

Laboratory Risk Assessment and Post-Exposure Prophylaxis (PEP) – Minimal Risk

Specimen Handling	Exposure Scenario	PEP	Follow-up/Monitoring
Routine clinical specimen (e.g., serum, cerebrospinal fluid)	• Person who manipulates a routine clinical specimen on an open bench with/without appropriate PPE, or in a Class II BSC without appropriate PPE. • Person present in the lab while routine clinical specimen is manipulated on an open bench, resulting in occurrence of aerosol-generating events.	None	May consider symptom watch
Routine clinical specimen (e.g., serum, cerebrospinal fluid)	• Person who manipulates a routine clinical specimen in a certified Class II biological safety cabinet (BSC), with appropriate personal protective equipment (PPE) (i.e., gloves, gown, eye protection). • Person present in the lab while someone manipulates a routine clinical specimen in a certified Class II BSC, or on an open bench where manipulation did not involve occurrence of aerosol-generating events.	None	N/A
Enriched material (e.g., a *Burkholderia* isolate, positive blood bottle)	• Person who manipulates enriched material or reproductive clinical specimen in a certified Class II BSC, with appropriate PPE (i.e., gloves, gown, eye protection). • Person present in the lab while someone manipulates enriched material or reproductive clinical specimen in a certified Class II BSC.	None	N/A

[1] *Adapted from Peacock S.J., et al. Management of accidental laboratory exposure to Burkholderia pseudomallei and B. mallei [online report]. Emerg Infect Dis 2008. CDPH adapted this document with permission from Minnesota Department of Health.*

Laboratory Risk Assessment and Post-Exposure Prophylaxis (PEP) – Low Risk

Specimen Handling	Exposure Scenario	PEP	Follow-Up/Monitoring
Enriched material (e.g., a *Burkholderia* isolate, positive blood bottle)	• Opening of the lid of an agar plate outside a biological safety cabinet (BSC). • Sniffing of an agar plate. • Splash event leading to visible contact of material with gloved hand or protected body, without evidence of aerosol. • Spillage of liquid culture (<1 mL) within a functioning BSC. • Contamination of intact skin with material.	Offer PEP** if independent risk factors* present. Discuss with health care provider (HCP).	Regular symptom watch (e.g., weekly) and daily self-fever checks through 21 days post-exposure, after last known exposure. Sequential serological monitoring at 0 (baseline), 1, 2, 4, and 6 weeks post-exposure, after last known exposure.

Laboratory Risk Assessment and Post-Exposure Prophylaxis (PEP) – High Risk

Specimen Handling	Exposure Scenario	PEP	Follow-Up/Monitoring
Routine clinical specimen (e.g., blood, serum, cerebrospinal fluid)	• Presence of any independent risk factor* without proper PPE. • Needle stick or other penetrating injury with contaminated implement. • Bite or scratch by experimental animal infected with *Burkholderia*. • Splash event leading to contamination of mucus membranes (e.g. eyes or mouth).	Offer PEP** for all high-risk exposures. Pregnant women should consult their obstetrician.	Regular symptom watch (e.g., weekly) and daily self-fever checks through 21 days post-exposure, after last known exposure. Sequential serological monitoring at 0 (baseline), 1, 2, 4, and 6 weeks post-exposure, after last known exposure.
Enriched material (e.g., a *Burkholderia* isolate, positive blood bottle)	• Presence of any independent risk factor* without proper PPE. • Splash event leading to contamination of mucus membranes (e.g. eyes or mouth). • Generation of aerosol outside BSC.	Offer PEP** for all high risk exposures. Pregnant women should consult their obstetrician.	Regular symptom watch (e.g., weekly) and daily self-fever checks through 21 days post-exposure, after last known exposure. Sequential serological monitoring at 0 (baseline), 1, 2, 4, and 6 weeks post-exposure, after last known exposure.

* Predisposing conditions: Diabetes mellitus, excessive alcohol consumption, chronic renal or hepatic disease, chronic lung disease, thalassemia, hematologic malignancy, neutropenia or neutrophil dysfunction, and any other immunocompromising condition (either by disease or drugs [e.g. steroids]).

** PEP recommendations: TMP-SMX, every 12 hours (if >60 kg body weight: 2x 960 mg. If 40-60 kg: 3x 480 mg. If <40 kg: 1x 960 mg or 2x 480 mg plus folate 5 mg/d). If isolate is non-susceptible to TMP-SMZ or if the person has contraindications to TMP-SMX: doxycycline (2.5 mg/kg every 12 hours) or amoxicillin-clavulanic acid (20/5 mg/kg every 8 hours) for 21 days.

Appendix B: Laboratory Exposure Interview [2]

Name: _____ Age: _____

Sex:

- ☐ M
- ☐ F

Pregnant?

- ☐ Yes
- ☐ No
- ☐ Unsure/don't know

Immunocompromised?

- ☐ Yes If yes, specify: _____
- ☐ No
- ☐ Unsure/don't know

Occupational Information

Type of facility:

- ☐ Hospital laboratory
- ☐ Research laboratory
- ☐ Commercial diagnostic laboratory
- ☐ Public health laboratory
- ☐ Other: _____

Job title:

- ☐ Laboratory technician
- ☐ Microbiologist
- ☐ Lab manager/supervisor/director
- ☐ Student
- ☐ Phlebotomist
- ☐ Other: _____

Type of laboratory:

- ☐ Microbiology
- ☐ Virology
- ☐ Pathology
- ☐ Other: _____

How long have you worked in this position?

_____ years or _____ months ☐ Unsure

Years of experience in this field:

_____ years or _____ months ☐ Unsure

_____

[2] *CDPH adapted this document with permission from Minnesota Department of Health.*

Exposure Information

Date	Worked with specimen in hood	Worked with specimen out of hood	Did not work with specimen and was ≤5 ft. away	Did not work with specimen and was >5 ft. away	Unsure	Type of Manipulation
						Opened culture plate ** (even without manipulating)
						Antibiotic resistance tests
						Blood culture bottle
						Break container
						Catalase test*
						Centrifuge setup or run*
						Examine growth on media
						Flaming loop
						Gram stain
						Inoculation of media
						Liquid suspension
						Oxidase test
						Sniff plate
						Sonicating*
						Spill media with culture*
						Splash media with culture*
						Subculture isolate
						Urea test
						Vortexing*
						Spotting for MALDI-TOF
						Apply matrix to MALDI-TOF**
						Putting plate in MALDI-TOF**
						Other:

* Manipulation classified as an aerosol generating procedure. Centrifuging is considered an aerosol generating event when performed without sealed carriers.

** May require further investigation or case by case evaluation.

☐ Splash event

If yes:

Contamination of mucus membranes? ☐ Y ☐ N
Aerosols generated? ☐ Y ☐ N

☐ Penetrating injury, describe:

_____

What personal protection equipment (PPE) were you wearing at the time? (check all that apply)

- ☐ Lab coat
- ☐ Gloves
- ☐ Eye Protection
- ☐ None
- ☐ Unsure/don't know

Risk Designation: ☐ High risk ☐ Low risk ☐ Minimal risk

PEP: ☐ Will begin PEP ☐ Declined PEP ☐ N/A

Serologic Monitoring (high and low risk):

- ☐ Will begin serologic monitoring
- ☐ Declined serologic monitoring
- ☐ N/A