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CDC HEALTH UPDATE

Distributed via the CDC Health Alert Network
October 22, 2021, 6:15 PM ET
CDCHAN-00455

Source Implicated in Fatal Case in Georgia: Multistate Outbreak of Non-travel Associated *Burkholderia pseudomallei* Infections (Meliodosis) in Four Patients: Georgia, Kansas, Minnesota, and Texas—2021

Summary

Testing at the Centers for Disease Control and Prevention (CDC) has identified the bacterial DNA of *Burkholderia pseudomallei* in an aromatherapy room spray in the home of the Georgia resident who was infected with and died from *Burkholderia pseudomallei* infection (meliodosis) in July 2021. This Georgia patient was the fourth meliodosis case in a cluster since March 2021 that involved three other patients in Kansas, Minnesota, and Texas, as described previously in [HAN Health Update 448: New Case Identified: Multistate Investigation of Non-travel Associated *Burkholderia pseudomallei* Infections \(Meliodosis\) in Four Patients: Georgia, Kansas, Minnesota, and Texas—2021](#) that CDC issued on August 9, 2021.

Based on genomic analysis, the four cases in Georgia, Kansas, Minnesota, and Texas in 2021 closely match, indicating they all most likely share a common source of exposure. Genomic analysis of the four patient isolates grouped closely with strains from South Asia. None of these cases had a history of traveling outside of the continental United States. The four cases include both children and adults; two are female, and two are male. The first case, which was fatal, was identified in March 2021 in Kansas. The second and third cases, identified in May 2021 in Minnesota and Texas, were hospitalized for extended periods before being discharged to transitional care facilities. The most recent case this July, in Georgia, involved a patient who died in the hospital. Post-mortem testing in late July 2021 identified meliodosis as a cause of death. Symptoms of meliodosis are varied and nonspecific, and may include pneumonia, abscess formation, blood infections, and neurological involvement. Due to its nonspecific symptoms, meliodosis can initially be mistaken for other diseases such as tuberculosis, which can delay proper treatment. *Burkholderia pseudomallei* may also be misidentified by some automated identification methods in laboratory settings.

The contaminated product identified by positive polymerase chain reaction (PCR) assay is the *Better Homes and Gardens-branded Essential Oil Infused Aromatherapy Room Spray with Gemstones “Lavender & Chamomile”* scent, manufactured in India. The spray was sold at Walmart between February and October 21, 2021, and was distributed in a limited number of stores and online nationwide. Whole genome sequencing results from the positive product sample are pending. This product was removed from stores and online marketplaces on October 21, 2021, and out of abundance of caution, the five other scents under the same brand were removed from Walmart marketplaces as well (Lemon & Mandarin, Lavender, Peppermint, Lime & Eucalyptus, and Sandalwood & Vanilla). Testing will be conducted on these additional scents as well. Recalls are being initiated by the Consumer Product Safety Commission and Walmart. CDC is working with the Kansas Department of Health and Environment, the Texas Department of State Health Services, the Minnesota Department of Health, the Georgia Department of Public Health, and federal partners to learn whether the other patients used the implicated product and if other products need to be further investigated. This investigation and response are ongoing, and CDC will share more information as it becomes available.

Background

Initial presentation for these four cases ranged from cough and shortness of breath to weakness, fatigue, nausea, vomiting, intermittent fever, and rash on the trunk, abdomen, and face. Two of the cases, one of them fatal, had several risk factors for melioidosis, including chronic obstructive pulmonary disease (COPD) and cirrhosis. The remaining cases had no known risk factors for melioidosis, though one case had a co-infection with SARS-CoV-2. Both pediatric cases had severe neurologic involvement.

Burkholderia pseudomallei, the causative agent of melioidosis, is a [Tier 1 select agent](#) that can infect animals and humans. Cases are most common in areas of the world with tropical and sub-tropical climates. The approximately one dozen cases reported to CDC annually predominantly occur in people returning from a country where the disease is endemic.

Melioidosis symptoms are nonspecific and vary depending on the type of infection. Melioidosis can present in a wide array of clinical syndromes with varying severity, including skin abscesses without fever, pneumonia, sepsis with multiple organ abscesses, sepsis without evident focus, genitourinary infection, and encephalomyelitis. Mortality varies depending on disease severity and clinical presentation, with case fatality ranging between 10 and 50% worldwide.¹ People with certain conditions are at higher risk of disease when they come in contact with the bacteria. The most common factors that make a person more likely to develop disease include diabetes, chronic kidney disease, chronic lung disease, chronic liver disease, excessive alcohol use, and cancer or immune-suppressing conditions other than HIV. Melioidosis is confirmed by culture. Testing must be conducted by trained personnel because some automated identification methods in clinical laboratories may misidentify *B. pseudomallei* as a different bacterium. For example, the isolate from the Texas case in this cluster was initially misidentified as *B. thailandensis* by MALDI-TOF.

Melioidosis is not considered to be transmitted person-to-person via air or respiratory droplets in non-laboratory settings. There have only been a few documented cases of person-to-person transmission. In disease-endemic areas, percutaneous inoculation is a common route for natural infection. However, in the context of this cluster, the route of transmission is most likely intranasal or inhalation of the contaminated room spray. Healthcare personnel are generally not at risk if they follow standard precautions when working with infected patients.² However, laboratory personnel are at increased risk because some lab procedures may aerosolize particles that could inadvertently release *B. pseudomallei* into the air. Laboratory personnel can reduce their risk of exposure by following safe laboratory practices and using BSL3 practices and procedures when handling suspect cultures.³ Laboratory staff who may have been exposed to *B. pseudomallei* should refer to existing CDC guidance.⁴

Recommendations for Consumers

People who have the Better Homes & Gardens Aromatherapy Room Spray “Lavender & Chamomile” with Gemstones product, or any of the other recalled scents with Gemstones (including Lemon & Mandarin, Lavender, Peppermint, Lime & Eucalyptus, and Sandalwood & Vanilla) in their homes should take the following precautions:

- Stop using this product immediately. Do not open the bottle. Do not throw away or dispose of the bottle in the regular trash.
- Double bag the bottle in clean, clear zip-top bags and place in a cardboard box. Return the bagged and boxed product to a Walmart store.
- Wash sheets or linens that the product may have been sprayed on using normal laundry detergent and dry completely in a hot dryer; bleach can be used if desired.
- Wipe down counters and surfaces that might have the spray on them with undiluted PineSol or similar disinfectant.
- Limit direct handling of the spray bottle and wash hands thoroughly after touching the bottle or linens. If gloves were used, wash hands afterward.
- If you used the product within the past 21 days and develop a fever or [other melioidosis symptoms](#), you should seek medical care and inform your doctor about your exposure to the

spray. If you do not have symptoms but were exposed to the product in the last 7 days, your doctor may recommend that you get antibiotics (post-exposure prophylaxis) to prevent infection.

Recommendations for Healthcare Providers

- Maintain high clinical suspicion for melioidosis diagnosis in patients with an [illness compatible](#) with melioidosis with an exposure history in the past 21 days to Better Homes & Gardens Aromatherapy Room Spray “Lavender & Chamomile” with Gemstones or similar products.
- Culture of *B. pseudomallei* from any clinical specimen is considered diagnostic for melioidosis. Recommended specimens for culture are guided by the clinical syndrome and include blood, sputum, urine, pus from skin and internal abscesses, joint aspirate, and cerebrospinal fluid. Throat swabs and rectal swabs inoculated into selective media increase diagnostic yield.
- When ordering specimen cultures to diagnose melioidosis, advise the laboratory that cultures may grow *B. pseudomallei*, and that appropriate laboratory safety precautions should be followed by the laboratory personnel.
- Consultation with infectious disease specialists is strongly recommended. Treat melioidosis with IV antibiotics (e.g., ceftazidime or meropenem) for at least two weeks. Depending on the response to therapy, IV treatment may be extended for up to eight weeks. Intravenous treatment is followed by oral trimethoprim-sulfamethoxazole (TMP/SMX) for three to six months to prevent relapse. Amoxicillin/clavulanic acid can be used in persons with a contraindication to, or who cannot tolerate TMP/SMX.⁵
- PEP guidance: Healthcare providers should offer postexposure prophylaxis (PEP) (Trimethoprim/sulfamethoxazole or Amoxicillin/clavulanic acid) to patients who were exposed to the *Better Homes and Gardens-branded Essential Oil Infused Aromatherapy Room Spray with Gemstones “Lavender & Chamomile”* scented product within the last seven days. At this time and out of an abundance of caution, PEP guidance also applies to the five other scents under the same brand (Lemon and Mandarin, Lavender, Peppermint, Lime & Eucalyptus, Sandalwood and Vanilla). Testing is underway to rule out contamination of these other scented aromatherapy products, and PEP guidance will be updated as more information becomes available.
 - Exposure is defined as:
 - being in the room while the product is being sprayed in the seven days before clinical consultation
 - having directly “sniffed” or inhaled from the product bottle in the seven days before clinical consultation
 - having direct contact with an item (such as pillowcases or other linens) on which the product has been sprayed in the seven days before clinical consultation.
 - High risk groups where PEP is highly recommended if exposed include:
 - Any child with no known risk factors who has directly “sniffed” or inhaled the product in the past seven days
 - Anyone with known risk factors for melioidosis which include diabetes, excessive alcohol use, chronic liver disease, chronic renal disease, chronic lung disease, cancer, or immune suppressing condition other than HIV. Diabetes is the most significant risk factor for melioidosis.
 - Lower risk groups where PEP may be considered if exposed include healthy adults with no known risk factors.
 - Patients who were exposed to the contaminated room spray more than seven days before the clinical encounter date and patients who were exposed within the past seven days but decide not to take PEP should be counseled to monitor or be monitored for [acute symptoms consistent with melioidosis](#) for the 21 days after their last exposure date.
 - For 95% of melioidosis cases, symptoms occur within 21 days from exposure; 5% of cases develop symptoms from latent infections past this 21-day exposure window. Although rare, an exposed person who develops [any of these acute symptoms](#) within 21 days of their last exposure should seek medical care.

- At this point serology testing is not warranted if PEP is offered due to exposure; if the patient is **symptomatic**, they should contact a primary health provider so specimens can be collected for culture if indicated.

Table: Postexposure prophylaxis for *Burkholderia pseudomallei*^{6,a}

Drug	Patient characteristics	Recommended dosage/frequency
Trimethoprim/sulfamethoxazole (co-trimoxazole) (dosing assumes normal renal function)	Adult, >60 kg	160 mg/800 mg tablets; two tablets every 12 h
	Adult, 40–60 kg	80 mg/400 mg tablets; three tablets every 12 h
	Adult, <40 kg	160 mg/800 mg tablets; one tablet every 12 h OR 80 mg/400 mg tablets; two tablets every 12 h
	Child	6 mg/30 mg per kg; maximum dose 320 mg/1600 mg every 12 h
OR Amoxicillin/clavulanic acid (co-amoxiclav)	Adult, >60 kg	500 mg/125 mg tablets; three tablets every 8 h ^b
	Adult, <60 kg	500 mg/125 mg tablets; two tablets every 8 h ^b
	Child	20 mg/5 mg per kg every 8 h; maximum dose 1000 mg/250 mg every 8 h

^a Duration of post-exposure prophylaxis is 21 days. If the organism is susceptible and the patient does not have a documented allergy to it, oral co-trimoxazole is the agent of first choice. If the organism is resistant to co-trimoxazole or the patient is intolerant, the second-line choice is co-amoxiclav.

^b Weight-based dosage based on 20 mg/5 mg per kg per dose.

Recommendations for Laboratorians

- Laboratory personnel are at increased risk for infection from clinical specimens because some lab procedures may aerosolize particles that could inadvertently release *B. pseudomallei* into the air. Laboratory personnel can reduce their risk of exposure by following safe laboratory practices and using BSL3 practices and procedures when handling suspect cultures.³ Laboratory staff who may have been exposed to *B. pseudomallei* should refer to existing CDC guidance.⁴
- For clinical specimens, laboratory testing involving automated identification algorithms (e.g., MALDI-TOF, 16s, VITEK-2) may misidentify *B. pseudomallei* as another bacterium. The isolate from the Texas case was initially misidentified as *B. thailandensis* by MALDI-TOF. Consider re-evaluating patients with isolates identified on automated systems as *Burkholderia* spp. (specifically *B. cepacia* and *B. thailandensis*), *Chromobacterium violaceum*, *Ochrobactrum anthropi*; and, possibly, *Pseudomonas* spp., *Acinetobacter* spp., and *Aeromonas* spp.
- If *B. pseudomallei* is identified or an organism is suspicious for *B. pseudomallei*, contact your state or local public health department immediately. The health department can facilitate forwarding the isolate for confirmation to the closest reference laboratory and initiate a public health investigation.

For More Information

- [CDC Updates on this Outbreak](#)
- CPSC Product Recall: [Walmart Recalls Better Homes and Gardens Essential Oil Infused Aromatherapy Room Spray with Gemstones Due to Rare and Dangerous Bacteria; Two Deaths Investigated | CPSC.gov](#)
- Visit [CDC-INFO](#) or call CDC-INFO at 1-800-232-4636

- CDC 24/7 Emergency Operations Center (EOC) 770-488-7100
- CDC Bacterial Special Pathogens Branch: email bspb@cdc.gov or call 404-639-1711
- [Signs and Symptoms | Melioidosis | CDC](#)
- Sample Submission Information: [Zoonoses and Select Agent Laboratory \(ZSAL\) | Bacterial Special Pathogens Branch | DHCPP | NCEZID | CDC](#)
- Contact your [health department](#) if you have any questions or suspect a patient may be infected with *Burkholderia pseudomallei*.
- **Kansas**
Kansas Department of Health and Environment
KDHE.EpiHotline@ks.gov or 877-427-7317
- **Minnesota**
Health.communications@state.mn.us or 651-201-4989
- **Texas**
[Disease Reporting Contacts](#)
[Laboratory Response Network](#)
- **Georgia**
Georgia Department of Public Health: 404-657-2588

References

¹ Epidemiology of Melioidosis:

[Cheng, A. C. & Currie, B. J. Melioidosis: epidemiology, pathophysiology, and management. Clin. Microbiol. Rev. 18, 383–416 \(2005\)](#)

² Precautions for Healthcare Providers:

[Healthcare Response Activities | Melioidosis | CDC](#)

³ Biosafety in Microbiological and Biomedical Laboratories:

[Biosafety in Microbiological and Biomedical Laboratories—6th Edition \(cdc.gov\)](#)

⁴ Management of laboratory exposures:

[Management of Accidental Laboratory Exposure to *Burkholderia pseudomallei* and *B. mallei* – Volume 14, Number 7—July 2008 – Emerging Infectious Diseases journal – CDC](#)

⁵ Treatment of Melioidosis:

- [Sullivan RP, Marshall CS, Anstey NM, et al. 2020 Review and revision of the 2015 Darwin melioidosis treatment guideline; paradigm drift, not shift. PLOS Neglected Tropical Diseases](#)
- [Workshop on Treatment of and Postexposure Prophylaxis for *Burkholderia pseudomallei* and *B. mallei* Infection, 2010 – Volume 18, Number 12—December 2012 – Emerging Infectious Diseases journal – CDC](#)
- [Melioidosis | Nature Reviews Disease Primers](#)

⁶ Postexposure prophylaxis for *Burkholderia pseudomallei*:

[Workshop on Treatment of and Postexposure Prophylaxis for *Burkholderia pseudomallei* and *B. mallei* Infection, 2010](#)

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