



Outbreak Investigation of *Burkholderia cepacia* Linked to Contaminated Ultrasound Gel

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Background*

Burkholderia cepacia complex (Bcc) is a group of aerobic, non-fermenting gram-negative bacilli comprising at least 20 species.¹ It is widely distributed in the environment and isolated from water, soil, vegetables and fruits.²⁻³ The spectrum of infections caused by Bcc are bloodstream infections, pneumonia, urinary tract infections, septic arthritis and peritonitis.⁴ Its ability to grow in nutrient-poor water and survive in disinfectants accounts for Bcc outbreaks in hospitals. Bcc is also a multidrug-resistant organism, intrinsically resistant to polymyxins, aminoglycosides, first- and second-generation cephalosporins and antipseudomonal penicillins.⁵

Historical Outbreaks Related To:

- IV Fentanyl from compounding pharmacy, 2012⁶
- Eye drops, 2014⁷
- Saline Flushes, 2016⁸
- Liquid docusate, 2016⁹
- Octenidine mouthwash solution, 2018¹⁰

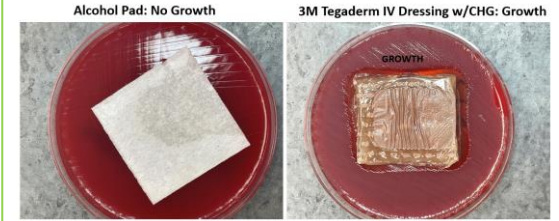
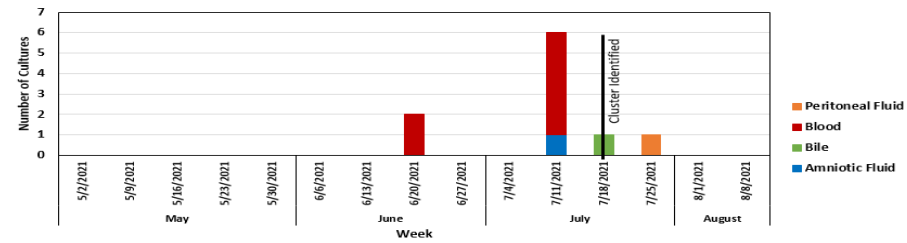
*Please see handout for references



Outbreak Initiation

Increase in Non-Respiratory isolates of Bcc mid-July 2021 identified simultaneously by Infectious Disease, Microbiology, and Infection Prevention

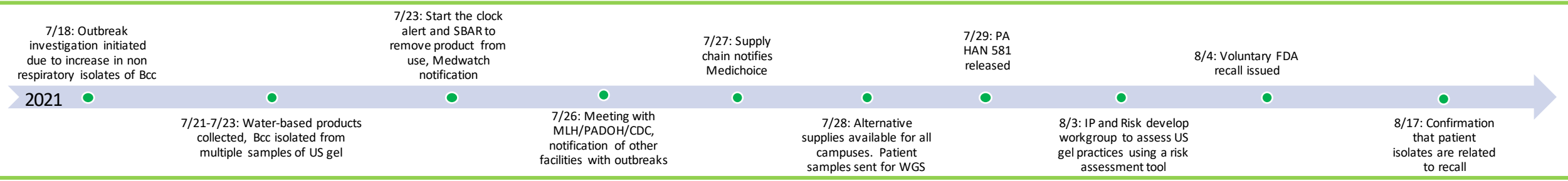
B.cepacia Epi Curve



Experiment 1 shows that Bcc growth is inhibited by 70% alcohol prep pad, but growth is not inhibited by 2% CHG impregnated dressing



PROCEDURAL GUIDELINES FOR TRANSDUCER CLEANING AND PREPARATION



Methods	Results
Chart reviews to identify patient risk factors	Ultrasound guided procedures identified as commonality among patients
Review of culture data January 2021-present	Culture review revealed no non-respiratory isolates prior to June 25th
Literature search for history of outbreaks involving Bcc	Literature search led to investigation of water-based items
Staff interviews conducted about products and practices	Staff mentioned that US gel liquifies after time
Microbiology cultured various water-based products	7 of 12 opened bottles of US gel grew 4+ pure culture of Bcc, 6 unopened bottles were no growth
Microbiology conducted several experiments to determine if current skin prep products inhibit growth of Bcc	Bcc growth was inhibited by alcohol but not CHG alone. Chloraprep (2% CHG and 70% alcohol) also inhibited growth.
Ten patient isolates of Bcc submitted for whole genome sequencing (WGS)	WGS linked all patients to a nationwide outbreak
IP/Risk form a multi-departmental system team of those performing US guided procedures	Team created a risk assessment tool, researched best practices, and developed an annual training

Discussion

- This investigation highlighted the need for clear guidance on correct utilization of sterile vs non-sterile gel and sterile probe covers
- Following infection prevention best practice guidelines may significantly reduce the risk of transmission from a contaminated bottle of US gel
- It is vital to discard US gel within 28 days of opening to reduce risk of using contaminated products¹¹
- Following manufacturer's instructions for cleaning and disinfection of US probes and equipment may help prevent cross contamination

Ongoing Work

- Annual computer-based training on best practices to prevent infection when using ultrasound gel now required for staff using US gel
- Increased rounding to ensure US gel is labeled upon first use and discarded after 28 days

Acknowledgements

This outbreak investigation, identification of source, quick product turnaround, and staff education would not have been possible without the collaborative efforts of the multiple departments at Main Line Health including Infection Prevention, Infectious Disease, Supply Chain, Vascular Access Team, Microbiology Lab, Risk Management, Hospital Administration, Hospital IP Champs, and Hospital Educators, as well as the PA Department of Health, CDC, and the University of Michigan Health System lab

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