



# MOBILIZING A FULL RESPONSE

Determination of a Carbapenem-Resistant *Acinetobacter baumannii*  
Outbreak in the Surgical ICU Using epiXact

## BACKGROUND

Over several months, three patients were found to have carbapenem-resistant *Acinetobacter baumannii* (CRAB) in the surgical intensive care unit (SICU) of a large academic hospital. The first patient was diagnosed within 48 hours of admission. Over a month later, a second patient was diagnosed with CRAB, also within two days of admission. Infection Control performed a review of the two cases but could not determine whether they were hospital-acquired infections (HAIs), or if the CRAB was brought in from the community. Nonetheless infection control practices were audited and reinforced. After a third patient presented with CRAB several weeks later, again within 2 days of admission, expanded infection control procedures were introduced to control the putative outbreak.

*The percentage of  
A. baumannii isolates  
resistant to carbapenems  
increased from  
21% in 2003-2005 to  
48% in 2009-2012<sup>1</sup>*

## The High Stakes Decision

A CRAB outbreak in the Surgical ICU required a full and immediate response. However, the unusually rapid presentation within 48 hours after admission from patients diagnosed months apart made it difficult to conclude if the CRAB infections were acquired in the hospital or brought in from the community.

Case reviews performed for the first two patients did not indicate a clear source for the infections, but the third patient brought additional urgency to the investigation. The infection control team was working diligently to identify a source for the infections and to develop strategies for a more aggressive response. Clear and compelling evidence demonstrating this was truly a hospital-acquired infection rather than different community strains was considered important to getting hospital-wide agreement on the interventions, which included the possibility of environmental sampling, room closings, and expanded cleaning procedures for rooms and equipment.

*Infections with  
carbapenem-resistant  
A. baumannii have  
been associated  
with death rates  
as high as 52%<sup>1</sup>*

## Solution

The Infection Control team contacted Day Zero Diagnostics to request an epiXact investigation of the patient isolates. Within 2 days of receiving the samples, the epiXact service provided whole genome sequencing data and analysis that confirmed that all three CRAB isolates were clonal. With this definitive confirmation, the hospital moved quickly to close specific rooms in the SICU and to perform an environmental analysis of potential sources. In a follow-up analysis, additional environmental samples were sequenced to confirm the sources of infection.

## Outcome

Rapid, definitive data confirming hospital transmissions resulted in quick decisions by the hospital with full agreement and commitment from the leadership of the SICU, environmental services, and hospital staff. Expanded cleaning procedures of rooms and equipment as well as changes to cleaning procedures for problematic equipment such as bed attachments and mobile equipment were implemented.

1. Bulens SN et al. Carbapenem Nonsusceptible *Acinetobacter baumannii*, 8 US Metropolitan Areas, 2012-2015. *EID Journal*, Vol 24:4, April 2018.  
Disclaimer: Details of the project may have been omitted or changed to clarify the use case and to ensure confidentiality.

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