A challenging *Burkholderia* outbreak investigation across multiple units at an academic medical center from June 2017 to February 2018

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**BACKGROUND**

- Most outbreak investigations involve short-term, geographically localized clusters or a point source of infection.
- *Burkholderia* outbreaks in the nosocomial setting are not an infrequent occurrence, and often originate from contaminated medications or medical products.
- We describe a prolonged *Burkholderia* outbreak at our institution not related to a point source of infection.

**METHODS**

- An investigation was conducted at a 738-bed tertiary care academic medical center in New York City.
- Epidemiologic interventions included review of cases and surveillance of asymptomatic patients and the local environment. A case control study was also conducted examining hypothesized risk factors for acquisition (see Poster 1257).
- *Burkholderia* isolates were genotyped using pulsed field gel electrophoresis (PFGE) and recA gene sequencing. Initial isolates were also sent to a national reference laboratory for multiplex sequence typing (MLST).

**RESULTS**

- From 6/2017 - 2/2018, 32 patients on 12 distinct units (see Figure 1) had one or more positive cultures for outbreak strains of *Burkholderia* cenocepacia. 29/32 (91%) patients had positive respiratory cultures, most of which were clinical pneumonias while others represented asymptomatic colonization. 3/32 (9%) patients had bacteremia. 30-day mortality was 5/30 (17%).
- Molecular analysis revealed that the majority of *Burkholderia* cultures during this time period were due to transmission of two distinct isolates (see Table 1). recA allele typing showed 100% concordance with PFGE results.
- Analysis of isolates by a reference laboratory revealed that both outbreak strains had not been previously described, and appeared to be unique to our institution.

**CONCLUSIONS**

- Ventilator cleaning practices were then investigated. Routine cleaning of ventilators after patient use was reinforced with respiratory staff.
- The following epidemiologic interventions were made to minimize the potential for transmission of *Burkholderia* between patients or to the environment:
  - Ensuring a sterilization process for ventilator temperature probes, which are used in heated humidification
  - Using disposable manometers on contact isolation patients
  - Reinforcing the cleaning of ventilators that reside outside of patient rooms, including those in radiology suites, after each use
- Incident cases subsided over the following months, though are still intermittently seen.

**Table 1. Molecular typing of Burkholderia species outbreak strains**

<table>
<thead>
<tr>
<th>Affected Patients</th>
<th>Species</th>
<th>PFGE Pattern</th>
<th>recA Allele</th>
<th>MLST Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outbreak strain 1</td>
<td>21</td>
<td>Burkholderia cenocepacia</td>
<td>A</td>
<td>365</td>
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<tr>
<td>Outbreak strain 2</td>
<td>11</td>
<td>Burkholderia cepacia</td>
<td>C</td>
<td>53</td>
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