



# EPI UPDATES

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## Joint KDHE & CDC Investigation into a Cluster of *Burkholderia cepacia complex* in a Hospital

By Amy Peterson

On July 5, 2011 the Kansas Department of Health and Environment (KDHE) was notified of a possible cluster of healthcare-associated *Burkholderia cepacia complex* (Bc) infections among patients in the surgical intensive care unit (SICU) of an acute care hospital. *Burkholderia complex* bacteria are often found in water and can also cause infections in critically-ill patients. Healthcare-associated outbreaks have been linked to intrinsic and extrinsic contamination of medical products and to suboptimal infection prevention practices among healthcare personnel. Infection and colonization with this bacterium is more commonly reported in patients with cystic fibrosis (CF).

Hospital A requested assistance following a perceived increase in Bc infections in the SICU among patients without CF. While individual cases of infection or colonization with this organism can occur, any cluster of infections warrants an investigation. We sought to understand the epidemiology and source of Bc

infections, and to provide recommendations to prevent additional cases.

Our initial investigation found a total of 11 positive cultures for Bc since November, 2010. Of these cases, 10 were further identified based on their DNA profile, 5 were closely related and the remaining 5 typed isolates represented 4 other distinct species. Because of the complexity of this outbreak, with multi-clonal reported cases spread out over a year, an Epi-Aid was called to bring in additional support from the Centers for Disease Control and Prevention's Division of Healthcare Quality Promotion (DHQP) from November 8 through 16, 2011. The goals of the investigation were to: 1) Understand the context of this cluster by characterizing cases of Bc at Hospital A during the past two years; 2) Conduct a case-series analysis of Bc at Hospital A and determine any epidemiological links among cases; 3)

(Continued on page 2)

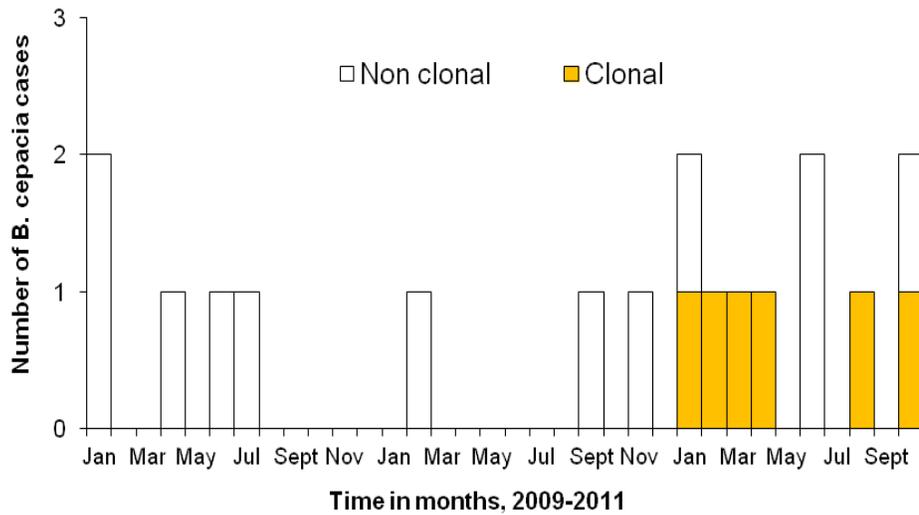
## CALENDAR OF UPCOMING EVENTS:

### Epi-Trax Regional Training

**When:** January - February  
**Where:** There will be an onsite training held in each BT Region  
**Details:** Please register on KS TRAIN <https://ks.train.org/DesktopShel.aspx> under Course ID 1030847. Susan can be contacted for more information at 785-296-7732 or [ksedssadmin@kdheks.gov](mailto:ksedssadmin@kdheks.gov)

Have an upcoming event you would like included in the next issue? Contact [vbarnes@kdheks.gov](mailto:vbarnes@kdheks.gov) with details.





**Figure 1: Epi-curve of *B. cepacia* cases among non-cystic fibrosis patients cultured > 48 hours after admission by PFGE pattern from January 2009–**

biochemical methods and typed by repetitive-element PCR fingerprinting.

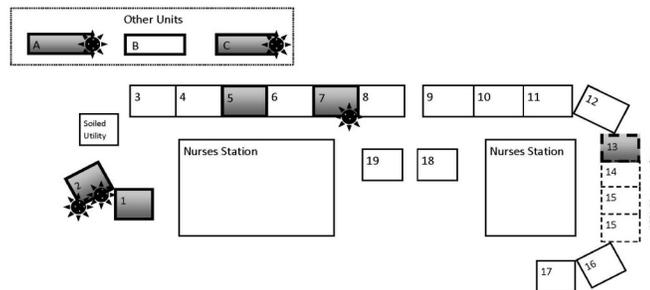
From January 2009–October 2011, 19 cases of Bc were detected from microbiology records of all cultures performed on patients without CF who had been in the hospital more than 48 hours at time of culture (Figure 1); 10/19 (53%) occurred in 2011 and were typed. As indicated in figure 1, all clonal cases (in yellow) occurred between January and October of 2011. Among cultures with molecular typing available, 7/10 (70%) were from patients residing in the SICU. Cases from the SICU clustered geographically within one end of the unit (Figure 2). Among SICU cases, 4 were clonally-related and were identified as *B. contaminans*; all 4 cultures came from respiratory sources such as sputum or bronchial alveolar lavage among mechanically-ventilated patients. Infection prevention observations detected a hand hygiene failure rate of 40% (73/184). Improper cleaning and disinfection of shared equipment was also noted, and improper care of nebulizer cups was also observed. Nebulizer cups were cleaned with tap water and stored while still moist. This could potentially allow for an organism found in water to grow. Bc was isolated from sinks in 2 (14%) patient rooms out of 14 total environmental swabs. Molecular confirmation and typing of these results is still pending at this time.

A review of Bc isolates from Hospital A suggested an increase in culture-positive patients with Bc beginning in January 2011; this increase was associated with a clonal cluster primarily located in the SICU. Suboptimal infection prevention practices might have led to environmental source contamination of patient supplies, and subsequent colonization or infection of patients. Ongoing laboratory testing of environmental samples will guide final recommendations based on these findings. Preliminary recommendations have already been made and disseminated to Hospital A.

Conduct observations of infection prevention practices within the unit; and 4) Perform environmental sampling of surfaces and water from patient care areas identified as high-risk through the case-series analysis.

During the Epi-Aid investigation in November 2011, Hospital A microbiology and medical records of case-patients were reviewed. A case was defined as colonization or infection with an isolate of a clonally-related Bc in a patient >48 hours post-admission. Infection prevention practices were observed and environmental swabs obtained from patient-care areas. Patient isolates were identified by conventional

| Patient: 1 |                     | Patient: 2 |                     | Patient: 3 |                     | Patient: 4 |                     | Patient: 5 |                     |
|------------|---------------------|------------|---------------------|------------|---------------------|------------|---------------------|------------|---------------------|
| Room       | Transferred In Date |
| A          | 12/25/2010          | 1          | 1/3/2011            | 2          | 2/25/2011           | 13         | 4/3/2011            | 5          | 7/9/2011            |
| Cultured * | 1/10/2011           | 7          | 1/31/2011           | Cultured * | 3/5/2011            | B          | 4/5/2011            | C          | 7/29/2011           |
|            |                     | Cultured * | 2/2/2011            |            |                     | 2          | 4/6/2011            | Cultured * | 8/4/2011            |
|            |                     |            |                     |            |                     | Cultured * | 4/17/2011           |            |                     |



**Figure 2: Geographic Distribution of Clonal Cases in Hospital A, January 2011–October 2011**

| Breakdown of the 583 Cases* in KS-EDSS by Disease                                   | Nov. 2011 | Average 08-10 |
|---|-----------|---------------|
| Amebiasis ( <i>Entamoeba histolytica</i> )  | 1         | 1             |
| Animal Bite; Potential Rabies Exposure  | 2         | 0             |
| Calicivirus/Norwalk-like virus (norovirus)  | 12        | 32            |
| Campylobacter Infection ( <i>Campylobacter</i> spp.)                                | 49        | 28            |
| Cryptosporidiosis ( <i>Cryptosporidium parvum</i> )                                 | 15        | 8             |
| Ehrlichiosis; <i>Anaplasma phagocytophilum</i>                                      | 1         | 1             |
| Ehrlichiosis; <i>Ehrlichia chaffeensis</i>  | 2         | 1             |
| Enterohemorrhagic <i>Escherichia coli</i> O157                                      | 5         | 3             |
| Enterohemorrhagic <i>Escherichia coli</i> shiga toxin positive (not serogrouped)    | 5         | 1             |
| Enterohemorrhagic <i>Escherichia coli</i> shiga toxin positive (serogroup non-O157) | 4         | 1             |
| Giardiasis ( <i>Giardia lamblia</i> )   | 23        | 12            |
| Hepatitis A   | 44        | 28            |
| Hepatitis B; acute  | 8         | 9             |
| Hepatitis B; chronic  | 50        | 32            |
| Hepatitis B; perinatal infection  | 1         | 0             |
| Hepatitis C virus infection; past or present  | 145       | 157           |
| Legionellosis   | 2         | 3             |
| Lyme Disease ( <i>Borrelia burgdorferi</i> )  | 12        | 12            |
| Malaria ( <i>Plasmodium</i> spp.)   | 4         | 1             |
| Meningitis; other bacterial   | 4         | 0             |
| Meningococcal Disease ( <i>Neisseria meningitidis</i> )                             | 3         | 1             |

| Breakdown of the 583 Cases* in KS-EDSS by Disease                 | Nov. 2011 | Average 08-10 |
|---|-----------|---------------|
| Mumps   | 3         | 3             |
| Non-Reportable Condition  | 2         | 0             |
| Pertussis (Bordetella pertussis)(Whooping cough)                  | 36        | 41            |
| Q Fever (Coxiella burnetti); Acute                                | 1         | 0             |
| Q Fever (Coxiella burnetti); Chronic                              | 1         | 0             |
| Rabies; Animal  | 2         | 4             |
| Salmonellosis (Salmonella spp.)                                   | 38        | 24            |
| Shigellosis (Shigella spp.)                                       | 7         | 20            |
| Spotted Fever Rickettsiosis (RMSF)                                | 11        | 6             |
| Streptococcal Disease; Invasive; Group A (Streptococcus pyogenes) | 3         | 1             |
| Streptococcus pneumoniae; invasive                                | 17        | 11            |
| Transmissible Spongiform Enceph (TSE / CJD)                       | 2         | 2             |
| Tularemia (Francisella tularensis)                                | 1         | 1             |
| Typhoid Fever (Salmonella typhi)                                  | 1         | 1             |
| Varicella (Chickenpox)  | 61        | 57            |
| West Nile; non-neurological (includes WN Fever)                   | 5         | 5             |

*\*Cases reported include cases with the case classifications of Confirmed, Probable, Suspect, and Not a Case*

*\*\* Increase in Hepatitis A, Total laboratory reports submitted to KDHE, not an increase in actual cases of Hepatitis A*

Please visit us at:  
[www.kdheks.gov/epi](http://www.kdheks.gov/epi)



## KS-EDSS DATA QUALITY INDICATORS

**K**DHE BEPHI emailed local health department users and administrators their county level quality indicator data this month. The Bioterrorism Regional Coordinators also received a copy of the regional breakdown of the quality indicators. At this time the report included the county's preliminary data for the previous month. We hope to improve this process by adding a second report that will compare preliminary month data with final data. For example, for August local health departments would receive one report that includes preliminary numbers for July data and a second report with June preliminary completion data side-by-side with June final data (We will pull a June report August 1st with the assumption that all June cases should have the basic quality indicator fields completed at this point.) Please email [vbarnes@kdheks.gov](mailto:vbarnes@kdheks.gov) if you received an incorrect report, have questions, or believe you should have received a report but did not.

Fields in **bold blue** have improved since the previous month. Frequency of completion has declined in *italic brown* fields. All other fields in have not changed since the previous month. - Virginia Barnes

\*Calculations do not include Hepatitis B, chronic or Hepatitis C, chronic (denominator: 388 cases).

\*\* Out-of-state cases not included in this calculation.

# Animal rabies not included in this calculation (den: 581 cases).

† Unknown considered incomplete.

†† Only diseases with supplemental forms included in this calculation

**KDHE Mission:**  
 To Protect and Improve the  
 Health and Environment of all  
 Kansans  
**Our Vision**  
 Healthy Kansans living in safe  
 and sustainable environments.

| <b>NOVEMBER 2011</b>       |                  | State's Total Case =<br>583 |
|----------------------------|------------------|-----------------------------|
| KS-EDSS Indicator          | Field Completed: | Percent Complete:           |
| Address Street             | 494              | 85% **, #                   |
| Address City               | 564              | 97% **                      |
| Address County             | 583              | 100% **                     |
| Address Zip                | 559              | 96% **                      |
| Date of Birth              | 580              | 99% #                       |
| Died                       | 308              | 53% †                       |
| Ethnicity                  | 353              | 61%, #, †                   |
| Hospitalized               | 304              | 52%, #, †                   |
| Imported                   | 210              | 36%                         |
| Onset Date                 | 186              | 35% *, #                    |
| Race                       | 381              | 65%, #, †                   |
| Sex                        | 583              | 100%, #, †                  |
| Supplemental Form Complete | 238              | 57% ††                      |
| Supplemental Form Partial  | 180              | 43% ††                      |