Laboratory Standards Institute (CLSI) recommends contamination rates should be <3%, yet our Emergency Department (ED) rate is consistently above this benchmark. Reasons for this are unclear, thus it is imperative to investigate potential risk factors for BCx contamination.

Methods. We performed a retrospective case-control risk factor analysis of patients with BCx collected in our ED between 2014 and 2018. Contaminated BCxs were identified by the microbiology laboratory per American Society of Microbiology recommendations. Demographics, comorbidities, and clinical characteristics were evaluated in patients with false-positive/contaminated BCxs (cases) and patients with negative BCxs (controls). Potential risk factors identified in univariate analysis were included in a logistic regression model. Unadjusted and adjusted analyses were performed using SAS 9.4.

Results. 25,668 BCxs from 13,782 patients were included in analysis. 20,907 BCxs from 11,266 (82%) patients were negative, 2,856 BCxs from 1,504 (11%) patients were true positives, and 1,905 BCxs from 1,012 (7%) patients were contaminated. Yearly ED contamination rates ranged from 5.0–9.3%. Collector contamination rates varied, though 38 (18%), 75 (35%), and 7 (3%) of 299 collectors had a contamination rate ≥3%, ≥10%, and ≥20%, respectively. Significant patient-specific risk factors identified in univariate analysis are listed in the attached table along with adjusted analysis.

Conclusion. In our analysis, we identified that older age, African American race, higher BMI, COPD, paralysis, and presenting in septic shock independently increases risk of having a contaminated BCx. Difficulty obtaining venipuncture in patients with these risk factors, often requiring multiple collection attempts, likely leads to decreased sterile technique. It is imperative to have a process assure sterile technique in these high-risk individuals to minimize consequences associated with having a false-positive BCx result in these high-risk patients. Additionally, variable collector contamination rates seen in this study highlight the necessity for frequent technique in-service training.

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2014. Assessment of Cost, Morbidity, and Mortality Associated with Blood Culture Contamination
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Session: 235. Antibiotic Stewardship: Diagnostics and Diagnostic Stewardship Saturday, October 5, 2019: 12:15 PM

Background. Blood cultures are the primary diagnostic tool for bloodstream infection, but accuracy of results is dependent on collection technique. Decreased blood culture contaminations is a priority for antimicrobial stewardship programs as false positives can expose patients to adverse effects of unnecessary antibiotics. In this study, we present an analysis comparing clinical outcomes and cost associated with false-positive and true negative blood cultures at our institution.

Methods. We conducted a single-center, retrospective, case-control study in patients admitted following blood culture collection in the emergency department from 2014 to 2018. Demographic and clinical characteristics were evaluated in patients with false-positive blood cultures (cases) and negative blood cultures (controls). Contaminants were identified per American Society of Microbiology recommendations. Clinical outcomes were compared between cases and controls, and adjusted analyses were performed with logistic regression, linear regression, and generalized linear models controlling for age, race, body mass index, and sepsis. Statistical analysis was performed using SAS 9.4.

Results. A total of 1,102 cases and 11,266 controls were included in analysis. All clinical outcome measures were significantly higher in patients with contaminated blood cultures (see table). Select clinical outcomes remained significant when controlling for potential confounders.

Conclusion. To the best of our knowledge, this is the largest study evaluating the clinical and financial impact of blood culture contamination with inclusion of >1,000 cases during a 5-year period. Our study shows that blood culture contamination is associated with increased length of stay, unnecessary exposure to antibiotics and procedures, development of antibiotic-associated adverse events, and higher hospital charges as reported in smaller studies. However, this study is the first to the best of our knowledge reporting increased mortality associated with blood culture contamination. Implementation of innovative strategies to reduce contamination should be pursued. Antimicrobial stewardship programs should prioritize identification of contaminants and rapid de-escalation of inappropriate antibiotics in these patients to improve patient care.

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Table: Clinical Outcomes Comparing Contaminated vs. Negative Blood Cultures

| Category                        | Cases (Contaminants) | Controls (True-Negatives) | Unadjusted Analysis | Adjusted Analysis |
|--------------------------------|----------------------|---------------------------|---------------------|------------------|
| Length of Stay (d)             | ≥3                   | <3                        | p value             | p value          |
| Mean (d)                       | 7.9 (9.3)            | 6.4 (7.3)                 | <0.0001             | <0.0001          |
| Length of Therapy (d)          | ≥6                   | <6                        | p value             | p value          |
| Mean (d)                       | 6.2 (12.2)           | 5.3 (10.5)                | <0.0001             | <0.0001          |
| Vanc ordered (n, %)            | 829 (61.5)           | 751 (64.9)                | <0.0001             | N/D              |
| Vanc length of Therapy (d)     | ≥6                   | <6                        | p value             | p value          |
| Mean (d)                       | 5.5 (4.0)            | 2.5 (3.6)                 | <0.0001             | N/D              |
| Acinet ordered (n, %)          | 374 (26.5)           | 292 (26.3)                | 0.1046              | 0.1046           |
| Acinet length of Therapy (d)   | ≥6                   | <6                        | p value             | p value          |
| Mean (d)                       | 16.0 (16.0)          | 14.7 (15.3)               | <0.0001             | N/D              |
| Cefoxitin ordered (n, %)       | 162 (11.3)           | 147 (12.9)                | 0.0956              | N/D              |
| Cefoxitin length of Therapy (d)| ≥6                   | <6                        | p value             | p value          |
| Mean (d)                       | 277 (24.3)           | 213 (19.2)                | <0.0001             | <0.0001          |
| Gentamicin ordered (n, %)      | 144 (10.3)           | 67 (6.0)                  | <0.0001             | N/D              |
| Gentamicin length of Therapy (d)| ≥6                   | <6                        | p value             | p value          |
| Mean (d)                       | 19.1 (19.1)          | 12.1 (12.1)               | <0.0001             | N/D              |
| In-hospital Mortality (%)      | 81 (6.0)             | 521 (4.6)                 | <0.0001             | N/D              |
| In-hospital Hospitalization (%)| 63 (4.8)             | 624 (5.5)                 | <0.0001             | N/D              |
| Hospital Charges (d)           | ≥6                   | <6                        | p value             | p value          |
| Mean (d) USD                   | 36,006 (32,244)      | 28,673 (46,291)           | <0.0001             | <0.0001          |

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2015. Minimal Impact of Blood Culture Contaminants on Patient Care Decisions May Limit Cost-Effectiveness of Interventions to Reduce Contamination Rates
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Background. High blood culture (BC) contamination rates have been associated with increased healthcare cost, antimicrobial use, and extended length of stay. Interventions using blood culture diversion devices (BCDD) reduce contamination rates, but oftentimes increase expenditures compared with no BCDD. Cost-effectiveness and clinical utility of BCDD programs are often not well studied.

Methods. A retrospective review of all contaminated BCxs collected in our Emergency Department (ED) from July 2018 to December 2018 was completed. Data included antimicrobial therapy, admission status, laboratory orders, and co-morbidities for patients with contaminated cultures, as defined by the College of American Pathologist (CAP), were recorded. Laboratory costs included rapid molecular assays performed for patients admitted from the ED, as well as technologist effort and media costs for BC work-up.

Results. During this study period, out of a total of 4,176 blood draws, there were 1,843 BCxs (2.8%) that met the CAP definition of contamination. Of all contaminated cultures, only 12.7% (n = 15) of patients were treated because of a positive BC, while 66.8% were given antibiotics due to other comorbidities; A total of 22 patients (18.6%) did not receive any antibiotics during the encounter. The most common therapy for treated contaminants was vancomycin (14/15, 93.3%) for an average of 5.2 days.

Conclusions. In our ED, BC contamination rates of ≥3% are ever-present, with a higher rate than any rate seen in the literature. After the BCDD intervention, the contamination rate drops to ≤3%, yet our Emergency Department rate is consistently above this benchmark. Cost savings will only be achieved, therefore, if contaminated BCxs do in fact lead to expensive care decision. The purpose of this study was to define the actual impact of contaminated BCxs on patient care as a means of determining the cost-effectiveness of implementing BCDD interventions.

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2016. Antibiotic Misuse of Rural Residents and Pilot Project of Antibiotic Take-Back Program
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Background. Self-medication with antibiotics (SMA) is a major form of antibiotic misuse behaviors contributing to increasing antimicrobial resistance (AMR). The main source of SMA usually comes from in-home leftover antibiotics which usually disposed as household waste without classification. Therefore, an antibiotic take-back program (ATBP) is urgently needed.

Methods. A pilot ATBP was launched in Liantang Village, Zhejiang Province from January to March, 2019. A total of 50 households were randomly selected for the baseline survey. A questionnaire was used to investigate their knowledge and antibiotic use behaviors. Health education leaflets and posters were distributed to each household. A village WeChat group was set up for health communication. Residents were encouraged to hand over those unused or expired antibiotics at home to the village clinic to redeem complimentary ATBP. The pilot ATBP was implemented for 30 days. The type, name, and amount of antibiotics were collected as after intervention data.

Results. All of 50 households finished the questionnaire. Although 27 (52.9%) agreed that keeping antibiotics at home would potentially increase risk of SMA, there were still 32 (64.0%) residents reported that they kept antibiotics at home and 25 (49%) residents indicated that their leftover antibiotics usually disposed as household waste. After the 30-day intervention, 10 (20.0%) households handed in their in-home antibiotics or medicine to the village clinic. In total, 32 boxes of medicine including 17 (53.1%)...