

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 BCx 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 BCx (cases) and patients with negative BCx (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 BCx from 13,782 patients were included in analysis. 20,907 BCx from 11,266 (82%) patients were negative, 2,856 BCx from 1,504 (11%) patients were true positives, and 1,905 BCx from 1,012 (7%) patients were contaminated. Yearly ED contamination rates ranged from 5.0–9.3%. Collector contamination rates varied, though 38 (19%), 75 (35%), and 7 (3%) of 209 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 assuring 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.

Clinical Outcome Measures	Case (Contaminant) N=1,012	Control (True Negative) N=11,266	Unadjusted Analysis		Adjusted Analysis
			P value	OR (95% CI)	OR (95% CI)
Age, yr mean (±SD)	58.5 (18.3)	56.3 (18.1)	<0.001	1.01 (1.003 - 10.10)	1.01 (1.005 - 1.012)*
Race - African American, n (%)	439 (44.0)	109 (37.0)	<0.001	1.25 (1.096 - 1.015)	1.32 (1.152 - 1.508)*
BMI, kg/m ² mean (±SD)	29.2 (9.8)	28.1 (8.7)	<0.001	1.01 (1.003 - 1.015)	1.01 (1.002 - 1.015)*
CHF, n (%)	236 (23.3)	2260 (20.1)	0.014	1.21 (1.040 - 1.412)	1.04 (0.879 - 1.219)
COPD, n (%)	478 (47.2)	4721 (41.9)	0.001	1.24 (1.091 - 1.412)	1.16 (1.018 - 1.329)*
Paralysis, n (%)	70 (6.9)	49 (4.4)	<0.001	1.62 (1.253 - 2.104)	1.64 (1.261 - 2.143)*
DM, n (%)	312 (30.8)	3121 (27.7)	0.034	1.16 (1.012 - 1.338)	1.03 (0.890 - 1.195)
Septic Shock, n (%)	201 (20.0)	1841 (16.3)	0.015	1.27 (1.079 - 1.492)	1.26 (1.065 - 1.485)*

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2014. Assessment of Cost, Morbidity, and Mortality Associated with Blood Culture Contamination

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Background. Blood cultures are the primary diagnostic tool for bloodstream infections, but accuracy of results is dependent on collection technique. Decreasing 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.

Table: Clinical Outcomes Comparing Contaminated vs. Negative Blood Cultures

Clinical Outcome Measures	Cases (Contaminants)	Controls (True Negatives)	Unadjusted Analysis	Adjusted Analysis
	N=1,012	N=11,266	p value	p value
Length of Stay (d), Mean (±SD)	7.9 (9.3)	6.6 (7.3)	<0.0001	<0.0001
Length of Abx Therapy (d), Mean (±SD)	6.2 (7.2)	5.2 (5.9)	<0.0001	<0.0001
Vanc ordered (n,%)	823 (81.3)	7,314 (64.9)	<0.0001	ND
Vanc length of therapy (d), Mean (±SD)	3.5 (4.0)	2.5 (3.6)	<0.0001	ND
Acute Kidney Injury (n,%)	374 (36.7)	2,962 (26.3)	<0.0001	<0.0001
ID Consult (n,%)	162 (16.0)	1,457 (12.9)	0.0056	ND
Transthoracic echocardiogram (n,%)	277 (27.4)	2,163 (19.2)	<0.0001	<0.0001
Transesophageal echocardiogram (n,%)	14 (1.4)	87 (0.8)	0.0392	ND
In hospital Mortality (n,%)	81 (8.0)	521 (4.6)	<0.0001	<0.0001
In hospital Hospice (n,%)	83 (8.2)	624 (5.5)	0.0005	ND
Hospital Charge (\$), Mean (±SD)	36,008 (51,284)	28,875 (48,591)	<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 often increase equipment costs compared with traditional collection techniques. Cost savings will only be achieved, therefore, if contaminated BCs do in fact lead to expensive care decision. The purpose of this study was to define the actual impact of contaminated BCs on patient care as a means of determining the cost-effectiveness of implementing BCDD at our institution.

Methods. A retrospective review of all contaminated BCs collected in our Emergency Department (ED) from July 2018 to December 2018 was completed. Data including 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 118 BCs (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 68.6% 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, 93.34%) for an average of 5.2 days. No patients with contaminated BCs were admitted to the hospital because of a positive result; 92.3% of patients with contaminated BCs were admitted, however, for a different diagnosis. Based on average treatment and laboratory costs, the total costs per contaminant were estimated at \$170 USD.

Conclusion. Contamination of BCs collected in the ED does not routinely lead to antimicrobial therapy or hospital admissions at our institution. This minimal impact of BC contaminants on patient care decisions and healthcare costs limits the cost-effectiveness of interventions such as BCDD at our institution. These findings may be specific to our institution based on our clinical practice and unique patient population.

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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 a commodity. 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 their in-home antibiotics or medicine to the village clinic. In total, 32 boxes of medicine including 17 (53.1%)