

PUBLISHED ABSTRACT

A Study in Reducing Blood Culture Contamination Rates

Wei-Chun Sheu, Marutha Arulthasan, Hima Ammana, Foma Munoh Kenne, Morolake Ojo, Entesar Elsaady, Sonia Chokshi, Khayala Balabayova, Sher Baig, Sadia Rehman, Khin Zin, Kelsey Dunn and Jessie Saverimuttu

Corresponding author: Wei-Chun Sheu, MD (WSheu@RUMCSI.org)

Keywords: blood; cultures; contamination

Introduction

True positive blood cultures are crucial to instituting necessary life saving measures. However these same measures can be harmful and costly when cultures are falsely positive- resulting in unnecessary antibiotics, delayed procedures, prolonged hospital stays, and increased costs. National target contamination rate is set at 2–3%. This study started with a goal to reduce our hospitals 2014 contamination rate, 5.07%, to the minimalist.

Methods

A multi-disciplinary approach was pursued. Mandatory video tutorials on proper sterile techniques, online certifying assessments, and customized blood collection kits were instituted. Using data from electronic medical records, contaminants were identified via chart reviews completed in 2014, 2015, 2016, and 2018. Personnel with high contamination rates were identified and retrained.

Results

Over a 5 year time period, the implemented methods resulted in a gradual reduction of contamination rates from 5.07% in 2014, 4.28% in 2015, 2.56% in 2016, and finally to 1.96% in 2018, which is below National Target. Though cost data from previous studies is lacking, it can be inferred that the low contamination rate of 2018 significantly minimized associated costs of wasted antibiotics and unnecessary hospital days. In a 6 month period of 2018, contaminations resulted in an expenditure of \$5,043.52 for antibiotics and \$72,732 for hospital days. The cost would likely have been higher if house staff was not already accustomed to accounting for the possibility of contamination in treatment planning.

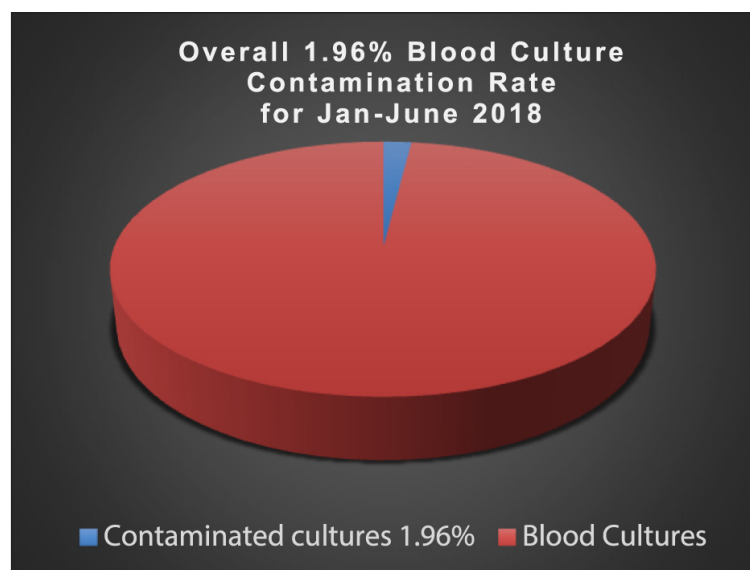


Figure 1.

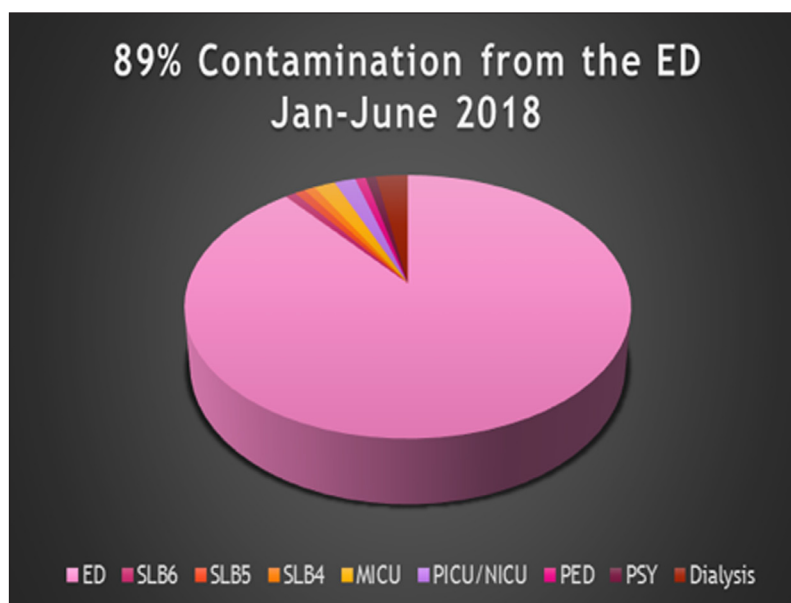


Figure 2.

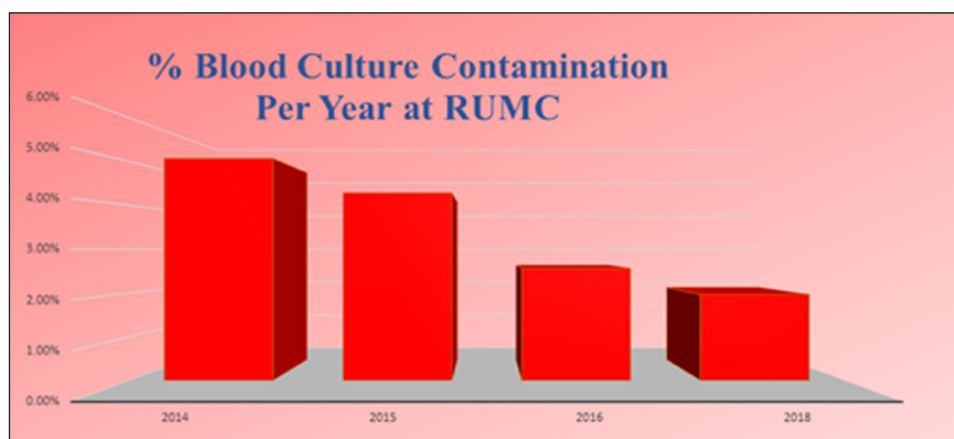


Figure 3.

Conclusion

Blood culture contamination is a patient safety and healthcare cost issue. It increases risk for potential harm and overall costs. In order to reduce the blood culture contamination rates, we provided ongoing education to staff, utilized customized blood culture collection kits, maintained surveillance, and provided performance feedback to personnel. As a result, over a 5 year span, contamination rates were reduced from 5.07% to our current below national rate of 1.96%. It should be noted, however, that each yearly rate has been determined by a different study team so there is concern that a difference in surveillance methods may affect the true rates. Nonetheless, the trend is undeniable showing that the measures implemented to reduce contamination are effective.

References

1. Richter SS, et al. Minimizing the workup of blood culture contaminants: implementation and evaluation of a laboratory-based algorithm. *J Clin Microbiol.* 2002; 40(7): 2437–44. DOI: <https://doi.org/10.1128/JCM.40.7.2437-2444.2002>
2. Gander RM, et al. Impact of blood cultures drawn by phlebotomy on contamination rates and health care costs in a hospital emergency department. *J Clin Microbiol.* 2009; 47(4): 1021–4. DOI: <https://doi.org/10.1128/JCM.02162-08>
3. Lee CC, Lee NY, et al. The impact of overcrowding on the bacterial contamination of blood cultures in the ED. *Am J Emerg Med.* 2012; 30(6): 839–45. DOI: <https://doi.org/10.1016/j.ajem.2011.05.026>

How to cite this article: Sheu W-C, Arulthasan M, Ammana H, Kenne FM, Ojo M, Elsaady E, Chokshi S, Balabayova K, Baig S, Rehman S, Zin K, Dunn K, Saverimuttu, J. A Study in Reducing Blood Culture Contamination Rates. *Journal of Scientific Innovation in Medicine*. 2019; 2(2): 28. DOI: <https://doi.org/10.29024/jsim.40>

Submitted: 06 August 2019 **Accepted:** 06 August 2019 **Published:** 27 November 2019

Copyright: © 2019 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/4.0/>.



Journal of Scientific Innovation in Medicine is a peer-reviewed open access journal published by Levy Library Press.

OPEN ACCESS The text 'OPEN ACCESS' followed by a circular icon containing a stylized padlock with an open keyhole, representing open access.