

## Background

In 2015, Houston Methodist Willowbrook Emergency Department blood culture contamination rate was 6.23% due to lack of training and inconsistent technique. The College of American Pathologist set a national benchmark for blood culture contamination rate at 3%. Blood culture contamination can lead to overuse and misuse of antibiotics.

De-escalation of broad spectrum antibiotics is key to our antimicrobial stewardship program. Physicians rely on timely microbiology results to make appropriate antibiotic selections. Literature also indicates that blood culture contamination leads to additional patient cost, increased length of stay, and unnecessary physician consults.

## Methods

The plan to reduce the blood culture contamination rate began by creating a core group that was trained to draw blood cultures. Emergency Medical Technicians (EMTs) and Patient Care Assistants (PCAs) were selected for training. Their technique was observed by using a check-off competency list.

The minimum requirement was set at two successful patient collections. The training period began April 2015 and the pilot data collection began May 2015. The contamination rate dropped to 4% and continued to fluctuate between 2-4% throughout 2015. However, in 2016 we sustained our blood culture contamination rate between 2-3%.

Competency is validated annually using a simulation arm to draw blood.

## Methods: Additional Education

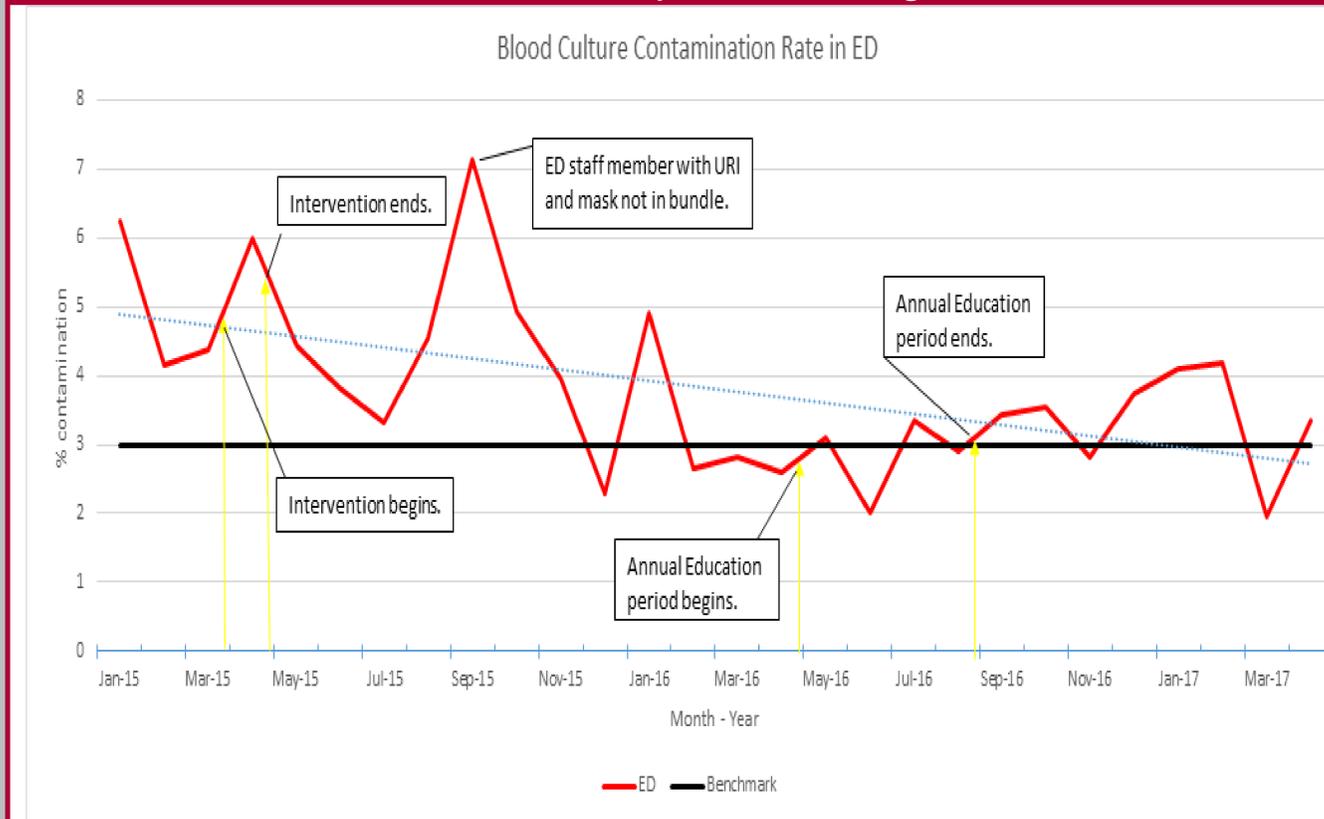
In addition to teaching the Emergency Medical Technicians and Patient Care Assistants on the proper techniques of blood culture contamination, there was a focused on the WHY?

All staff were required to attend a 2 hour session on Sepsis. The course objectives were:

1. Understanding what is Sepsis
2. How to recognize early signs of sepsis
3. The key role the EMT/PCA plays in the diagnosis and rescuing patients with early signs of sepsis

This course emphasized the importance of how proper technique affects effective treatment and diagnosis.

## First conclusionary statement of findings



## Methods: Competency Form

BLOOD CULTURE COMPETENCY FORM		S	U	NP	Comments
Name: _____ S = Satisfactory   U = Unsatisfactory   NP = Not Performed					
Verify there is a physician order.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Select the appropriate bottle(s): a. Pediatric bottle for patients less than 8 years of age only. b. Adults - one aerobic & one anaerobic bottle for each separate site. 2nd must be obtained by a separate venipuncture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Inspect the blood culture bottles and verify they are not expired or have any signs of contamination (turbidity, bulging septum, or leakage).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mark the appropriate volume on the side of the blood culture bottle. For adults, mark off 10 mL above the fluid level on the bottle. This visual guide will help facilitate optimal blood volume as the blood is injected into the bottle.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Greet the patient by name, introduce yourself, and explain that you will be drawing blood that the physician has ordered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Provide privacy for the patient.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Perform hand hygiene before patient contact. Wash hands & Don gloves.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Verify the correct patient using two identifiers. Verify that the patient's full name, date of birth, and medical record number on the IIS labels are consistent with the verbal information given by the patient. Any discrepancy must be resolved before proceeding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Raise or lower the bed or chair to a comfortable working height to prevent injury.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Position the patient so that the arm forms a straight line from the shoulder to the wrist and is supported if necessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3   Page					
BLOOD CULTURE COMPETENCY FORM					
Name: _____ S = Satisfactory   U = Unsatisfactory   NP = Not Performed					
Remove metal disk from the bottle tops and disinfect the septum with an alcohol swab allow to dry. Do not use iodine or the Chlorhexidine prep as it may damage the septum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Apply tourniquet and identify suitable vein for puncture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ensure that there is proper lighting to assist with visualizing vein contours and colors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Assess the need for equipment to help localize the vein, such as the ultrasound machine.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cleanse puncture site by initially cleaning the skin with an alcohol prep. Break open the Chlorhexidine and starting at the venipuncture site scrub back and forth for 20 seconds until the area is completely saturated and allow to dry (30 seconds). DO NOT BLEB.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do not palpate or touch the site after cleansing. If the equipment is a difficult one and the vein must be palpated after the site has been cleaned, palpate slightly above or below the actual puncture site to avoid contamination. Cleanse the puncture site again if it becomes contaminated with additional palpation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Remove needle guard and perform venipuncture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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BLOOD CULTURE COMPETENCY FORM					
Name: _____ S = Satisfactory   U = Unsatisfactory   NP = Not Performed					
Repeat the specimen collection sequence for a second sample.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Discard all sharps in sharps container.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Thank the patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Send bottles to laboratory within one hour.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Discard supplies, remove gloves, and perform hand hygiene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Document the procedure in the patient's record. 1) Document in the flow sheet - Open the flow sheet and add a column corresponding to the correct time - Under TV specimen identify the site and that a butterfly device was used then select the blood culture collected radio button 2) Add a specimen: - open order area of the chart - right click the blood culture order highlight it - select add specimen - use drop down to date the specimen - type in the time in the dialogue box - select OK or apply - select blood source - this should mostly be peripheral then click the link button to forward to further identify site and the side of body.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Direct Observation #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Direct Observation #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Employee: _____ Signature: _____ Evaluator: _____ Signature: _____ Date: ____/____/____					
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## Methods: Blood Culture Feedback Form

**Contamination Alert!**

Name of Employee: \_\_\_\_\_  
 PT's Medical Record #: \_\_\_\_\_  
 Comments/Reasons for contamination: \_\_\_\_\_  
 \_\_\_\_\_  
 Amount of Contamination for employee: \_\_\_\_\_  
 Employee's Signature: \_\_\_\_\_

## Summary

Best practice to reduce blood culture contamination is:

1. Limit the number of persons who collect blood cultures.
2. Yearly training on a simulation arm is needed to validate competency. Variation in technique was seen, therefore yearly competency and return demonstration check-offs are vital to ensure best practice.
3. Re-educate those on the process whom experienced a culture contamination.

We successfully reduced our blood culture contamination rate from 6.23% in January 2015 to below the national benchmark of 3% ranging between 2-3% throughout 2016.

## References

Bekeris, L. G., Tworek, J. A., Walsh, M. K., & Valenstein, P. N. (2005). Trends in blood culture contamination: A College of American Pathologists Q-Tracks study of 356 institutions. Archives of Pathology & Laboratory Medicine, 129(10), 1222-1225.

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