Blood Culture Contamination Process Improvement
Our Road to Better Patient Care

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OBJECTIVES

- Discuss key elements to decrease blood culture contamination
- Describe WMC's procedure for tracking blood culture contamination
- What is needed to see sustained improvement?

Williamson Medical Center

- 203 bed hospital
- Adult and Pediatric ER
- Children's hospital – 16 beds
- Bone & Joint Institute of Tennessee
- Williamson Medical Group
- Large orthopaedic and vascular service lines
- Not for profit community hospital 20 miles from Nashville

Why all the fuss?

- 1.2 million patients impacted by false positive blood cultures
- Expense – every false positive blood culture adds an average of $6,000 in hospital costs; increases LOS and antibiotic days
- Delayed diagnosis
- Patient safety – increases patient's risk of antimicrobial resistance due to unnecessary antibiotics; increases C.difficile risks
- "National benchmark" of 3% is too high – there are growing numbers to support a benchmark of 1-1.5%

Key Elements for Successful Program

- Program Champion
- Key Stakeholders – this is a team effort
  - Laboratory Director/Microbiologist
  - Administration (CNO, COO)
  - Infectious Disease
  - Infection Preventionist
  - Patient Safety and Quality
  - Antimicrobial Stewardship
  - Nursing Champion
  - IT report writer
- Develop an Action Plan
- Education
- Training
- Feedback – timely when possible
- Re-train when necessary
- Reinforce education annually (HealthStream and Competency)
- Post contamination rates
- Contamination rates tied to evaluation and merit raises
- Celebrate successes

The Dream Team

- Program Champion
- Key Stakeholders – this is a team effort
  - ❖ Laboratory Director/Microbiologist
  - ❖ Administration (CNO, COO)
  - ❖ Infectious Disease
  - ❖ Infection Preventionist
  - ❖ Patient Safety and Quality
  - ❖ Antimicrobial Stewardship
  - ❖ Nursing Champion
  - ❖ IT report writer

Develop an Action Plan

- What is your pre-intervention BCC rate?
- Define what is considered a contaminant across your system.
- Not all plans will be the same. Plans should be facility specific.
- Considerations:
  - ✓ Phlebotomy/Nursing or a combination of collectors
  - ✓ Patient populations – adults/pediatrics/combo
  - ✓ Number of cultures collected/year
  - ✓ Blood Culture Diversion Collection Devices
- Develop action plan for education, training and follow-up based on the specifics of your facility.

What is classified as a contaminant at WMC?

- Staphylococcus epidermidis
- CoNS (Coag Negative Staph)
- Diphtheroid
- P.acnes (C.acnes)
- Bacillus species (other than anthracis)
- Micrococcus species
- viridans group Streptococcus
- Alpha-hemolytic streptococci

In a single blood culture or in two sets with different sensitivities

Education

- Explain the “why” in terms that phlebotomists and nurses can understand
- Discussed at nursing and lab orientation
- Review policy
- Annual HealthStream Course and quiz
- HealthStream Courses as needed –
- Included on Annual Competency
- Stress the importance of proper collection. A Blood Culture is only as good as the sample collected
  - ✓ aseptic collection techniques
  - ✓ volume of blood in the bottles
  - ✓ Pediatric bottles collected on adults

Avoiding contamination
(examples of Education in easy to understand language)

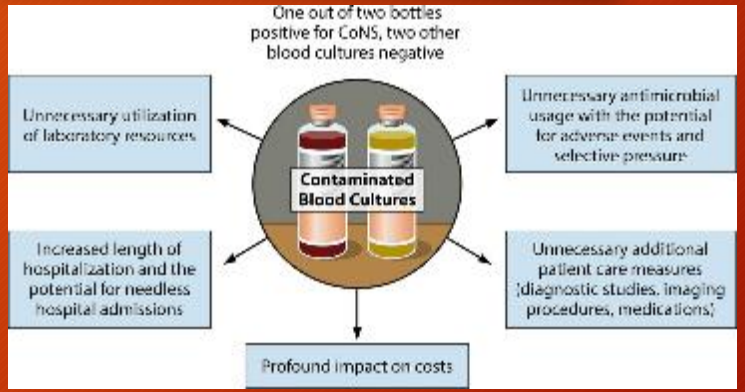
Always follow protocol:

- Prep the uncapped bottles by wiping with alcohol prep
- Prep the skin: Cleanse with alcohol prep followed by **30-60 second friction scrub** with Chlorhexidine
- **Do not** re-palpate (re-touch) the site! If necessary, re-cleanse the skin.

Review of Blood Culture contamination

What is the cost of contamination?

- When a blood culture is positive whether it's a true positive or a false positive, the patient is treated for a bacterial infection.
- The estimated additional cost on a patient for a false positive blood culture is $6,000-$10,000!
- They are treated with antibiotics that are not needed. This increases their risk of developing C.diff infections and antimicrobial resistance (typical antibiotics used to treat certain bacteria will no longer work).
- The patient is often kept longer in the hospital.



- Most contaminants are called CoNS or "Coag Negative Staph." This is bacteria commonly found on the skin. It could be from the skin of the patient or from the skin of the phlebotomist or collector.
- Williamson Medical Center's overall goal for contamination is less than 1%.
- You can review your contamination rate each month on the audit.

Optimizing blood culture volumes

A quality improvement program to improve patient care includes giving monthly feedback to collectors on the number of complete sets collected and the amount collected in each bottle.

At WMC, the % of complete sets is included in our monthly audit. The goal is collect a complete set on at least 80% of blood cultures collected.

The blood culture instrument also detects the amount of blood in each bottle. A report is generated on a quarterly basis. This is reported on the monthly audit in January, April, July, and October and posted on the Quality Board

I	J	K	L	M	N	O
		Blood Cultures			*Ave Vol	
COL.	1 bottle	% ERROR	Contam.	% ERROR	mL	
82	16	19.51%		0.00%	4.7	
63	10	15.87%	1	1.59%	6.3	
14	0	0.00%		0.00%		
34	11	32.35%		0.00%	3.2	
54	2	3.70%		0.00%	4.1	
49	4	8.16%	1	2.04%	5.0	
33	5	15.15%		0.00%	5.8	
43	2	4.65%		0.00%	4.2	
53	8	15.09%	3	5.66%	4.7	
83	14	16.87%		0.00%	5.4	
0	0	0.00%		0.00%		
19	4	21.05%		0.00%	4.2	
10	0	0.00%		0.00%	8.2	
53	9	16.98%	2	3.77%	4.7	
36	18	50.00%			3.9	
12	0	0.00%		0.00%		
35	4	11.43%		0.00%	4.6	
11	1	9.09%				
0	0	0.00%		0.00%		
50	0	0.00%	1	2.00%		
734	108	12.00%	8	0.84%		
ws:	BC:	Nonstandard		Contam.		
		<20%		<1.00%	*Quarterly	
		>20%		1.00-3.00%	8-10mL	
					>10mL	
				>3%	<5ml	

Our 2021 goal is to improve the average volume per bottle where most phlebotomists are collecting the optimal volume of 8-10mL

What about using a Pediatric bottle?

- A pediatric bottle should only be used as a last resort on an adult.
- According to the manufacturer of the BC bottles, use of pediatric bottles “is never indicated for an adult.”
- The peds bottle is formulated to grow pathogens that are more common in children. If used in adults, there’s a higher chance a pathogen will be missed.
- The lower volume used for an adult increases the chance of missing a pathogen
- Sometimes, a difficult stick requires the use of a Peds bottle. While it’s not optimal, it is better than no blood culture collected.
- Supply issues also create a need to avoid using Peds bottles. We need to make sure we have an adequate supply allocated for pediatric patients.

Annual Competency: Direct Observation

Employee Name:		**Due Date: September 1, 2021**
Test System: **Blood Culture Collection**	☐ **Introductory** ☒ **Annual**	
Scope of Assessment:	☒ Direct Observation ☒ Review Collection Records	☒ Evaluate problem-solving skills

Direct Observation Blood Culture using SYRINGE (V#_____)	**Yes**	**No**	**NA ☐**
Acceptability criteria: 100% compliance			
1. Introduce themselves to patient, explain procedure			
2. Patient Identification is correctly performed			
3. Verifies specimens needed and assembles equipment appropriately			
4. Performs hand hygiene – in and out			
5. Uses appropriate PPE			
6. Assesses appropriate site for collection			
7. Correctly preps the bottles			
8. Performs proper prep of the site			
9. Does not re-palpate arm or touch prepped area			
10. Follows Order of Draw			
11. Uses all supplies and devices properly			
12. Removes tourniquet, holds pressure, applies proper bandage			
13. Labels specimen correctly, scans all specimens correctly			
Observed by:	**Date:**		

Evaluation Of Performance:	**Satisfactory**		**Unsatisfactory**

Annual Competency: Review of Records and Problem Solving Skills

Review Collection Records	Yes	No	NA ☐
Acceptability criteria: 80% compliance- Standard bottle usage. 99% No contamination			
1. Evidence of work reviewed. Non-std BC bottle usage audit and event reports. BC contamination audit– Acceptable criteria met			

Assessment of Problem Solving Skills	Yes	No	NA ☐
Acceptability criteria: 100% compliance			

Statement of Problem/Issue:

1. Patient is a difficult stick and phlebotomist is only able to collect 5 mls of blood for an adult. What is the proper way to distribute blood in the blood culture bottles?

2. List three negative consequences of a contaminated blood culture.

3. A nurse in the ER wants to collect the blood cultures when starting an IV. Is this acceptable? What steps should be followed?

Supervisor Review:	Satisfactory	Unsatisfactory

TRAINING

- High performers are trainers
- Make sure nurse trainers are following lab approved training guidance. New nurse trainers must be trained by laboratory management.
- Train and then assess both knowledge and skill before allowing independent collections (even with experienced phlebotomists/RN’s)

Feedback

- Post blinded monthly contamination rates
- Praise high performers
- Laboratory Mgmt attends Lab-Nursing Task Force and Nursing Director’s meeting monthly
- Retrain as needed
- Nursing Directors sent timely information on all contaminants drawn by their staff

Timely Collector Feedback is Important

Probable contaminated blood culture log

If you suspect a BC is contaminated (CNS, GPR), please attach a footie to log. Cases of contamination will be reviewed with phlebotomist.

Completed by Micro staff:	Reviewed by Asst Director	
	Organism:	Drawn by:
Patient footie		
Patient footie		
Patient footie		

Blinded Contamination Rates posted monthly

Apr, 2021 Phlebotomist:	Blood Cultures				
	COL.	1 bottle	%ERROR	Contam.	%ERROR
1	79	15	18.99%		0.00%
2	50	10	20.00%		0.00%
3	13	1	7.69%		0.00%
4	16	4	25.00%		0.00%
5	55	5	9.09%		0.00%
6	26	2	7.69%		0.00%
7	32	4	12.50%		0.00%
8	40	4	10.00%		0.00%
9	57	4	7.02%		0.00%
10	65	8	12.31%	1	1.54%
11	18	7	38.89%		0.00%
12	50	11	22.00%		0.00%
13	32	4	12.50%		0.00%
14	29	4	13.79%		0.00%
15	64	7	10.94%	2	3.13%
16					
17	34	10	29.41%		0.00%
18					
20	15	2	13.33%		0.00%
Total/Ave:	675	102	15.95%	3	0.27%

		BC:	Nonstandard		Contam.
			<20%		<1.00%
			>20%		1.00-3.00%
					>3%

Blood Culture Volume Data posted Quarterly

Blood Cultures					*Ave Vol mL
COL.	1 bottle	%ERROR	Contam.	%ERROR	
122	17	13.93%	1	0.82%	5.0
72	9	12.50%	1	1.39%	7.0
17	0	0.00%		0.00%	
24	6	25.00%		0.00%	7.3
27	2	7.41%	1	3.70%	4.9
7	3	42.86%		0.00%	
13	1	7.69%		0.00%	7.9
3	0	0.00%		0.00%	4.9
34	5	14.71%		0.00%	5.9
76	7	9.21%		0.00%	6.2
2	0	0.00%		0.00%	
33	4	12.12%		0.00%	8.2
28	0	0.00%		0.00%	4.8
42	5	11.90%		0.00%	5.3
74	7	9.46%		0.00%	4.6
16	0	0.00%		0.00%	6.3
38	14	36.84%		0.00%	
2	0	0.00%		0.00%	
37	1	2.70%		0.00%	
667	81	10.86%	3	0.31%	

/s:	BC:	Nonstandard	Contam.	
		<20%	<1.00%	*Quarterly
		>20%	1.00-3.00%	8-10mL
				>10mL
			>3%	<5ml

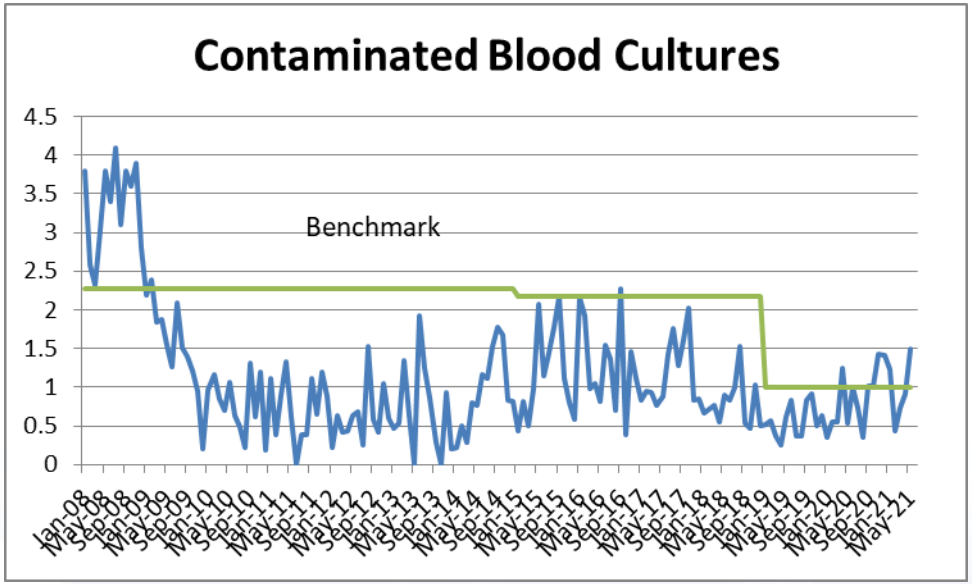
Key Quality Indicators

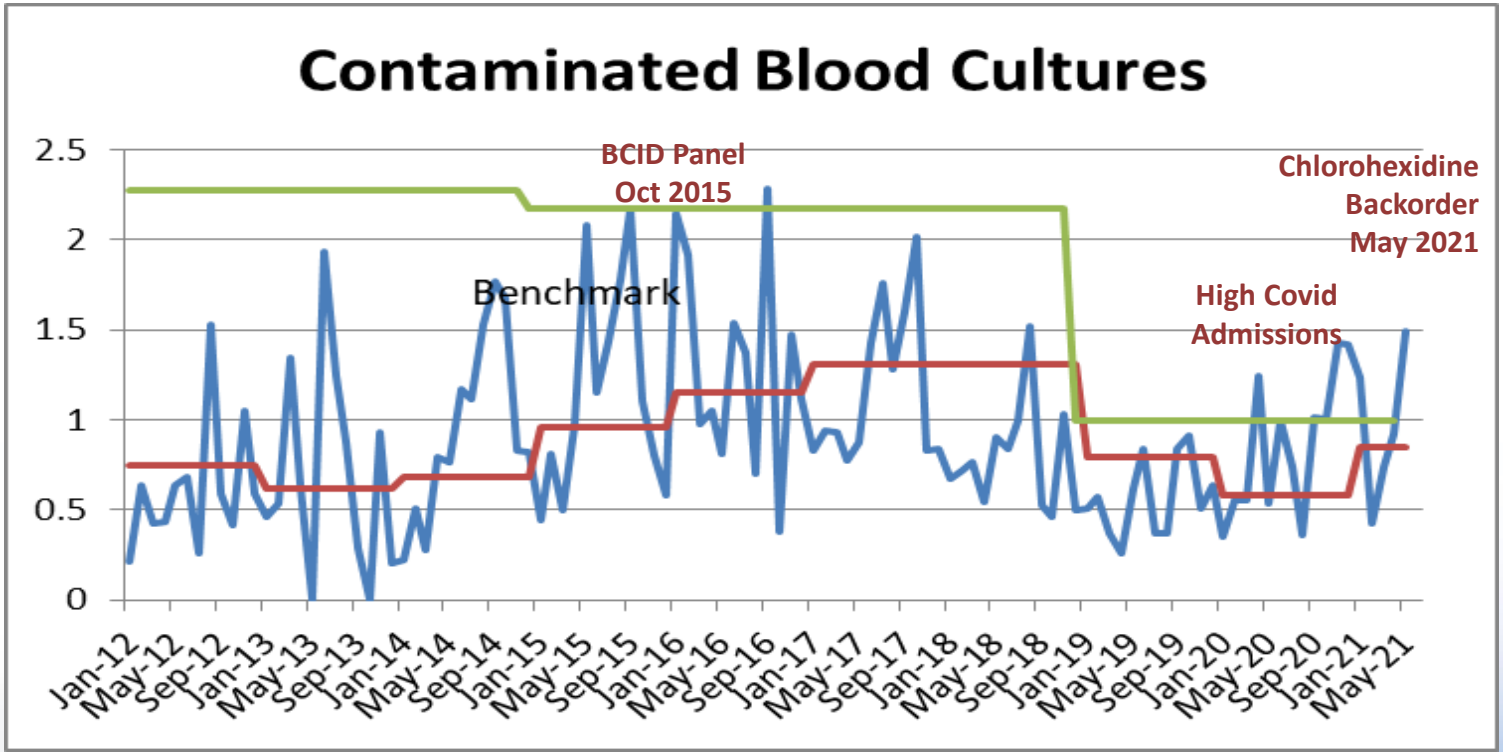
QUALITY	ED TAT	Percent of ED tests meeting defined TAT	All	M	90%	≥ 90 % 86-89 % X ≤ 85 %	90%	94.7%	
	INPAT TAT	Percent of Inpatient Stat tests meeting defined TAT	All	M	95%	≥ 93% 90-92% X <89%	90%	91.2%	Impacted by Covid patients and staffing issues.
	Out by 7 am	Percent of morning clinical lab work collected and in the lab by 6:30am	Pre	M	90%	≥ 90 % 86-89 % X ≤ 85 %	85%	92%	
	Corrected Reports	Percentage of laboratory reports that require correction and notification	Ana	M	<1%	< 1.000% 1.001 - 1.500 % X >1.501 %	2%	0.000%	
	Specimen Redraws	Percentage of laboratory collected specimens requiring recollection	Pre	M	<1%	< 1.0% 1.1 - 2.0% X >2.0 %	2%	0.88%	
	Blood Culture Contamination	Percentage of Contaminated Blood Cultures	Pre	M	<2%	< 2.0% 2.1 - 2.4% X >2.4 %	<2.5%	0.92%	0.44% Phlebotomy Rate. GREAT JOB!!!
	Order/Entry Errors	Percentage of Order/Entry Errors	Pre	M	<1.0%	< 1.0% 1.0 - 2.5% X >2.5 %	<2.5%	0.24%	
	Frozen Section Accuracy	Percentage of frozen section results that match pathology report	Ana	M	100%	100% 98.9% - 99.9% X <98.9%	99%	100.0%	
	Proficiency Testing	Percent of Acceptable Proficiency Test	Ana	M	99%	≥ 99% 95-98% X <94%	95%	100.0%	

Included on Performance Evaluation

3	Blood cultures are volumes are adequate. Average bottle volume is between 5-10mL and: 🕐 0-5 % non-standard bottle usage= EE 🕐 5.1-19.9 % non-standard bottle usage= MS 🕐 >20% non-standard bottle usage = BS	D	BS	MS	EE	
4	Blood culture contamination rate is acceptable: 🕐 < 1.00% contamination= EE 🕐 1.00-2.50 % contamination= MS 🕐 >2.50% contamination = BS	D	BS	MS	EE	

Where We Started




Contaminated Blood Cultures
2.5
2
1.5
1
0.5
0
BCID Panel
Oct 2015
Chlorohexidine
Backorder
May 2021
Benchmark
High Covid
Admissions
Jan-12
May-12
Sep-12
Jan-13
May-13
Sep-13
Jan-14
May-14
Sep-14
Jan-15
May-15
Sep-15
Jan-16
May-16
Sep-16
Jan-17
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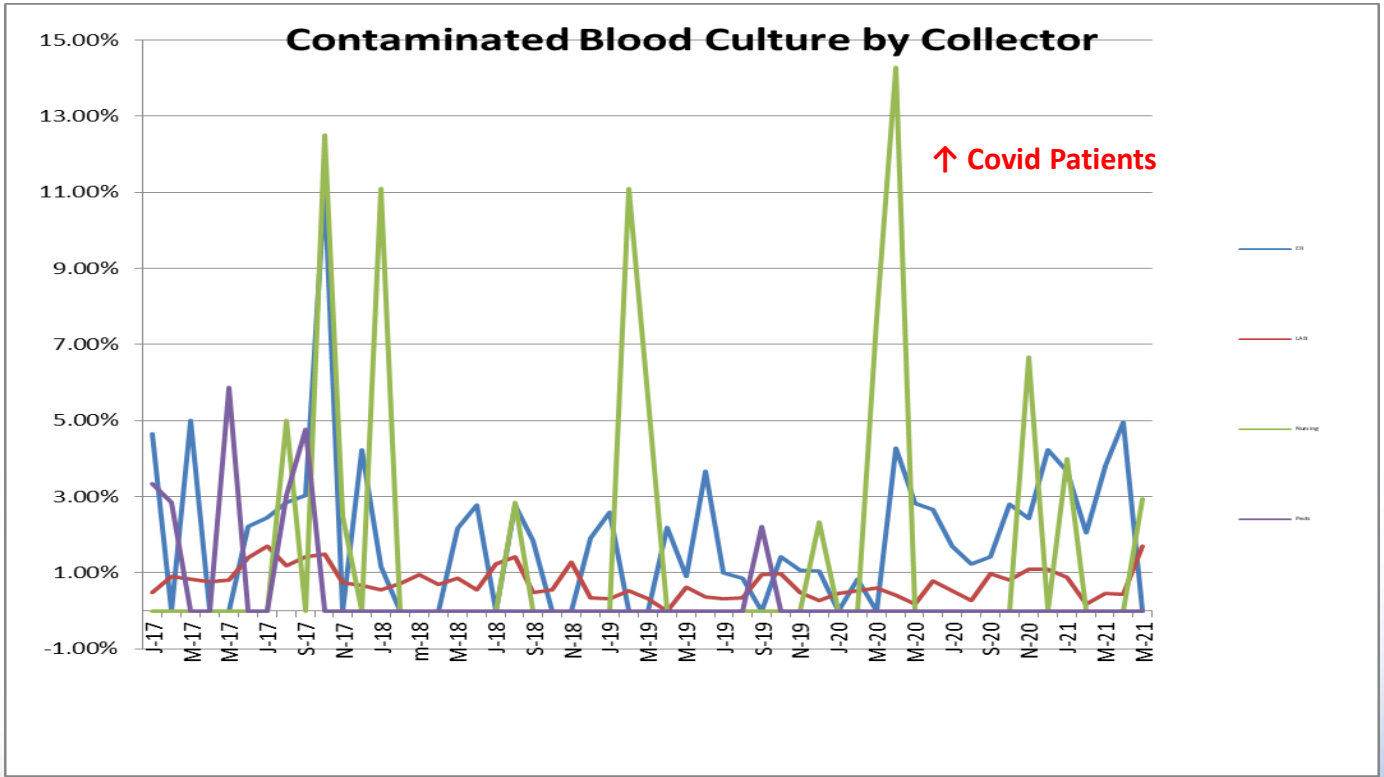
May-20
Sep-20
Jan-21
May-21


Contaminated Blood Culture by Collector
↑ Covid Patients
15.00%
13.00%
11.00%
9.00%
7.00%
5.00%
3.00%
1.00%
-1.00%
J-17
M-17
M-17
J-17
S-17
N-17
J-18
m-18
M-18
J-18
S-18
N-18
J-19
M-19
M-19
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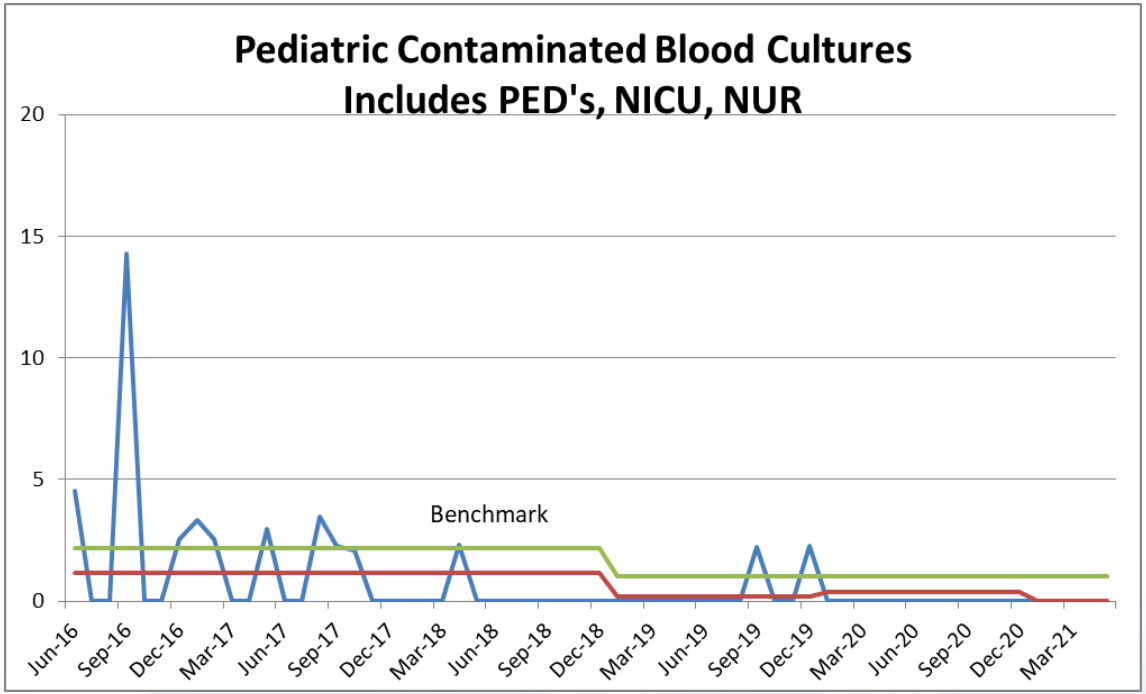
J-20
S-20
N-20
J-21
M-21
M-21


Pediatric Contaminated Blood Cultures
Includes PED's, NICU, NUR
20
15
10
5
0
Benchmark
Jun-16
Sep-16
Dec-16
Mar-17
Jun-17
Sep-17
Dec-17
Mar-18
Jun-18
Sep-18
Dec-18
Mar-19
Jun-19
Sep-19
Dec-19
Mar-20
Jun-20
Sep-20
Dec-20
Mar-21

BioFire Blood Culture ID Panel

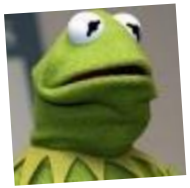
Implemented October 2015

Gram Positive Bacteria	Gram Negative Bacteria	Yeast	Antibiotic Resistance
Enterococcus	Acinetobacter baumanniii	Candida albicans	mecA- methicillin resistant
Staphylococcus **Staphylococcus aureus**	Haemophilus influenzae	Candida glabrata	vanA/B- vancomycin resistant
Streptococcus **Streptococcus agalactiae** **Streptococcus pyogenes** **Streptococcus pneumoniae**	Enterobacteriaceae Enterobacter cloacae complex Escherichia coli Klesbiella oxytoca Klebsiella pneumoniae Proteus Serratia marcescens	Candida krusei	KPC – Carbapenem resistant
Listeria monocytogenes	Neisseria meningitidis	Candida parapsilosis	
	Pseudomonas aeruginosa	Candida tropicalis	

Guidelines for Positive Blood Cultures Interpreting BioFire Results

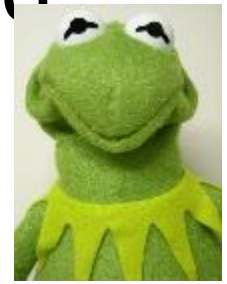
***Staphylococcus aureus*, mecA detected** Probable methicillin-resistant *Staphylococcus aureus* (MRSA); further testing in progress. MRSA is predictably resistant to beta-lactam antibiotics (except ceftaroline). Patient requires contact precautions if hospitalized.
***Staphylococcus aureus*, mecA not detected** Methicillin (oxacillin)-susceptible *Staphylococcus aureus*. Preferred therapy is an anti-staphylococcal beta-lactam antibiotic, unless clinically contraindicated.
***Staphylococcus*, coagulase-negative, mecA detected** Methicillin (oxacillin)-resistant coagulase-negative staphylococcus. Possible blood culture contaminant (unless isolated from more than one blood culture draw or clinical case suggests pathogenicity). No antibiotic treatment is indicated for blood culture contaminants.
***Enterobacter cloacae* complex** This organism may contain an inducible β-lactamase. Penicillin or second- or third-generation cephalosporin monotherapy may result in the emergence of high-level resistance.

2 case studies of contamination and the related costs:



Case: Christmas Interrupted

- Patient presented to the ER with abscess on tonsil
- 1 BC collected: 1 bottle positive on day 1 (Christmas Morning)
- BCID = CoNS/mec A detected
- Mostly likely skin contaminant but because only 1 set drawn, patient called back to ER by MD. Change in antibiotics and 2nd set drawn.
- Second set – negative
- Patient missed Christmas festivities due to improper BC collection



Case: a kick in the bill

- 6 month old presents to PED ER with high fever
- 1 BC drawn: positive 2 days later
- CoNS(most likely skin contaminant)
- Mom called by MD and conveys that culture drawn via heel stick
- Condition improves: no repeat BC drawn
- Bill credited for $2005.92

Blood culture ID Case Study

- 56 YO healthy female w/splenectomy at 9
- C/o fever, body aches, headache, neck pain
- 9/2 Treated at walk-in clinic for viral infection and given Zofran (Flu – Neg)
- 9/4 presents to ED and diagnosed with pyelonephritis (based on a contaminated urine); BC collected per protocol for fever; given Rocephin in ED and sent home w/PO augmentin
- 9/5 BC positive – S. pneumo by PCR; patient called back into ED; lumbar puncture performed and ME panel positive for S. pneumo.
- 9/9 – patient discharged home on IV

9/4		9/5	
WBC	22.26 K/cmm	WBC	30.24 K/cmm
UA	Slt Cldy	CSF	8904 WBC
	2+ Protein		<3000 RBC
	2+ urobilinogen		93 Neutrophils
	2+ Leukocyte Esterase		7 Monocytes
	25 WBC's		50 CSF glucose
	3+ bacteria		300 CSF protein
	17 Squ Epi suggestive of contamination; recollect		

- Target rate:
  1.0%
  Our average rate for past 12 months:
  0.79%

Shout out to Kristin, Heather and John for no contaminated blood cultures last year.

COST OF FALSE POSITIVE BLOOD CULTURES

$ Blood culture: $122 x2

$$ Micro ID of organism: $160

$$$$ BCID (PCR): $2006

Study published in the Journal of Clinical Microbiology in 2009 found:

*Increased hospital stay by 1 day

*Increased additional charges by $8,720

*unnecessary treatment

*Rate of contamination is much lower when drawn by phlebotomy staff vs ED staff.

What's Next?

- Currently validating Sepsityper on Maldi-TOF
- Challenges –
  - ✓Technique dependent
  - ✓More time consuming to set up than BioFire
  - ✓Can identify 100's of bacteria; will be challenging for clinicians. Currently working on education

Sustained Improvement


THANK YOU

- Veronica M. Paur, Chris Zirges, Keith Landeros, April Hawk, Blood Culture Contamination: Educational Roadmap to Improvement, American Journal of Infection Control, Volume 47, Issue 6, Supplement, 2019,Page S25, ISSN 0196-6553,https://doi.org/10.1016/j.ajic.2019.04.044.(https://www.sciencedirect.com/science/article/pii/S019665531930272X)

- Dempsey C, Skoglund E, Muldrew KL, Garey KW. Economic health care costs of blood culture contamination: A systematic review. Am J Infect Control. 2019 Aug;47(8):963-967. doi: 10.1016/j.ajic.2018.12.020. Epub 2019 Feb 20. PMID: 30795840.

- Infection Control & Hospital Epidemiology , Volume 37 , Issue 6 , June 2016 , pp. 736 - 738 DOI: https://doi.org/10.1017/ice.2016.30

Duke Regional Emergency Department Blood Culture Contamination Rate Improvement Project

DukeHealth

Background

- DRH ED collects between five to six hundred sets of blood cultures per month and had contamination rates above DUHS balanced score card and College of American Pathologist (CAP) bench marks (<3% adult inpatient population)

- Studies show that blood culture contamination potentially leads to excessive LOS, increased inappropriate antibiotic usage, increased lab charges and excessive overall costs.

- BC contamination negatively impacts patient care and adds unnecessary costs to the organization.

Introduction

Blood culture contamination is a common and costly aspect of healthcare that can be minimized.

Team members identified a need to improve the process and thereby reduce the rate of contaminated blood cultures on patients seen in the DRH Emergency Department.

Previous attempts were unsuccessful

- Earlier attempts had centered on department education
- There were no standard practice. Rather, staff just shared with one another what they thought was working.
- There was not tracking of individual rates
- No feedback to staff on their performance.

Improvement Methodology

Data Measurement

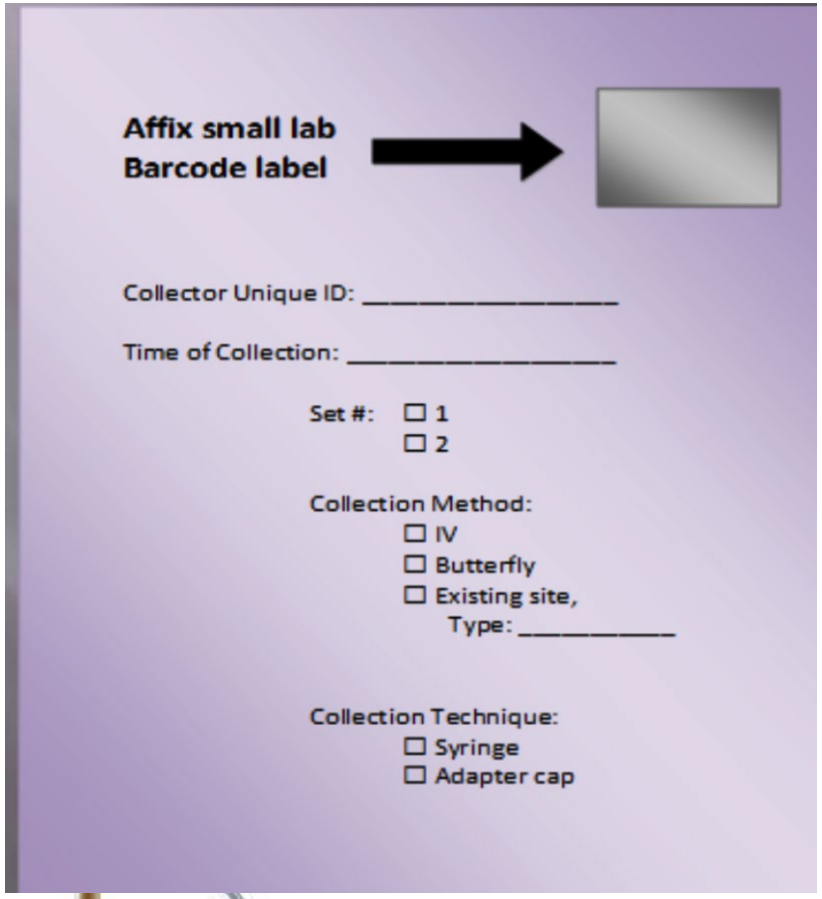
- All three hospital laboratories report blood culture contamination rates for lab and ED on a monthly basis.

- Reviewed and standardized data collection and counting methods utilized by all 3 laboratories to ensure comparable data analysis.

Analyze

- Developed detailed process maps for venipuncture and IV blood collection using lab and front line ED nursing staff
- Researched evidenced based care recommendations for blood culture collection
- Developed a blood culture data collection slip for recording particular collection detail necessary for creation of detailed database tools and reports (drill down data)
- Investigated skin and bottle asepsis preps (CHG, alcohol & betadine) and literature/manufacturer recommendations.

What is the best practice?



Blood Culture Kits

IV start kit

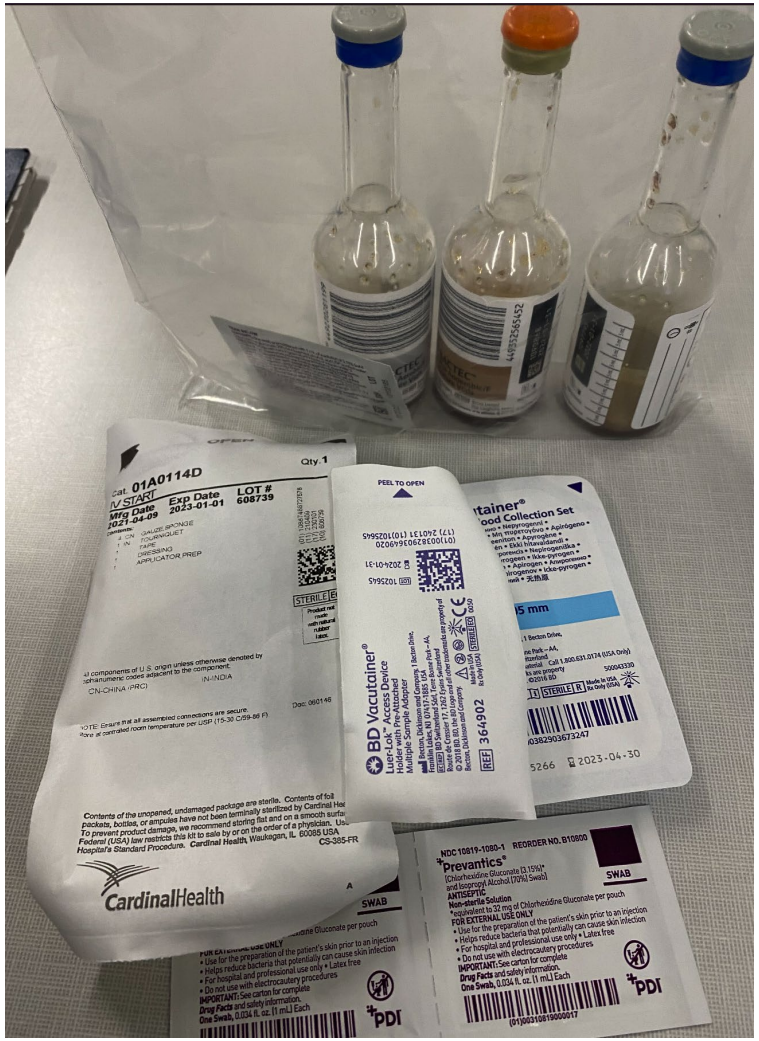
butterfly

blood culture vacutainer

clear-top waste blood collection tube

chlorhexidine swabs

blood culture bottles



Accountability

- Real time feedback and follow up with their clinical team lead

Healthy Competition

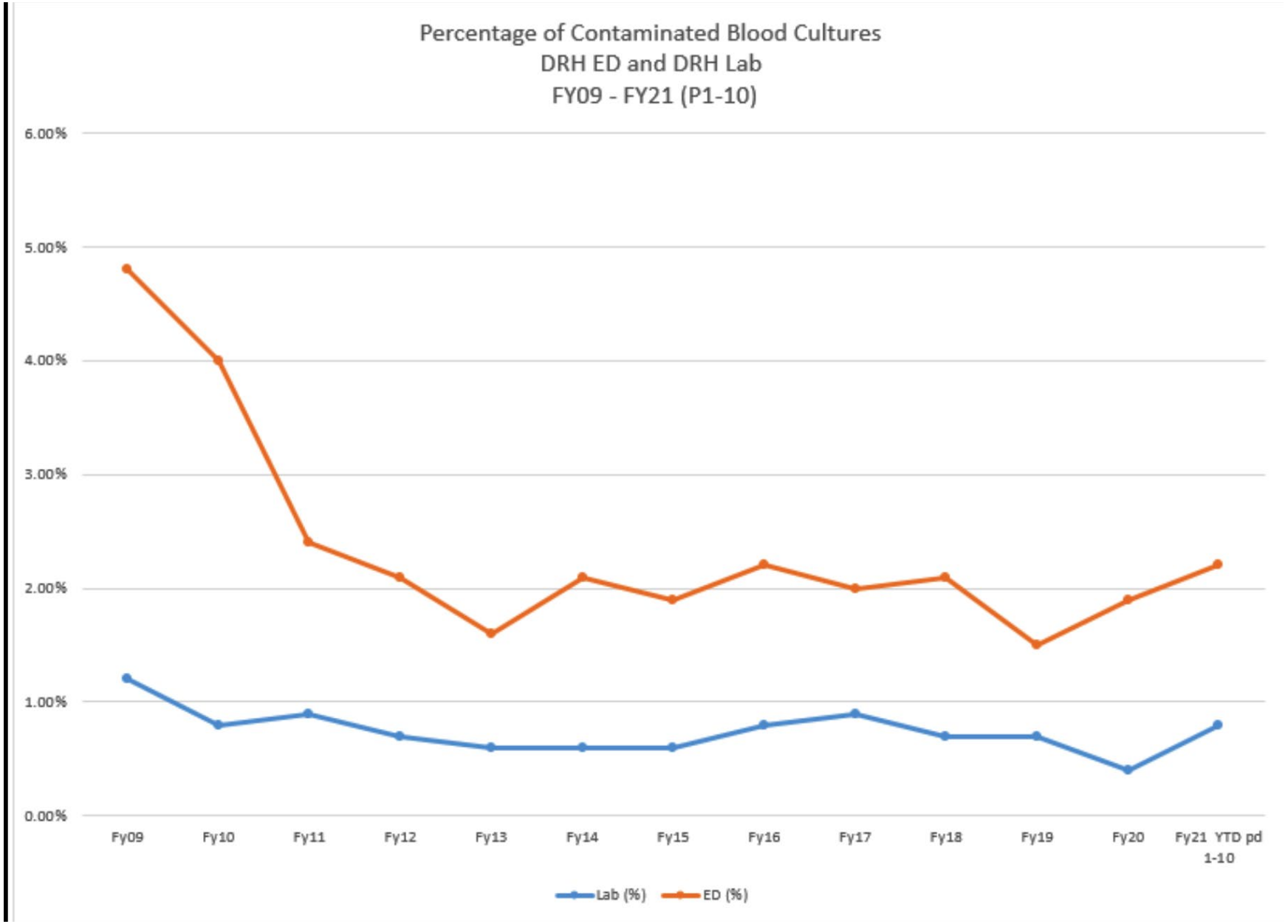
Random ID	Collected	Slips Returned	Slip Return Rate	Contaminated	% Success
7712	37	37	100.0%	0	100.0%
2392	29	29	100.0%	0	100.0%
8290	12	12	100.0%	0	100.0%
4633	10	10	100.0%	0	100.0%
1029	9	9	100.0%	0	100.0%
4330	9	9	100.0%	0	100.0%
2863	8	8	100.0%	0	100.0%
616	7	7	100.0%	0	100.0%
7195	7	7	100.0%	0	100.0%
8262	6	6	100.0%	0	100.0%
3396	5	5	100.0%	0	100.0%
3584	5	5	100.0%	0	100.0%
8340	5	5	100.0%	0	100.0%
635	4	4	100.0%	0	100.0%
2182	4	4	100.0%	0	100.0%
2798	4	4	100.0%	0	100.0%
7048	4	4	100.0%	0	100.0%
8056	3	3	100.0%	0	100.0%
4089	2	2	100.0%	0	100.0%
4299	2	2	100.0%	0	100.0%
5987	2	2	100.0%	0	100.0%

Interventions

- Implemented exclusive use of chlorohexadine (CHG) for site and bottle ascepsis.
- Held staff training /scheduled educational sessions
- Created new preassembled blood culture kits with standardized supplies for ED staff.
- Improved the use of luer lock collection sleeve allowing the collection of cultures directly into the blood culture bottles.
- Developed and implemented a competency assessment tool.
- Provided staff with real time feedback on contaminated cultures
- Monitored individual employee/staff culture contamination rates.
- Developed a reward program for top performers.

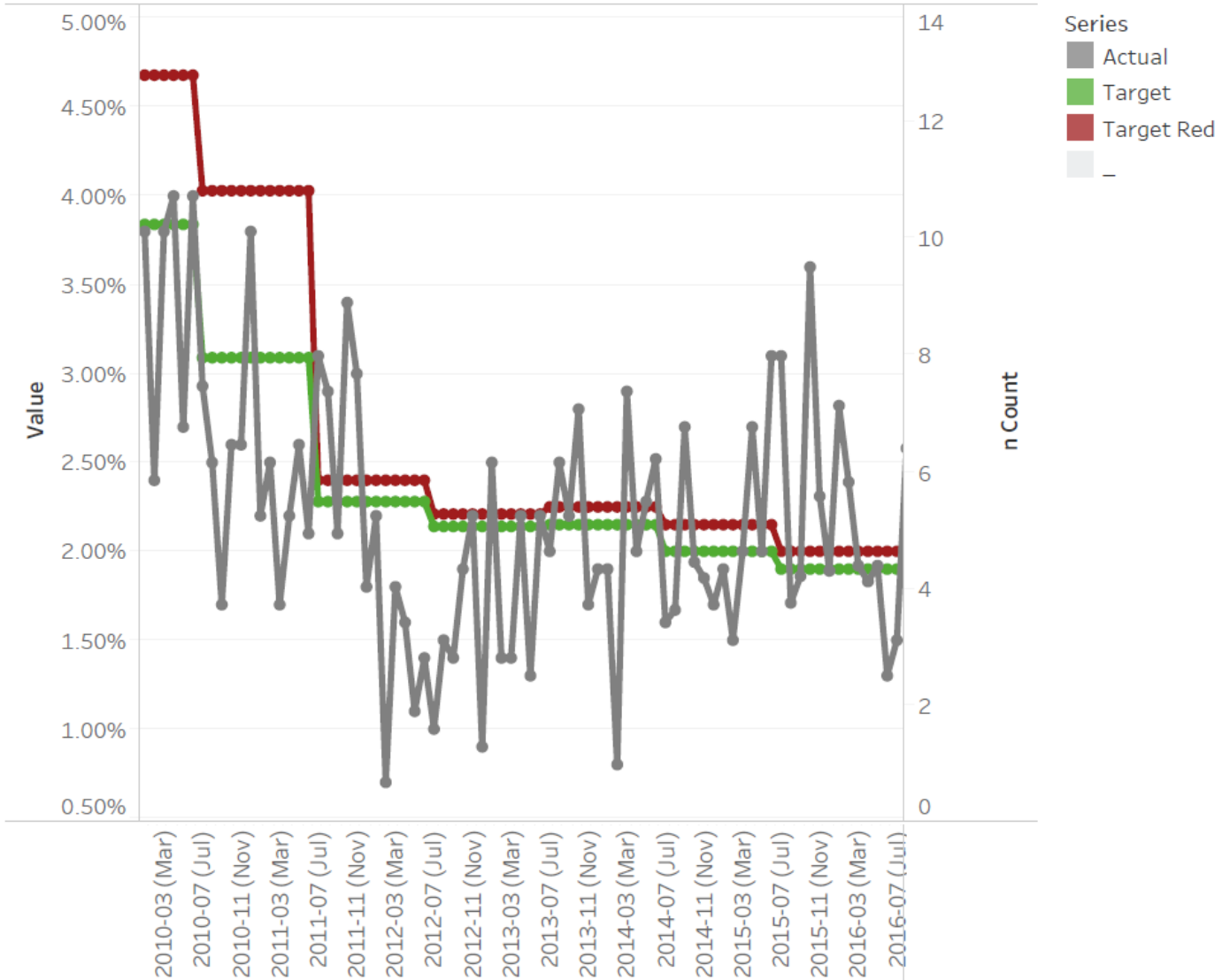
Improvement/Results

- By implementing the strategies developed within the Six Sigma Improvement Phase, DRH ED was able to lower the contamination rate by 50%.
  - 4.8% in FY09
  - 4.0% in FY10
  - 2.4% in FY11
  - 2.4% YTD FY12
- Sustaining the new rate has exceeded the CAP bench mark of <3% and met the Six Sigma Goal of ≤2.8%.
- The new average also represents the lowest rate of the three Emergency Departments in the Duke University Health System.


Percentage of Contaminated Blood Cultures
DRH ED and DRH Lab
FY09 - FY21 (P1-10)
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
Fy09
Fy10
Fy11
Fy12
Fy13
Fy14
Fy15
Fy16
Fy17
Fy18
Fy19
Fy20
Fy21 YTD pd 1-10
Lab (%)
ED (%)

Emergency Services

Blood Culture Contamination Rate: ED Collected



Lessons Learned

- It is critical to map out every step in the process
- Direct care staff involvement in the process improvement is a critical project success factor.
- Seek out best practices and evidenced based care
- Establish / communicate clear expectations and goals
- Implement and provide the right equipment consistently
- Provide the right type of education
- Monitor data consistently and identify trends
- Provide meaningful feedback to the bedside provider in a timely manner
- Praise the high performers

Our Practice

Update to blood culture collection process, effective 12/1/2015

1. 1. Open the tops of the blood culture bottles and clean the insertion area with chlorhexidine swab.
2. 2. Open the IV start kit.
3. 3. Clean the insertion area of the waste tube, and set it down in the open IV start kit.
4. 4. Allow the chlorhexidine to dry on the bottles and waste tube as you prepare the remaining steps.
5. 5. Select phlebotomy/IV site.
6. 6. Using the chlorhexidine swab, scrub the skin for thirty seconds.
7. 7. Allow the chlorhexidine to dry, and do not re-palpate the site.
8. 8. Perform IV insertion/phlebotomy.
9. 9. Collect 2-3 mL blood in the waste tube.
10. 10. Collect 10mL blood in the aerobic blood culture bottle.
11. 11. Collect 10mL blood in the anaerobic blood culture bottle.

Important to remember:

- □ Students cannot draw blood cultures in this setting
- □ Never draw blood cultures from an established IV line.
- □ Do not remove the finger tip of your glove; this is the same as wearing NO glove.
- □ If a blood culture was drawn by another individual, or if it came from a central line placement, please note this in the chart, to allow for more accurate data collection about contaminations.

Annual Competency

ADULT Blood Culture Collection By Venipuncture (Non-IV Start) Competency Form

EMPLOYEE:

EVALUATOR: DATE:

- Greets patient (and family), identifies self, and explains procedure.
- Identifies patient using established procedure.
- Selects and examines appropriate culture bottles:
- Assembles equipment and has proper supplies close at hand. A Butterfly needle set and Blood culture adapter cap (blood drawing insert if needed for tube collections).
- Removes protective flip top overcap. **Cleans each bottle with a separate CHG wipe. Allow to air dry.**
- Washes hands and puts on clean non-latex gloves.
- Properly applies tourniquet. Does not leave on excessive amount of time.
- Demonstrates good judgment in vein selection.
- Removes tourniquet prior to cleansing site.
- Properly uses Chlorascrub Swabstick to cleanse site.
- Scrub area thoroughly for at least **15** seconds. Rotate the swab and scrub for an additional **15** seconds, for a total of **30** seconds. If stick shows debris on the pad, repeat this procedure.
- Allows site to air dry for **30** seconds before performing next step. Do not wipe dry, blot, wave hand or blow on site.
- Reapplies the tourniquet.
- Anchors vein and enters vein smoothly with needle bevel up (at a 30˚ angle or less). Advances needle successfully into vein.
- Withdraws adequate amount of blood.
  - Manufacturer recommendation is **10 mls per bottle**.
  - Collects **BLUE rim gray cap** top aerobic bottle first.
  - Collects **GOLD rim orange cap anaerobic** bottle second.
  - Collects **BLUE rim gray cap** top aerobic bottle third
  - If unable to obtain adequate blood for three bottles, collects Blue rim gray cap and gold rim orange cap.
  - Keeps needle steady when changing bottles. If other tests are ordered, the other tubes are collected after blood cultures.
  - Releases tourniquet prior to removing needle from vein.
  - Smoothly removes needle, applies pressure to venipuncture site.
  - Checks puncture site for bleeding and performs appropriate aftercare.
  - Disposes of needle safely and properly in biohazard sharps container.
  - Labels specimens correctly and completely **at the bedside:**
  - Does not pre-label bottles or obscure barcodes.
  - Labeling includes **initials**, **set #**, and **time** of collection.

Piedmont Atlanta Case

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dason DUKE ANTIMICROBIAL STEWARDSHIP OUTREACH NETWORK

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Blood Culture Contamination Reduction at Piedmont Atlanta Hospital

- What was the instigating factor that made you say “Ok, it’s time to fix this!”
  - Emergency Department Blood Contaminations were reported out during IP Committee each quarter. Rates had been above 2% and higher than the rest of the hospital rate. CMO requested a meeting be held to help brainstorm ideas to reduce contamination percentage in the ED.
- What were the resources available to you?
  - Partnerships with Phlebotomy and Microbiology lab
- Did you try other solutions before landing on this one?
  - ED Leadership and Unit Based Educator followed up with staff who had any reported contaminants
  - Due to the manual process of reporting of contaminants, made real time follow up difficult
- If you did a number of interventions, could you share the timeline (see next slide)
  - August 2020- ED implemented limiting the staff who could draw cultures
  - September 2020- identified staff members attended session put on by Microbiology and Lab on proper technique and steps for drawing blood cultures
- What hiccups occurred along the way?
  - Limiting the staff who are able to draw cultures in the ED, places strains on other timed processes such as Code Stroke, SEPSIS and EKGs
  - Phlebotomy getting called to ED to assist when dedicated ED staff unable to obtain the cultures
  - Sustainability of current process due to limited resources

Impact Continued