

مستشفى الوكرة

Al Wakra Hospital

عضو في مؤسسة حمد الطبية

A Member of Hamad Medical Corporation

Cultivating Quality: A Path to Zero Blood Culture Contamination in Maternal Care

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Introduction

Blood culture is a diagnostic test used to detect and identify the type of pathogen present in the blood stream. Blood culture as a diagnostic test plays a crucial role to identify the type of pathogen among clients with symptom of sepsis developed during antepartum, intrapartum and postpartum period which in return has helped in preventing maternal morbidity and mortality. This ongoing quality improve patient safety project has given a pragmatic view that, by continuous monitoring , obtaining feedback ,reviewing data received from lab on monthly basis and implementation of evidence-based strategies to overcome has significantly reduced blood culture contamination rate in Emergency obs & gyn in one year.

Method:

This quality improvement project applied PDSA (Plan-Do-Study-Act) cycle at various level, to reduce blood culture contamination rate in emergency obs and gyn since 1st of January 2023. The department has target to achieve the blood culture contamination rate of 1.9% by the end of December 2024.

Based on the evidence, a structured based strategies were implemented to identify the best practices related to blood culture specimen collection. These strategies were implemented in order to improve maternal health services and care in emergency The strategies incorporated over the 6 month period proved to be effective to overcome the identified barrier. To execute the plan for the accomplishment of the target at the desired time frame a team was established for proper monitoring of the practice based on standard criteria.

This plan of action included targeting environmental and skin contaminants, teamwork, education and feedback based on the data received from laboratory technician on monthly basis and monitoring of staff practice in timely manner.

Cause and effect

The diagram illustrates the causes and effects of increased blood culture contamination. A central blue oval points to the effect: "Increased in number of blood contamination rate in Emergency obs & gyn,Awh".

- People**
 - Staff Shortage
 - Unavailability of phlebotomy team
 - Unaware of specimen collection guidelines
- Method**
 - Improper technique of blood collection
 - Insufficient sample
 - Not following proper hand hygiene
- Equipment**
 - Lack of use of vacuum extraction collection system
 - Lack of sufficient supplies
 - Expired blood culture bottles
- Environment**
 - Patient flow
- Leadership**
 - Lack of training
 - Poor surveillance and feedback
 - Lack of monitoring
- Other Factors**
 - Blood culture bottle disinfectant
 - Lack of Diagnostic stewardship

The diagram shows five PDSA cycles aimed at reducing blood culture contamination:

- PDSA 01:** Establish IV Team within the OBED. Aim: To enhance patient care by providing specialized expertise in the insertion, maintenance, and management of intravenous access.
- PDSA 02:** Monitoring and providing staff with performance feedback and updates on their progress towards the objective. Aim: To facilitate continuous improvement, boost motivation, and ensure alignment with organizational goals, ultimately enhancing overall efficiency and effectiveness in achieving the intended outcomes.
- PDSA 03:** Educate healthcare professionals about blood culture contamination risks for better patient safety. Aim: To raise the awareness about the risks of blood culture contamination and its impact on the quality of health care and patient safety.
- PDSA 04:** Blood culture collection kit. Aim: For easy access to supplies at time of blood culture collection.
- PDSA 05:** Training Staff on blood culture extraction technique. Aim: Ensuring Adherence to Evidence-Based Best Practices for Blood Culture Collection among Staff.
- PDSA 04:** Avoid requesting unnecessary blood culture. Aim: Reduce The risks of unnecessary blood culture requests which include patient discomfort, resource overutilization, false positives, antibiotic overuse, hospital-acquired infections, diagnostic confusion, and psychological stress.

Overall goal: Reduce the percentage of Blood culture contamination rate in OBS & GYN Emergency by less than 2.03% by the end of December 2023.

Result:

In 2022, the baseline blood culture contamination (BCC) rate was 5%. Following the first PDSA cycle implemented in February 2023, the contamination rate significantly declined to 0% by March 2023. Through continuous monitoring and the application of evidence-based interventions, the BCC rate was successfully sustained at 0% throughout 2024. This achievement reflects a substantial improvement in adherence to best practices for blood culture collection and demonstrates the effectiveness of the quality improvement strategies implemented.

Year	Median Contamination Rate
2022	5%
2023	2%
2024	0%

Graph1: Blood Contamination Rate significantly dropped to 0% by 2023

Date	Adherence Rate
1-Jan-2023	84%
1-Feb-2023	92%
1-Mar-2023	100%
1-Apr-2023	92%
1-May-2023	84%
1-Jun-2023	100%
1-Jul-2023	92%
1-Aug-2023	100%
1-Sep-2023	100%
1-Oct-2023	100%
1-Nov-2023	100%
1-Dec-2023	100%
1-Jan-2024	100%
1-Feb-2024	100%
1-Mar-2024	82%
1-Apr-2024	97%
1-May-2024	96%
1-Jun-2024	100%
1-Jul-2024	100%
1-Aug-2024	100%
1-Sep-2024	100%
1-Oct-2024	100%
1-Nov-2024	100%
1-Dec-2024	100%

Graph 2: % of staff adherence to evidence-based practice for collecting Blood Culture samples achieved 100%

Date	Unsuccessful Rate
12/5/2022	9%
3/15/2023	0%
6/23/2023	0%
10/1/2023	0%
1/9/2024	1%
4/18/2024	0%
7/27/2024	0%
11/4/2024	0%
2/12/2025	0%

Graph 3: % of Unsuccessful Blood Culture sampling events Significantly declined from 9% in 2022 to 0% in 2023

Conclusion:

Blood culture contamination rate in Emergency obs and gyn ,showed progressive improvement with continuous and careful implementation of evidence-based intervention applied. Timely data collection, its review, surveillance has improved the quality of patient safety in reducing the blood contamination rate up to 0 % by making up to meet the target.

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