

CLABSI Rate Reduction Strategy (CRRS)

Introduction

Central Line-Associated Bloodstream Infection (CLABSI) result in thousands of deaths each year and billions of dollars in added costs to the healthcare system, yet these infections are preventable.

A central line-associated bloodstream infection (CLABSI) is defined as a Laboratory Confirmed Bloodstream Infection (LCBI) that is not secondary to an infection at another body site with a CL that has been in place for more than two consecutive calendar days (on or after CL day 3).

A central line-associated bloodstream infection (CLABSI) is a serious infection that occurs when microorganisms enter the bloodstream through the central line. Healthcare providers must follow a strict protocol when inserting the line to make sure it remains sterile and a CLABSI does not occur. In addition, to inserting the central line properly, healthcare providers must adhere to stringent infection control practices.

EPIDEMIOLOGY

An estimated 250,000 bloodstream infections occur annually, and most are related to the presence of intravascular devices. In the Kingdom of Saudi Arabia (KSA), the CLABSI rate in intensive care units (ICU) is estimated to be 2.5 per 1000 central line days. In the USA, the CLABSI rate in intensive care units (ICU) is estimated to be 0.9 per 1000 central line days.

According to recent GDIPC data, the most common pathogens are *Klebsiella pneumoniae*, *Acinetobacter baumannii* and *Candida* species. These are known three enemies that cause CLABSI outbreaks in MOH hospitals' ICUs. The relative rise in these infections is alarming and suggests that new approaches are needed to prevent them.

PROBLEM STATEMENT & MAGNITUDE

The national rate of CLABSI of 2.5 per 1000 central line days is considered higher than the NHSN rate which is 0.9 per 1000 central line days. Many efforts had been directed to lower the rate; however, the response is still not well – remarked.

Zero CLABSI initiative was produced as a champion for 19 hospitals in the KSA in 2019. Challenges to reach zero CLABSI or even closer are varied and many. Some of the competing hospitals struggled to improve their rate due to a lack of staff experience and skills. Supplies issues imposed another risk to have a zero CLABSI. However, the surveillance program had provided many interventions in terms of training, electronic system development, monitoring and evaluation, but still, the rate is not within the proposed target.

The problem of high CLABSI rate in MOH hospitals must be tackled in a uniformed strategic plan.

GAP AND FISHBONE ANALYSIS

Many causes affect CLABSI rate to be high. The strategy addressed these causes in details, by conducting Ishikawa (fishbone) methodology. The analysis showed clearly that the lack of compliance to infection control practices still forms the major cause of having CLABSI rate higher than NHSN international benchmark (*see Figure 1*).

The strategy team found that the malpractice during insertion, maintenance and removal of central lines had severe implications on the rate.

The strategy team targeted the staff who were closely linked to the process in many aspects. Unfortunately, there is a remarkable shortage of nurses attending the procedure and maintaining the central line. In many ICUs, nurse to patient ratio peaks up to 1:4. This will affect the quality of care since the nurses confront the challenge of giving care to the patients in optimal conditions. Failure to have a convenient time and favorable environment impedes the process and ends at a high rate.

Training and education of the staff in an ordinary way is not helping much. For example, lectures are not enough without practical training. The staff is still unable to identify the cases correctly despite the previous CLABSI training courses and workshops.

Leadership and administrative support to reduce the rate or help in maintaining safe practices need more attention and encouragement. Infection control committees in some regions and hospitals are inactivated. Some are following the rate without any effective interventions to keep the rate within its required limit and confinement. One of the major manifestations of lack of that support and aid is the phenomenon of continuous running short of supplies. Interrupted supplies impose certain risks and impediments to the adoption of preventive bundles. Chlorhexidine gluconate insufficiency, PPE unavailability and other runs-out materials are examples of shortage.

A matter of misdistribution of these supplies and materials are seen. Some regions or hospitals have more than they ask; others are lacking the essential needs. Even within one hospital, there are variations and deviations from the equation of supply and needs. By reviewing the prevention

strategies put for CLABSI rate reduction in some MOH hospitals, the strategy team found that they are meager and of little impact. So, strategies and plans are highly considered and recommended.

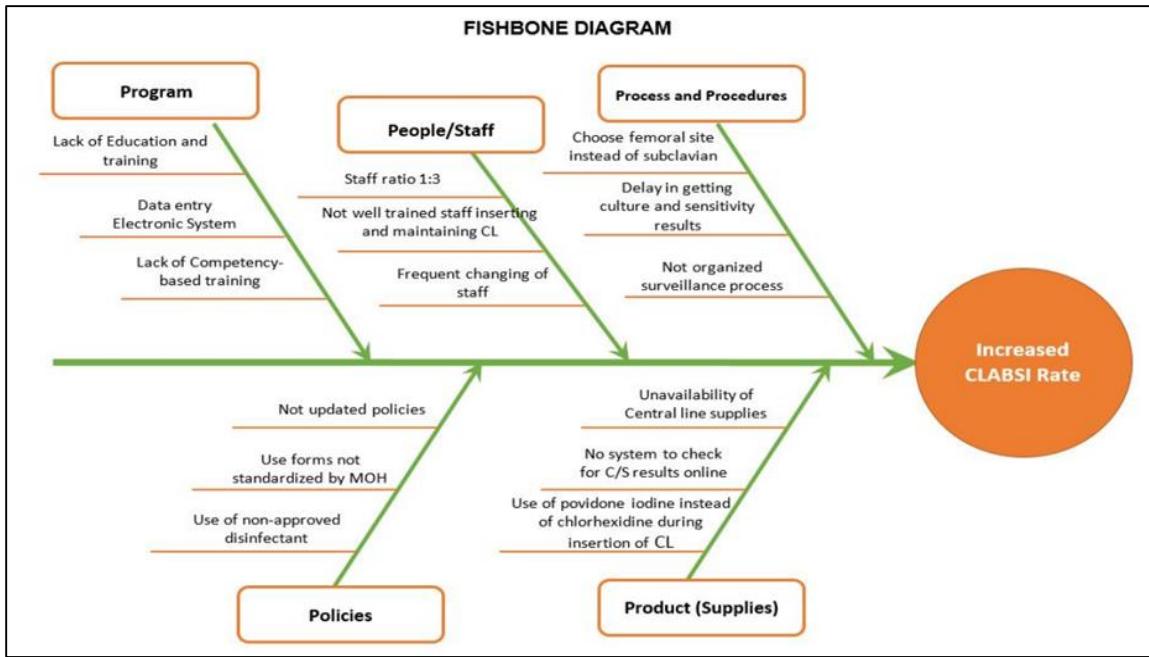


Figure 1: Gap and fishbone analysis for CLABSI Rate Reduction Strategy (CRRS).

SURVEILLANCE DATA AND CLABSI RATE ANALYSIS

The surveillance program is well-established in GDIPC and has professional personnel with recognizable qualifications and experience. There are surveillance coordinators in the regions and the hospitals. Surveillance electronic program (HESN) has started in 2018.

In the Kingdom of Saudi Arabia, there are twenty health regions with more than 200 MOH hospitals. The number of hospitals that are under surveillance is 106. Out of the 106 hospitals the strategy targets to reduce the rate in 78 hospitals with adult ICUs.

The CLABSI national rate is 2.5 per 1000 central line days. Clearly, the rate is higher than the NHSN CLABSI rate of 0.9 per 1000 central line days. Thus, the strategy aims to lower the rate from 2.5 to 0.9 per 1000 central line days or even less.

General Directorate of Infection Prevention and Control in Healthcare Facilities (GDIPC) has divided the regions and hospitals into four zones (Black, Red, Yellow and Green) according to CLABSI rate (see **Table 1**).

Table 1: Four zones for regions and hospitals based on CLABSI rate

Zone	CLABSI Rates	Level
Green	0 – 0.9	1
Yellow	> 0.9 – 2.5	2
Red	> 2.5 - 5	3
Black	> 5	4

VISION

To have Zero CLABSI in all the Medical Surgical adult ICUs of MOH hospitals.

MISSION

To implement evidence-based interventions to reduce the current CLABSI rate.

AIM

To reduce the current national CLABSI rate 2.5 to 0.9 or even less in the adult Medical Surgical ICUs of 78 MOH hospitals, starting from January 2022 to December 2024 (3 years period).

OBJECTIVES

STRATEGIC GOALS

1. To let leaders and decision-makers are fully aware of CLABSI reduction, its effects in shortening the LOS, lowering the costs and reducing morbidity and mortality.
2. To ensure that the Infrastructure of adult medical surgical ICUs meet the IC standards.
3. To have adequate supplies (Quantity and Quality) in ICUs for appropriate central line insertion and maintenance.
4. To have sufficient staff in numbers and qualifications to deal with CLABSI insertion & maintenance.
5. To change behavior, train and educate the health care workers (HCWs) on how to prevent CLABSI in the targeted hospitals / ICUs.

6. To increase the compliance and strict adherence to the prevention bundle and to apply best practices in the targeted hospitals / ICUs.
7. To prevent and control central line-associated outbreaks in the targeted hospitals/ICUs.
8. To facilitate the surveillance program of GDIPC, regions/clusters and hospitals of MOH for decreasing the National CLABSI Rate (2.5) down to (0.9).
9. To have an advanced Electronic Surveillance System (faster and better HESN/HESN Plus).
10. To Go Green (0.9 per 1000 central line days) or even less for the targeted hospitals/ ICUs.
11. To monitor and evaluate CRRS KPIs quarterly, on regular basis and when deemed necessary for the three years' duration of the strategy.

STRATEGIC OBJECTIVES

1. To ensure that all leaders and administrators understand the meaning of CLABSI and its effect on regions and hospitals' performance.
2. To have modern and well-equipped ICUs for appropriate Central line insertion and maintenance according to the standards.
3. To have adequate supplies (Quantity and Quality) in ICUs for appropriate central line insertion and maintenance.
4. To orient the new staff in ICUs.
5. To well distribute the tasks in ICUs.
6. To motivate staff working in a surveillance program and recognize their minor achievements.
7. To develop comprehensive workshops on surveillance for the coordinators.
8. To classify trainees into different categories.
9. To retain trained ICP staff until taking approval from GDIPC.
10. To solve the issues of language barrier.
11. To encourage the staff to dedicate to surveillance tasks.
12. To augment the practice of hands-on - training.
13. To increase the compliance of Central line-related infection control measures.
14. To improve the clinical practice of catheter insertion and maintenance.

15. To increase compliance to CLABSI prevention bundles.
16. To solve the internet connectivity issues.
17. To get faster and better surveillance electronic system.
18. To encourage complete surveillance data entry in HESN.
19. To get staff ratio at least 1:2 in ICUs.
20. To educate surveillance coordinators.
21. To avoid recurrent shifting and transfers of staff.
22. To keep leaders updated on the progress of CRRS.

STRATEGY FORMULATION JUSTIFICATIONS

GDIPC looks at the CLABSI situation after thorough evaluation processes. A need for a holistic approach and comprehensive strategy to tackle the various issues of CLABSI reduction is absolutely required. There were many efforts that had been implemented previously. Some of them were fruitful; others still require improvements to be effective. So, the strategy is formulated not only to reduce the CLABSI rate but also to function as a model for reducing other national HAIs rates.

STRUCTURE & FUNCTIONS OF THE STRATEGY TEAM & SURVEILLANCE DEPARTMENT

GDIPC director called for a meeting in the mid of September to discuss the situation upon the provided data of CLABSI. The meeting came out with recommendations to have a well-written strategy.

On the 20th of September 2021, a grand workshop was held in GDIPC under the patronage of the director. He presented the strategy to the GDIPC team members which are divided into four working groups.

METHODOLOGY AND WORKFLOW

The strategy team began with clear roles and collaborative responsibilities for everyone in the team.

The first group is the steering group, which is responsible for the preparation of the main strategy draft. This group represented itself as a connecting hub for the other three groups.

The second group is the group for consultations, which provides technical assistance to the members of the strategy team, whenever needed. The members of consultation group are professionals, experienced and dedicated members of GDIPC.

The third one is the surveillance group, which organizes the activities, offers data, documents the achievements and reports all the deliverables of the strategy.

The fourth and last group is the group of monitoring and evaluation.

Many workshops had been conducted to achieve the strategic goals.

Training and education workshop in GDIPC got into the depth of how effectively the training could improve the compliance to the pertinent standards. Focus group discussion of that workshop was productive and fruitful. GDIPC training and education department was involved and enriched the workshop remarkably.

King Saud Medical City (KSMC) workshop on the 24th of October 2021 was aimed to determine the gaps in clinical practices, that are closely linked to IPC measures and standards. In that workshop, the participants were from different rays of specialities and backgrounds. They discussed their points of view in an encouraging and favorable climate. They came out with valid recommendations that added much to the strategy.

STRATEGY TEMPLATE DESCRIPTION

The template was simply depicted into an excel sheet. It had many columns drawn to well explain the purposes of the strategy. Gap analysis had been processed and problems had been listed and numerated. The strategic goals were matching the strategic components. They were broken into strategic objectives in the same body of the template.

KPIs were stated in the template to precisely measure the achievement of the strategic goals.

The progress of achieving the goals was designed according to the levels of intervention accompanied with a colour-coding system for the different zones (Black, Red, Yellow and Green).

Finally, the template answered the questions of what, why, how, who, when and where.

EXPECTATIONS AND LIMITATIONS

One of the serious failures of the strategy implementation is dealing with it like any other invaluable strategy.

Although the strategy does not require huge funds or a big budget, lack of will and determination of the stakeholders, leaders and decision-makers may seriously affect the strategy negatively.

CONCLUSION

GDIPC by implementing this strategy aims to lower the CLABSI rate from 2.5 to 0.9 per 1000 central line days or even less.

