DEDER GENERAL HOSPITAL

HEALTHCARE QUALITY IMPROVEMENT PROJECT

Improving Safe Surgery Checklist (SSC) Adherence

By: OR QI TEAM

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Deder, Eastern Ethiopia

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ABSTRACT

Background: Using the WHO Safe Surgery Checklist (SSC) is essential to reduce preventable surgical errors. However, in many resource-limited settings like Deder General Hospital, consistent use of the checklist has been a challenge. A baseline audit conducted from **October 15, 2017 to December 30, 2017E.C**, found that the checklist was properly used in only 60% of surgeries—leaving patients at higher risk for complications such as surgical site infections (SSIs), anesthesia mistakes, and retained surgical instruments.

Objective: This QI project aimed to raise SSC adherence from a baseline median of 60% to 100% over a five-month period, from **January 01, 2017E.C-May 30, 2017E.C.**

Methods: A quality improvement initiative was launched using the Model for Improvement and four Plan-Do-Study-Act (PDSA) cycles. Key interventions included: (1) Integrating the SSC into the hospital's Electronic Medical Record (EMR) system, (2) Providing hands-on training for OR teams, (3) Posting visual reminders of the SSC in operating rooms, and (4) Appointing nurse ambassadors to promote checklist use. Data on SSC adherence were collected every two weeks.

Results: Each intervention led to marked improvements. After integrating the SSC into the EMR, adherence rose to 80% (8 out of 10 cases). Following staff training, it increased to **90% (27/30**). The introduction of posters pushed it to **97% (29/30),** and by assigning nurse ambassadors, full compliance—100% (30/30)—was achieved. Overall, the median adherence reached 100% by the end of the project. At the same time, SSI rates dropped significantly—from 12.3% before the interventions to just 2.4%, an 80% reduction ($p<0.01$).

Conclusion: This project shows that even in low-resource settings, simple, cost-effective strategies—like EMR integration, team training, visual cues, and empowering frontline staff—can lead to full adherence to the Safe Surgery Checklist. The sharp decline in infection rates further highlights how vital the checklist is in ensuring safer surgeries and better patient outcomes.

INTRODUCTION

Surgical care is a critical component of modern healthcare, but it's not without risks. Around the world, too many patients still suffer from complications or even death due to preventable surgical errors. In response to this global challenge, the World Health Organization (WHO) introduced the **Safe Surgery Checklist (SSC)** in 2008, as part of its "Safe Surgery Saves Lives" initiative.

The checklist is a simple yet powerful tool designed to be used at three key stages of surgery—**Sign In, Time Out, and Sign Out**. It promotes better communication, teamwork, and attention to essential safety steps such as confirming the patient's identity, giving timely antibiotics, and ensuring equipment readiness. When used correctly, the SSC has been shown to reduce surgical complications and save lives.

However, success depends on how consistently and thoroughly surgical teams apply it. Unfortunately, in many healthcare settings—especially in low-resource environments like Ethiopia—adherence to the checklist remains far from optimal. Barriers such as limited training, time constraints, lack of strong leadership, resource shortages, and resistance to change often stand in the way of full implementation.

At **Deder General Hospital**, although the SSC has been officially adopted, initial observations show that it is not being used consistently or effectively. This gap between policy and actual practice poses a serious risk to patient safety and increases the likelihood of avoidable errors in the operating room.

This project was launched to address that concern. Our aim is to closely examine how the SSC is currently being used at Deder General Hospital, understand the real-world challenges and opportunities that influence its use, and design practical, targeted strategies to improve adherence. Through this work, we hope to build a stronger culture of safety, improve communication and teamwork among surgical staff, reduce preventable harm, and ultimately enhance the quality of care for every surgical patient we serve. By focusing on this initiative, we reaffirm our commitment to delivering safe, evidence-based care and to protecting the health and well-being of our community in Deder.

CONTEXT

This quality improvement project was implemented to **improving safe surgery checklist (SSC) adherence** at Deder General Hospital.

STATEMENT OF PROBLEM

The Safe Surgery Checklist compliance audit, conducted biweekly from October 15, 2017 to December 30, 2017E.C, revealed that only **60%** of patients adhered to the Safe Surgery Checklist. This is significantly lower than the near-universal compliance recommended by WHO guidelines. This gap means that in 40% of surgeries, essential safety steps are ignored, increasing the risk of preventable complications such as surgical site infections, anesthesia problems, incorrectly located surgeries, and instrument retention.

AIM STATEMENT

The Operating Theatre Quality Improvement (QI) team at Deder General Hospital aims to increase Safe Surgery Checklist (SSC) adherence from a baseline median of 60% to 100% from **January 01, 2017 E.C to May 30, 2017 E.C**

ASSESSMENT OF PROBLEM AND ANALYSIS OF ITS CAUSES:

To improve the Safe Surgery Checklist (SSC) adherence at Deder General Hospital, the quality improvement team used the Model for Improvement (MFI) and the Plan, Do, Study, Act (PDSA) cycle to test change ideas. We used Fishbone and Driver diagrams to identify and address root causes.

INTERVENTION

The QI team analyzed the root causes using a fishbone diagram **(figure1),** plotted possible intervention packages using driver diagram and designed an implementation plan **(figure 2)**. A series of PDSA cycles were conducted. Intervention data were collected and analyzed bi-weekly. the intervened change ideas were:

- Integrate SSC Checklists with EMR (Electronic Medical Records).
- Provide training on SSC for all surgical team members.
- Use SSC Posters to reinforce awareness.
- Assign SSC ambassadors.

FISHBONE DIAGRAM

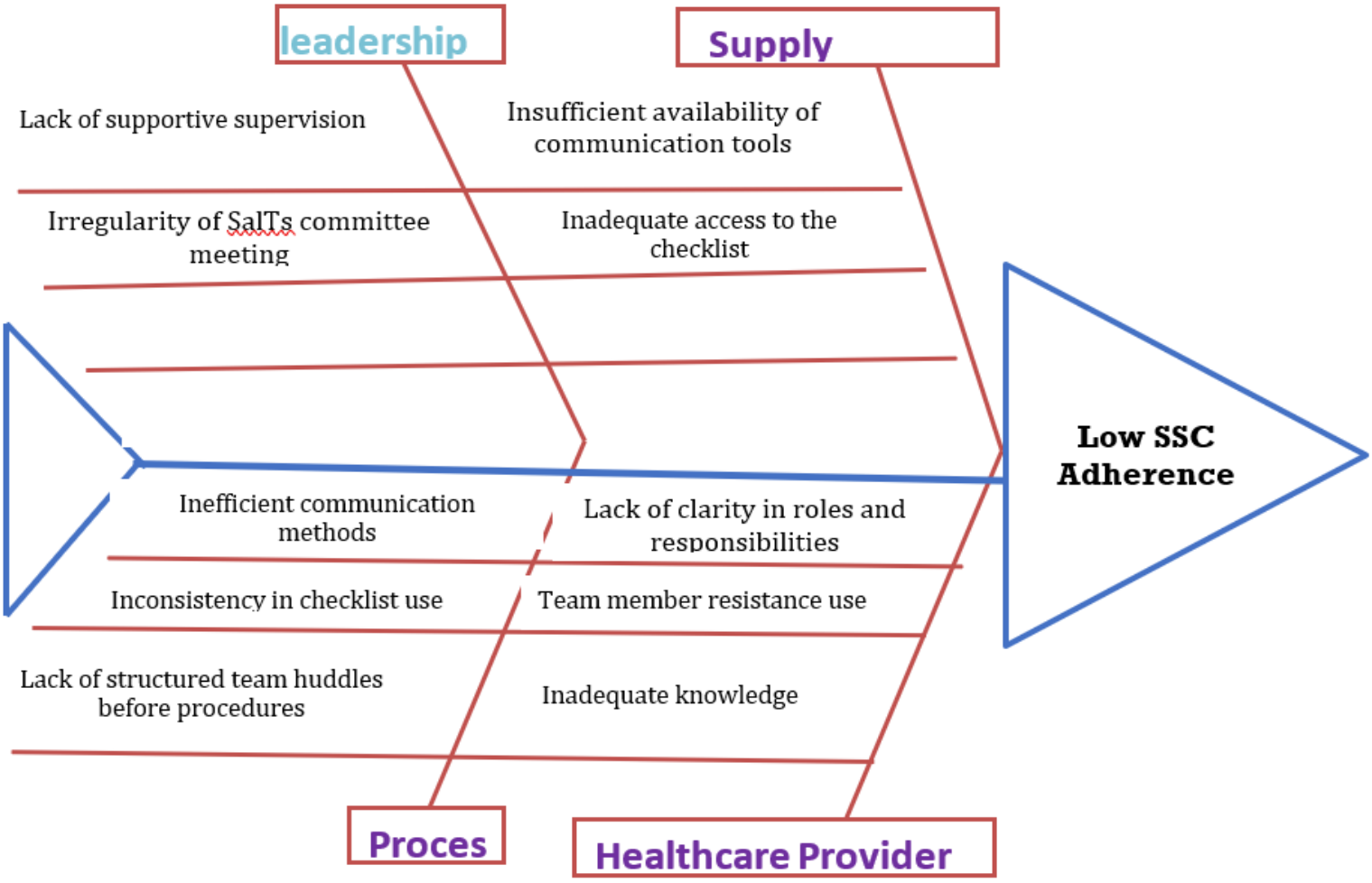

Figure 1: *Fish Bone Diagram to increase Safe Surgery Checklist (SSC) adherence from a baseline median of 60% to 100% from January 01, 2017 E.C to May 30, 2017 E.C*

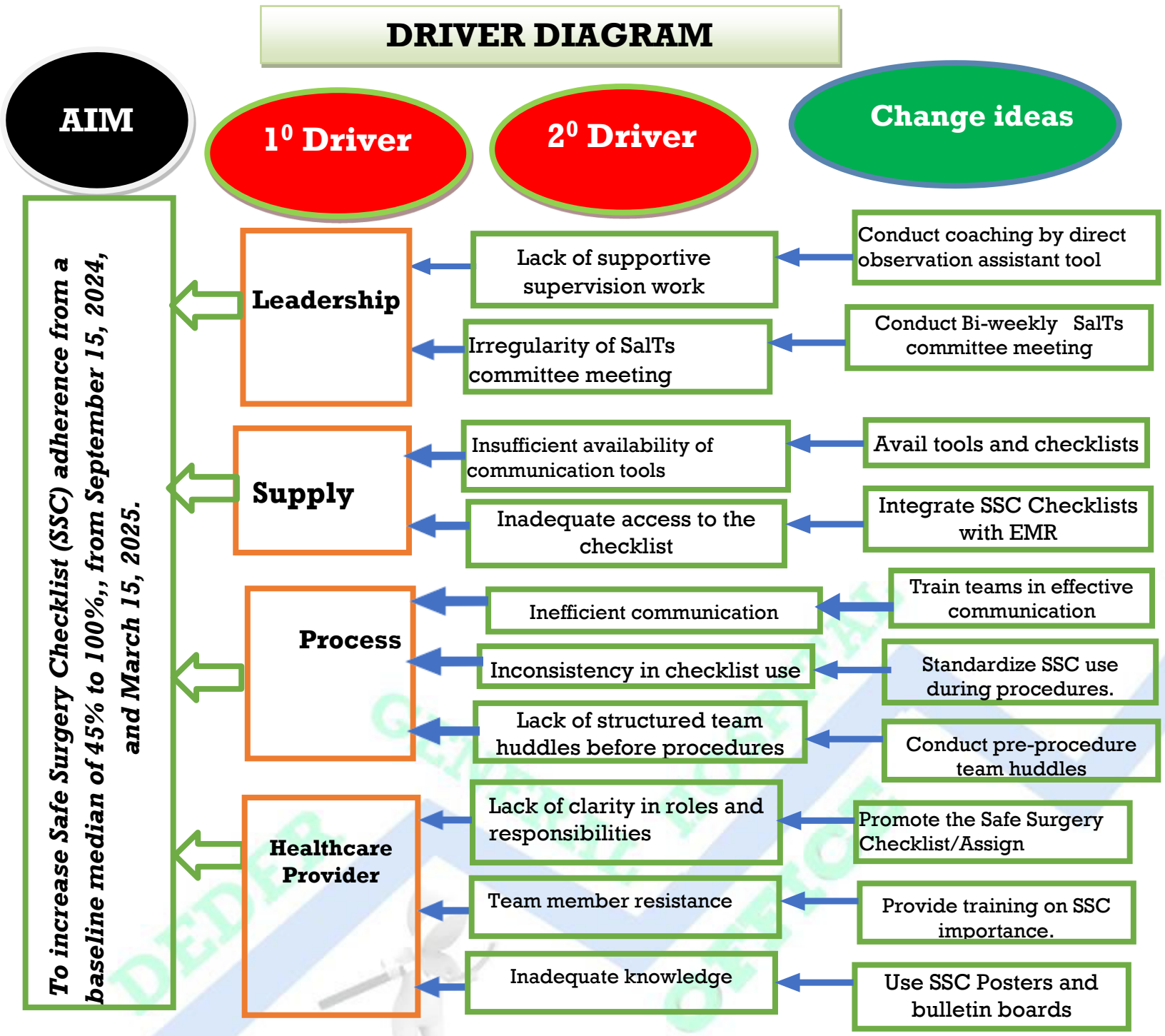

***Figure 2**: Driver diagram to increase Safe Surgery Checklist (SSC) adherence from a baseline median of 60% to 100% from January 01, 2017 E.C to May 30, 2017 E.C*

MEASURES

Outcome measurement

- % of Safe Surgery Checklist (SSC) adherence

Process measures

- Proportion of SSC Checklists integrated with EMR (Electronic Medical Records).
- Proportion of trained staff on SSC utilization.
- Proportion of SSC Posters availed to reinforce awareness.
- Number of Assigned SSC ambassadors

Balancing measures

- Rate of surgical site Infection (%)

IMPLEMENTATIONS OF PLAN OF PDSA

Table 1: ***Process Measures:***

Change Idea	HOW	WHO	When	Where
Integrating the SSC into the Electronic Medical Record (EMR):	To ensure the checklist became a non-negotiable part of every surgical procedure, we embedded it directly into the EMR system. Each phase of the checklist—**Sign In, Time Out,** and **Sign Out**—was made a mandatory step that had to be completed and electronically signed before moving on in the surgical workflow.	EMR focal person (Rudwan) and OR Director (Dr.Taju A)	From January 01-15, 2017E.C	Deder General hospital OR
Providing Comprehensive SSC Training:	Senior surgeons were developed and delivered comprehensive SSC training. This included power point, interactive workshops, and realistic operating room simulations. To maintain skills over time, we scheduled quarterly refresher sessions and built in knowledge checks to confirm understanding and competency.	Training Coordinator (Haza J), OR Director (Dr. Taju A), and Quality Director (Abdi T)	From January 16-February 30, 2017E.C	Deder General hospital training hall
Displaying SSC Posters in Key Areas:	To keep the checklist top-of-mind, we designed clear, visually prominent posters summarizing the key SSC steps and displayed them in high-traffic areas relevant to the surgical team. They placed these posters at operating room entrances, scrub sinks, and staff station.	Finance head (Obsa), Quality Director (Abdi T), & Nursing Director (Yonis M)	From March 01- April 15, 2017E.C	Deder General hospital OR
Assigning Surgery Checklist ambassador:	The OR Director (senior surgeon) trained and assigned 4 nursing staff to act as SSC Ambassadors for each surgical shift. These ambassadors took responsibility for actively leading the checklist process during every surgery on their shift, coached team members on proper use, and conducted brief, informal compliance audits.	OR Director (Dr.Taju A), and Quality Director (Abdi T)	From April 16-May 30, 2017E.C	Deder General hospital OR

Table 2: ***Data collection Plan (process indicators)***

Process/Change Idea	Data Source (Where)	Data Collection Method (How)	Time (When)	Responsible body
Integrating the SSC into the Electronic Medical Record (EMR):	Electronic Medical Records (EMR) System	Automated tracking of checklist completion in EMR	From January 01-15, 2017E.C	OR nurse head (Shame Ahmed) & OR Director (Dr. Taju)
Providing Comprehensive SSC Training:	Training attendance records and evaluation	Conduct staff surveys on awareness and usage	From January 16-February 30, 2017E.C	OR nurse head (Shame Ahmed) & OR Director (Dr. Taju)
Displaying SSC Posters in Key Areas:	Operating Room (OR) and staff common areas	Visual audits and staff feedback surveys	From March 01-April 15, 2017E.C	OR nurse head (Shame Ahmed) & OR Director (Dr. Taju)
Assigning Surgery Checklist ambassador:	Operating Room and staff meetings	Observation of ambassador activities and staff interviews	From April 16-May 30, 2017E.C	OR nurse head (Shame Ahmed) & OR Director (Dr. Taju)

Table 3: *Process Indicator Performance Tracking Sheet*

S.No	Change Ideas/ Interventions				Remark
		Number/session on planned	Number/session performed	% of achievement	
1.	**Integrating the SSC into the Electronic Medical Record (EMR):**	1	1	100	
2.	**Providing Comprehensive SSC Training:**	1	1	100	
3.	**Displaying SSC Posters in Key Areas:**	1	1	100	
4.	**Assigning Surgery Checklist ambassador:**	4	4	100	

Do of PDSA

Table 4: ***Outcome Indicator Performance Tracking Sheet***

AIM	**OUTCOME INDICATOR OF the QI project overtime (in Bi-weekly)**											
To Improve SSC Adherence from Current Median of 60% to 100% from January 01, 2017 E.C to May 30, 2017 E.C	Numerator, Denominator & outcome Indicator		**15-Jan-17**	**30-Jan-17**	**15-Feb-17**	**30-Feb-17**	**15-Mar-17**	**30-Mar-17**	**15-Apr-17**	**30-Apr-17**	**15-May-17**	**30-May-17**
	Numerator	# of chart with fully completed and documented Checklist (SSC)	8	8	10	9	10	9	10	10	10	10
	Denominator	Total # of audited surgical cases.	10	10	10	10	10	10	10	10	10	10
	Indicator	% of SSC adherence	80	80	100	90	100	90	100	100	100	100

RESULTS

A quality improvement project at Deder General Hospital brought about a remarkable transformation in how consistently the Safe Surgery Checklist (SSC) was used in the operating theatre. Over a Five month period, adherence to the checklist rose dramatically from a baseline median of just **60% to a full 100% (Figure 3).**

This success was achieved through a series of carefully planned and tested PDSA (Plan-Do-Study-Act) cycles that tackled key barriers to checklist use. **PDSA Cycle 1** (**January 01- 15, 2017E.**C) focused on integrating the SSC into the hospital's Electronic Medical Record (EMR) system. This integration made it mandatory to complete the checklist at the Sign-In, Time-Out, and Sign-Out stages of surgery. The results were immediate: adherence jumped from **60% to 80**%. Of 10 surgery cases reviewed audited during this cycle, 8 (80%) showed full checklist completion. **PDSA Cycle 2** (**January 16-February 30, 2017E.C**) aimed to strengthen staff capacity. Team members participated in hands-on training, including simulations and workshops, which helped reinforce the progress made during Cycle 1. By mid-February, all 10 surgeries audited had full SSC adherence, and overall, 27 out of 30 surgery cases reviewed (90%) met compliance standards. **PDSA Cycle 3** (**March 01- April 15, 2017E.**) introduced SSC reminder posters and placed at operating room entrances, OR staff station, and in main OR. These simple but effective prompts helped teams maintain high performance. Of the 30 surgeries reviewed during this cycle, **29(97.5%)** had fully completed checklists. **PDSA Cycle 4** (**April 16-May 30, 2017E**) introduced a new leadership role: nurse SSC Ambassadors. These ambassadors conducted shift-level audits and provided real-time coaching. Their efforts paid off—100% of the 30 surgeries reviewed during this period had complete and accurate checklist use **(Table 4 and (figure 3).**

Beyond checklist adherence, the project led to substantial clinical improvements. Most notably, the rate of surgical site infections (SSIs) dropped by **80%—from 12.3%** in the pre-intervention period (**October 15, 2017 to December 30, 2017E.**C) to just 2.4% by May 2017E.C ($p < 0.01$) **(Figure 4).** This dramatic decline was seen across 100 audited surgical cases and mirrored the improvements in checklist use: after Cycle 2 (93% compliance), SSI rates were cut in half (6.1%), and by the end of Cycle 4 (100% compliance), they had reached their lowest point.

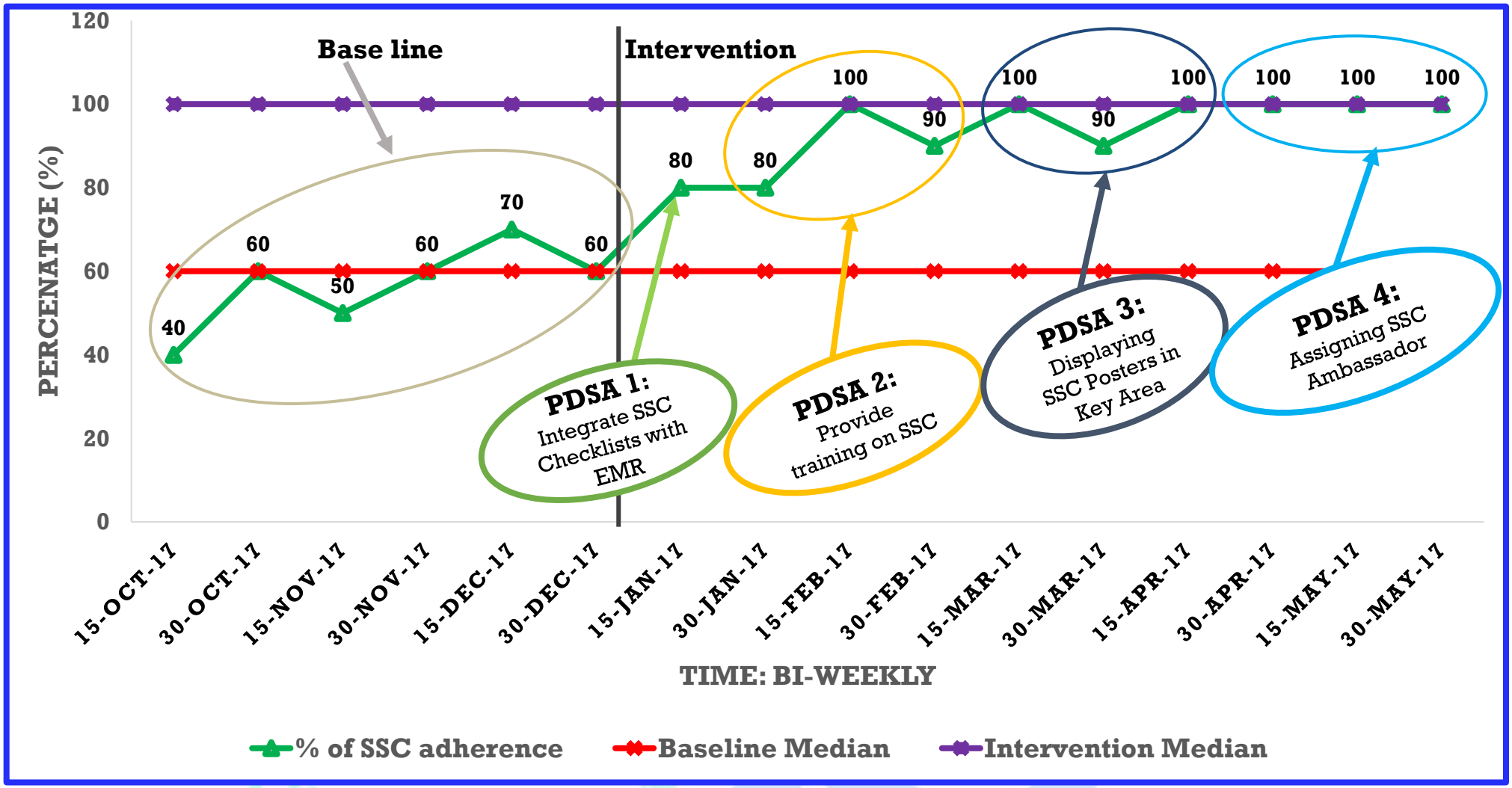

Figure 3: *Run chart with multiple PDSA cycles to increase Safe Surgery Checklist (SSC) adherence from a baseline median of 60% to 100% from January 01, 2017 E.C to May 30, 2017 E.C*

BALANCING MEASURE OUTCOMES

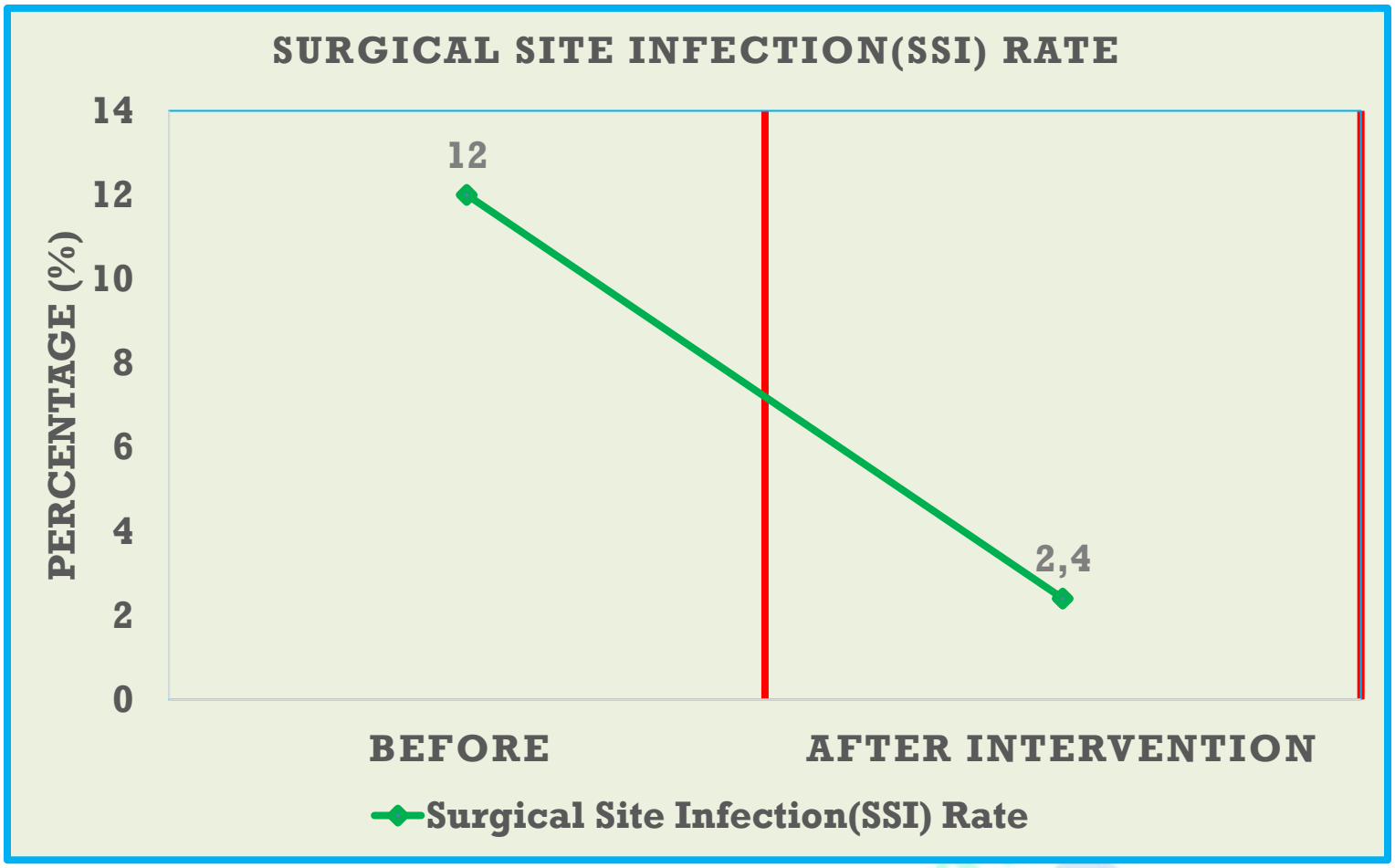

Figure 4: Shows that improved SSC Adherence resulted that reduced Surgical site infection (SSI) rate from ***January 01, 2017 E.C to May 30, 2017 E.C***

DISCUSSION

The success of this quality improvement project at Deder General Hospital highlights just how powerful practical, context-aware interventions can be—even in settings with limited resources. By digging into the real root causes of inconsistent use of the Safe Surgery Checklist (SSC)—like unclear processes, knowledge gaps, and lack of accountability—the team was able to implement step-by-step changes through the PDSA (Plan-Do-Study-Act) cycles. These weren't complex or expensive solutions, but they worked. Integrating the SSC into the hospital's Electronic Medical Record (EMR) system made it a required part of care. At the same time, targeted staff training and clear visual reminders (like posters) helped reinforce the checklist's importance. Perhaps most importantly, assigning nurse ambassadors gave frontline staff both ownership and real-time coaching, helping to turn the checklist from a one-off task into a normal, reliable part of surgical care. Together, these efforts pushed SSC compliance from just 60% to a full 100%, showing that even low-cost, practical strategies can break through barriers like staff resistance and workflow issues.

But the benefits didn't stop with checklist use. The project also led to major clinical improvements—especially an 80% drop in surgical site infections (SSIs), from 12.3% down to 2.4%. This sharp decline wasn't a coincidence; it was closely tied to better checklist compliance, especially around steps like timing of antibiotics and equipment checks. These results echo global research, confirming that faithful use of the SSC can significantly cut surgical complications. What makes this experience unique is how achievable it proved to be in a low-resource environment. Still, keeping these gains will require continuous leadership support, refresher trainings, and the ongoing presence of nurse ambassadors to keep standards high. For other hospitals working with limited means, this project offers a strong example to follow: focus on digital tools when possible, empower staff at every level, and use visual cues to turn policy into daily practice. In the end, this combination not only improved patient safety—it also strengthened the hospital's overall capacity to deliver consistent, high-quality care.

CONCLUSION

Based on the findings of this quality improvement project, Deder General Hospital successfully achieved its ambitious goal of increasing Safe Surgery Checklist (SSC) adherence from a baseline median of **60% to a sustained 100%** over a Five month period, primarily through the systematic implementation of four sequential PDSA cycles integrating the SSC into the Electronic Medical Record (EMR), providing comprehensive staff training, displaying prominent visual reminders via posters, and assigning dedicated SSC ambassador nurses to lead and coach checklist completion during every surgical shift, which collectively addressed key root causes of non-adherence and fostered a culture of safety, ultimately resulting in a clinically significant 80% reduction in surgical site infection rates, demonstrating that rigorous application of quality improvement methodologies can overcome barriers and achieve near-perfect compliance with critical safety protocols even in resource-limited settings, thereby substantially enhancing patient safety outcomes.

LESSONS LEARNT

Based on the successful implementation at Deder General Hospital, key **lessons learnt** include: **Integrating the SSC into the Electronic Medical Record (EMR)** proved critical for making checklist completion mandatory and non-negotiable, significantly boosting adherence by embedding it into the surgical workflow; **sustained, hands-on training** reinforced through simulations and refreshers was essential to build team competency and address knowledge gaps; **visible reminders like strategically placed posters** served as constant prompts that maintained awareness and standardized practice; and **designating dedicated SSC ambassadors** empowered frontline staff to champion compliance, provide real-time coaching, and foster accountability, demonstrating that combining system-level changes (EMR), ongoing education, environmental cues, and empowered leadership creates a synergistic effect for achieving and sustaining 100% adherence and tangible clinical benefits like reduced infections.

MESSAGES FOR OTHERS

Full adherence to the Safe Surgery Checklist (SSC) can be achieved even in resource-limited settings. Our experience shows that with a few focused, low-cost strategies, real change can occur. We began by integrating the checklist into our electronic medical records to ensure consistent use. We also invested in team training through simulations, added visual reminders in high-traffic areas, and empowered frontline staff to act as SSC ambassadors, promoting accountability and responsibility. Our experience demonstrates that systematic adherence to the Safe Surgery Checklist, driven by leadership commitment and frequent PDSA cycles, not only transforms the culture of safety but also directly reduces preventable harm, as shown by an 80% reduction in surgical site infections.

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