DEDER GENERAL HOSPITAL

HEALTHCARE QUALITY IMPROVEMENT PROJECT

QI PROJECT: REDUCING IRRATIONAL DRUGS USE

By: GYN/OBS WARD QI TEAM

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March 2017E.C,

Deder, Eastern Ethiopia

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Lists of Health Service Quality Team Members

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1.	Nuredin Yigezu	CEO	MPH	CEO
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3.	Abdi Tofik	HSQ	MPH	Coach
4.	Dr. Anwar Sham	OBGYN	Gynecology & Obstetrics	Team leader
5.	Dr.Taju Ale	OBGYN	Gynecology & Obstetrics	Member
6.	Beyan Abdo	OBGYN	Gynecology & Obstetrics	Secretary
7.	Abdella Mohammed	OBGYN	Ward head	Data collector
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ABSTRACT

Introduction: Irrational use of drugs refers to prescribing drugs that fails to conform to good standards of treatment. **Under-prescribing** indicates the instance where the medicines required are not prescribed, or an insufficient dosage or treatment duration is issued. **Over-prescribing** refers to instances where a medicine that is not indicated is prescribed. **Incorrect prescribing** also occurs when a medicine is given for the wrong diagnosis, the prescription is prepared improperly, or adjustments are not made to incorporate the patient's co-existing medical, genetic, or environmental conditions. **Extravagant prescribing** is said to have occurred when a prescriber issues a more expensive medicine when a less expensive one of comparable safety and efficacy exists. **Multiple prescribing** is also deemed to have taken place when two or more medicines are prescribed when fewer would have achieved same effect

Objective: The aim of this QI project was to reduce the encounters of Irrational drug use from the current median of 47% to 0% from October 2017E.C to March 2017E.C.

Methods: To reduce irrational drugs prescription, the QI team used the model for improvement model (MFI). The PDSA (Plan-Do-Study-Act) cycle was used to test the change ideas. We used a Fishbone diagram and a Driver diagram technique to identify the root causes and address them. The key change ideas implemented consisted of provide in- service training, availing lists of essential drugs to prescribers, conduct weekly chart audits & provide feedback, conduct focused group discussion

Result: Upon completion of the QI project, the overall irrational drug use was decreased from 47% to 0%. The implementation of the project brought positive consequences in improving the average length of stay as balancing measure and decreased the patient's hospital readmission from 15% to 5%.

Conclusion: Irrational drug use has improved since the beginning of the project period. Implementation of "in-service training, provision of essential medication lists, focus group discussions with all stakeholders, medication audit and feedback" were some of the key improvement ideas implemented to improve irrational drug use.

Key Words: Irrational drug use, health service quality, Deder General Hospital, Oromia

INTRODUCTION

Irrational use of drugs refers to prescribing drugs that fails to conform to good standards of treatment [1]. This April manifest in five different ways, namely: under-prescribing, over- prescribing, incorrect prescribing, extravagant prescribing, and multiple prescribing.

Under-prescribing indicates the instance where the medicines required are not prescribed, or an insufficient dosage or treatment duration is issued [2]. Over-prescribing refers to instances where a medicine that is not indicated is prescribed, or if indicated, the duration of treatment is too long or the quantity of medicine given to patients exceeds the amount required for the current course of therapy. This can include, for instance, giving 21 days course of an antibiotic for a minor infection that requires just 7 days of treatment, or when an antibiotic is prescribed in the first place for a suspected viral infection [3]. Incorrect prescribing also occurs when a medicine is given for the wrong diagnosis, the prescription is prepared improperly, or adjustments are not made to incorporate the patient's co-existing medical, genetic, or environmental conditions [4]. Extravagant prescribing is said to have occurred when a prescriber issues a more expensive medicine when a less expensive one of comparable safety and efficacy exists, or where a prescriber treats a patient symptomatically instead of tackling the underlying serious condition [5]. Multiple prescribing is also deemed to have taken place when two or more medicines are prescribed when fewer would have achieved same effect, or where prescribers treat several related conditions when treatment of the underlying (primary) disorder would improve or cure the other conditions [6].

In Ethiopia, study indicates that there is over prescribing of antibiotics (58.1%) and injection (38.1%) [9]. inadequate knowledge of patients for the potential side effects of their dispensed drugs (5.6%) [10], low labeling of drugs dispensed to the patient (8.47%) and lack of documentation of patient diagnosis on the prescription by prescribers [11].

Therefore, this Quality improvement project was carried out as interventional study to reduce irrational drug use in Deder General Hospital and also provides information for better understanding of the contribution of rational drug use in study

CONTEXT

The QIP was conducted at Maternity ward of Deder General Hospital from October 2017E.C to March 2017E.C

STATEMENT OF PROBLEM

A chart review conducted on irrational drug use from August 01, 2016E.C to September 15, 2017E.C, in the maternity ward of Deder General Hospital revealed that the rate of irrational drug use was 47%, which was significantly high and led to wastage of resources, unnecessary adverse drug effects, antimicrobial resistance, and prolonged hospital stays.

AIM STATEMENT

To reduce the encounters of Irrational drug use from the current median of 47% to 0% from October 2017E.C to March 2017E.C

Assessment of problem and analysis of its causes:

To reduce irrational drugs prescription, the QI team used the model for improvement model (MFI), and the PDSA (Plan-Do-Study-Act) cycle was used to test the change ideas. We used a Fishbone diagram and a Driver diagram technique to identify the root causes and address them.

BASELINE DATA COLLECTION AND ANALYSIS

The medical records of the junior physician's diagnosis and prescribed/ordered medication were reviewed by the Hospital Health Service Quality Unit and clinical audit team. Their audit on under-prescribing, over-prescribing, incorrect prescribing, extravagant prescribing, and multiple prescribing. The team extracted six weeks (from September 15, 2017E.C to October 30, 2017E.C.) of data from the Medical Records of each patient's file. They found a significant gap in the rational drug use for patients admitted to Maternity Ward. We used this finding as baseline data. Based on this, we planned to reduce the overall level of irrational drug use for admitted patients in Maternity ward was 47% **(Figure 1).**

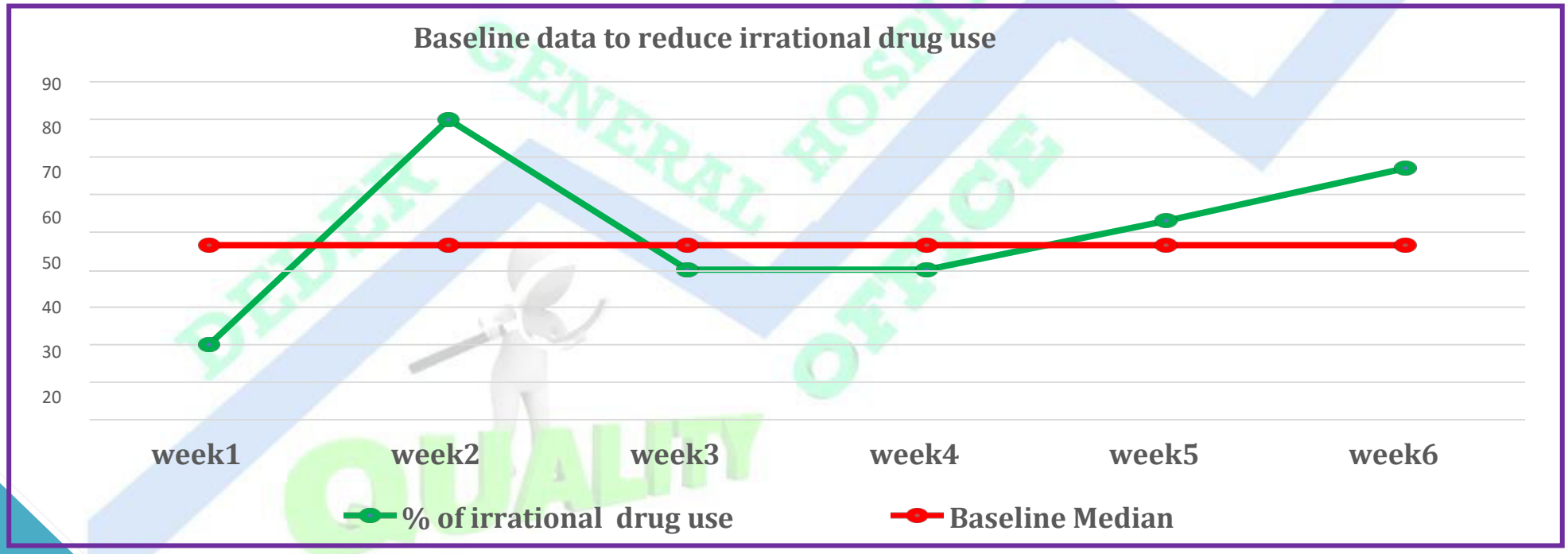

Figure 1: *Baseline data of QI project to reduce the encounters of Irrational drug use from the current median of 47% to 0% from October 2017E.C to March 2017E.C*

INTERVENTION

The QI team analyzed the root causes using a fishbone diagram **(figure 2)**, plotted possible intervention packages using driver diagram (**Figure 3**) and designed an implementation plan. A series of PDSA cycles were conducted. Intervention data were collected and analyzed every two weeks. The target unit heads, and care providers implemented changes and received feedback after the results were thoroughly interpreted.

The identified major causes were skill gaps, absence of lists of nursing diagnosis at service areas, and lack of intensive night rounds with immediate corrective action **(figure 2).**

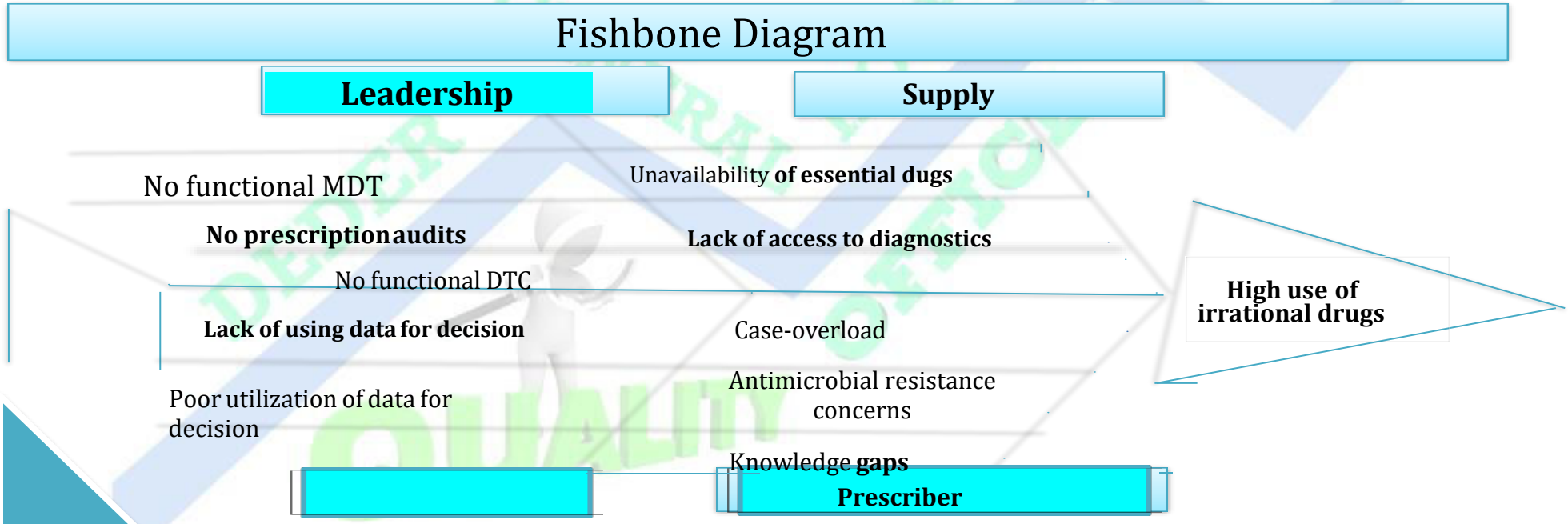

Figure 2: fishbone diagram to reduce the encounters of Irrational drug use from the current median of 47% to 0% from October 2017E.C to March 2017E.C

VER DIAGRAM

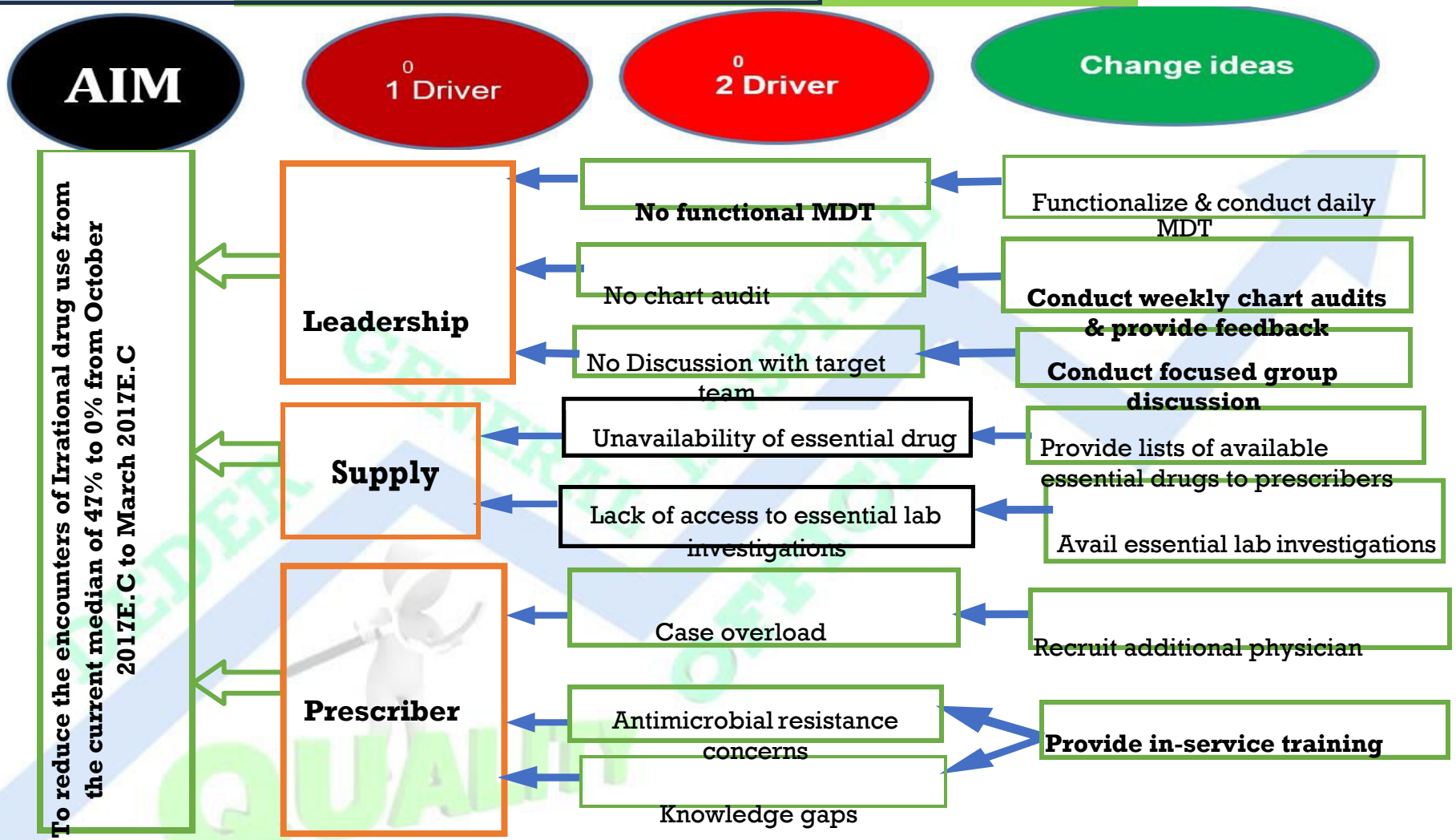

Figure 3: Driver diagram to reduce the encounters of Irrational drug use from the current median of 47% to 0% from October 2017E.C to March 2017E.C

INTERVENTION TOOLS AND PROCESS

We utilized basic and frequently used clinical criteria adopted from the WHO drugs prescription audit tool for our data collection. The following questions were developed to audit the appropriate prescription of junior physicians. 1) Did the patient receive under-prescription medication? 2) Did the patient receive over-prescription medication? 3) Did the patient receive an incorrectly prescribed medication? 4) Did the patient receive an expensive prescription medication? and 5) Did the patient receive multiple prescription medications? The data extraction sheet is presented in **(Appendix 1).**

The intervention process takes place as follows. First, after the patient is admitted to the ward, the junior physicians assesses and diagnosis the patient and order/prescribe the medication on the order sheet. Second, the senior physician assessed the junior physician's clinical finding documentations and prescribed drugs using the prepared instrument **(Appendix 1).** Third, the senior physician provided verbal feedback and recommendations (if any) to the junior physician based on his audit findings and what the patients had. Fourth, the maternity head submitted the audited data to Health Service Quality Unit. Finally, the Health Service Quality Unit analyzed the audit and provided the audit result and feedback to the department and individual respectively. The process is shown in **Appendix 2**.

INTERVENTIONS CHANGING IDEAS

The following change ideas are targeted to reduce irrational use of drugs from 47% to 0%. Using a prioritization matrix, we focused on 4 specific change ideas from a pool of 7 possible Change ideas. These proposed interventions and change ideas were:

- Provide in-service training
- Availing lists of essential drugs to prescribers
- Conduct weekly chart audits & provide feedback
- Conduct focused group discussion

MEASURES

Outcome measurement

- Proportion of irrational use of drugs at Deder General Hospital.

Process measures

- Proportion of training provided
- Proportion of week lists of essential drugs to provided for prescribers
- Proportion of weekly chart audits conducted with feedbacks
- Proportion of FGD conducted

Balancing measures

- Decrease hospital readmission rate.

Table 1: MEASUREMENTS:

Aim statement	Outcome measure		Change ideas	Process measures				Balancing measures
				Indicator	Numerator	Denominator	Data source	
To reduce irrational use of drugs at Maternity Ward of Deder General Hospital, from 47% to 0% October 2017E.C to March 2017E.C	To reduce irrational use of drugs at Maternity Ward of Deder General Hospital, from 47% to 0% October 2017E.C to March 2017E.C	Proportion of irrational use of drugs	Provide in-service training	Proportion of training provided	Number of training session provided	Total Planned training session	Minute	Decreased average length of stay
	Numerator	Number of charts with irrational drugs	Provide lists of available essential drugs to prescribers	Proportion of week lists of essential drugs to provide for prescribers	Number of week lists of essential drugs to provide for prescribers	Total number of week	Minute	
	Denominator	Total charts audited	Conduct weekly chart audits & provide feedback	Proportion of weekly chart audits conducted with feedbacks	Number of conducted d chart audits	Total number of planned chart audits	Report	
	Data Source	Patient charts	Conduct focused group discussion	Proportion of FGD conducted	Number of FGD conducted d	Total number of Planned FGD	Document	

***Table 2**: IMPLEMENTATION PLAN (P OF PDSA)*

Change idea	Measure	How to test the change ideas	Responsible Body	When to be done		Where to be done
				Start date	End date	
Provide in- service training	Proportion of training provided	Training was given with power point prepared for this purpose and presenters was present interactive presentation for two days	QU Director (Abdi Tofik), AMR focal person (Ibsa Shamil), & Medical Director (Dr. Derese Gosa)	October 01, 2017E.C	November 15, 2017E.C	Skill lab hall
Weekly provide lists of available Essential drugs to prescribers	Proportion of week lists of essential drugs for provided for prescribers	The pharmacy head weekly avail the lists of available essential drugs to prescribers of maternity ward	Pharmacy head	November 16, 2017E.C	December 30, 2017E.C	Maternity ward
Conduct focused group discussion	Proportion of FGD conducted	At the end of each week senior obstetrician conducted the chart audit for identification of junior irrational drugs prescription and reported to the quality unit. Then the HSQU participated all the stakeholders (all maternity ward staffs, Medical Director, & pharmacy head) and conducted focus group discussion.	HSQD	January 01, 2017E.C	February 15, 2017E.C	Maternity ward
Conduct weekly chart audits & provide feedback	Proportion of weekly Chart audits conducted with feedbacks	At the end of each week senior obstetrician conducted the chart audit for identification of junior irrational drugs prescription and reported to the quality unit. Then the QU provided written feedback for the prescribers.	Dr. Anwar Sham (Senior OBGYN specialist), and Abdi Tofik (HSQD)	February 16, 2017E.C	March 30, 2017E.C	Maternity ward

Plan OF PDSA------

Table 3: *OUTCOME MEASUREMENT DATA COLLECTION PLAN*

AIM/Out Come Indicator	Data source (Where)	Data collection method (how)	Time (When)	Responsible body
To reduce irrational use of drugs at Maternity Ward of Deder General Hospital, from 47% to 0% October 2017E.C to March 2017E.C	Patient chart	Developed audit tool	Weekly.	Gyn/Obs ward head (Abdella Mohammed)

Plan OF PDSA------

Table 4: *PROCESS MEASUREMENTS DATA COLLECTION PLAN*

Measurement	**Data source**	**Timeline for DC**		**frequency of DC**	**Responsible for DC**
		Start	**End date**		
Proportion of training provided	Attendance	October 01, 2017E.C	November 15, 2017E.C	weekly	GYN Ward head (Abdella M)
Proportion of week lists of essential drugs to provide for prescribers	Meeting minute	November 16, 2017E.C	December 30, 2017E.C	weekly	GYN Ward head (Abdella M)
Proportion of weekly chart audits conducted with feedbacks	Minute	January 01, 2017E.C	February 15, 2017E.C	weekly	GYN Ward head (Abdella M)
Proportion of FGD conducted	Document	February 16, 2017E.C	March 30, 2017E.C	weekly	GYN Ward head (Abdella M)

Table 5: Process measures progress tracking sheet:

S/N	Change Ideas/ Interventions	Process measure			Remark
		Number/session planned	Number/session performed	% of achievement	
1.	Provided in-service training	1	1	100%	6wk
2.	Provided lists of essential medications available to prescribers every week	6	6	100%	6wks
3.	Conducted a focused group discussion	6	6	100	6wks
4.	Conducted weekly chart audits & provide feedback	6	6	100%	6wks

Table 6: OUTCOME MEQSURE PROGRESS TRACKING

AIM	QIP: To reduce irrational use of drugs at Deder General Hospital, from 47% to 0%, from October 2017E.C to March 2017E.C		Time: weekly																								
To reduce irrational use of drugs at Deder 0 from 47% to 0%, from October 2017E.C to March 2017E.C	Numerator, Denominator & outcome Indicator		**Oct_1wk**	**Oct_2wk**	**Oct_3wk**	**Oct_4wk**	**Nov_1wk**	**Nov_2wk**	**Nov_3wk**	**Nov_4wk**	**Dec_1wk**	**Dec_2wk**	**Dec_3wk**	**Dec_4wk**	**Jan_1wk**	**Jan_2wk**	**Jan_3wk**	**Jan_4wk**	**Feb_1wk**	**Feb_2wk**	**Feb_3wk**	**Feb_4wk**	**Mar_1wk**	**Mar_2wk**	**Mar_3wk**	**Mar_4wk**
	Numerator	Number of charts with prescribed irrational drugs	4	3	1	3	0	3	4	0	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Denominator	Total number of charts Audited	10	10	9	9	8	6	9	7	8	7	7	8	8	8	9	9	7	5	8	7	7	8	10	10
	Indicator	Percentage of irrational drug use	**40**	**30**	**11**	**33**	**0**	**50**	**44**	**0**	**25**	**29**	**14**	**13**	**13**	**13**	**11**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

QI Project strategy

We use the plan, do, study, and act (PDSA) approach to reduce the irrational use of drugs. We conducted four PDSA cycles (PDSA1- 4) of interventions for six months (Six weeks each).

PDSA Cycle 1: During this cycle, we formed the improvement team and made the task division specified in Table 1. we gave training about the aim of the project, data collection procedure, data measurement, monitoring, and subsequent plans. The duration of this cycle of the project was from October 1, 2017E.C to November 15, 2017E.C. we found areas of improvement, and the overall irrational use of drugs was 28.5% achieved. The improvement team decided to proceed to PDSA cycle 2 by adding some improvement points. These include1) the irrational drugs use issue incorporated as one agenda in the department's weekly clinical forum.

PDSA Cycle 2: during this cycle we Provided lists of essential medications available to prescribers every week and incorporating additional intervention listed, weekly forum, in PDA cycle 1. we became more successful in reducing irrational use of drugs. Other interventions applied during PDSA cycle 1 were continued in this cycle. We believe that failure to integrate and test these tools would prevent the improvement from being maintained. Based on the outcome, the sign of improvement found in cycle I was further improved and the improvement team decided to implement the change intervention and monitoring for the following 6 weeks. This cycle was run from November 16, 2017E.C to December 30, 2017E.C.

PDSA Cycle 3: During this cycle we Conducted a focused group discussion with case team. Other interventions applied during PDSA cycle 1& 2 were continued in this cycle. We believe that failure to integrate and test these tools would prevent the improvement from being maintained. Based on the outcome, the sign of improvement found in cycle 1& 2 was further improved and the improvement team decided to implement the change intervention and monitoring for the following 6 weeks. This cycle was run from January 1, 2017E.C.to February 15, 2017E.C.

PDSA Cycle 4: During this cycle we Conducted a chart audit with feedbacks. Other interventions applied during the previous PDSA cycles **(1, 2** & **3**) were continued in this cycle. We believe that failure to integrate and test these tools would prevent the improvement from being maintained. Based on the outcome, the sign of improvement found in the previous cycles (cycle 1-3) were further improved and the improvement team decided to implement the change intervention and monitoring for the following 6 weeks. This cycle was run from February 16, 2017E.C. to March 30, 2017E.C.

Table 7: *THE PROJECT TEAM MEMBERS AND THE RESPONSIBILITIES*

Team	Project responsibility
Junior physicians	• They evaluate and Diagnosis admitted patients • Make rounds with the midwifery staffs • Order medications for admitted patients
Senior physicians	• Audit the Diagnosis and drugs prescription of junior physicians • Give verbal feedback to junior physicians about their diagnosis and drugs prescriptions • Lead the weekly clinical forum
Quality team	• Conduct the baseline auditing and report it • Analysis the audit conducted by senior physician and give written feedback for junior physicians • Arrange & conducted focused group discussions with all stakeholders
Maternity head	• Prepare the weekly audit charts for senior physician • Submit the raw data of audited charts to health service quality unit • Summarize and present activities on weekly clinical forum • Monitor MDT round and If absenteeism occurs, communicate with the individuals and solve it
Pharmacy head	• weekly update the junior physicians on the current available lists of essential drugs • Make MDT round with junior physicians • Monitor stockout drugs and provide request for drug supply company
Hospital administrative	• Organize the feedback and recommendations from participants • Arrange finance for continues supply of essential drugs

RESULTS

The Quality Improvement (QI) project at Deder General Hospital successfully reduced irrational drug use from a baseline median of 47% to 0% over six months through four PDSA cycles. In **PDSA Cycle 1,** the team provided in-service training to address knowledge gaps among prescribers and established weekly clinical forums to discuss irrational drug use. These interventions led to an 18% improvement, reducing irrational drug use to 28.5%. The team identified areas for further refinement, such as integrating drug use discussions into regular clinical meetings, and proceeded to the next cycle.

During **PDSA Cycle 2,** the team introduced weekly updates on available essential drugs to prescribers and reinforced the clinical forums. These additional measures further reduced irrational drug use to 20%, demonstrating the effectiveness of ensuring prescribers had access to up-to-date medication information. The consistent decline in irrational prescriptions highlighted the importance of combining training with practical tools like drug lists. The success of this cycle prompted the team to expand interventions to include broader stakeholder engagement in **PDSA Cycle 3.**

In **PDSA Cycle 3,** the team conducted focused group discussions with all stakeholders, including physicians, pharmacists, and administrators, to address systemic issues contributing to irrational drug use. This collaborative approach, combined with previous interventions, resulted in a dramatic reduction to 0% irrational drug use. **PDSA Cycle 4** reinforced these gains by implementing weekly chart audits with individualized feedback, ensuring sustained improvement. The project not only achieved its primary goal but also improved secondary outcomes, such as reducing hospital readmission rates from 15% to 5%, showcasing the broader impact of rational drug use on healthcare quality.

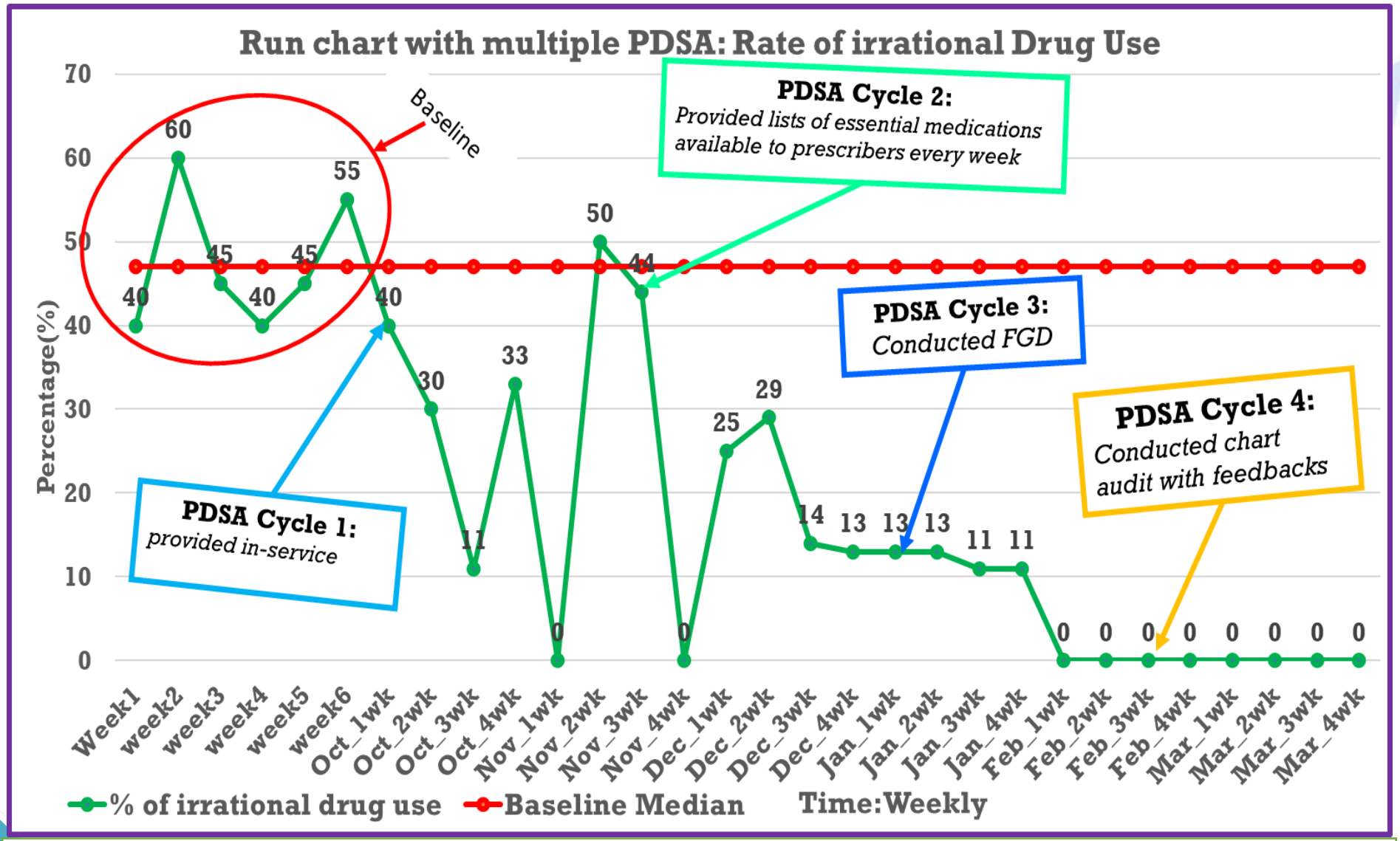

Figure: Run Chart with multiple PDSA showing improvement in irrational use of drugs at Deder General Hospital from **47% to 0%, from October 2017E.C to March 2017E.C.**

BALANCING MEASURE OUTCOMES

The implementation of the project brought positive consequences in improving the average length of stay as balancing measure and decreased the patient's hospital readmission from 15% to 5%.

DISCUSSION:

The Quality Improvement (QI) project at Deder General Hospital successfully reduced irrational drug use from 47% to 0% over six months by implementing structured interventions through four PDSA cycles. The findings demonstrate that a multifaceted approach—combining education, systemic support, stakeholder engagement, and continuous monitoring—can significantly improve prescribing practices. The success of this project aligns with existing literature, which emphasizes that interventions such as prescriber training, audit and feedback, and access to essential drug lists are effective in promoting rational drug use (WHO, 1985; Godman et al., 2014). The reduction in irrational prescriptions also contributed to secondary benefits, including decreased hospital readmission rates and improved resource utilization, reinforcing the broader impact of rational prescribing on healthcare efficiency.

A key factor in the project's success was the iterative nature of the PDSA cycles, which allowed for continuous refinement of interventions. The initial training in PDSA Cycle 1 addressed knowledge gaps but alone was insufficient to sustain change. However, when combined with weekly drug list updates in Cycle 2 and stakeholder discussions in Cycle 3, the interventions became more robust. This aligns with studies showing that single interventions are less effective than combined strategies in changing prescribing behavior (Llor & Bjerrum, 2014). The final implementation of structured audits and feedback in Cycle 4 ensured sustainability, as real-time monitoring and corrective actions helped maintain compliance. The project's structured approach,

using tools like fishbone and driver diagrams, also ensured that root causes—such as lack of essential drug access and inconsistent supervision—were systematically addressed.

The project's outcomes highlight the importance of interdisciplinary collaboration in healthcare quality improvement. Engaging physicians, pharmacists, and hospital administrators fostered a shared commitment to rational drug use. Additionally, the reduction in hospital readmissions (from 15% to 5%) suggests that irrational prescribing may contribute to treatment failures and prolonged hospital stays, reinforcing the need for similar interventions in other settings. Future efforts should focus on scaling this model to other departments and hospitals while integrating digital tools for real-time prescription monitoring. Overall, this QI project underscores that sustained improvements in drug use require continuous education, systemic support, and accountability mechanisms.

LESSONS LEARNED

This Quality Improvement (QI) project highlighted several key lessons in addressing irrational drug use. First, **multifaceted interventions**—such as combining training, essential drug lists, stakeholder discussions, and audit feedback—are more effective than isolated efforts, as they address both knowledge gaps and systemic barriers. Second, **continuous monitoring and iterative improvements** through PDSA cycles ensured sustained progress, demonstrating the value of adaptive strategies in healthcare quality initiatives. Third, **interdisciplinary collaboration** among physicians, pharmacists, and administrators was critical, as rational drug use requires coordinated efforts across departments. Finally, the project reinforced that **data-driven decision-making**, supported by tools like fishbone diagrams and run charts, is essential for identifying root causes and measuring impact. These insights can guide similar interventions in other healthcare settings to enhance prescribing practices and patient outcomes.

CONCLUSION:

The Quality Improvement (QI) project at Deder General Hospital successfully reduced irrational drug use from 47% to 0% through structured interventions, including prescriber training, access to essential drug lists, stakeholder engagement, and continuous audit feedback. By employing iterative PDSA cycles and data-driven strategies, the project not only improved prescribing practices but also reduced hospital readmissions, demonstrating the broader impact of rational drug use on healthcare efficiency and patient outcomes. The success of this initiative underscores the importance of multidisciplinary collaboration and systemic approaches in addressing complex healthcare challenges.

MESSAGES FOR OTHERS

By working together and using data to guide our decisions, our quality improvement project has dramatically improved irrational drug use. This teamwork exemplifies the power of collaboration in driving high-quality health care. We achieve lasting change by taking a structured approach, using tools such as fishbone diagrams to identify root causes and PDSA cycles to test and improve solutions.

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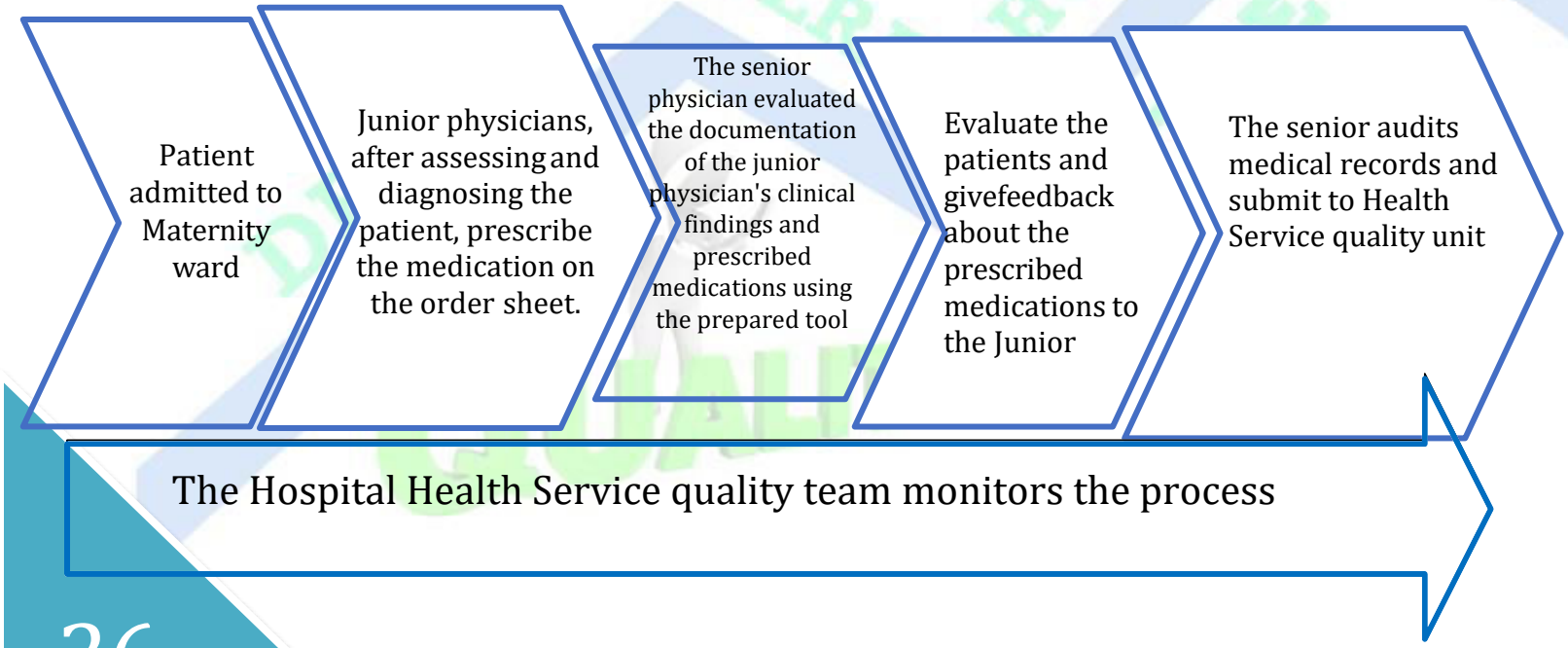
Appendix 1: Data Extraction tool

S/N	Indicators	Yes=1	No=0
1	Did the patient receive under-prescription medication?		
2	Did the patient receive over-prescription medication?		
3	Did the patient receive an incorrectly prescribed medication?		
4	Did the patient receive an expensive prescription medication?		
5	Did the patient receive multiple prescription medications?		
	TOTAL		

Appendix 2: Process map demonstrating the steps involved in audit feedback monitoring of irrational drug use in maternity ward of Deder General Hospital

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