DEDER GENERAL HOSPITAL

HEALTHCARE QUALITY IMPROVEMENT PROJECT

QI PROJECT: REDUCING RATE OF ELECTIVE SURGERY CANCELATION

By: OR QI TEAM

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Jan 2017E.C,
Deder, Eastern Ethiopia

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4.	NuredinYigezu	(BSc, MPH)- CEO	Member
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ABSTRACT

Introduction: An elective surgical cancellation is when an operation is planned but not carried out as scheduled. Previous studies showed that the prevalence of surgery cancellations ranged from around 2% to nearly 50%.While wealthier nations see cancellation rates exceeding 20%. However, the issue is even more significant in developing countries, reaching nearly 49%, with Ethiopia, for example, experiences a cancellation rate of over 33%.

Objective: The aim of this QI project was to reduce rate of elective surgery cancellation from current median of 5.1% to <1% from April 2016E.C To Jan 2017E.C

Methods: To improve adherence to the appropriate nursing care plan, 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. The key change ideas implemented consisted of protocoling pre-operative preparation, availing pre-operative preparation guide tools at SW & Gyn Ward, implementing surgical scheduling protocol and, availing CBC and hormone analysis reagents

Result: The overall 12 months interventions to reduce the rate of elective surgery cancelation is presented by the run chart and all implemented change ideas were annotated on the graph. Up on completion of the QI project the rate of elective surgery cancellation at Deder General Hospital was decreased from 5.1% to 0%.

Conclusion: The rate of elective surgery cancellation was reduced since the start of the project period. Implementation of "protocoling pre-operative preparation, availing pre- operative preparation guide tools at SW & Gyn Ward, implementing surgical scheduling protocol and, availing CBC and hormone analysis reagents" were key improvement ideas implemented for the achievement of reducing rate of elective surgery cancellation.

Key Words: Quality improvement, elective surgery cancellation, Deder General Hospital, Oromia, Easter Ethiopia.

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INTRODUCTION

An elective surgical cancellation is when an operation is planned but not carried out as scheduled [1]. Previous studies showed that the prevalence of surgery cancellations ranged from around 2% to nearly 50% [1-4]. While wealthier nations see cancellation rates exceeding 20% (4). However, the issue is even more significant in developing countries, reaching nearly 49%, with Ethiopia, for example, experiences a cancellation rate of over 33% [3, 5].

The cancellation of elective surgery is a problem with the healthcare system's quality that impacts the individuals and wastes resources. Particularly, it can negatively affect the morale of patients, families, and healthcare workers, which may potentially lead to decreased productivity [6]. Research suggests that a significant portion of these cancellations, over 80%, could be prevented, while only about 20% of cancellations were inevitable [7-12].
Quality improvement (QI) in healthcare is all about understanding of the complex healthcare system; using a methodology approach to problem solving; designing, testing, and implementing changes using real-time measurement; and improving safety, effectiveness and experience of patient care [13]. PDSA (Plan-Do-Study- Act) is one of the QI models used widely to improve surgical services: it refers to a systematic approach to testing and measuring ideas in an iterative manner that may lead to improvement in the processes or outcomes [14]. PDSA can be used in various surgical context and objectives such as to improve the quality of postoperative procedures, process mapping and finding improvable points in surgery, to improve communication between patients and medical staff, and to reduce patient waiting time before surgery [15].

Problem Statement

A Data from the Elective surgery cancelation monitoring Register from October 01, 2016E.C to March 30, 2016E.C showed that the rate of elective surgery cancellation was 5.1% which may lead to increased unnecessary hospital stay and unnecessary expenditures. Particularly, it can negatively affect the morale of patients, families, and healthcare workers, which may potentially lead to decreased productivity.

Aim Statement

The aim of this QI project is, therefore, to reduce rate of elective surgery cancellation from current median of 5.1% to <1% from April 2016E.C To Jan 2017E.C

METHOD

Study setting and period

This quality improvement project of reducing rate of elective surgery was conducted at Deder General Hospital from **April 2016E.C to Jan 2017E.C.** Deder General Hospital is one of the oldest and earliest hospitals in Oromia, which was established in 1957 GC in East Hararghe Zone, Deder town by Mennonite missions.

The Mission and Vision of the hospital is to reduce morbidity, mortality, and disability which improve the health status of people in the catchment areas through providing comprehensive rehabilitative, promotive, and curative health services via integrated collaboration with all stakeholders, and to See healthy, productive, and prosperous people respectively. It has a well-organized multi- disciplinary team comprising physicians, nurses, pharmacists, laboratory technologists, anesthetists, and midwifery professionals.

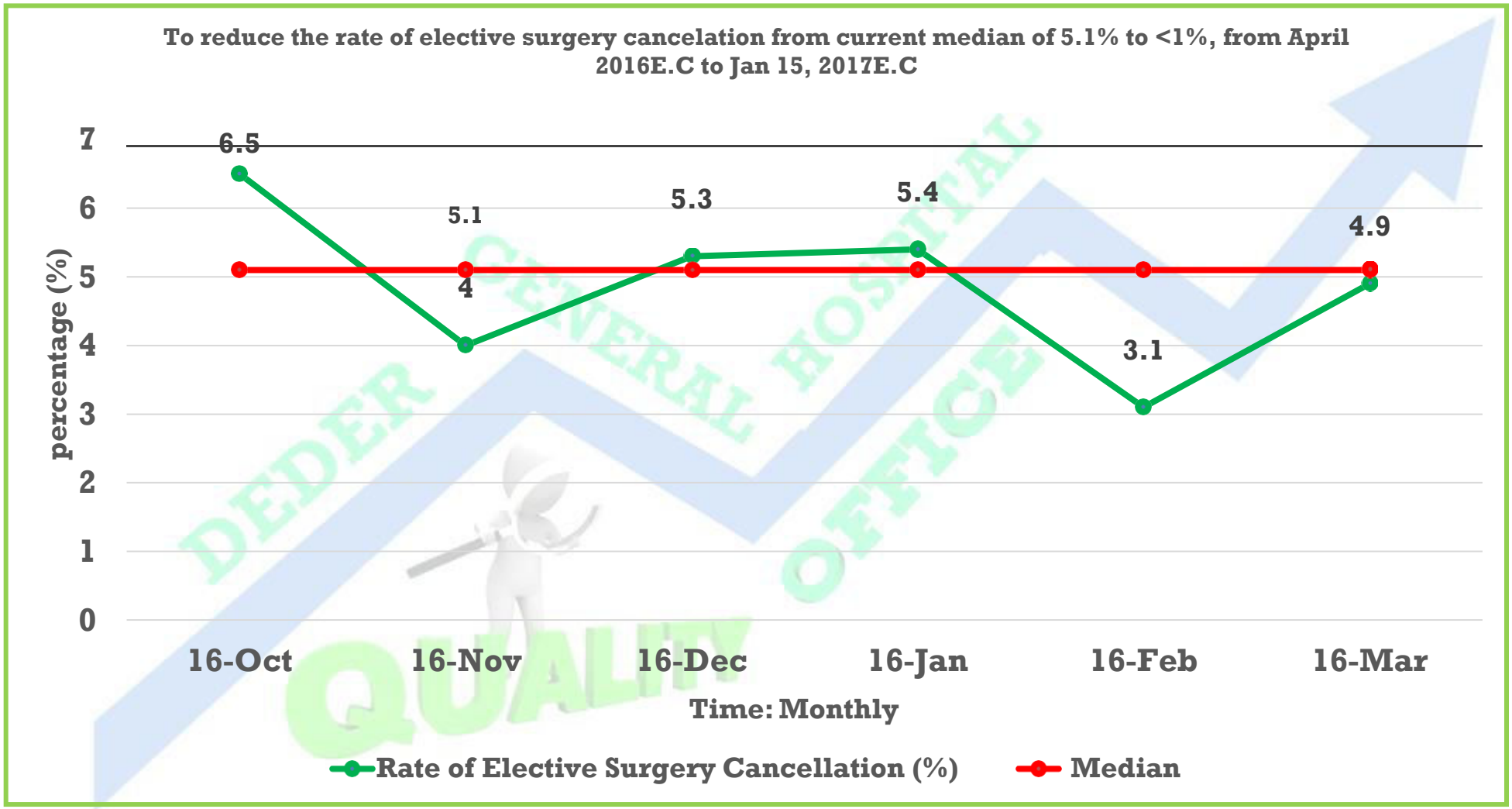
Model used

Our quality improvement (QI) team aimed to reduce the rate of elective surgery cancelation. We implemented a Plan-Do-Study-Act (PDSA) cycle based on the Model for Improvement (MFI) framework. To identify the factors leading to cancellations, we utilized Fishbone and Driver diagrams. By addressing these root causes, we sought to minimize rate of elective surgery cancellations.

Data collection and analysis

The QI project team studied reducing rate of elective surgery cancellation of patients admitted to General Surgery and Gynecology wards over a series of cycles. In each cycle, we evaluated the project status every month. Trained data collectors used a prepared data collection tool, which was then analyzed statistically. The result was displayed on a run chart. We assessed whether an enhanced level of performance was achieved and maintained after each PDSA cycle

Baseline Data



MEASUREMENTS

Outcome measurement

- Rate of elective surgery cancellation

Process measures

- **Proportion of protocolized pre-operative preparation.**
- **Proportion of pre-operative procedures guide tool availed at surgical & Gyn wards**
- **Proportion of implemented surgical scheduling protocol**
- **Proportion of CBC and Hormone analysis reagents provided**
- Proportion of clear and concise written plain-language consent forms developed
- Proportion of protocolized for prioritizing blood transfusions based on urgency.

Measurements

Aim	Outcome measure		Change ideas	Process measures				Balancing measures
				Indicator	Numerator	Denominat or	Data source	
To reduce rate of elective surgery cancellation from current median of 5.1% to <1% from April 2016E.C To Jan 2017E.C	To reduce the rate of elective surgery cancelation from current median of 5.1% to <1%, from April 01 2016E.C to Jan, 2017E.C	Percentag e of elective surgeries cancelled	Protocolize pre-operative preparation	Proportion of pre-operative preparation Protocolized	Number of pre-operative preparation Protocolized	Total plan pre-operative preparation	Minute	Decreased average length of stay
			Avail Pre- operative procedures guide tool at surgical & Gyn wards	Proportion of Pre-operative procedures guide tool availed at surgical & Gyn wards	Number of Pre-operative procedures guide tools availed at surgical & Gyn wards	Total plan Number of Pre- operative procedures guide tools availed at surgical & Gyn wards	Observatio n	
	Numera tor	Number of elective surgeries cancelled	Implement surgical scheduling protocol	Proportion of surgical scheduling protocol implemented	Number of implemente d surgical scheduling protocol	Number of planned scheduling protocol to be implemente d	Minute	Improving patient satisfaction
	Denomi nator	Total Number of patients undergone elective surgery	Avail CBC and Hormone analysis machines	Proportion of availed CBC and Hormone analysis machines	Number of availed CBC and Hormone analysis machines	Total number of planned CBC and Hormone analysis machines	Attendance	
	Data Source	Regusters						

IMPLEMENTATION PLAN (P OF PDSA)

Change idea	Measure	Responsible Body	When to be done		Where to be done	How
			Start date	End date		
Protocolize pre-operative preparation.	Proportion of pre-operative preparation Protocolized	QU Director (Abdi Tofik) & pain focal person (Abdella Aliyi)	April 2016E.C 01,	April 2016E.C 30,	OR	Pre operative preparation protocol was prepared and availed at case team
Avail Pre- operative procedures guide tool at surgical ward	Proportion of Pre-operative procedures guide tool availed at surgical & Gyn wards	Finance	May 2016E.C 01,	June 2016E.C 29,	SW & GYN Ward	A poster was prepared on pre- Anesthesia preparation like NPO, and other preparation
Protocolized surgical schedule & implemented	Proportion of surgical scheduling protocol implemented	QU & OR Director (Dr. Isak Abdi)	July 2016E.C 01,	August 30, 2016E.C	OR	Surgical scheduling protocol was prepared and implemented at OR for use
Provide CBC and Hormone analysis reagents	Proportion of availed CBC and Hormone analysis machines	Lab SMT head &	September 2017E.C 01,	October 2017E.C 29,	Lad Department	Lab head and SMT was avail CBC and hormone analysis machines
Conduct audit with feedback	Proportion of S/Cancellation audit conducted	OR head Nurse	November 2017E.C	January 15, 2017E.C	OR head Nurse	S/Cancellation audit conducted and finding was provided as feedback

Plan OF PDSA------

Outcome Measurement data collection plan

AIM/Out Come Indicator	Data source (Where)	Data collection method (how)	Time (When)	Responsible body
To reduce rate of elective surgery cancellation from current median of 5.1% to <1% from April 2016E.C To Jan 2017E.C	Register	Data was collected by structured	Monthly	OR head (Shame) & QO(Abdi Tofik)

Plan OF PDSA------

Process measurements data collection plan

Measurement	Target	Timeline for DC		frequency of DC	Responsible for DC	Data source
		Start	End date			
Protocolize pre- operative preparation	1	April 2016E.C 01,	April 2016E.C 30,	Once	QU & OR Director (Dr. Isak Abdi)	Observati on
Avail Pre- operative procedures guide tool at surgical ward	2	May 2016E.C 01,	June 2016E.C 29,	Once	Finance	Observati on
Protocolized surgical schedule & implemented	2	July 2016E.C 01,	August 30, 2016E.C	Once	QU & OR Director (Dr. Isak Abdi)	Observati on
Provide CBC and Hormone analysis reagents	2	September 2017E.C	October 2017E.C	Once	Lab head & SMT	Observati on
Conduct audit with feedback		November 2017E.C	January 15, 2017E.C	Once	QU & OR Director (Dr. Isak Abdi)	

IMPLEMENTATION PLAN (P OF PDSA)

Change idea	Measure	Responsible Body	When to be done		Where to be done	How
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Avail Pre- operative procedures guide tool at surgical ward	Proportion of Pre-operative procedures guide tool availed at surgical & Gyn wards	Finance	May 2016E.C 01,	June 2016E.C 29,	SW & GYN Ward	A poster will be prepared on pre- Anesthesia preparation like NPO, and other preparation
Protocolized surgical schedule & implemented	Proportion of surgical scheduling protocol implemented	QU & OR Director (Dr. Isak Abdi)	July 2016E.C 01,	August 30, 2016E.C	OR	Surgical scheduling protocol will be prepared and implemented at OR for use
Provide CBC and Hormone analysis reagents	Proportion of availed CBC and Hormone analysis machines	Lab SMT head &	September 2017E.C 01,	October 2017E.C 29,	Lad Department	Lab head and SMT will avail CBC and hormone analysis machines
Conduct audit with feedback	Proportion of S/Cancellation audit conducted	OR head Nurse	November 2017E.C	January 15, 2017E.C	OR head Nurse	S/Cancellation audit conducted and finding will be provided as feedback

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Plan OF PDSA------

Process measurements data collection plan

Measurement	Target	Timeline for DC		frequency of DC	Responsible for DC	Data source
		Start	End date			
Protocolize pre- operative preparation	1	April 2016E.C	April 2016E.C	Once	QU & OR Director (Dr. Isak Abdi)	Observati on
Avail Pre- operative procedures guide tool at surgical ward	2	May 2016E.C	June 2016E.C	Once	Finance	Observati on
Protocolized surgical schedule & implemented	2	July 2016E.C	August 30, 2016E.C	Once	QU & OR Director (Dr. Isak Abdi)	Observati on
Provide CBC and Hormone analysis reagents	3	September 2017E.C	November 2017E.C	Once	Lab head & SMT	Observati on
Conduct audit with feedback	2	December 2017E.C	January 2017E.C	Once	QU & OR Director (Dr. Isak Abdi)	

Do of PDSA

Outcome measurement

Aim	Numerator, denominator a and outcome indicator	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-17	Oct-17	Nov-17	Dec-17	Jan-17
To reduce rate of elective surgery cancellation from current median of 5.1% to <1% from April 2016E.C To Jan 2017E.C	Number of cancelled elective surgeries	0	1	0	1	0	0	0	0	0	0
	Total number of elective surgeries scheduled	29	65	44	30	23	43	64	16	5	10
	% of elective surgery cancellation	0	1.5	0	3.3	0	0	0	0	0	0

Process Measure:

S/N	Change Ideas/ Interventions	Process measure			Remark
		Number/session planned	Number/session performed	% of achievement	
1.	Protocolize pre- operative preparation	1	1	100	
2.	Avail Pre- operative procedures guide tool at surgical ward	2	2	100	
3.	Protocolized surgical schedule & implemented	2	2	100	
4.	Provide CBC and Hormone analysis reagents	3	3	100	
	Conduct audit with feedback	2	2	100	

STRATEGY TO IMPLEMENT THE PROJECT

The QI team analyzed the root causes using a fishbone diagram **(figure 1)**, plotted possible intervention packages and designed an implementation plan. A series of PDSA cycles were conducted. Data were collected and analyzed on monthly basis.

ROOT CAUSE ANALYSIS

In this study, using a fishbone diagram, the root causes of the problem were identified. The identified causes were no pre-operative preparation protocol, no implementation of surgical scheduling, and no CBC and hormone analysis reagents (**Figure1**).

Fishbone Diagram

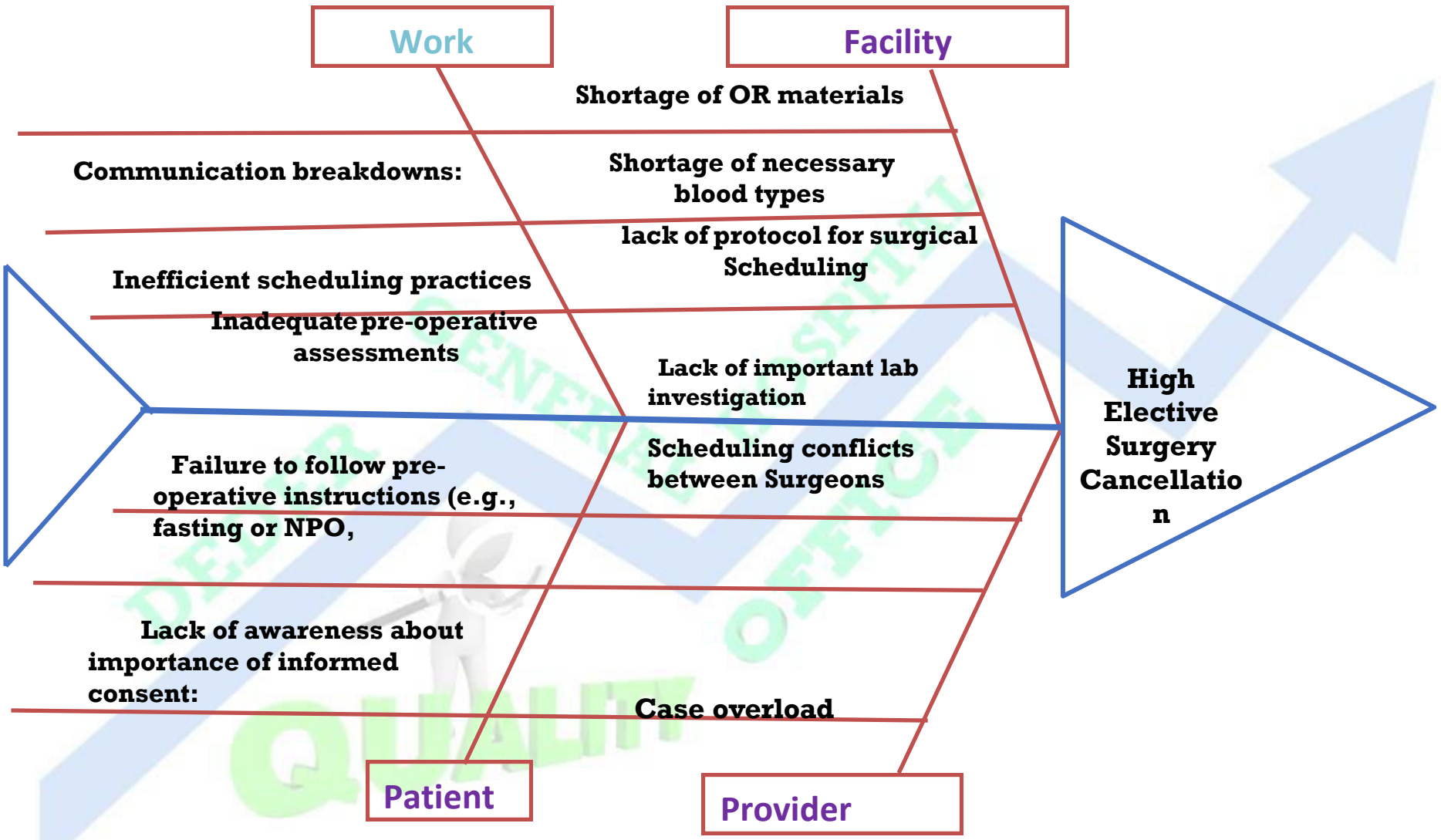

Figure 1: *Fishbone diagram to reduce rate of elective surgery cancellation from current median of 5.1% to <1% from April 2016E.C To Jan 2017E.C*

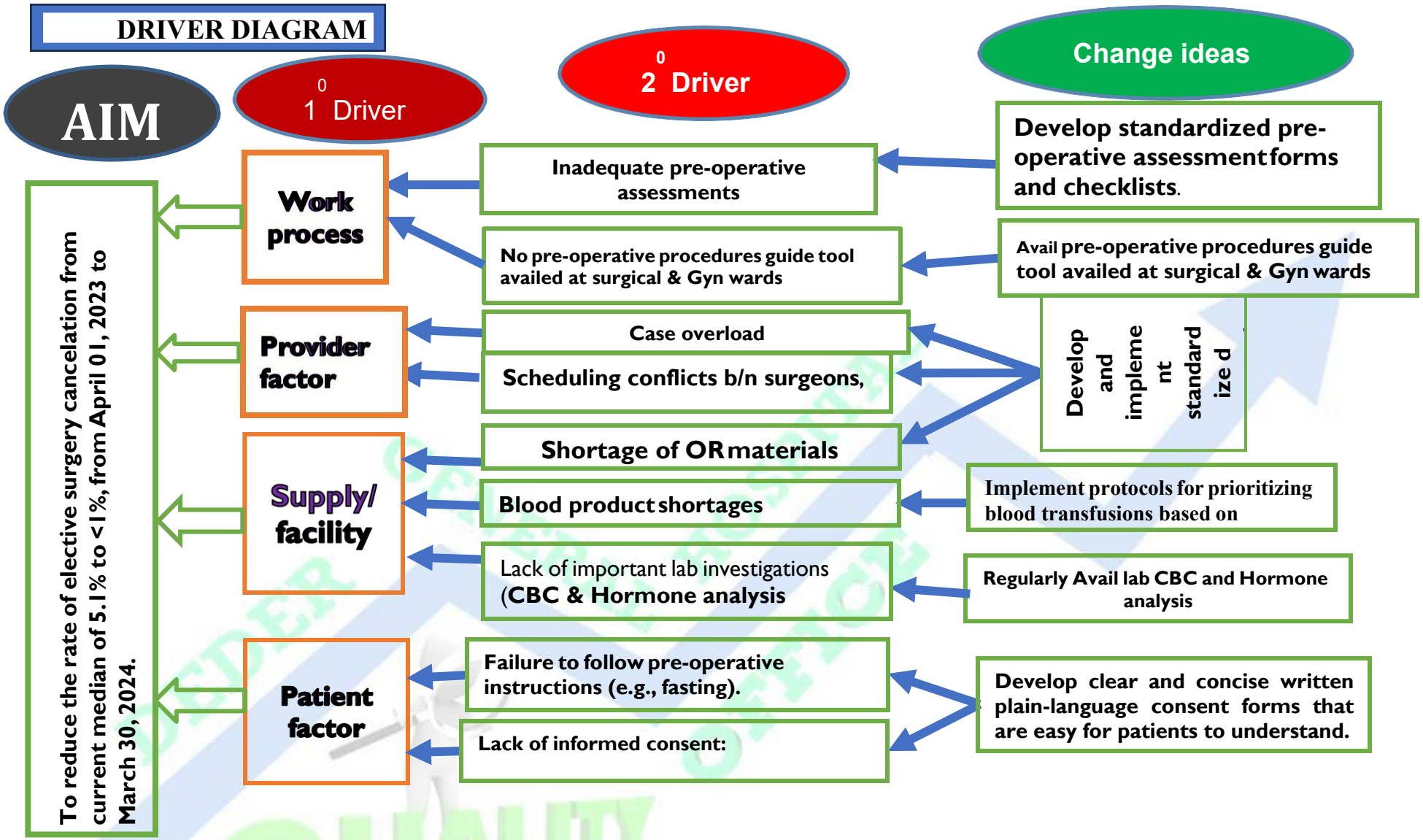

Figure 2: *Fishbone diagram to reduce rate of elective surgery cancellation from current median of 5.1% to <1% from April 2016E.C To Jan 2017E.C*

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PDSA CYCLE OF THE QI PROJECT

Five PDSA cycles were completed over 10 months. In each cycle, an intervention was implemented and studied for respective months. Further antiprevention were explored in subsequent PDSA cycles, along with reinforcement of the previous one.

PDSA CYCLE I

In the first PDSA cycle, the plan was to prepare **pre-operative preparation protocol.** Accordingly, the QU and OR Director prepared the pre-operative preparation protocol which includes:

- **Medical history and physical examination**: prior to admission A detailed medical history shall be taken to assess the patient's overall health, including past surgeries, medications, allergies, and risk factors for complications and A **physical examination** shall be performed to identify any existing medical conditions that may affect surgery lab tests.
- **Laboratory Test:** A battery of blood tests shall be ordered to assess a patient's blood count, clotting function, organ function, and blood sugar levels. Similarly, other tests, such as chest X-rays, EKGs, or MRIs, may be needed depending on the type of surgery
- **Informed Consent:** The anesthetist and surgeon shall be explaining the details of the surgery, including the risks, benefits, and alternative treatment options. The patient shall be asked to sign an informed consent form after they have had a chance to ask questions and feel comfortable proceeding.
- **Pre-operative Education:** The healthcare team shall be educating the patient about what to expect before, during, and after surgery. This may include information on pain management, wound care,

medications, and activity restrictions.

- This PDSA cycle was implemented from April 01-30, 2016E.C. At the end of a month, the QI team was conducted an assessment which showed that the rate of elective surgery cancellation was 0%(i.e, for all (29 clients registered) surgery were done as their schedule **(Figure 3).**

PDSA CYCLE 2

In this PDSA cycle, the QI team reinforced a previous intervention. The team utilized the Preoperative Procedure Guide (Poster) tool in the Surgery and Obstetrics and Gynecology wards. This PDSA cycle was implemented over two consecutive months from **May 1, 2016E.C to June 30, 2016E.C**. At the end of each month, the QI team conducted an assessment that showed that the cancellation rate of elective surgeries was 1.5% and 0%, respectively (i.e., in May, out of a total of 65 surgical cases registered, 1 case was cancelled **(Figure 3).**

PDSA CYCLE 3

In this PDSA cycle, the QI team reinforced both previous interventions. The PDSA cycle was consecutively administered over two months from **July 01, 2016E.C to August 30, 2016E.C**. In this PDSA cycle, the QI team decided to implement Surgical scheduling protocol. A surgical scheduling protocol outlines the steps involved in booking an operating room (OR) for a surgical procedure. It aims to ensure efficient use of resources, prioritize patient care, and optimize workflow.

Here's a Breakdown of contents of Surgical Scheduling protocol:

- **Introduction**
  - Purpose and benefits of the surgical scheduling protocol
  - Definitions of relevant terms (e.g., elective surgery, emergent surgery)
- **Pre-Scheduling**
  - Referral and case selection process (criteria for surgery type, urgency)
  - Pre-operative evaluation and clearance guidelines
  - Patient education and informed consent procedures
- **Scheduling Process**
  - Roles and responsibilities (surgeons, schedulers, anesthesia staff)
  - Block booking vs. individual scheduling procedures
  - Factors to consider when scheduling (OR availability, surgeon & staff schedules, estimated case duration, equipment needs)
  - Communication protocols (confirming availability, notifying of changes)
- **Patient Communication**
  - Pre-surgical instructions (fasting guidelines, medications to avoid)
  - Confirmation of scheduled date and time
  - Contact information for questions or concerns
- **post-scheduling**
  - Cancellation/rescheduling policy
  - Guidelines for urgent/emergent cases needing OR time

- Documentation and record-keeping

- **Additional Considerations**
  - Optimizing OR utilization (minimizing wasted time between cases)
  - Blood product management
  - Safety protocols (e.g., time-out procedure to verify correct patient, surgery details)
  - Performance monitoring and improvement strategies for surgeons and staff.

At the end of each month, the QI team was conducted an assessment and accordingly, the assessment findings showed that the rate of an elective surgery cancellation was **3.3%, and 0%** respectively (i.e., in July, out of a total of 30 surgical cases registered, 1 case was cancelled **(Figure 3).**

PDSA CYCLE 4

In this PDSA cycle, the QI team reinforced all previous interventions. This PDSA cycle was consecutively administered over three months (from **September 01, 2017E.C** to **November 30**, **2017E.C**). In this PDSA cycle, the QI team decided to avail CBC and Hormone analysis reagents. At the end of each month, the QI team was doing an assessment and accordingly, the assessment findings showed that the rate of elective surgery cancellation was **0%, 0%, and 0% respectively** (**Figure 3)**

PDSA CYCLE 5

In this PDSA cycle, the QI team reinforced all previous interventions. This PDSA cycle was consecutively administered over one and half months (from **December 01, 2017E.C To January 15, 2017E.C**). In this PDSA cycle, the QI team decided to conduct audit with feedback. At the end of PDSA, the QI team was doing an assessment and accordingly, the assessment findings showed that the rate of elective surgery cancellation was **0%** (**Figure 3).**

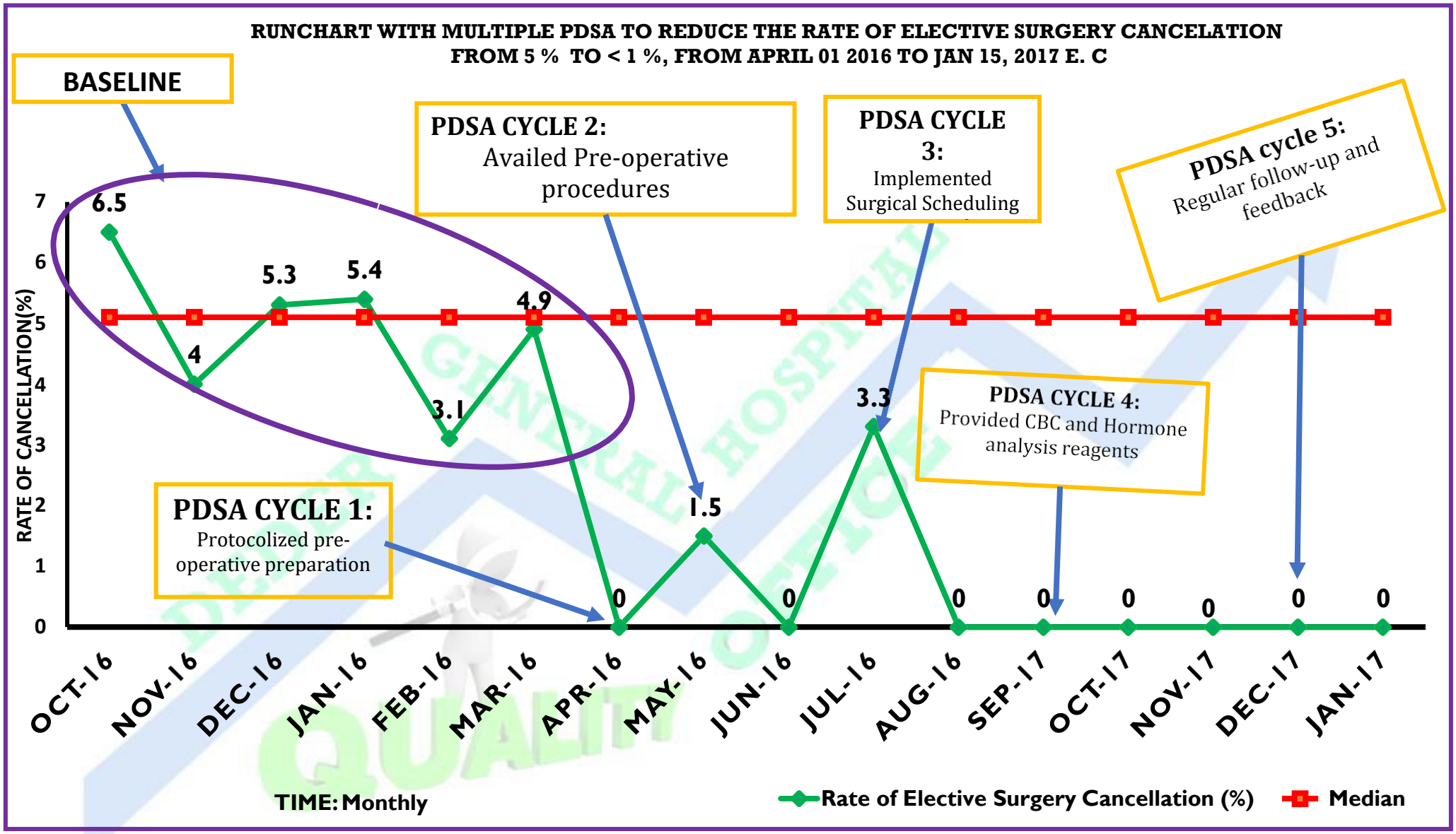

Figure 3: *Run chart with Multiple PDSA to* ***reduce the rate of elective surgery cancelation*** *from current median of* ***5.1% to <1%, from April 2016E.C To Jan 2017E.C***

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RESULT

The overall 10 months interventions to reduce the rate of elective surgery cancelation is presented by the run chart and all implemented change ideas were **annotated** on the graph. Up on completion of the QI project the rate of elective surgery cancellation at Deder General Hospital was decreased from **5.1% to 0%** (**Figure 3).**

LESSON LEARNT

The QI project interventions have proven sustainable over time as evident in our results. Overall, through QI intervention, the the rate of elective surgery cancellation was decreased from 5.1% at baseline to 0% over 10 months of intervention period. Therefore, the QI team decided to sustain and continue this QI as a learning QI project over a long period to see its effect in reducing rate of elective surgery cancellation. Additionally, the change ideas used in this study should be tested over a long period in multiple facilities of Deder General Hospital's cluster to see the outcome for further scale-up to other health institutions.

CONCLUSION AND RECOMMENDATIONS:

- The Quality Improvement (QI) project at Deder General Hospital successfully reduced the rate of elective surgery cancellations from a baseline median of 5.1% to 0% over a 10-month intervention period. The project demonstrated the effectiveness of the Plan-Do-Study-Act (PDSA) cycle and root cause analysis (e.g., fishbone diagrams) in identifying and addressing systemic gaps. The sustained reduction in cancellations highlights the potential for scalable, long-term improvements in surgical care efficiency, patient satisfaction, and resource utilization.

- **To sustain and expand the project's success, the following actions are recommended:**
  - Integrate pre-operative preparation and scheduling protocols into hospital policies to ensure continuity beyond the QI project.
  - Maintain consistent supplies of critical reagents (e.g., CBC, hormone tests) and surgical materials to prevent cancellations due to shortages.
  - Partner with regional health authorities to advocate for resource allocation (e.g., lab equipment, staffing) to support similar initiatives.
  - Recognize and reward teams for compliance with protocols to sustain motivation.

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