

NATIONAL HEALTHCARE QUALITY AND SAFETY BULLETIN

Creating Quality Culture Through Continuous Improvement and Learning

June 2022



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MINISTRY OF HEALTH-ETHIOPIA

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Reducing Major-OR Cancellation and Optimizing the Quality of OR Care Delivery, A Quality Improvement Interventions, Minilik-II CSH

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Abstract

Background

Same day cancellation of elective surgical cases has been a major contributing factor to the increased health burden on patients and led to staff dissatisfaction, leading to the increased backlog and underperformance of the Major-OR of MIICSH.

Methods

We used the two phases of the model for improvement through this QIP, we set our aim to decrease OR cancellation rate from 17.5% to below 10%. A four-month retrospective data was collected on cancellation rate from March to June 2013 E.C. Interventions instituted from July 2013 to September 2014 E.C were strictly followed with daily data collection, weekly Quality Improvement Team evaluation, and monthly OR council assessment discussing the system design and understand, evaluate, and decide on the introduced change ideas. The PDSA cycle's interventions included improving the data quality and reporting system with a newly designed excel format to register data. Moreover, an improved multidisciplinary team approach to pre-op preparations; medical investigation completeness, anaesthetic evaluation completeness, medical equipment, medication, and accessories readiness were dictated in the newly designed protocol. In addition, stakeholder involvement was introduced with departments within the hospital as well as AARHB and FMoH to enhance interventions.

Result

This has led to a significant drop in the cancellation rate which was 22.8%, 13.57%, 16.4%, 18.4%, in March, April, May, and June respectively keeping the median at 17.45%, to 7.2% at the end of the intervention (first quarter) sustained through the second quarter at 8.34%. OR utilization and performance directly increased, patient pre-op waiting time decreased, and this has also increased the multi-disciplinary team approach and enhanced team spirit.

Conclusion

Organized institution of the concept of change ideas through a quality improvement project has shown a positive change in decreasing OR cancellation.

Key terms: operating room cancellation, quality improvement project.

Introduction

Cancellation of elective surgical operations in developing countries with scarce resources, due to various preventable reasons, is not an uncommon phenomenon in most institutions (1) rather it is prevalent with a very high cancellation rate, especially in low and middle-income countries(2). This decreases OR performance by decreasing productivity, and decreasing raw utilization (time), and comes with wastage of resources like excess staffing cost (3) consequently posing an economic burden for both the patients and the hospital (2,4,5)causes and pattern of cancellation of elective surgical operations in our setting and to find the appropriate solutions for better patient management. Methods: This was a prospective hospital-based study which was conducted in a teaching hospital at Bugando medical Centre from March 2009 to February 2010. Results: A total of 3,064 patients were scheduled for elective surgical operations. Of these, 644 (21.0% because OR internal revenue generation for hospitals is one of the highest (6). In addition, it decreases staff morale and affects the drive for work decreasing surgeons' productivity and causing a psychological burden for patients and their families (7,8). The burden imposed on patients comes from two perspectives. First, patients miss their surgeries and are prone to extra expenditure on hospital stay, medication and equipment expenses. Second, patients are predisposed to emotional trauma due to for example repeated NPO days that are a bad experience.

Scheduled elective surgical cases are cancelled due to numerous contributing factors including the organizational system, procedures, patient-related conditions, and non-organized and integrated operating structure (2). The institutional restriction in providing supplies and equipment essential to give service to surgical patients has an enormous impact on the cancellation rate despite the availability of competent staff and time allocation. Moreover, the lack of adherence/ availability of well-drafted TORs, protocols and flowcharts for smooth workflow and mutual understanding between staff and patients leads to unprecedented and avoidable cancellations. Therefore, a break in this system flow including following trends out of protocol coupled with an increased volume of patients who do not match the available supplies and human resources leads to a high rate of same-day cancellation of scheduled elective surgical cases.

It is well known that Menelik-II CSH Major-OR gives service to a huge volume of patients who come with complicated cases as well as sub-specialty care-seeking population from mainly low socioeconomic status who travel a long distance from every region of the country. The hospitals' major OR gives service in various departmental and sub-departmental surgeries namely general, cardiothoracic, hepatobiliary, pediatric, urosurgery, neurosurgery, orthopedic, ENT, and maxillofacial. However, the cancellation of elective surgical procedures poses a major problem within the major OR and the hospital.

Despite this problem, little has been done to assess the cause and address the reason for preventable cancellations in our setting. Therefore, this quality improvement project was designed to better tackle the contributing factors leading to unprecedented cancellation considering all the available resources, and measures are directed against improving system flow, organizational structure, and procedures despite the already identified scarcity of various resources nationwide. Ultimately, improving the quality of operating room service delivery to our patients and enhancing staff satisfaction.

Methodology

This quality improvement project commenced after obtaining approval from the Menelik-II CSH management body. In July 2013, we began by organizing QIT for a benchmark session at Yekatit 12 Hospital Medical College, which was selected best hospital in Ethiopian Hospital Alliance for Quality CATCH-IT Initiative in May 2013. After gaining a profound understanding of the system organization of their OR, we did a retrospective documentation review of the major OR in Menelik II CSH from March-June 2013 collecting data on surgical cancellation in the Major-OR which has six operating tables where one is allocated only for emergency cases. Data collection was done manually due to a lack of organized documentation and centralized report which was one of the main problems identified. In addition, we have found out that the first case incision time starts at 8:30 AM (not strictly adhered) without clear cut last incision time.

After collecting the initial input for our project, we constructed a driver diagram (Diagram 1) to appropriately identify and classify contributing factors like primary and secondary drives with change ideas accordingly which directly and indirectly affect the cancellation rate. The primary drives include system, patient factors, and supplies.

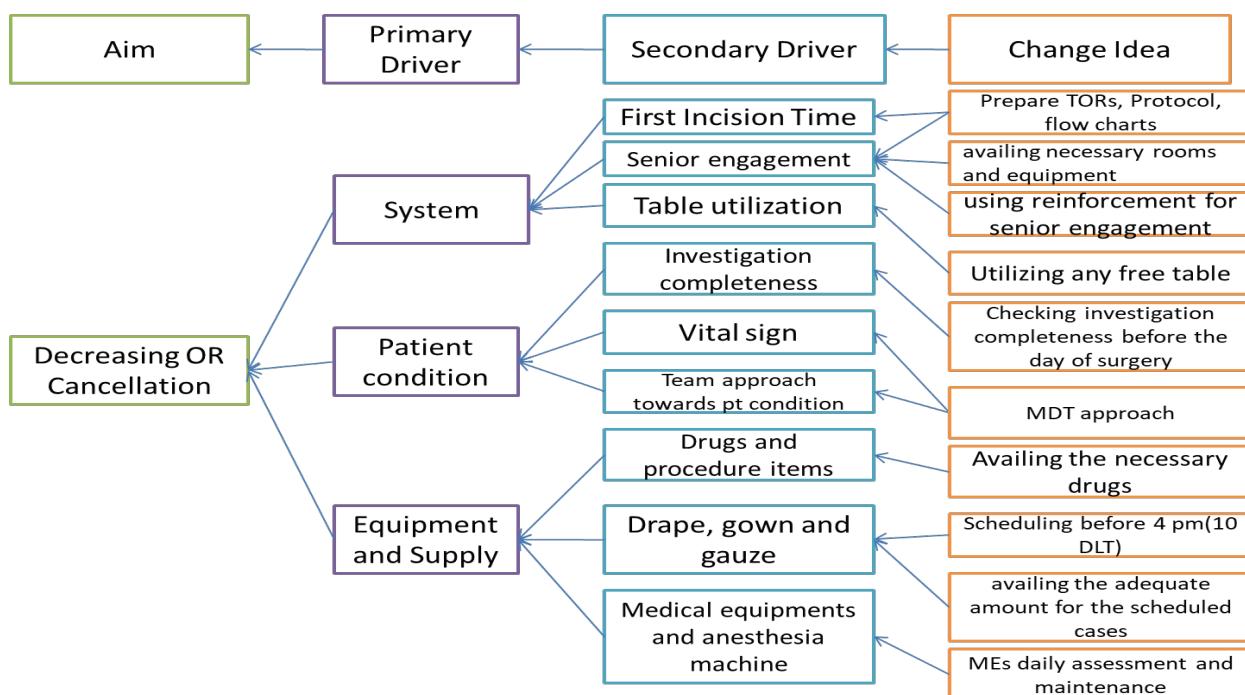


Diagram 1. A Driver Diagram

Measures

Outcome measure:

$$\% \text{ of major OR cancellation} = \frac{\# \text{ of cancelled major cases}}{\text{Total Major OR cases per week}} * 1000$$

Process measures

The following process measures were used to assess level of our change testing/implementation/

Activity	Process Indicator	Data Component	How frequent	Data Source	Responsible Body
Investigation completeness before schedule	% of cancelled patients due to LOIx	<u>Numerator</u> Number of pts scheduled with incomplete ix <u>Denominator</u> Total number of schedule	weekly	OR register	Data owner of the OR and OR head
Early detection and mgt of medical conditions	% of cancelled patients due to medical conditions	<u>Numerator</u> Number of scheduled pts with medical condition <u>Denominator</u> Total number of schedule	weekly	OR register	Data owner of the OR and OR head

Activity	Process Indicator	Data Component	How frequent	Data Source	Responsible Body
Early anesthetic evaluation of scheduled pts	% of cancelled patients due to lack of anesthetic evaluation	<u>Numerator</u> Number of pts cancelled with LOA Evaluation <u>Denominator</u> Total number of schedule	weekly	OR register	Data owner of the OR and OR head
Early preparation of medical equipment	% of cancelled patients due to LOEq	<u>Numerator</u> Number of pts cancelled with LOEq <u>Denominator</u> Total number of schedule	weekly	OR register	Data owner of the OR and OR head

Implementation of change ideas was carried out in the first quarter of the 2014 EFY to curb the avoidable causes of cancellation, where the rate was significantly high before the start of this project. For these, four core areas of improvement were identified and an action plan was developed accordingly (table 1-4).

1. Data quality

S.No	Change Ideas	Needed items	What to be done	Responsible body	Time frame	Remark
1	Computerization of data documentation	Tables and chairs	-Quantifications -Follow up on purchase	OR managers	1 week	Final assessment to be reported after 2 weeks
		Computers		Medical director		
		Shelfs		Purchasing head		
2	Availing registration books	HMIS approved registration books	-Requesting the needed numbers -Making sure sustainable books are availed	HMIS team	2 weeks	*Dr. Yohannes will take the lead
		Shelfs		Dr. Alemwosen		
		Tables		OR managers		
3	Assigning data owner focal for each department	nurses	-Daily data report -check data completeness	OR managers Dr. Yohannes	1 week	
4	Back-logs report	-	-Strengthening back log registrations and report system	Liaison head	1 week	
5	Anesthesia log book	-standard registration books		-anesthesia team head	1 week	

Table 1. Action plan to improve data quality

3. Medical Equipment demand Vs supply

S.No	Change Ideas	Needed items	What to be done	Responsible body	Time frame	Remark
1	Open OR pharmacy	Room	-assess site to be OR pharmacy room	OR managers	1 week	Final assessment to be reported after 2 weeks
		Tables and chairs		Pharmacy dep		
		Shelves		OR dep head		
2	OR pharmacy equipped with necessary drugs	-drug request lists	-assessment and team approach to avail drugs and equipment	Anesthesia head	2 weeks	
		-equipment request lists		Pharmacy head		
		-detailed specification		OR managers		
3	OR MEs assessment and maintenance	-checklists	-thorough evaluation of the OR MEs and detailing their status	Pharmacy Head Biomedical unit leader OR managers	2 week	
4	Availing equipment for the OR pharmacy	-follow up	-serious follow up in the procurement and purchasing of the requested items	-Procurement and purchasing head -OR dep head	2 week	

Table 2. Action plan to improve supplies

4. Work System Establishment

S.No	Change Ideas	Needed items	What to be done	Responsible body	Time frame	Remark
1	Prepare TORs, Protocol, flow charts	National and regional guidelines	-designing and creating and making sure its implementation	OR dep head	1 week	Final assessment to be reported after 2 weeks
2	Prepare daily report formats,		-designing and creating audit tools -analysis of the reported data	OR dep head	1 weeks	
3	Senior engagement during surgeries	-duty rooms -duty rooms equipment	-availing necessary rooms and equipment -using reinforcement for senior engagement	OR dep head Medical director AtoTeferi	2 week	

Table 3. Action plan to improve workflow

5. Human Resource

S.No	Change Ideas	Needed items	What to be done	Responsible body	Time frame	Remark
1	Nursing staff allocation as needed	-	-assess OR productivity and allocate nursing staff as needed	Matron office OR managers	1 week	Final assessment to be reported after 2 weeks
2	Anesthetist staff allocation as needed	-	-assessment and allocation of anesthesia staff as needed	Anesthesia head Dr. Shimelis Dr. Yohannes	1 weeks	
3	Overall staff allocation assessment including porters	-OR productivity data	-thorough assessment and allocation of human resource as needed	Matron Office	1 week	

Table 4. Action plan to improve human resource allocation

Statistical Analysis

Based on the retrospective data we collected in the four months prior to this intervention, we draw the median and projected it on a run chart. After the intervention, we feed data weekly to the graph denoting the total cancellation rate. Furthermore, data monitoring and evaluation included specific process measures.

Results

Primarily, data quality was improved by introducing a newly developed detailed operating room performance excel sheet reporting mechanism (Table 5-7) and a detailed OR cancellation reporting format (FIG 1) which is reported daily to a telegram group for the OR team.

Data quality is very important to decide based on facts and figures and it is indirect enforcement to the OR staff and surgeons upon its report where not only the OR team but also the hospital management can view.

Then we organized a multidisciplinary incident management committee composed of a surgeon as a chairperson, a scrub nurse and anesthetist as a secretary with a rotation, and the OR department head as a member. This committee oversee the OR performance through the reports and sit for discussion whenever there is an avoidable but arguable cancellation. For this, we introduced an incident report format (FIG 2) derived from the Canadian Incident Analysis Framework.

Therefore, based on an appropriate evaluation of the report and with thoroughly evaluated patient charts, this committee report the finding and pass appropriate measurement based on the outcome of the scenario studied. This has helped hugely to reduce the cancellation rate for the same reasons through time.

Fig 1. Cancellation reporting format

Date: - -----

Department: -----

Pt Name: -----

Age: ----- Sex: ----- Card No: -----

✓ Pre-OP Diagnosis:- -----

✓ Cancellation Reason :- -----

✓ Cancellation decision time:- -----

✓ Name of surgeon:- -----

✓ Name of Anesthetics/Anesthesiologist:- -----

✓ Name of scrub: - -----

✓ Recovery: - -----

Elective Surgeries Done in Major OR											
1	Date	Table	Scheduled	Department	Surgeon Name	Time taken for surgery in minutes	Total time taken	Done	Emergency surgeries	Cancellation	Reason For Cancellation
2	11/5/2013	1		Emergency	Mesale	145'			2 GS-2		
21		2		1 General surgery	Mesale	145'	2hrs and 45min	1		0	
22		3		1 Neurosurgery	Merhawi	200'	3hrs and 20 min	1		0	
23		4		4 Pediatric	Belachew	150', 270'	7hrs	2		2 LOT	
24		5		2 General surgery	Mesale	210', 92'	5hrs and 2min	2		0	
25		6		3 Ortho	Dagne	40', 13', 30'	1hr and 23min	3		0	
26		27		Total	11		19hrs and 30min	9		2	
28	11/6/2013	1		Emergency	Seyoum	240', 75', 60'	6hrs and 15min	3	4 GS-3, ENT-1		
29		2		3 Cardiothoracic		72', 60,	2hrs and 12min	2		0	
30		3		2 Hepatobiliary	Henok	62', 115', 130', 20'	5hrs and 27min	4		0	
31		4		5 Pediatric	Fisseha					1 LOT	
32		5		3 General surgery	Tadesse	144', 65', 75'	4hrs and 44min	3		0	
33		6		3 Ortho	Dagne	35', 27', 120'	3hrs and 2min	3		0	
				MOR	GYNObS	MIOR	OphthaOR	WeeklyMOR	MonthlyMOR EFY	Quarterly	Sheet 1

	G633	v : X ✓ f&	7hrs and 13min	J	K	L	M	N	O	P	C
1	G	H									
2	Total time taken	Done	Emergency surgeries	Cancellation	Reason For Cancellation	Induction time	First Case Incision Time	Last Case Incision Time	Last case Log Out time	Interval between cases	
21		2 GS-2									
22	2hrs and 45min	1		0		4:45 AM	4:50			7:15	
23	3hrs and 20 min	1		0		2:30	3:10			6:30	
24	7hrs	2		2 LOT		2:20	2:45	6:40		11:10 20'	
25	5hrs and 2min	2		0		2:50	3:00	7:20		8:52 36'	
26	1hr and 23min	3		0		2:55	3:40	6:15		6:45 13', 15'	
27	19hrs and 30min	9		2							
28		4 GS-3, ENT-1									
29	6hrs and 15min	3		0		3:32	3:32	8:20		9:45 20'	
30	2hrs and 12min	2		0		3:00	3:15	8:15		9:30 45', 103'	
31	5hrs and 27min	4		1 LOT		2:48	2:58	9:37		9:50 40', 45', 17'	
32	4hrs and 44min	3		0		2:44	2:50	7:25		8:40 30', 35'	
33	3hrs and 2min	3		0		3:20	3:35	5:30		7:30 38', 30'	
	MOR	GYN OBS	MiOR	OphthaOR	WeeklyMOR	MonthlyMOR EFY	Quarterly	Sheet1	⊕		

Ready Accessibility, Investigate

+ 110%

Quarterly OR Productivity									
Month	Department	Scheduled (Elective)	Done (Elective)	Emergency surgeries	Cancellation	Rate of Cancellation	Time taken for surgery	Surgeon Name	OR Su
2									
Quarter 1 2014EFY									
3	Emergency	153	146		7	4.57%	209:23	Mesale-53+, Tadesse-38+, Samuel-35+	Alt
4	Sene 21-Meskerem 20	General Surgery	211	189	22	10.42%	292:36	Fisseha-133+, Belachew-19+, Hana-27, Merhawi-2	Alt
5	Pediatrics Surgery	80	76		4	5.00%	171:34	Mezgebe-36+, Admassu-34+	Ac
6	Uro Surgery	20	19		1	5.00%	35:43	Merhawi-15+, Hananivya-2+, Berhanu-1+	As
7	Neuro Surgery	24	22		2	8.33%	33:35	Henok-22	Az
8	Hepatobilary Surgery	44	41		3	6.81%	93:36	Seyoum-41	De
9	Cardiothoracic Surgery	22	21		1	4.54%	32:38	Shimelis-13+, Wendimu-4+	Eh
10	Maxillofacial Surgery	29	27		2	6.89%	22:43	H/Maryam-3+, Both-19	G/
11	ENT Surgery	120	111		9	7.50%	100:43	Thomas-37+, Dagne-35+, Nigussie-24+	M
12	Orthopedic Surgery	703	652		51	7.25%			M
13	MOR Total	1396	1310		101	6.16%			Re
14	Ophtha OR	108	101		324	7	6.48%	275:29	Sa
15	GYN/OBS OR Total	381	368		13	3.41%	257:55	Te	
16	Minor OR								Til
Quarter 2 2014FY									
17	Emergency								
18	Meskerem 21-Tahisas 20	General Surgery	125	110	15	12.00%	194:10	Mesale-44, Samuel-40, Tadesse-17, Mohammed-9Ye	
19	MOR	GYN/OBS	MIOR	Ophtha/OR	MonthlyMOR	MonthlyMOR EFY	Quarterly	Sheet1	

Table 5-7. Newly introduced data collection tool (daily, weekly, monthly, quarterly, and yearly)

Other introduced change ideas were in developing a protocol for the OR dictating; posting a schedule before 4:00 PM in a way to give ample time to anesthesia evaluation, assigning focal scrub nurse, anesthetist, biomedical staff daily to monitor, assess, and avail necessary OR supplies required to give the full function of the operating room the next day otherwise to notify the respected department for further actions up to prohibiting surgeries for the next day before scheduling cases. In addition, after a successful council meeting with department heads including the nursing and midwifery department, standardized allocation of human resources in the OR was done by revising the previous allocation.

Monitoring, evaluation, and assessment were done to quantify the impact of the change ideas introduced by daily quality assurance, weekly QIT meetings, monthly departmental meetings and quarterly council meetings involving the medical director, CEO and departmental stakeholders within the hospital measuring the process and outcome measures of the project (Table 8-9), the first is described below and the latter being cancellation rate. Furthermore, QIP training was given to three staff including the ones within this project.

Minilik II CSH Patient/Staff Safety Incident Report

Ward/OR/Recovery/ICU:	Client/Staff Identification (Name, Age, Gender)																																
Date of Event:	MRN: _____ Reporting Personnel: _____																																
Time of Event:																																	
 <table border="1"> <tr> <td>Event Description:</td> <td> Discovered by: <input type="checkbox"/> Surgeon <input type="checkbox"/> Nurse <input type="checkbox"/> Intern <input type="checkbox"/> Pharmacist <input type="checkbox"/> Anesthetist/ologist <input type="checkbox"/> Resident <input type="checkbox"/> Other </td> </tr> <tr> <td colspan="2">Patient/Staff- Relevant information or interventions taken for this patient/Staff. <input type="checkbox"/> Check none necessary or describe:</td> </tr> <tr> <td colspan="2"> Outcome: <input type="checkbox"/> Good Catch <input type="checkbox"/> No Harm <input type="checkbox"/> Harm (required extra monitoring or intervention) <input type="checkbox"/> Harm Major / Sentinel Event (notify manager or delegate immediately) <input type="checkbox"/> Death </td> </tr> <tr> <td colspan="2">Immediate Action Taken:</td> </tr> <tr> <td colspan="2">Other Comment:</td> </tr> </table> 				Event Description:	Discovered by: <input type="checkbox"/> Surgeon <input type="checkbox"/> Nurse <input type="checkbox"/> Intern <input type="checkbox"/> Pharmacist <input type="checkbox"/> Anesthetist/ologist <input type="checkbox"/> Resident <input type="checkbox"/> Other	Patient/Staff- Relevant information or interventions taken for this patient/Staff. <input type="checkbox"/> Check none necessary or describe:		Outcome: <input type="checkbox"/> Good Catch <input type="checkbox"/> No Harm <input type="checkbox"/> Harm (required extra monitoring or intervention) <input type="checkbox"/> Harm Major / Sentinel Event (notify manager or delegate immediately) <input type="checkbox"/> Death		Immediate Action Taken:		Other Comment:																					
Event Description:	Discovered by: <input type="checkbox"/> Surgeon <input type="checkbox"/> Nurse <input type="checkbox"/> Intern <input type="checkbox"/> Pharmacist <input type="checkbox"/> Anesthetist/ologist <input type="checkbox"/> Resident <input type="checkbox"/> Other																																
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OR manager																																	
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Patient																																	
Family																																	
Other																																	

Response Approved by Incident Management Chairperson or OR Department Head

Name and Signature: _____

	PLAN	DO	STUDY	ACT
1	Prepare TORs, Protocol, flow charts	Incident mgt, Clinical audit, and council TORs, OR protocol prepared	Delayed decision towards certain points in the protocols	Adherence
2	MDT approach	Encouraging Senior, Anesthetist, Residents, ward nurses engagement	Below expected senior engagement Staff resistance to some extent	Checking completeness of pt data on chart before surgery Taking measure by incident mgt team Adherence
3	availing adequate amount of MEs for the scheduled cases	Preparing enough gowns, drapes, surgical and medical equipment and medications prior to day of surgery	Delayed purchasing processes and resistance from laundry and autoclave	Follow up
4	MEs daily assessment and maintenance	Biomedical team daily checkup and maintenance	Not enough number of biomedical staff	Biomedical HR allocation

Table 10. PDSA cycle

Menelik-II CSH major OR gave service to 651 elective surgical patients during the first quarter of the Ethiopian fiscal year of 2014.

Out of the scheduled 703 patients, there were 51 same day elective surgical operating cases cancelled. The study population were not altered, and the type of surgeries provided was the same based on the departments when compared with the baseline data. Based on this data we can say that there is a huge and significant reduction in the cancellation rate from the median of 17.5% to 7.2% (FIG 4). Each of the nine surgical disciplines including the sub-speciality departments-maintained cancellation to below 10% except for pediatric surgery 10.42% (FIG 5) attributed to miscellaneous reasons like lack of time due to high loads of surgery, 189 cases out of the total 651 in the first quarter and by part due to staff burnout since the extra time was not compensated with payment.

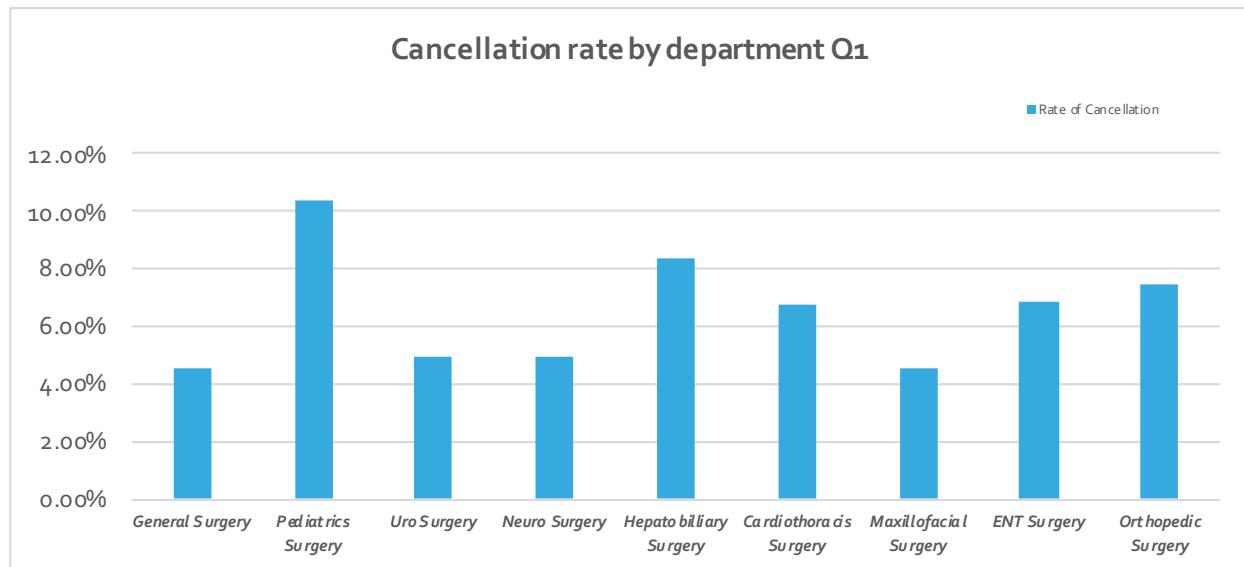
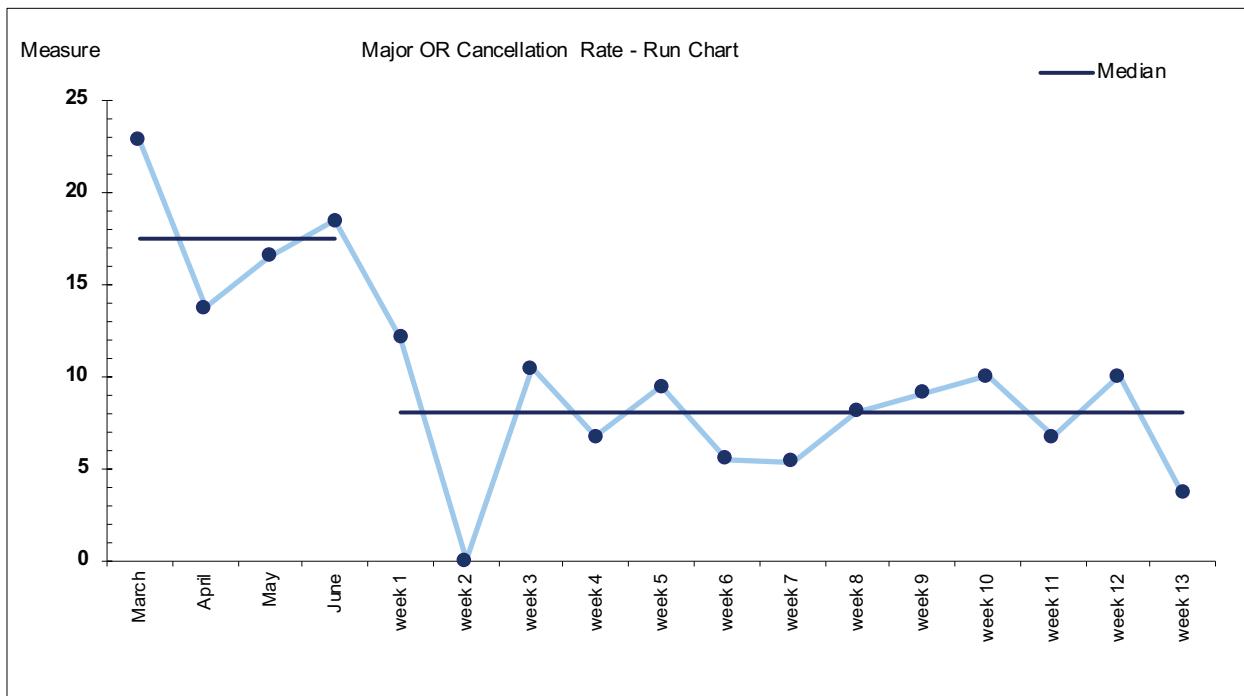


FIG 4-5. QIP Outcome Indicator and Cancellation Rate by Department

Even if we do not have documented reasons for cancellation in the baseline assessment, we did in the previous four months prior to the intervention date due to inadequate and proper documentation, we have strictly measured the cause of cancellation for all the 51 patients scheduled in the total 703 patients. Moreover, process measures were seriously followed and documented to institute change ideas and base decision making on facts and figures. Out of 51 cancellations, 33 (64.7%) are attributed to patient conditions mainly medical conditions developed or noticed overnight or during the day of surgery which makes patients unfit for surgery based on the anaesthesia team or surgeon's decision upon the day of surgery. Reasons include cough, fever, increased BP, positive RDT for Covid-19 and avoidable reasons like failure to identify investigation results or late arrival of results like increased electrolyte levels, requiring new ECHO or underdiagnosis of cases. For this, deciding to schedule patients before 4:00 PM was later changed to 2:00 PM to give ample time for pre-OP preparation and anaesthetic evaluation which helps to early identify avoidable reasons for cancellation which has

shown improvement. 10 (19.6%) cancellations are attributed to miscellaneous reasons including lack of time, emergency conditions or accidents for surgeon absence mainly, lack of ICU for specific patients who undergo surgeries for longer hours like cardiothoracic, hepatobiliary and urosurgery patients. 4 (7.84%) cancellations are attributed to lack of investigations due to different approaches of anaesthetists as the one evaluating the patient in the pre-OP may differ from the one during the surgery. For this reason, we assign a delegate anaesthetist to evaluate and post scheduled cases to their telegram page in a way to discuss and manage patients in teams further to curb differences leading to cancellation. 3 (5.88%) was attributed to lack of anaesthetic evaluation which could be completely avoidable, however, a significant reduction is witnessed by OR staff after the intervention of increasing the multidisciplinary team approach among nurses, anaesthetists, and surgeons. The rest of the cancellation reasons, 1 (1.96%), are attributed to lack of equipment due to lack of drape. This is again an area of huge improvement due to two reasons. Firstly, the availability of necessary supplies for the next day's operating room functionality based on the number of scheduled cases is studied and intervened by mainly biomedical engineers but including nursing and anaesthesia team assessment daily. Secondly, the hospital administration has shown huge support for this initiative (the QIP) by availing necessary equipment on time and in advance as well.

Therefore, with this coordinated response designed within this QIP, and the heroic and courageous work morale of the staff, we have improved the OR performance and OR utilization by decreasing cancellation, increasing interdepartmental as well as intradepartmental networking with involved pertinent stakeholders, decreased surgical waiting time from 100 days to below 80 days, and increased multidisciplinary team approach.

While instituting this innovation we encountered balancing measures. The positive balancing measures include increased staff awareness regarding QIP, the concept of SaLTs, and diverse ways of analyzing OR performance which is not only productivity but also raw utilization (time) (FIG 6), block utilization, staffing costs, surgical interval time and various nationally designed checklists during the successive meeting held for monitoring and evaluation and by formal pieces of training. The negative balancing measures include increased staff burnout regarding the last incision time, which was not set, or the extra hour stay on surgeries was not compensated with payment or any form of incentive which still is our limitation (not resolved).

From this project's result, the primary beneficiary is the patient because cancellation as noted earlier imposes various negative impacts on the patient. In addition, the institution is also beneficiary by part successfully giving quality patient care to those in need which aligns with its mission and vision. and in part by limiting the extra costs imposed by cancellation in supplying medications and equipment, especially through CBHI and through staffing costs (paying for staff who are not working their intended 8hrs per day job).

Limitations

The quality improvement project, in its nature, lasts for a noticeably brief period of time (3 months for this project) with a rapid cycle of instituting change ideas resulting in improvement/change. As this project is done on small population size, only one unit of the OR (major OR) in Menelik-II CSH is considered (not including Gyn/Obs, Ophthalmology, and Minor ORs), it is difficult to necessarily generalize the result outside the major OR in Menelik-II CSH. In addition, due to the lack of detailed documentation on the reason for cancellations on the retrospective data we collected, we cannot compare the preintervention and postintervention results despite the total reduction in the cancellation rate. Moreover, as QIP change ideas were instituted in bundles, it makes it difficult to monitor and evaluate individual factors and to conclude on each of them.

Conclusion

One of the important indicators of operating room performance is the number of same-day cancellations of scheduled elective surgical cases (9). Even if cancellation is not a totally avoidable indicator due to acceptable reasons like the medical condition of patients, there are also avoidable reasons due to various breaks in the workflow of the institution. Therefore, interventions in this QIP were directed at minimizing avoidable cancellation of elective surgical patients by improving system structure, workflow, pre-OP patient preparation and readiness of the operating room before the day of surgery. The result was a significant reduction in cancellation rate to below 10% at 7.25% exactly. In this project, only reducing staffing costs due to increased workload in a few subdepartments extending more than 8hr/day distributed for the day activities, has not been resolved. This needed risk-taking decision making from the hospital management.

While instituting these change ideas, we have understood that the OR is highly dependent on other departments within the institution and highly contingent on support from higher bodies including the hospital management, AARHB, MoH and donor organizations due to the delicate and complicated nature of the work and expensive, and sometimes unavailable medical equipment and medications needed for surgeries. Therefore, for the sustainability of the result of this project, joined hands and coordinated measurements from the stakeholders are mandatory.

This QIP's innovative ideas can be instituted in other hospitals with proper modifications to match the type of surgeries done, the type of population concerned, and the organizational structure taken into consideration.

We recommend hospitals, regional bureaus and the MOH enhance their quality unit and support leaders in organizing the OR workflow, structures, and procedures to increase OR productivity and decrease cancellations that require close follow up, if done so, substantial improvement will be seen as in this QIP..

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