

Application of Value Stream Mapping Tool on Patient Experience Management in Endoscopy Department of a Tertiary Care Hospital, Mumbai, India

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ANNOTATION

The study assesses various aspects contributing to patient experience in the endoscopy department of a Tertiary care hospital in Mumbai, India. The prime focus is on understanding the reasons for delay in patient care delivery and identifying areas of improvement in the processes through application of value stream mapping tool. A time-motion study of 148 patients was conducted at a multi-specialty tertiary care hospital in the Endoscopy, Bronchoscopy & Urodynamic department to study the time delays and determine reasons for the same. Value-stream mapping, Ishikawa/Fish-bone Diagram and ASQ's Quality Tools: Cause & Effect Matrix with Improve plan were used for analysis. The study highlights the main problem areas linking to methodical issues, manpower issues and communication issues which could improve significantly through the use of value stream mapping application.

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INTRODUCTION

Hospitals are focusing on continuous quality improvement and are thus incorporating patient-centered care in the healthcare delivery. Patient experience encompasses all the interactions a patient undergoes with the healthcare system, which includes doctors, nurses, admission & billing staff, healthcare managers & other healthcare facilities. Patients want a good experience. It does not necessarily mean the best of all facilities but it can be as simpler as less waiting time, proper communication with the healthcare providers and many such things. Knowing and discussing the attitudes of patients to their treatment promote involvement and commitment, enhance the quality of their service and the appropriate use of resources.¹

Published studies show how important patient experience is for endoscopists and their staff. To handle the patient's pain, have appropriate skills and interact with their patient efficiently in terms of treatment and outcomes. Similarly, the care pathways also needs to be streamlined so that the undue delays can be avoided.²

The process or the patient journey could be redesigned to offer better service experience and lesser complaints from the patients. Lack of communication from patients can lead to uncomfortable procedure causing inaccurate diagnosis.³

Eliminating non-value-added time will mobilise time resources in and for re-allocation of process measures for value added. Secondly, VSM can solve other services, such as reduced costs for care facilities, by reducing total processing time so that existing resources are used in other fields.⁴

Lean healthcare makes the flows of value more visible, which can eliminate waste, uncertainty, patient unnecessary trips, unwanted appointments or any other appointment and the need for clinical remediation. In the medical industry and in particular in emergency departments, value stream mapping has been commonly used.⁵

Continuity of care is extremely crucial in any healthcare set-up. This is linked directly with patient satisfaction and good patient experience. Recent developments, especially the growing specialization

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and fragmentation of primary care services, shifting habits of professional work and the emphasis on fast access, have raised concern about the increasing difficulty of maintaining a continuity with General Physician.⁶

Eventually, patient engagement has an important connection with patient and family-centred care values and practices. Because patient experience remains an important global focus area in healthcare, the need for a common standard definition becomes even clearer, which makes it vital for patient experience to be a viable and valued part of the conversation.⁷

Process Mapping in Healthcare

A new and important way of clinical audit is to evaluate how we deal with our patient experience and to identify problems and suggest improvements in patient perspective. Process mapping allows us to understand and see the perspective of the patient through a sequence of occurrences and steps to distinguish care of a specific condition or treatment. The series of these steps between two healthcare points can be seen as a patient pathway. The patient pathway is strengthened by integration of multidisciplinary practice, aimed at improving clinical efficacy and quality through the reduction of ineffectual and unnecessary care. The data provided by process mapping can be used to modify the patient route for improving the clinical management efficiency or efficacy and to focus attention on activities that are of patient's highest value.⁸

VSM in Healthcare Operations

All steps required to complete a specific process form a part of the value stream and VSM seeks to identify ways to reduce waste (e.g. patient wait times). One obvious application for VSM when used in healthcare is to chart a patient's path for therapy in order to maximize quality and reduce delays. The accurate design of a system requires the collection of high-quality, reliable data on the information flow and time a patient spends between or at steps. To get a true picture of what is going on, it is crucial to accurately time process steps and to use multi-departmental teams. A current state map can be rendered in a VSM tool to help identify areas for improvement and track the care path of a patient.⁸

AIM AND OBJECTIVES

To study the patient experience in the Endoscopy department of a tertiary care hospital value stream mapping tool.

Objectives:

- To study the process flow of the Endoscopy Department.
- To identify the shortcomings at various levels of patient experience
- To provide recommendations and action plan for improving the patient experience.

MATERIAL AND METHODS

This study involves OPD and IPD patients availing diagnostic services at the endoscopy department. Depending on the part of body being examined, the patients may be asked to avoid eating and drinking for several hours (usually 12 hours) before the procedure. They may also be required to take laxative

which helps clear stools from bowel before colonoscopy and sigmoidoscopy procedures. Antibiotics may be given in some cases to reduce the risk of infection. Sedatives or Anaesthesia is required to be administered which require the patients to be accompanied by someone. Patients undergoing Urodynamics tests may have urine bag attached. Urodynamic tests require the patient to consume adequate amount of water before the procedure.

Study Design

An observational study was conducted at a multi-specialty tertiary care hospital.

The study has analytical approach. A time-motion study was used to track the study subjects and their exposure to different aspects of healthcare to study the time delay and determine reasons for the same. There was no active interaction with the study subjects. According to the process flow, several key check-points were determined to record the timings of the study subjects.

Sample Size

A turnaround time study of 148 study subjects undergoing different procedures at the scopy Department was carried out. It comprised majorly of 60 UGI (EGD) scopy, 20 colonoscopy, 7 bronchoscopy and 17 uroflowmetry procedures.

Data Source

Primary data was collected through direct observations of time of study subjects at different check-points.

Data Collection

Technique: The data for this study was collected through direct observations of the study subjects.

The study subjects were tracked through the entire healthcare delivery process in the Scopy Department. Common check-points for various procedures were determined to facilitate tracking of study subjects arriving for different procedures.

The following check-points were used for tracking the study subjects:

1. Process A: Entry of the patient in the department to Initial Point of Contact.
2. Process B: Procedure & Recovery Time.
3. Process C: Billing Time.
4. Process D: Discharge Process.

For the above-mentioned processes, a Start time and End Time were identified. It helped determine the cycle time of the process and idle time

Data Analysis Tool

Microsoft Excel 2016 & ASQ's Quality Tools: Cause & Effect Diagram was used for analysis.

Process Mapping:

The process-mapping was carried out over a period of 5 days for 11 patients undergoing different procedures in the

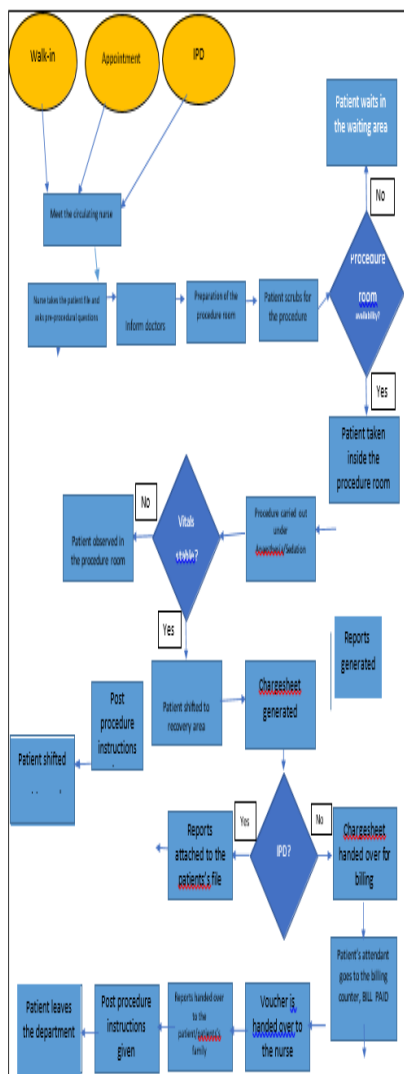
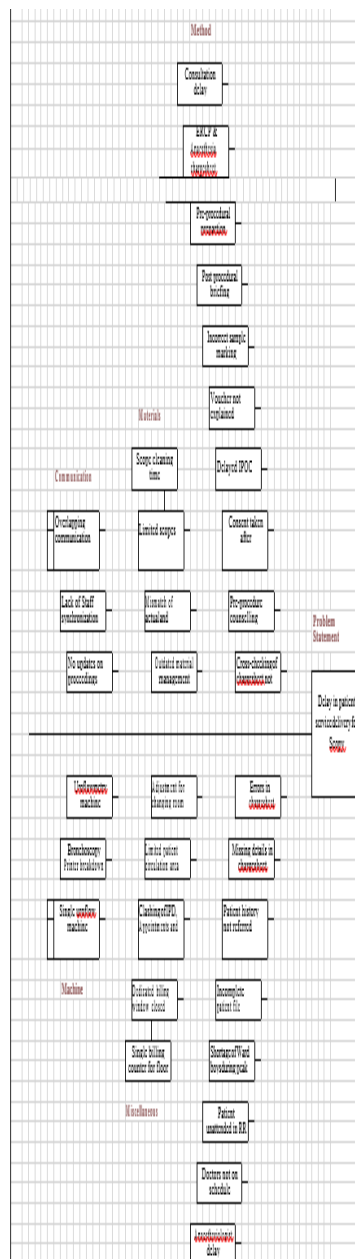


Figure 1: Patient flow in the endoscopy Department.

Fig. 1: The patient flow in the department as per the observational process mapping conducted



department. The findings of these study subjects have been excluded from the data used for analysis

The Figure 1 depicts the patient flow in the department as per the observational process mapping conducted (Fig. 1)

Analysis

The current state Value-stream mapping depicts the graphical representation for the process mapped (Fig. 2).

Cause & Effect Matrix for the reasons for delay in patient care delivery. (Fig. 3)

FINDINGS

This study highlights the key factors involved in delay of patient care delivery affecting patient experience under methodical and manpower issues with communication gaps. Methodical issues like consultation delay (highest impact), incomplete pre procedural preparation, post procedural briefing not provided;

manpower issues like inadequate support staff, errors in charge sheet entry, incorrect sample marking, doctors not being on schedule and communication issues like lack of staff synchronization, relatives not updated about patient status and overlapping communication with patient were the reasons contributing to maximum delay.

DISCUSSION

Knowing and optimizing the care of patients is a key element in the successful delivery of high- quality treatment based on the needs of patients.

In order to assess satisfaction of patients and concentrate on the unhappiness sector, an enhancement in health services structure is necessary. This method has been found to be helpful in improving global standards; with such input, it improves particularly the performance of endoscopists. This entire system eventually leads to the department’s long-term credibility.⁷

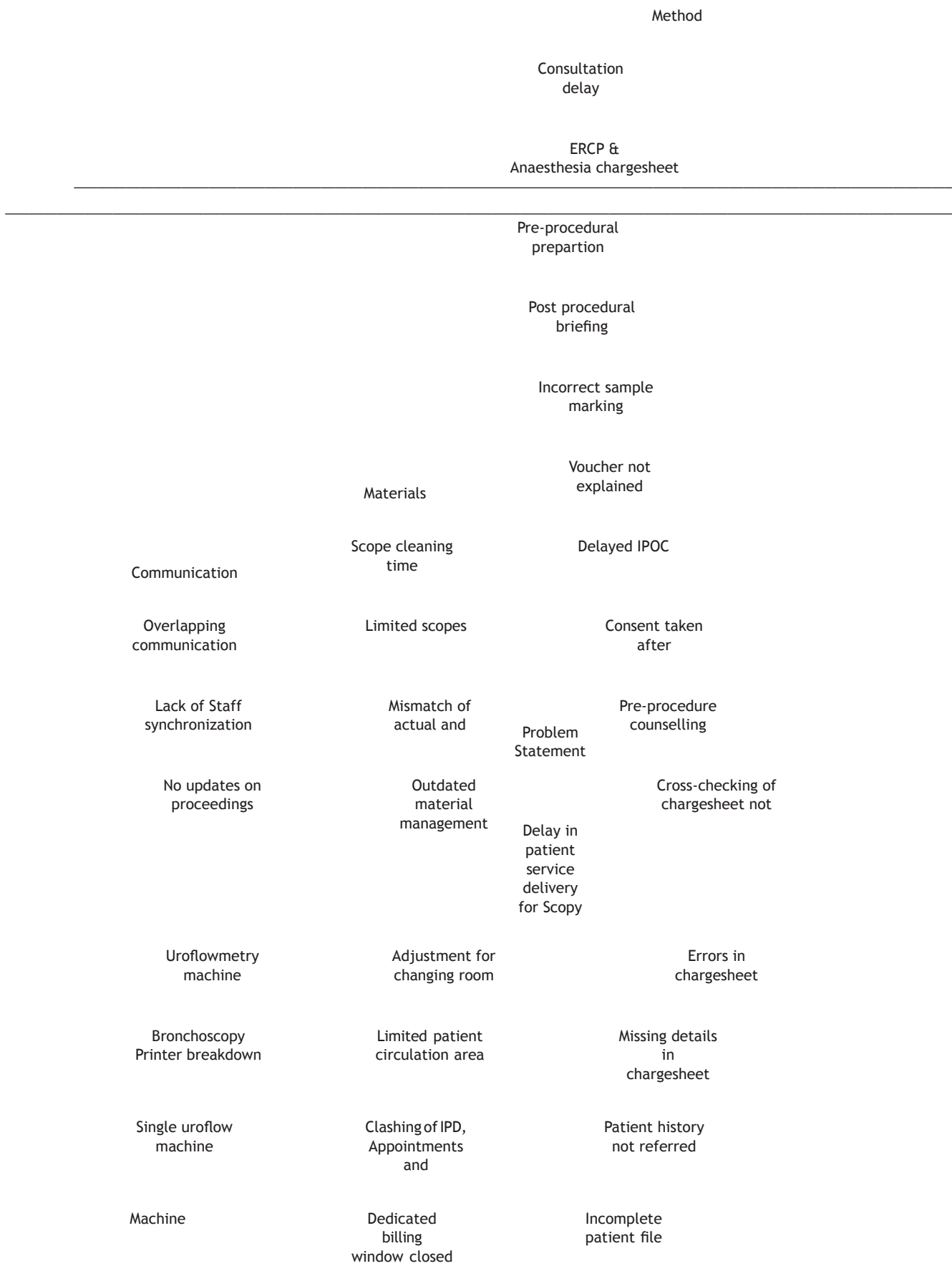


Fig. 2 : Ishikawa Diagram showing the reasons for delay in patient care delivery

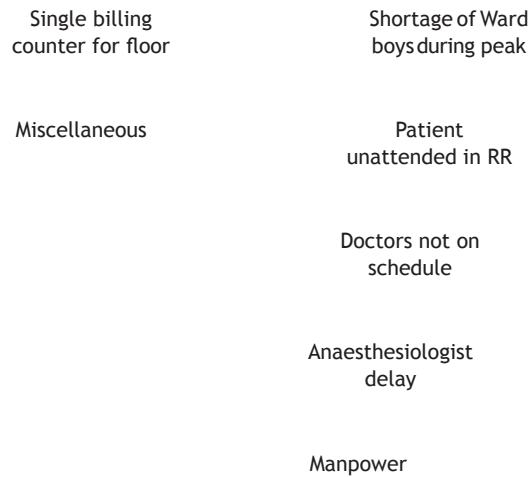


Fig. 2 (Continued) : Ishikawa Diagram showing the reasons for delay in patient care delivery

		Rating of Importance			
		10	10	10	
Category	Causes				
Key Requirements	0-no impact 1-low impact 3-Med impact 9-High Impact	Delay in patient service delivery in scopy PRE-PROCEDURE	Delay in patient service delivery in scopy during PROCEDURE	Delay in patient service delivery in scopy POST-PROCEDURE	Total
		1	Method	9	9
2	Method	9	9	1	190
3	Method	9	9	1	190
4	Manpower	3	9	3	150
5	Materials	3	9	3	150
6	Manpower	9	1	3	130
7	Manpower	3	9	1	130
8	Materials	3	9	1	130
9	Miscellaneous	3	9	1	130
10	Method	1	3	9	130
11	Method	9	1	1	110
12	Manpower	9	1	1	110
13	Manpower	9	1	1	110
14	Communication	1	1	9	110
15	Machine	1	9	1	110
16	Machine	1	1	9	110
17	Method	1	1	9	110
18	Method	1	1	9	110
19	Method	1	1	9	110
20	Method	1	1	9	110
21	Method	1	1	9	110
22	Manpower	1	9	1	110
23	Manpower	1	1	9	110
24	Materials	1	1	9	110
25	Communication	1	1	9	110
26	Machine	1	9	1	110
27	Materials	1	1	9	110
28	Communication	1	1	9	110
29	Manpower	3	1	3	70
30	Miscellaneous	3	1	3	70
31	Miscellaneous	3	1	3	70
32	Miscellaneous	3	1	1	50
33	Miscellaneous	1	1	3	50

Fig. 3 : Cause & Effect Matrix for the reasons for delay in patient care delivery.

The major issues faced in the department mainly constitute of methodical issues such as pre-procedural preparation often takes very long and the counselling is not done in a proper manner to prepare the patient for the procedure. Consultation is delayed due in availability of the doctor as they are occupied with other duties. Many patients face difficulties during the billing process as the charge sheet is not clearly printed raising queries.

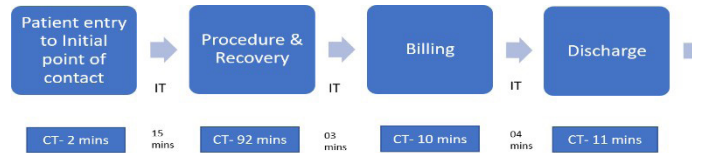
Man power issues which were observed are short staffing and schedules not being followed again reducing the work force. The ward boys for attending patient are not enough in numbers which increase the time for patients in the recovery room making them anxious about the results of the procedure. Doctors do not stick to the schedules.

The cleaning and sterilising process is long and time consuming. Materials management systems are not efficient enough often causing discrepancy in physical stock available and stock updated in the system. Only one uroflowmetry machine is available which makes the patient for the specific procedures wait in the same queue for longer time and any breakdown

or maintenance shuts the particular scopy procedures down completely.

Other issues involved in the delay are compact infrastructure which was observed from the factors like very narrow area for patients' staff circulation, smaller waiting area and changing room within the department. Clash between the appointments of IPD and OPD patients is very common occurrence.

RECOMMENDATIONS



$$VAR = \frac{VAT}{VAT+NVAT} * 100 = \frac{115}{137} * 100 = 83.94\% \quad NVA= 22 \quad VA=115$$

The following recommendations are given to improve patient experience.

Future value stream mapping is suggested for all endoscopy procedures.
 Improve Plan for the reasons for delay in patient care delivery.

Sl. No.	Category	Causes	ACTION	ACTION ADDRESSEE
1	Method	Consultation delay	Consultation to be provided as soon as the procedure is complete	Doctor
2	Method	Pre-procedural preparation incomplete	A checklist to be followed for every procedure that ensures the availability of consumables, equipments etc. required during the procedure.	Scrub Nurse
3	Method	Post procedural briefing	A leaflet of post procedure instructions to be handed over to the patient, a board containing the same to be put up in the department, an email can be sent to the patients informing them of the post procedural instructions.	Doctor/ Nurse, Management
4	Method	Incorrect sample marking	Bar-coding, prior labelling of sample containers in a pre-defined format and the labelling to be reflected in the pre-procedural checklist, cross checking the patient details with labels	Scrub Nurse
5	Manpower	Errors in chargesheet entry	Cross-check chargesheets before handing it over to the patient, a computer generated chargesheet with alerts by the computer in case of incomplete details.	Scrub Nurse
6	Manpower	Missing details in chargesheet	Cross-check chargesheets before handing it over to the patient, a computerized chargesheet that gives an error to generate or print in case of missing details.	Scrub Nurse
7	Manpower	Patient history not referred	Patient history to be referred before patient is shifted to the procedure room	Doctor
8	Manpower	Shortage of Ward boys	Allocating dedicated ward boys during peak hours.	Management
9	Manpower	Doctors not on schedule	Doctors should arrive on time. Nurses to co-ordinate with doctors to inform about the arrival of patients, establishing sound communication between doctors and nurses to reduce patient anxiety in case of waiting time.	Doctors
10	Manpower	Anaesthesiologist delay	A synchronization between Anesthisologists' routine OT cases and scopy cases and send scopy procedural schedule a day prior.	Management
11	Materials	Limited scopes	Synchronize scope cleaning and appointment in order to ensure scope availability. Consider investing in a new endoscope, if financially feasible.	Management
12	Materials	Outdated material management system	A well-established material management system with re-calculated levels for maximum stock, minimum stock, re-order level and buffer stock as per the ABC classification.	Management
13	Miscellaneous	Single billing counter for floor	Extend scopy billing timings according to the procedures. Incorporate patient's chargesheet with HMIS to ensure quick billing.	Management

Sl. No.	Category	Causes	ACTION	ACTION ADDRESSEE
14	Miscellaneous	Dedicated billing window closed	A dedicated billing window to be open and staffed at scopy timings, Incorporate patient's chargesheet with HMIS to ensure quick billing.	Management
15	Miscellaneous	Clashing of IPD, Appointments and Walk-in	Reserved time-slots for IPD as well as OPD. Walk-ins to be accepted only when there are no or less appointments for a given procedure.	Management
16	Communication	Lack of Staff synchronization	Effective communication, clearly defined responsibilities, sync up meetings	Management
17	Machine	Uroflowmetry machine breakdown	Root cause analysis to avoid breakdown, regular maintenance,adequate training for proper equipment handling.	Management

Future State VSM for all Scopy Procedures

Improve Plan: The highest rated 17 reasons were identified from sorting in the Cause & effect Matrix. Recommendations with brief action plan were provided by identifying 'who' and 'when' to reduce or eliminate the delay.

CONCLUSION

This study gives insight on various factors involved in delay of patient care delivery affecting patient experience under methodical and manpower issues with communication gaps. The key recommendations suggested in this study are developing a checklist for the procedures, improving / modifying the charge sheet, bar coding / prior labelling of sample containers leaflet of post procedural instructions etc as mentioned in improve plan are some of the components that can help reduce the delay and improve overall patient experience. A streamlined redesign of the patients scopy pathway leads to lower waiting time, decreased staffing requirements and improvement in patient flow which can form basis of path model that can effectively be adopted to alternative environments of similar nature with high and improved patients' satisfaction.

REFERENCES

1. Aerlyn GD, Paul P. L. (2003). Patient Satisfaction Instruments used at Academic Medical Centers: Results of a Survey. *American Journal of Quality*, Vol: 18, NO. 6 [online], available at: <http://ajm.sagepub.com/content/18/6/265>[Accessed: November/ December2003] [PubMed]
2. Tierney, M. & Bevan, Roisin & Rees, Colin & Trebble, T. (2015). What do patients want from their endoscopy experience? The importance of measuring and understanding patient attitudes to their care. *Frontline Gastroenterology*, 7. 10.1136/flgastro-2015-100574.
3. Grocott, A., & McSherry, W. (2018). The Patient Experience: Informing Practice through Identification of Meaningful Communication from the Patient's Perspective. *Healthcare (Basel, Switzerland)*, 6(1), 26.
4. <https://doi.org/10.3390/healthcare6010026>
5. McEntire, J., Sahota, J., Hydes, T., & Trebble, T. M. (2013). An evaluation of patient attitudes to colonoscopy and the importance of endoscopist interaction and the endoscopy environment to satisfaction and value. *Scandinavian Journal of Gastroenterology*, 48(3), 366-373. <https://doi.org/10.3109/00365521.2012.758768>
6. Myles, P. S., Williams, D. L., Hendrata, M., Anderson, H., & Weeks, A. M. (2000). Patient satisfaction after anaesthesia and surgery: Results of a prospective survey of 10,811 patients. *BJA: British Journal of Anaesthesia*, 84(1), 6-10. <https://doi.org/10.1093/oxfordjournals.bja.a013383>
7. Fujimoto K, Ishiwata T, Kasai H, Terada J, Shionoya Y, Ikari J, et al. (2018) Identification of factors during bronchoscopy that affect patient reluctance to undergo repeat examination: Questionnaire analysis after initial bronchoscopy. *PLoS ONE* 13(12): e0208495. <https://doi.org/10.1371/journal.pone.0208495>
8. Shaw, C., Williams, K., Assassa, P.R. and Jackson, C. (2000), Patient satisfaction with urodynamics: a qualitative study. *Journal of Advanced Nursing*, 32: 1356-1363. doi:10.1046/j.1365-2648.2000.01627.x
9. Antonacci, G., Reed, J. E., Lennox, L., & Barlow, J. (2018, May). The use of process mapping in healthcare quality improvement projects. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/29707978>