

Study on First Medication Turnaround Time in IPD Setting: A Pre and Post Test Analysis

By

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The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical. This training is in fulfillment of the course requirements.

I wish her all success in all future endeavors.



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We wish her all the best for future endeavors


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ABSTRACT

A Study on First Medication Turnaround Time in IPD Setting: A Pre and Post Test Analysis

Dr. Shruti Kohli

Keywords: Medication turnaround time, Indent, Hospital Information System

INTRODUCTION: Medication turnaround time is defined as the interval from the time a medication order is written (manually or electronically) to the time the medication was administered. Monitoring medication turnaround time in inpatient settings allows organizations to measure the impact of their health IT application on the increased efficiency of patient care.

RATIONALE: The common complaints by the patient party as registered by the service excellence department in SRS Sunflag Hospital, stated that the patient receives first dose of medicine many hours after the admission. The average Medication Turnaround Time as recorded by the administration team in month of January was around 4.5 hours i.e.: 270 minutes whereas the policy of the hospital says that first dose of medication should be given no later than 2 hours i.e.: 120 minutes.

METHODOLOGY: **Study Design-** Pre Test & Post Test Observational study

Sample- 210 New admitted patients to the Wards of Sunflag Hospital In Pre Test Phase and 180 New admitted patients to the Ward In Post Test Phase **Data Collection-** Pre intervention and Post intervention data has been collected for 210 patients and 180 patients respectively, admitted to the general ward for duration of 8 days each. It is based on time observation of critical events, HMIS system of the hospital and patient records. The data collected were under following heads:

Date of admission, Time of Admission (T1), First indent time- Time at which the Nursing staff ordered the indent of Cannula, Germicidal Solution and Dressing (T2), Prescription time – first time at which the prescription by the Consultant was available in patient

records. (T3), Order by Resident on Duty – time at which the Duty Doctor has written the prescription on Physician order Sheet(T4), Treatment indent time – Time at which the Nursing staff made the ordered the indent of Medicines(T5), Medicine received in Ward – (T6), Treatment Administration Time – (T7).

RESULT: There was a decrease in time at all levels of delay in post test phase i.e. at level 1 (Time of Admission to Treatment indent Time -T1 to T5), level 2 (Indent Time to Medicine received in Ward -T5 to T6) and level 3 (Medicine received in ward to Medicine given to patient -T6 to T7). The change in median observed is 83 minutes, 5 minutes and 7 minutes respectively. First Medication Turnaround Time in minutes i.e. Time of admission to Time medicine has been given to the patient (T1 to T7). In pretest phase the median is 260.5 minutes whereas in post test phase the median is 143 minutes. There is a decrease of 117.5 minutes in post test phase.

CONCLUSION:The intervention of MTAT Register for new admitted patients has increased the accountability of all the persons involved in the process i.e. Nurse, Duty Doctor and GDA. Although Consultant and Pharmacy are still not accountable for the process but recording of activities puts a pressure on the system at all levels to fasten up the process. The regularity in maintaining the MTAT Register has significantly decreased the MTAT by 117.5 minutes.

ACKNOWLEDGEMENT

Any attempt at any level cannot be satisfactorily completed without the support and guidance of learned people. I owe a great debt to all the professionals at SRS Sunflag Hospital, Faridabad, for sharing generously their knowledge and time, which inspired me to do our best during my internship.

I would like to express my immense gratitude to Mr. Kunal Bansal (Director and Chief Finance Officer), SRS Sunflag Hospital, Faridabad, for providing support and guidance for my learning in the hospital and for directing my thoughts and objectives towards the attitude that drives to achieve and other aspects that one as novice needs to be acquainted with. It has been a privilege to work under their dynamic supervision at the hospital as management trainee.

I am glad to acknowledge Dr. S.D. Gupta, Director, Ashok Kaushik, Dean and Professor, IIHMR University for incorporating right attitude into me towards learning. I am grateful to my Mentor and my constant source of guidance, Dr. Tanjul Saxena, without whom the project could not have taken the shape.

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ABBREVIATIONS

BCMA	Bar Code Medication Administration
CMS	Centres for Medicare & Medicaid Services
CPOE	Computerized physician order entry
eMAR	Electronic Medication Administration Record
GDA	General Duty Assistant
MTAT	Medication Turnaround Time
NPSA	National Patient Safety Agency
TAT	Turnaround Time
IV	Intravenous

INTRODUCTION:

A new medication is prescribed for a patient. The action sets in motion a complex series of interrelated supply chain and workflow processes aimed at providing the patient this medication as quickly, efficiently, accurately and cost-effectively as possible. However, within hospitals and across the healthcare system, these processes vary in ways that may have consequences. Variations impact initiation and timing of medication therapy for patients. A breakdown at any point in these processes may lead to delayed, omitted or incorrect medication therapy.

Medication turnaround time is defined as the interval from the time a medication order is written (manually or electronically) to the time the medication was administered. Monitoring medication turnaround time in inpatient settings allows organizations to measure the impact of their health IT application on the increased efficiency of patient care. Nursing and Pharmacy departments had been in long-term state of war. The medicines are the lifeline of any treatment. The moment a patient enters the IPD, they thrive for medicines to relieve their suffering. Often the attendants complain about the delay in first medication of their patient. The process involved in this scenario has many critical activities that determine the Medication Turnaround Time. Firstly the patient enters the ward; availability of prescribed medicines by consultant is the first nodal time. Ideally the prescription should be written in clear and capital letters by the consultant or duty doctor in order to avoid any time wastage or medication error.

In SRS Sunflag Hospital, it is ensured that this step is being taken care by the duty doctor by filling up the physician order sheet which is the document from where the nurses order the medicines for patients in HMIS system. Once the order has been placed, the pharmacy verifies the order and sends the medicine pack to the ward. After receiving the medicine, the treatment of patient starts.

LITERATURE REVIEW:

1) Medication turnaround time can be defined according to the literature as time when the medication was ordered by physician or health care provider to the medication delivery to the patient (Jensen, 2006; Wietholter, Sitterson & Allison, 2008). There is a delivery association between reducing medication turnaround time and patient safety. The quicker the medication delivery process is: the better patient outcome will be accomplished. This will be reflected on the quality of care and reduction of cost ⁽¹⁾. With the emerging of information technologies in health care field, many health care organization raced to adopt different kind of technologies to improve the workflow and health care processes : such as e- Prescribing, digital Scanning and Computerized Physician Order Entry ⁽²⁾. With departments such as pharmacy that have a heavy workload to supply medications to all other areas within health care organization; the use of technologies and automation of routine preparations will have tremendous impact on patient outcomes by reallocating pharmacists to patient-centered and productivity particularly in times of staff shortage⁽³⁾

2) Medicines doses may be frequently omitted or delayed in hospital for a variety of reasons. Only a small percentage of these occurrences may cause harm or have the potential to cause harm, this can happen as a result of errors during the prescribing, dispensing, supply or administration of the medicines in hospitals. A review of medication incidents but the NATIONAL PATIENT SAFETY AGENCY (NPSA) in 2007 revealed that for some kinds of medicines, such as antibiotics, anticoagulants and insulin, an omitted or delayed dose can have serious and even fatal consequences. The main reasons for medicines not being administered to patients were that the medicine was not available on the ward (38 percent of omissions), the patient was nil by mouth (32 percent), or patient refused the medicine (10 per cent). In 19 percent of cases there was no recorded for the omitted dose. The authors conclude that omitted doses could lead to increased morbidity and length of stay.

3) Sept. 9/2010 newsletter⁽⁴⁾, Discussed the results of the survey regarding the requirements in the Centres for Medicare & Medicaid Services (CMS) Conditions of Participation *Interpretive Guidelines* to administer medications within 30 minutes before or after the scheduled time. ⁽⁴⁾which directs surveyors to determine whether "...drugs [are] administered within 30 minutes of the scheduled time for admonition.") The survey elicited response from almost 18,000 nurses. Respondents made it clear that changes to drug delivery methods and gradual increases in the complexity of care, number of prescribed medications per patient, and number of patients assigned to each nurse have made the long-standing CMS "30- Minute rule" troublesome. Many nurses now feel the rule is unsafe, impossible to follow, and often unnecessary from a clinical perspective. Aware that nurses were struggling to comply with the rule and that surveyors were sometimes citing hospitals for noncompliance, we conducted the survey to prepare for interaction with CMS leaders to discuss our concern regarding the rule's unintended effects on patient safety.

4) Medication administration is crucial nursing task and safety checks at medication administration are critical. Firstly, administration errors are increasing continuously and only a few of them are identified because of fewer checkpoints due to manual processes. Secondly, nurses are alone while administering medication. Several studies are conducted on medication administration error and have proved that medication errors are very common and occur regularly in every health care setting. ⁽⁵⁾ Therefore to concentrate on administration error is very important. Leape et al. conducted study in 1995 and conducted that most error occurs due to inadequate information management system.

5) Westbrook (2007) stated "Electronic medication administration records provide the potential to make the administration of medications safer for patients by reducing errors rates and also by allowing nurses to move more efficiently manage medication task". Since 1995 AKUH is working with dot system of CPOE for medication and in 2005 we initiated window based CPOE system. Soon after that we realized that although CPOE helps to prevent prescription, transcription and dispensation errors, the administration errors are still there and requires having electronic system. This vision of CPOE unaccompanied by eMAR will not be able to reduce medication error and thus research studies such as ⁽⁶⁾. Consequently implementation of eMAR has been achieved in 30% of all the admitted beds at AKUH. Read more: ⁽⁷⁾

6) However, when I started reviewing the literature on this topic, I identified that very little study is conducted to identify wrong time error & omission of drug. Out of most of the studies on medication errors, only few of them included time error and drug omission whereas, in my prescription these are two of the most important problems of a day for example⁽⁹⁾highlighted that medication administration error included wrong time error up to 11% and omission of drug error uptake 15.2% of the total study outcome. He asserts that most of the administration errors are underreported due to manual process (2007). Allan & Baker 1990 stated “Wrong time errors are generally considered less serious than other errors”. On the other hand, FitzHenry et al. (2007) He recommended future study of medication administration processes to determine a classification of medication based on “timing criticality” for administration”.

7) Thus my study mainly focuses on data generated from eMAR system which helps to identify wrong time error electronically. The data will then be compared with incident report data of medication error o identify number of delay / omission of drug administration error reported. This identification helps management to reinforce users on time documentation as well.

8) National Patient Safety Agency Report highlighted the need to “have the systems that ensure drugs are given on time”. Further added that “An area of major concern is where a dose is omitted or delayed. This was the second largest category of medication incidents reported to the NSPA in 2007”. On time documentation for medication administration is questionable with manual recording as recording is unable to identify delay/ wrong time error as well as omission of drug.

9) Study conducted by green et al. (2009) omission of drug administration highlighted multiple reasons for omissions of drugs: out of them 19% of omitted dos appeared without any reason for omission. Furthermore, Rogers 2005 conducted similar type of study but was not only provide accurate data on frequency of omission. However, few studies which did provide accurate data focussed only on timely administration of antibiotics.

10) Therefore, the new system of eMAR has been designed keeping all the mentioned issues in mind. It does not allow nurses to omit dose without any comments, dose remains on nurses” administration screen till comments has been entered and saved thus enabling the seems to capture dose administration time automatically and if any medication is administered at wrong time , system changes its colour on the screen and asks for reason for delayed administered. FitzHenry et al.(2007) highlighted “ EMAR and BCMA systems must addresses the difficult challenge of determining “ correct” administration times, in particular the correct” start time, because the effort required for nurses to modify the scheduled administration time in an electronic system will be higher than for a paper- based system.

RATIONALE OF THE STUDY:

The common complaints by the patient party as registered by the service excellence department in SRS Sunflag Hospital stated that the patient receives first dose of medicine many hours after the admission. The average Medication Turnaround Time as recorded by the administration team in month of January was around 4.5 hours i.e.: 270 minutes whereas the policy of the hospital says that first dose of medication should be given no later than 2 hours i.e.: 120 minutes.

RESEARCH QUESTION:

What are the probable causes for delay in Medication Turn Around time for new admitted cases?

Does an Experimental Intervention reduce the average Medication Turnaround Time?

NULL HYPOTHESIS:

There is no significant change in First Medication Turnaround Time after intervention.

OBJECTIVES:

1. To study the process flow chart and identify the ongoing activities for indentation of drugs for new admitted cases.
2. To explore the probable causes for the delay in Medication Turn Around time for new admitted cases.
3. To implement an intervention for recording of vital activities.
4. To compute the reduction in TAT after implantation of the intervention in specified time period

METHODOLOGY:

1. **STUDY DESIGN:** Pre Test & Post Test Observational study
2. **STUDY POPULATION:** 210 New admitted patients to the Ward In Pre Test Phase and 180 New admitted patients to the Ward In Post Test Phase
3. **STUDY AREA:** Wards of Sunflag Hospital

4. DATA COLLECTION:

Pre intervention and Post intervention data has been collected for 210 patients and 180 patients respectively, admitted to the general ward for duration of 8 days each. It is based on time observation of critical events, HMIS system of the hospital and patient records. A series of time were noted, starting from admission of the patient to the time of medicine administration. The data collected were under following heads:

- Date of admission
- Time of Admission (T1)
- First indent time- Time at which the Nursing staff ordered the indent of Cannula, Germicidal Solution and Dressing.(T2)
- Prescription time – first time at which the prescription by the Consultant was available in patient records. (T3)
- Order by Resident on Duty – time at which the Duty Doctor has written the prescription on Physician order Sheet.(T4)
- Treatment indent time – Time at which the Nursing staff made the ordered the indent of Medicines.(T5)
- Medicine received in Ward – (T6)
- Treatment Administration Time – (T7)

RESULTS AND FINDINGS.

1. Objective 1: To study the process flow chart and identify the ongoing activities for indentation of drugs for new admitted cases.

Process of Medicine Administration:



- Patient is admitted to the ward accompanied by the nurse from nurse station.
- Then nurse informs the concerned Doctor.



- Nurse gives the room orientation to the patient and nurse examines the patient's condition and fills up the IP assessment form online in HIS.



- Then Doctor comes and examines the patient.
- Writes down the chief complaints, vitals, allergies, medication advice, investigations



- Then nurse counter checks the command and inform the duty doctor to write the prescription on physician order sheet.



- Then Duty Doctor examines the patient and then writes the prescription as mentioned by Consultant on Physician order sheet.

**INDENT
ORDER
GIVEN**

- After the prescription has been written on Physician order sheet, nurses place the order of the medication on Pharmacy portal.

**ORDER
PACKED AND
DISPATCHED**

- Pharmacy looks at the order sheet and packs the medicines and hand overs the GDA to deliver to the respective ward.

**MEDICINES
RECEIVED IN
WARD**

- GDA delivers the medicine to the ward and keeps the packet on a table at nursing station.

**MEDICINES
GIVEN TO
PATIENT**

- Nurses pick up the bag and place it near the patient bed.
- Patient is given the medicine by the nurse in treatment rounds in every shift.

2. Objective 2: To explore the probable causes for the delay in Medication Turn Around time for new admitted cases.

Reason	Example
High patient load/ poly pharmacy	Administering multiple medications to half a dozen patients or more
Medication not available	Pharmacy delay in dispensing medications/missing medications Awaiting pharmacy verification of order
Interruptions during medication administration	Phone calls (physicians, families, ancillary staff) Getting patients ready for the OR, caring for returning patients. Answering patient questions about medications, medical care Admissions, discharge, transfer in/out of unit Rounds with physicians Addressing call lights/alarms from equipment that require attention Bathroom assistance (fall precautions), incontinence care Educating patients about medications Reviewing medications/ indication/contraindication/patient assessment before drug administration. Reviewing unfamiliar drugs, waiting for physician order clarification
Delays during administration	Administering each drug separately via gastric tube/flush... Administering each pill/tablet/capsule separately to elderly patients with difficulty swallowing. Awaiting food/feeding of patient to administer drug with meal. Multiple IV meds: waiting for one to infuse before starting the next.
Time-consuming documentation of medication administration	Flow sheets, vital sign records, pain assessment records, narcotic documentation EMAR documentation of reason for administering medications late Incident report required for late medications

3. Objective 3: To implement an intervention for recording of vital activities.
A MTAT register should be placed in each ward designed in order to monitor the process periodically.

S.NO	BED NO.	IP NO.	TIME OF PRESCRIPTION	TIME OF INDENT	TIME OF RECEIVING
			Filled by doctor on duty	Filled by nurse	Signed and filled by GDA

4. Objective 4: To compute the reduction in TAT after implantation of the intervention in specified time period

Table 1: First MTAT at three levels of delay

		PRE TEST			POST TEST		
		TOTAL	MEDIAN	MEAN	TOTAL	MEDIAN	MEAN
Time of Admission to Treatment indent Time (T1-T5)	LEVEL 1	32977	155	157.0	12932	72	72
Time of Admission to Time of Prescription Written (T1 - T3)	1A	11629	53	55.4	5816	34	32
Prescription Written to Order written by Resident Doctor(T3-T4)	1B	10880	49	51.8	3763	38	21
Order written by Resident Doctor to Treatment indent Time (T4-T5)	1C	10468	48	49.8	3353	36	19
Indent Time to Medicine received in Ward (T5-T6)	LEVEL 2	11406	50	54.3	8692	45	48
Medicine received in ward to Medicine given to patient (T6-T7)	LEVEL 3	10837	48	51.6	4272	41	24
Time of Admission to Medicine given to patient (T1-T7)	MTAT	55220	260.5	263.0	25896	183	144

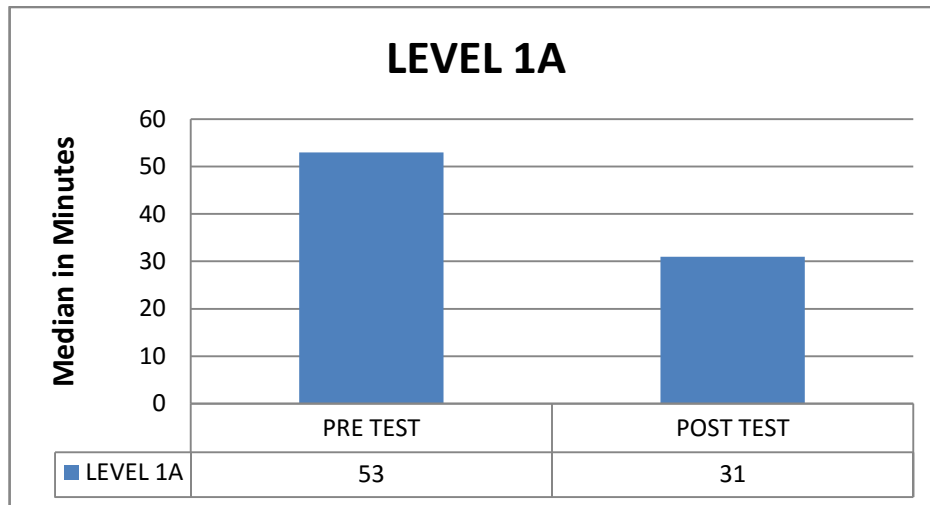


Figure 1: The median of delay at level 1A in minutes

Figure1 Illustrates the median of delay at level 1A in minutes i.e. Time of admission to time the prescription has been written(T1 to T3). In pretest phase the median is 53 minutes whereas in post test phase the median is 31 minutes. There is a decrease of 18 minutes in post test phase.

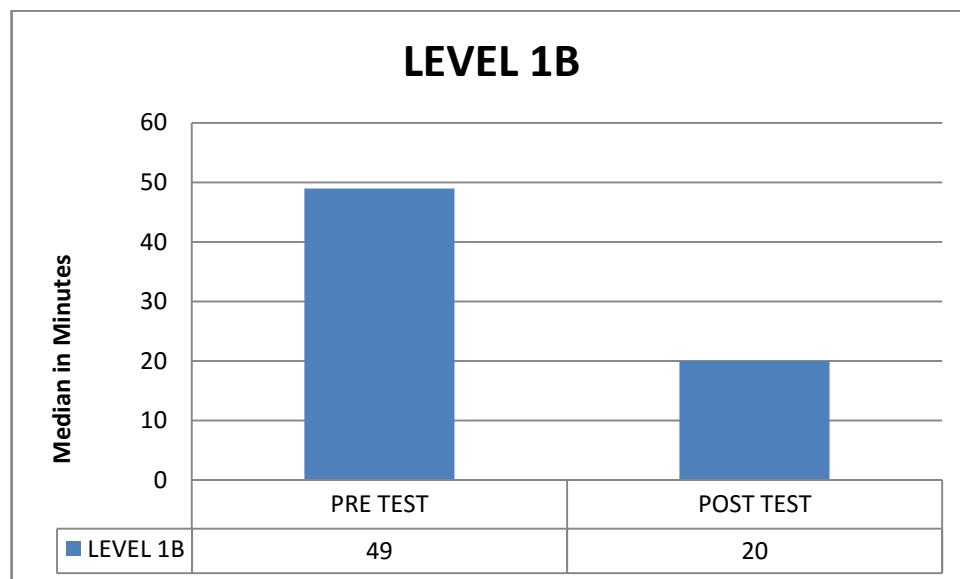


Figure 2: The median of delay at level 1B in minutes

Figure 2 Illustrates the median of delay at level 1B in minutes i.e. Time the prescription has been written to Time taken by Duty Doctor to write the prescription on Physician order sheet (T3 to T4). In pretest phase the median is 49 minutes whereas in post test phase the median is 20 minutes. There is a decrease of 19 minutes in post test phase.

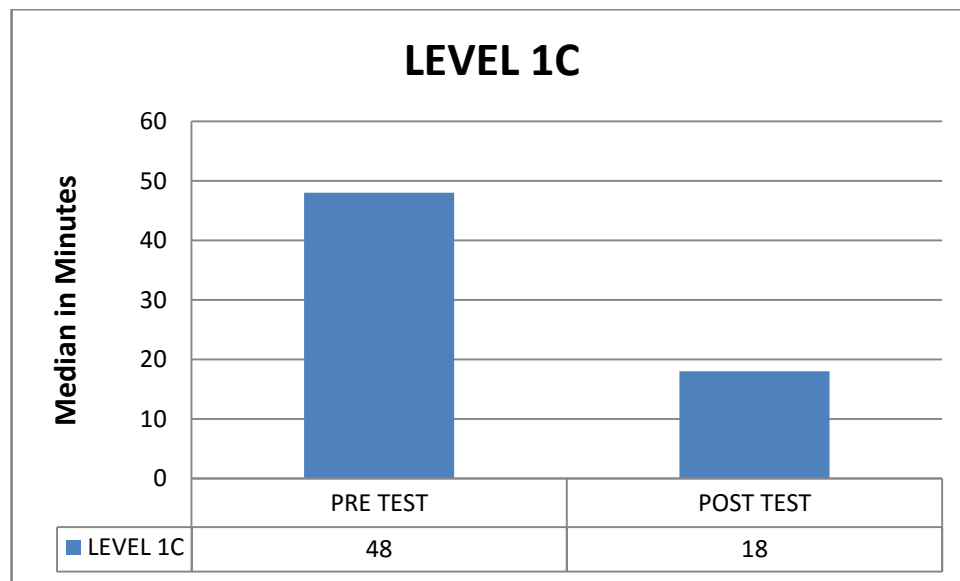


Figure 3: The median of delay at level 1C in minutes

Figure 3 Illustrates the median of delay at level 1C in minutes i.e. Time taken by Duty Doctor to write the prescription on Physician order sheet to Time when the nurse has place the indent order for medication (T4 to T5). In pretest phase the median is 48 minutes whereas in post test phase the median is 18 minutes. There is a decrease of 30 minutes in post test phase.

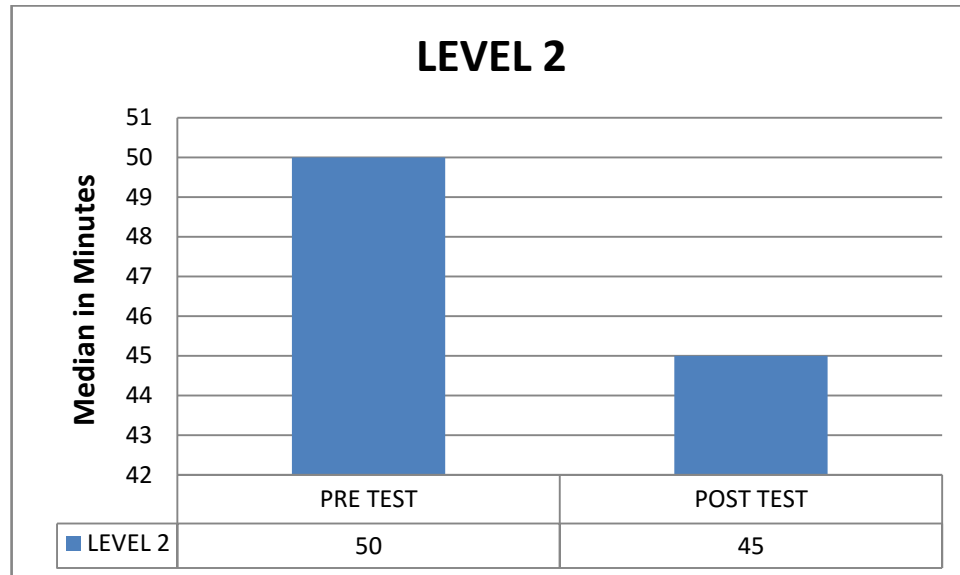


Figure 4: Illustrates the median of delay at level 2 in minutes

Figure 4. Illustrates the median of delay at level 2 in minutes i.e. Time when the nurse has place the indent order for medication to Medicine received in the ward (T5 to T6). In pretest phase the median is 50 minutes whereas in post test phase the median is 5 minutes. There is a decrease of 5 minutes in post test phase.

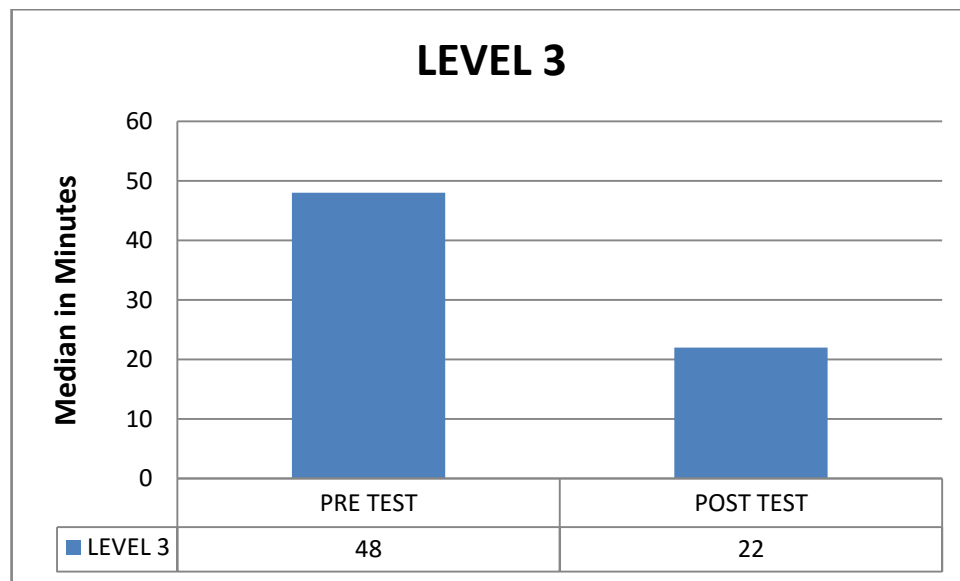


Figure 5: The median of delay at level 3 in minutes

Figure 5 Illustrates the median of delay at level 3 in minutes i.e. Time when Medicine received in the ward to Time medicine has been given to the patient (T6 to T7). In pretest phase the median is 48 minutes whereas in post test phase the median is 22 minutes. There is a decrease of 26 minutes in post test phase.

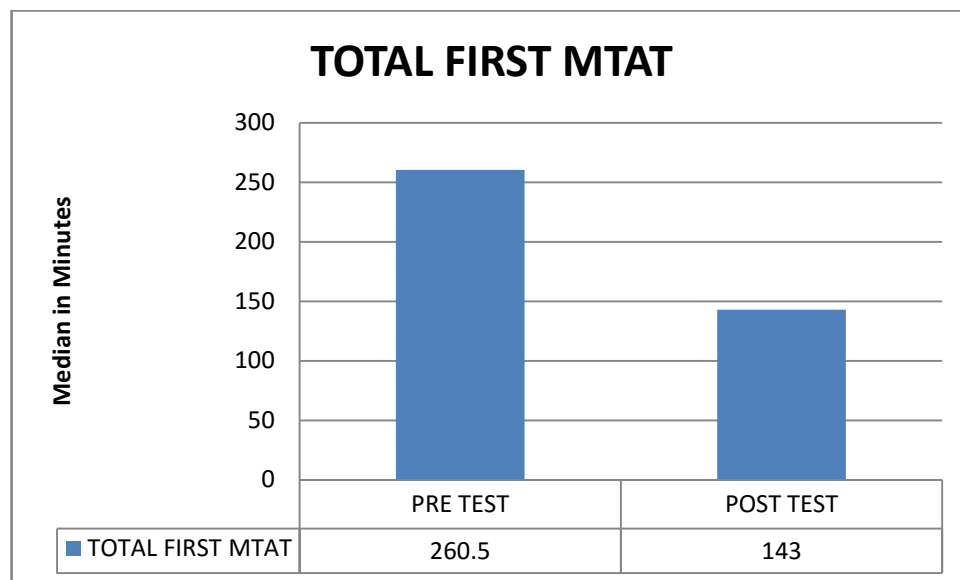


Figure 6: The Total First Medication Turnaround Time in minutes

Figure 6 Illustrates the Total First Medication Turnaround Time in minutes i.e. Time of admission to Time medicine has been given to the patient (T1 to T7). In pretest phase the median is 260.5 minutes whereas in post test phase the median is 143 minutes. There is a decrease of 117.5 minutes in post test phase.

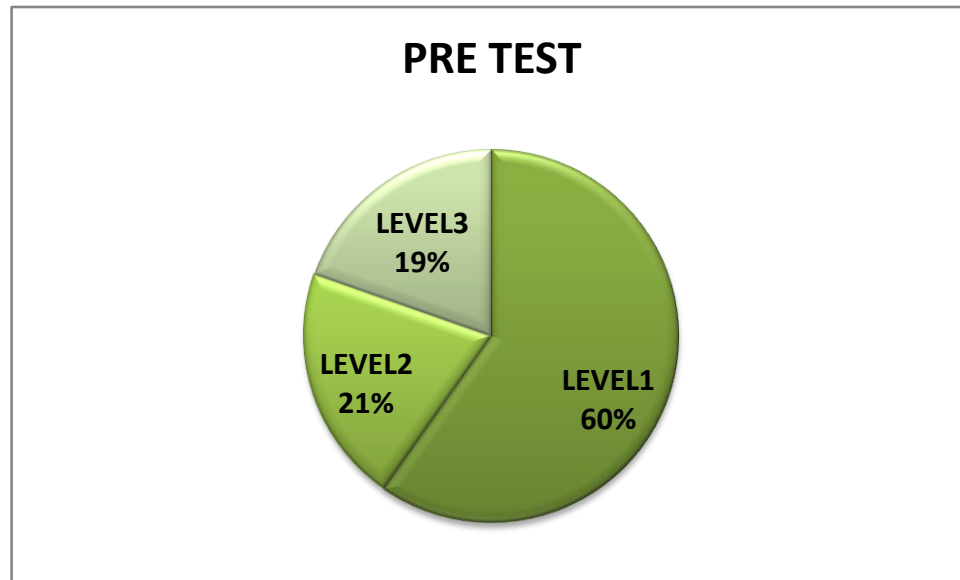


Figure 7: Distribution of three levels of delay in Total First Medication Turnaround Time.

Figure 7 depicts the pretest distribution of three levels of delay in Total First Medication Turnaround Time. Level 1 i.e. Time of admission to Time the prescription has been written by the consultant-T1 to T5 (n=32977), Level 2 i.e. Time when the nurse has place the indent order for medicine to Medicine received in the ward -T5 to T6 (n=11406) and Level 3 i.e. Time when Medicine received in the ward to Time medicine has been given to the patient -T6 to T7 (n=10837).

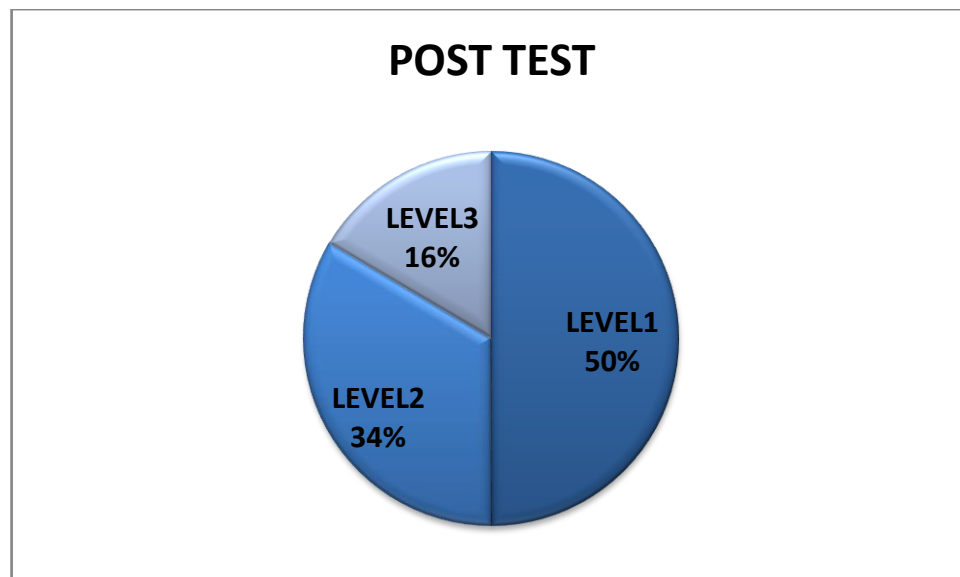


Figure 8: Pretest distribution of three levels of delay in Total First Medication Turnaround Time.

Figure 8 depicts the pretest distribution of three levels of delay in Total First Medication Turnaround Time. Level 1 i.e. Time of admission to Time the prescription has been written by the consultant-T1 to T5 (n=12932), Level 2 i.e. Time when the nurse has place the

indent order for medicine to Medicine received in the ward -T5 to T6 (n=8692) and Level 3 i.e. Time when Medicine received in the ward to Time medicine has been given to the patient -T6 to T7 (n=4272).

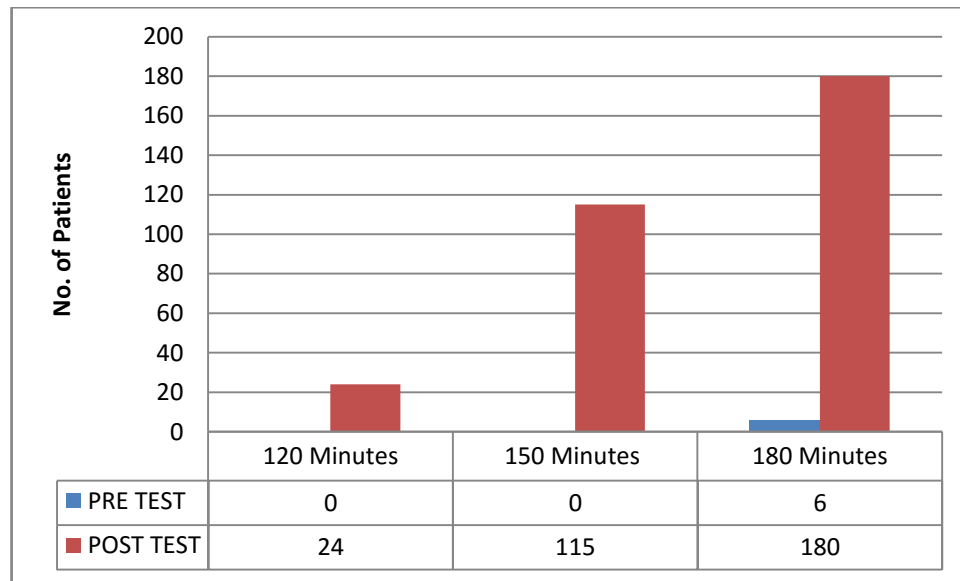


Figure 9: The distribution of patients who received medication within different limits of time

Figure 9 illustrates the distribution of patients who received medication within different limits of time. In pretest phase none of the patients received medicines within 120 minutes whereas 24 patients received it in post test phase. Second column shows that none of the patients received medicines within 150 minutes whereas 115 patients received it in post test phase. Last column shows that 6 patients received medicine whereas in post test phase all the patients received medicine within 180 minutes.

T-TEST:

Applying the formula:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2} \right) \left(\frac{1}{N_1} + \frac{1}{N_2} \right)}}$$

Mean1= 263

Mean2= 144

N1= 210

N2= 180

S.D pre test= 47.8174

S.D post test= 21.85386

The p value for pre and post testis less than .001. Hence, there is statistical change in MTAT after intervention therefore we reject null hypothesis.

DISCUSSION:

Observing the probable causes for delay at each level, requires a detailed analysis of the ward manpower availability and routine activities of all the personnel involved in the process. For the delay at Level one i.e. time interval between the times of prescription to the time of indentation of Medicine, the most probable reason is the low Nurse to Bed ratio which is around 1:7. Moreover the nurses are involved in too much paper work and there is poor management of time. There is no fixed time for giving treatment and recording vitals. They do not inform the consultant about the arrival of patient in ward. They usually do these activities on the arrival of the Consultant. The protocol for indentation of medicines is not clear. Few nurses wait for the Duty doctor to write the physician order sheet to make the indent and few do it just on Consultant's order on activity sheet. The time taken by the Duty Doctor to write the prescription is an important cause for delay. As there were times when this delay was as low as zero therefore it has not been taken into consideration while analyzing the data. On average a nurse takes around 3 to 4 minutes in making an indent for Cannula, Germicidal Solution and Dressing for each patient. Similarly, pharmacy takes around 3 to 4 minutes to verify the order, packing and making the bill for this indent. Hence, about 8 minutes are utilized for the first non-medicinal indent which consumes around 60 to 80 minutes per day (excluding the time taken by the person delivering the order) and it creates traffic in the busy hours of hospital. This step has not been considered in analysis as the order placed was non-medicinal.

Low manpower at pharmacy and increased workload, it becomes difficult to tackle the situation at level 2, which is time taken by the pharmacy to deliver the medicine after its indentation. There is low real time availability of GDA staff on the floor. Though 4 staff is deputed at the floor but they are never available to bring the medicines from pharmacy. Once the packet of medicines has been given to the GDA by pharmacy, they again take a lot of time to reach the ward. They usually spend some time in the basement where other GDA and housekeeping staff is sitting. Moreover there is no follow up from nursing staff's end for the order even in cases of stat orders. There are also times when only a single bag is being delivered from the pharmacy.

At level 3 i.e. time taken by the Nursing staff to administer the medicine after it has been delivered, there are two main reasons observed. Firstly, the person who delivers the bag at the nursing station does not inform the nurse about its arrival. Secondly, most of the times the medicines are delivered between 2pm to 4 pm and this is the time when nurses are busy in activities like lunch, handover and treatment of old admission patients. There are some factors that may also be contributory to the situation like unawareness among the healthcare providers about the importance of timely administration of medicines. There were on average 7 cases daily when the attendants complained about the delay in first medication.

The distribution of each level in Pre Test was 60 percent for level 1, 21 percent for level 2 and 19 percent for level 3. In post test phase the distribution for level 1, 2 and 3 was 50 percent, 34 percent and 16 percent respectively. An increase in percentage at level 2 is relative as there was a drop at level 1 and level 3. This emphasizes the fact that drop at level 1 and level 3 is because they are in control of the intervention whereas level 2 involves activities by pharmacy which are not under control, although the delay at level 2 has also decreased because GDA is now accountable for delivering the medicines to ward and he needs to record the time for the same.

Decreased manpower and workload are two most common problems in any busy system but cost effective and time saving ways should be designed in order to combat the shortfall.

RECOMMENDATIONS

- There should be a clear protocol for the activities involved in the process of medicine indentation and all the personnel should be oriented in this regard.

Role of Duty Doctor

- It is essential to supervise the treatment hence; it becomes necessary to do strict monitoring over the process by the Duty Doctor.
 - They should see the patient, document it timely and write down the prescription independently or in consultation with the Consultant treating the patient.
 - The physician order sheet should be immediately written by the Duty Doctor after the medicines have been prescribed by the Consultant/ Duty Doctor.
 - Special attention should be given to new admissions and following interventions should be evaluated by experts for reducing the MTAT:
1. One GDA out of the four should be solely placed for bringing the medicines for new patients. Observation over 2 hours is suggestive of that it takes only 7 to 9 minutes for a GDA to get medicine from pharmacy. It means even if we have 10 new admissions per day, approximately 1.5 hours of engagement can be spared for getting medicines from pharmacy.
 2. The first indent i.e. Cannula, Germicidal Solution and Dressing should be a part of inventory as reserve and should be replaced at midnight when traffic at pharmacy is low.
 3. A MTAT register should be placed in each ward designed in order to monitor the process periodically.

S.NO	BED NO.	IP NO.	TIME OF PRESCRIPTION	TIME OF INDENT	TIME OF RECEIVING
			Filled by doctor on duty	Filled by nurse	Signed and filled by GDA

CONCLUSION

The intervention of MTAT Register for new admitted patients has increased the accountability of all the persons involved in the process i.e. Nurse, Duty Doctor and GDA. Although Consultant and Pharmacy are still not accountable for the process but recording of activities puts a pressure on the system at all levels to fasten up the process. The regularity in maintaining the MTAT Register has significantly decreased the MTAT by 117.5 minutes.

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