



Research Article

MEDICATION TURNAROUND TIME IN HOSPITAL PHARMACY DEPARTMENT

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ABSTRACT

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 organization to measure the impact of their efficiency of patient care.

Objective: To trace the delays in the order and delivery system of In-patient pharmacy and check the average total time consumed in delivering drugs and medical consumables to the patients.

Method: A time motion study was done in the in-patient pharmacy at a multi specialty hospital in Jaipur. A sample size of 300 indents was taken by using non-probability convenient sampling method. Out of 300 indents, 56.6% were normal indents, 26.6% were new admission indents and 16.6% were urgent indents. Both primary and secondary data has been used in the study. The secondary data was obtained from the track care software, which was used in the pharmacy. SPSS and Microsoft excel was used for data analysis.

Results: The study found that 25.2% of the normal indents, 48.7% of the new admission indents and 60% of the urgent indents were delayed. In addition, the average time taken to deliver normal indent was found to be 1hour 8 minutes, for new admission indent it was 48 mins and for urgent indent it was 1hr 20 minutes i.e. more than the normal indent and new admission indent. It was also found that the peak hours of the indent order were 10:00 pm to 12:00 am, also the peak hours of indent order and the availability of work force at that time was contradicting. The average number of indents per day was found to be 1224.

Conclusion: Through this study, we were able to identify various points of delays, which were occurring in delivering indents to the patients. The results of the study revealed that all types of indents were delayed; especially urgent indents also got delayed, which became the major area of concern. In addition, if hospital follows indenting practices by the nursing staff, than the training for nursing staff is essential requirement regularly, to overcome this problem. The results of the study will definitely benefit in improving TAT of the pharmacy indents and most importantly the patient care.

Keywords: Turnaround time, Pharmacy department, Medication turnaround time, Delay of In-patient pharmacy.

INTRODUCTION

The major expectation from the pharmacy department in the hospital is to make right drug available at the right time. The delays in delivering of drugs and medical consumables interrupt in the smooth functioning of pharmacy. Monitoring medication turnaround time in inpatient settings allows organizations to measure the impact of their quality on the increased efficiency of patient care. A potential benefit of health application software's in inpatient setting is decreased medication turnaround time. Turnaround time (TAT) is the total time taken between the submission of a process/task for

execution and the return of the complete output to the customer/user. TAT is one of the metrics used to evaluate operating system scheduling algorithms [1]. Medication turnaround time is a time-to-first-dose, or medication turn-around time, is considered the interval from the time a medication order was composed to the time the medication was delivered. Moreover, time-to-first dose can be broken down into two key phases: the time from when the order was composed to the time that pharmacy verifies the order, and the time from pharmacy verification to the time the

medication was delivered^[2].

Hospitalized patients may experience delays in care due to delays in medication administration. Delays can be disastrous, the effects can be horrifying in terms of mortality and morbidity, and that is why continuous monitoring of the procedure and continuous efforts, dedication of whole staff and co-ordination between the staff members is required for smooth running of the process of pharmacy to vitalize the lifelines of hospital that is "Medicines". For example, delays in therapeutic or prophylactic administration of antibiotics can have a major effect on patient outcomes.

Many advocate that electronic processes for medication ordering and pharmacy verification and dispensing are more efficient than paper based systems because they may be: (1) instantly delivered to the pharmacy as opposed to manually written by the physician, delivered to the appropriate department by the clerk, transcribed to the medication administration record (MAR) by the nurse, and processed by the pharmacy; (2) easier to read as compared to copies of providers' handwriting; (3) more complete because of required fields; and/or (4) more legible to the pharmacist, reducing the need for clarification phone calls to the provider^[3]. Studies also found a statistically significant 70% reduction in their medication turn-around time. More specifically, they found that their medication turn-around times were reduced by roughly 64%^{[2],[4]}.

Improves medication turnaround time could help providers to better adhere to evidence- based guidelines in case where medication administration is recommended for a given time in the patient's care.

METHODOLOGY

The study is a time motion study was conducted for 3 weeks for the In-patient area pharmacy in Hospital at Jaipur, Rajasthan. The total sample size of 300 admitted patients were collected. Out of 300 (100%) indents, 170(56.6%) were normal indents, 80(26.6%) were new admission indents and 50(16.6%) were urgent indents. The sampling method used was non-probability convenient sampling.

The study was completed under 2 key phases. In phase-1 for one week, an observational study was done for understanding of the pharmacy functioning, the time from order composition to pharmacy verification and the time from pharmacy verification to delivery. During Phase -two

for two weeks: Collection of a data set of medication orders, In addition, certain factors hindering the smooth functioning of pharmacy were identified and recommendations were given to overcome those factors. The quantitative data collected was analyses with the help of SPSS and Microsoft excel.

RESULTS AND DISCUSSION

Pharmacy process: The process starting from the nurse indenting or placing order for medicines in electronic patient record system till porter supplying the medicines in the respective wards is broken down in number of following steps:

1. Ordering of medicine from wards, ICU or other areas.
2. Printing the order in the pharmacy department.
3. Time taken in collecting drugs, Checking drug name, patient name or number, date of expiry of medicine.
4. Keeping the collected drugs on the respective racks as per the wards.
5. Verified and Dispatching.
6. Drugs reaching wards.

The average total time taken to deliver medicines against the indents was observed to be 1 hour and 06 minutes. The average TAT for packing the indent once it is sent to the system by the nursing staff was found to be 09 minutes. The average TAT for taking the packing slip in the store for collection of medicines was 11 minutes. That means the print out stays on the printer for 11 minutes. Average TAT for collecting the drugs as observed as 16 minutes. Average TAT for exit of drugs from the pharmacy store was found to be 27 minutes. It is alarming to see that even after the drugs are collected and ready to be dispatched, it takes 27 minutes for the exit of the drugs from the store. This is mainly due to the reason that drugs after being collected are kept on the racks as per the wards for long time and here occurs the unnecessary delay in dispatching medicines. Finally, the average TAT for delivering drugs to the respective wards after the exit of the drugs from the pharmacy store was 3 minutes.

New admission and normal Indents -The total new admission indents tracked was 77, 39(51%) of the indents were delayed, indent delivered in more than 30 minutes and

38(49%) indents were delivered in time. That almost half of the new admission indents were delayed.

The average total time consumed in delivering drugs against new admission indents is fifty-eight minutes shown in Table No. 1. However, the standards as per the standard operating system (SOP's) of hospital say that the TAT of the new admission indents should be 30 minutes.

If we see the whole process step wise then the average time taken for packing the received indent on the system is 9 minutes. The average time taken for taking packing slip inside the store is ten minutes; this is mainly because the printouts keep accumulating on the printer and the bulk is taken to the store. The average time for collecting the drugs was found to be seventeen minutes. The average time for exit of drugs after collection was observed to be nineteen minutes. Here, the unnecessary delay takes place because the drugs are kept for long in the racks. Finally, the average TAT for delivery of drugs after exit was three minutes.

The average total time taken for delivering drugs against normal indents is one hour eight minutes shown in Table No-1. However, the standard time in delivering drugs against normal indents as per SOP's is 2 (Two) hours. It is a positive indication that the drugs against the normal indents were delivered well before the normal time. Similarly, if we see the time taken for packing the indent on the system is nine minutes. The average time taken for taking the packing slip inside the store was eleven minutes. The average time for

drug collection was fifteen minutes; average time for drug exit was twenty-nine minutes, average time for delivery of drugs after collection was found to be four minutes.

The time taken at each step was observed and documented by the following:

1. The ideal pharmacy TAT for:
 - Normal indents were 2 hours.
 - An urgent indent was 15 minutes.
 - New admission indents was 30 minutes.

The total normal indents tracked was 170, 43(23%) of the indents were delayed, indent took more than 2 hours and 127(77%) indents took 2 hours or less time.

The total urgent or emergency indents tracked was 50, 30(60%) of the indents were delayed, and 20(40%) urgent indents were delivered in time. It is alarming to see that the average total time taken in delivering drugs against the urgent indents was one-hour twenty minutes. However, the standards as per the Standard Operating System say that the drugs against urgent indents must be delivered within fifteen minutes. We can clearly observe that the maximum time taken in exit of drugs was forty-seven minutes. This is highest as compared to normal and new admission indents mainly because the pharmacy staff waits for the GDA to come and collect the drugs and the GDA staff never arrives on time, rest of the timings are nearly similar to that of normal and new admission indents.

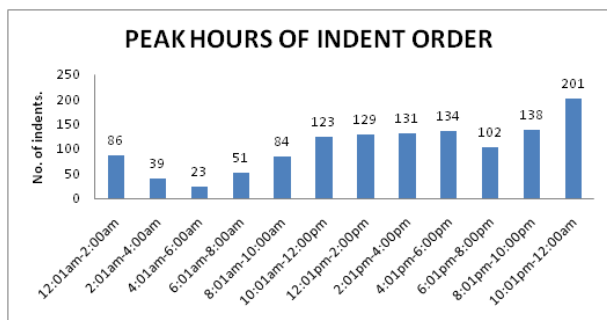
Peak hours of indent order -The following data was

Table No. 1: Average time taken at each steps during observation, Normal, new admission and emergency indent process in delivering drugs against patient / departmental indents

Step	Observation TAT	Normal Indent (n= 80)	New Admission Indents (n= 170)	Urgent/Emergency Indent (n= 50)
For packing	0:09 minute	0:09 minute	0:09 minute	0:04 minute
For taking packing slip in store	0:11 minute	0:11 minute	0:10 minute	0:09 minute
For Drug collection	0:16 minute	0:15 minute	0:17 minute	0:17 minute
For exit of drugs from Pharmacy	0:27 minute	0:29 minute	0:19 minute	0:47 minute
For Delivery of drug	0:03 minute	0:04 minute	0:03 minute	0:03 minute
Total time Taken	1:06 minutes	01:08 minutes	00:48 minutes	01:20 minutes
Time as per SOP's	-	2 Hours	30 Minutes	15 Minutes

collected from the system; it is secondary data, which was assessed to calculate peak hours of indent order. The data for two weeks was taken from the system and then average was calculated.

Figure No. 1. : Peak hours of indent, order was between 10:00pm to 12:00am.



The study shows that maximum number of indents was done from the Ward level, this shows that ward nurses need more training.

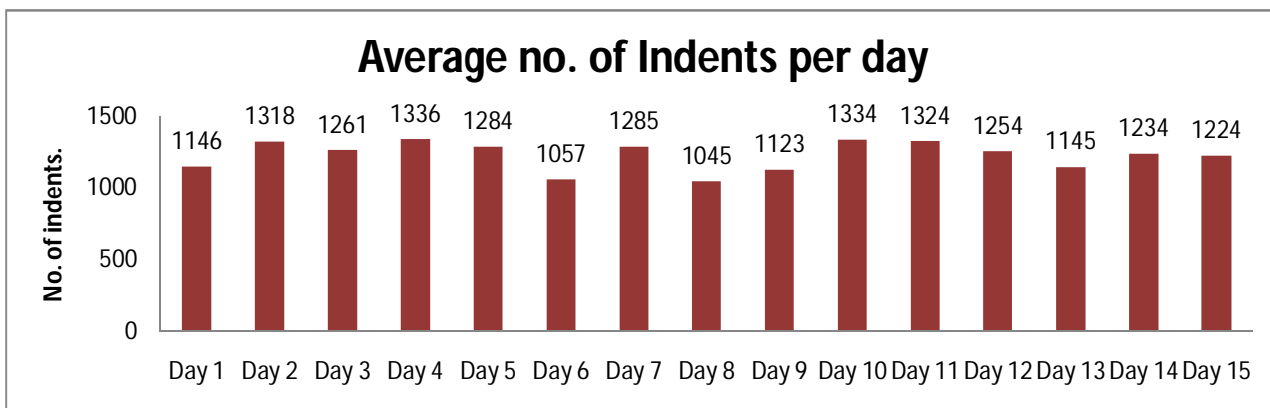
Average number of indents per day - The total number 18370 indents were placed in two weeks. The average number indent per day was found to be 1224 shown in figure number- 2.

relivers), assistants wait for the porter GDAs (General Duty Assistants) to come from the respective ward and take away the medicine and the GDAs do not arrive on time, If any medicine in the packing slip is stock out while others are present, all other remaining items are kept in the rack until that stock out medicine has been locally purchased.

These were the few reasons for delay:

1. Delay occurs in delivering of medicines due to stock variability. In other words, delay occurs due to availability of stock of any item shown by the software but actually, when the assistant searches for the medicine he finds that particular item is physically unavailable in the pharmacy. Expired medicines are not removed from the stock maintained in the system and as a result the system shows availability of such items but those are physically unavailable.
2. Delay also occurs when the software cannot pack the item and the pharmacist has to make the manual for the following indent.
3. Random indents from wards.
4. Lot of load on the department

Figure No. - 2: Average number of indents per day.



Few issues, which come out from the study, were that preference was not given to new admission indents and urgent indents also, that after collection of drugs, it is kept in the rack for long time, though it is ready to be dispatched. Major reasons for the above problem were: Lack of Manpower, assistants who are supposed to deliver medicines to the respective wards are busy in collecting the drugs for other indents, assistants are on leave (less number of

in nighttime as compared to daytime and lack of staff in nighttime.

5. In a span of 10 minutes indents of the patient are repeated for 4-5 times.
6. Sometimes the medicines, which have been dispatched from the pharmacy does not reach the respective wards. This mainly happens in case of expensive drugs and when drugs sent to the

respective ward through porter GDAs.

RECOMMENDATIONS

The drugs can be dispatched in the bags with the tag of respective patients so that at the nursing station, less time will be consumed in segregation. In case of new admission, urgent indents the software should show the status and should be highlighted. Items for new admission and urgent indents should be immediately dispatched after collection and not be kept in rack as per the department. For dispatching immediately, manpower should be checked and priority should be given for urgent and new admissions.

The nurse ordering drugs for patient should indent the complete order (bulk order) at once, instead of indenting numerous incomplete orders. For normal daily indent, timing can be fixed for indenting, except peak hours in evening or night.

The monitoring pharmacy delay, when nursing staff sign the order, it should be signed with the time and employee ID so that time of medicines reaching the wards can be calculated. and the person receiving the drug is known in case of any discrepancy. Regular training should be given for each staff (involve in indenting) and part of induction program for new employees.

CONCLUSIONS

Patient safety is ensured when every step of the process, from choosing the most appropriate medication, to writing the prescription, to dispensing the medication is optimized to prevent delays in therapy and medication errors. Ultimately, it is most important that effective communication takes place to ensure accurate prescriptions and optimal patient care. The results of this research study have organizational applications. On an organizational level, the results of this study can be used to build and strengthen internal administration and /or Nursing, physician support.

Also, from this study, we were able to obtain information about ordering practices and information could be quite useful for training requirement within the departments and organization. Although we did not find nearly the reduction in overall time, we did see a significant improvement. But more important, the results of this study will benefit in improving TAT and patient care.

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