

ORIGINAL ARTICLE

Role of discharge planning and other determinants in total discharge time at a large tertiary care hospital

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ABSTRACT

Introduction: Discharge time, a crucial quality indicator, is dependent on several other factors like clearance time and patient-related issues. The present study analyzes these determinants and presents measures to control the discharge time. **Materials and Methods:** This cross-sectional study was conducted during May-June 2013 at a large multispecialty hospital. During initial 15 days, that is, the pilot study, data was collected across various steps where time was consumed during discharge process and initiatives were taken to increase the number of planned discharges. For the main study, discharges were classified as planned/unplanned and patients as insured and uninsured. Results of pilot study and main study were compared. We computed one-sample *t*-test on overall discharge time, clearance time, and independent sample *t*-test on discharge time consumed for types of discharges. All results with $P < 0.05$ were considered statistically significant. **Results:** Out of 105 discharges, 75 were included wherein mean discharge time of 177.6 (± 613) min was significantly lower than the mean time of 285.42 (± 105.46) min taken for 35 discharges during pilot study ($P < 0.01$). Mean discharge time of 572 (± 1378.4) min for the 14 insured patients was significantly higher ($P < 0.0001$) than the 61 uninsured patients where discharge time was 88 (± 84.7) min. Mean discharge time for planned discharges ($n = 18$) was 85 (± 87.9) min that was significantly lower than unplanned discharges ($n = 57$) with a mean of 524 (± 1446.6) min ($P < 0.01$). The patient-related factors like, delay in bill payment, request for discounts further increased the discharge time. **Conclusion:** Planning the discharges reduced the total time of discharge process substantially. Discharge time was substantially high for insured patients that need to be controlled. Departmental clearance and patient-related factors also impact the discharge time.

Keywords: Clearance, department, determinants, discharge time, hospital

INTRODUCTION

Hospital discharge process is one of the very lengthy procedures. Discharge time taken by hospitals is one of the quality indicators. Hence, maintaining an acceptable level of discharge time provides competitive edge to the organization.^[1-3] Hospital discharge plan includes clearance from all departments, bill settlement, and inform patient

regarding appropriate post-hospital treatment as per standard documentation.^[4-6]

The patients and their families are eager to return home; whereas, hospital needs to complete all the processes to ensure successful discharge and minimize readmission. Every hospital strives to improve quality through various measures, one of which is reduction in discharge time. The total time consumed in the discharge process is a summation of clearance time consumed by every department along with other factors related to patients and the process. However, discharge time cannot be brought down without analyzing the underlying factors that consume time during discharge process. The present study aims to identify the different factors that determine the total discharge time and identify the measures that can contribute in reduction of the total discharge time.

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MATERIAL AND METHODS

Study design and setting

This was a cross-sectional study conducted from May to June 2013 at a multispecialty hospital after receiving permission as well as ethical approval from the hospital authorities.

Subjects

All hospital discharges between 8:00 am and 6:00 pm during the 2-month study tenure were included in the study. Discharges done on Sundays/emergency night discharges were excluded from the study.

Study procedure

In the initial first week, an observational study was conducted to identify the departments and other variables that consume time during discharge process.

For further study, the discharge process form [Appendix 1] and the time motion recording charts [Appendix 2] were developed by the authors in consultation with all the concerned departments. These were developed as a part of the standard operating procedure (SOP) development for the newly established hospital. The discharge process form was used to collect data on following variables: Patient name; registration number; mode of payment (out-of-pocket/insurance); date and time of admission and discharge; discharge intimation time given by nursing unit of inpatient ward (through bulk SMS) to finance and all concerned departments; and time of granting no-dues clearance by radiology, café, pharmacy, laboratory, and physiotherapy departments. The time-motion recording chart was used to collect data for: Type of discharge (planned/unplanned); completion of discharge reports by concerned doctors; and time lapse between sending discharge intimation to concerned departments and the actual clearance provision from their side. Total time taken in the discharge process was calculated on this basis. Though there are several factors that determine time taken for discharge process, we were keenly interested to study the difference between planned and unplanned discharges. As the hospital was newly set-up, this study was targeted to propose guidelines for hospital discharges.

The discharge process form and the time-motion recording charts were pilot-tested for use in further study. The data was collected through these forms for the study as well as for maintaining records by accounts department. The discharge process form was completed by the accounts executive responsible for

Appendix 1: Discharge process form

Discharge process form		
Patient name		
MRN		
Self/insurance		
Admission date and time		
Discharge date and time		
Departments	Name	Time
Nursing unit		
Radiology		
Laboratory		
Café		
OT		
Physiotherapy		
Pharmacy		
Finance		

Notes:- MRN: Medical record number, OT: Operation theatre

Appendix 2: Time motion recording chart

Sr. no.	1	2	3	4
Date				
MRN				
Self/insurance				
Room no.				
Pt. name				
OPD/IPD/ER				
Doctor				
Planned/unplanned				
Confirmation from Dr.				
Nursing unit				
Time taken				
Radiology				
Time taken				
Laboratory				
Time taken				
OT				
Time taken				
Café				
Time taken				
Pharmacy				
Time taken				
Physiotherapy				
Time taken				
Finance				
Time taken				
Total time on paper				
Total time on-system				
Difference				
Comments				

MRN: Medical record number, OT: Operation theatre, OPD: Out-patient department, IPD: In-patient department, ER: Emergency room

completing the discharge-related formalities. As per the analysis, modifications in the discharge process were recommended ('hospital discharge planning checklist' and 'clearance charts').

Based on the results of this study, certain initiatives were taken to control the discharge time. It was communicated to all staff and doctors that discharges must be planned 1 day in advance unless there is a strong justification. This will provide time for completion of discharge summary at

night and preparation of bill estimate and return of issued drugs in advance. Clearance charts (to be completed for each discharge) were developed for all departments to keep a track of timings related to a) intimation for discharge from nursing department to concerned departments and b) the time taken for clearance by respective departments to the finance department. Staff had to update the clearance chart with information related to patient's registration number, consulting doctor, intimation time (tentative time of discharge intimated from ward to concerned departments for clearance of no-dues), time of clearance from the concerned departments (from where clearance of no-dues is to be received), total time taken (for providing no-dues by concerned departments), and remarks (if any). The name of the person who notified the department as well as the staff who received the information had to be mentioned in the chart with date and time. This helped in tracking and controlling the delays due to increased accountability of staff.

In addition to this, a Hospital Discharge Planning Checklist [Appendix 3] was proposed to collect

information related to pre-admission process, pre-discharge factors, discharge plan, and summary. After each step is completed, the responsible staff will tick the relevant point with date and time. This will further check the steps completed in time and the ones that were delayed.

Data analysis

The data was computerized and statistical analysis was done using Statistical Package for Social Sciences version 11.5 for Windows (SPSS Inc., Chicago, IL, USA). Analysis was done at 95% confidence level and results with $P < 0.05$ were considered significant. Baseline analysis was done through calculation of mean, standard deviation, and percentages. One sample *t*-test was performed to test the statistical significance of overall discharge time and overall clearance time. For analysis across categories like planned and unplanned discharges, insured and uninsured patients; mean discharge time was tested through independent samples *t*-test.

RESULTS

During the initial 1 week, observational study was done on 35 discharges and it was observed that the discharge process involved four steps: (i) Doctor intimates/prepares the discharge summary, (ii) nursing unit intimates all departments (through bulk SMS) for clearance, (iii) clearance obtained, and (iv) draft bill prepared. In case of uninsured patients, draft bill is provided to them, whereas for insured patients back office coordinates with insurance company for settlement of final bill. The discharge process consumed more than 2 h for all the patients and major points where time could be controlled was during clearance and during final bill settlement after receipt of clearance as after clearance was provided some more time was spent in final bill settlement. The 'discharge process form' and the 'time motion recording charts' were pilot-tested during the first 15 days on 35 hospital discharges out of which 23 were planned and 12 were unplanned. The overall discharge time was 285.42 (± 105.46) min and overall clearance time was 162 min in pilot study. The overall clearance time for departments was: Laboratory 15.37 (± 7.79) min, radiology 15.68 (± 8.24) min, pharmacy 34.8 (± 19.69) min, cafeteria 28.05 (± 10.89) min, and finance 71.97 (± 26.45) min.

After pilot study, staff and consultants were requested to plan the discharges in as many cases as possible. The staff was asked to prepare the discharge summary at night and plan for pharmacy issue return the night

Appendix 3: Hospital discharge planning checklist	
Patient ID _____	Admitting Dx _____
Admission date _____	Planned Rx _____
Pre-admission process	
1	Living arrangements
2	Physical (ADL) function
3	Mental function
4	Social supports
5	Services received
6	Special circumstances
Pre-discharge factor	
1	Understanding of medical condition by patient
2	Understanding of medical condition by family/SO
3	Physical (ADL) function
4	Mental function
5	Financial resources
6	Social supports available after discharge
7	Special circumstances
Discharge plan	
1	Services needed after discharge
2	Type of placement preferred by patient
3	Type of placement preferred by family/SO
4	Type of placement recommended by hospital
5	Type of placement agreed to by patient/family
6	Specific agency/home recommended by hospital
7	Specific agency/home agreed to by patient/family
8	Pre-discharge counseling recommended
9	Special circumstances
Summary	
1	Nature and outcome of patient and family involvement in discharge planning process
2	Anticipated problems in implementing post discharge plans
3	Further hospital action contemplated

SO: Significant others, ADL: Activities of daily living

before discharge was planned. The forms used in pilot study were used for further study as well. Out of 105 discharged patients, 75 were included as remaining 30 patients fell in exclusion criteria of the study. The planned discharges increased from 20% in pilot study phase to 44% during main study. One-sample *t*-test showed that the overall mean discharge time ($n = 75$) of 177.6 (± 613) min was statistically lower than the overall mean discharge time observed during the pilot study (values given above) in the study sample with a $P < 0.01$. With an increase in planned discharges, clearance time reduced substantially from 162 min in pilot study to 67 min in main study as shown by one-sample *t*-test ($P < 0.01$). The overall mean clearance time for different departments also reduced substantially as compared to the pilot study data given above: Laboratory 7 (± 6.6) min, radiology 6.5 (± 9.2) min, pharmacy 11.7 (± 11.39) min, cafeteria 11.74 (± 9.7) min, and finance 29.5 (± 18.5) min.

The mean discharge time for insured patients ($n = 14$) was 572 (± 1378.4) min that was significantly higher ($P < 0.0001$) as compared to the uninsured patients ($n = 61$) where the mean was 88 (± 84.7) min. In case of unplanned discharges ($n = 57$) the discharge time of 524 ($\pm 1,446.6$) min was also significantly higher than planned discharges ($n = 18$) where mean discharge time was 85 (± 87.9) min ($P < 0.01$).

The overall discharge time is much higher than the clearance time because additional time is spent both before and after the clearance. Before clearance, time is consumed in preparation of discharge summary and sending intimation to departments; whereas after clearance is obtained, time is consumed in final bill settlement by patient, their request for discounts, and so on. In maternity cases, bill of mother and baby has to be settled and paid together so if one bill takes time the other is also delayed. This is more so in case of unplanned discharge. Thus, total discharge time is much higher than clearance time.

DISCUSSION

The study aimed to identify the key factors that affect the hospital discharge time. We found that clearance time by different departments, planned/unplanned discharge, patients being insured or uninsured as well as final bill settlement were all the different variables which affect the delay in discharge process for inpatients. As the hospital was newly established, many processes were being designed and developed. After

the pilot study, emphasis on planning the discharges was increased so that activities like discharge summary preparation and return of medicines to pharmacy can be completed well in time.

The effect of these steps is evident through increase in planned discharges and reduction of mean discharge time from around 285 min (4.75 h) during pilot study to 177.6 min (2.96 h) in the main study. This is similar to one of the Indian study that reported discharge time of 133 min (2.22 h);^[7] whereas, another study reported discharge time as high as 276 min (4.6 h) for a general patient.^[8] The discharge time for insured patients in our study was around 570 min (9.5 h), which is much higher than a previous study reporting 336 min (5.6 h) for insured patients.^[8] These delays occur due to the slow bill approval, involvement of third party, and lack of planning the discharges. This somewhere indicates the paperwork and official formalities are higher for insured patients. The finance department with the help of back office keeps track of patients who are being provided draft bill for final bill settlement. This time can also be reduced with planned discharges as the process of bill estimate preparation and approval can be done in time.

In our study, the unplanned discharges consumed 522 min (8.7 hours) whereas for planned discharges total time was only 84.6 min (1.41 hours). This is supported by a study which documents that much of the work is put on hold until the actual day of discharge.^[9] Hence, planning the discharges reduces the discharge time substantially which has a direct association with customer satisfaction as well as optimum patient turnover.^[10] We found that with an increase in planned discharges, clearance time reduced substantially from about 162 min (2.7 h) in pilot study to 67 min in main study. According to a previous study, clearance from all departments consumed around 78 min;^[8] whereas, in our study clearance was completed in 67 min. Planning the discharges plays an important role in reducing the burden of pharmacy issue return and provides for timely bill settlement for self-paid and insurance patients.^[11-13] Based on the findings of our study 'clearance charts' for each department and 'discharge planning checklist' were developed for future use by the hospital. These have been recommended by a previous study also.^[10]

The strength of our study is that we studied the discharge time across its various determinants like clearance time, patient type, and type of discharge.

The hospital planning checklist and clearance charts may be validated in other hospital settings and utilized for tracking and controlling the discharge time. The patients were not involved in this study as only hospital process was studied. So, future studies with patient involvement are recommended. As the study was a part of the summer training project (SM), there were constraints of time resulting in a smaller sample size. The hospital was newly established so the processes were under development. These points should be considered while generalizing the results of this study.

CONCLUSION

The study indicates that with higher number of planned discharges, total discharge time can be reduced. This also helps in reducing the clearance time by different departments. Hence, an effort should be made to plan as many discharges as possible to enhance the discharge flow process. Checking each inpatient bill at night and encouraging duty doctors to promote discharge summary indentation for insurance patients before morning shift will also contribute to improvements. The clearance charts and hospital planning checklist must be regularly monitored to keep a track of all delays and control these immediately.

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