

REDUCTION OF INPATIENT DISCHARGE TURNAROUND TIME (TAT)

Dissertation Submitted to



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in

Hospital and Health Management

by

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Under the Supervision and Guidance of

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2022

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **REDUCTION OF INPATIENT DISCHARGE TURNAROUND TIME (TAT)** is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Dr. Sivasankari C

05. 07. 2022

CERTIFICATE

This is to certify that **DR. SIVASANKARI C** in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur has successfully completed her internship at **APOLLO HOSPITALS, BANNERGHATTA ROAD, BANGALORE** during March 22, 2022 to June 19, 2022.

Bangalore
22.06.2022



LAVANYA AROLLA
Head of Operations

CERTIFICATE

This is to certify that the dissertation titled **REDUCTION OF INPATIENT DISCHARGE TURNAROUND TIME (TAT)** is a record of the research work undertaken by **DR. SIVASANKARI C** in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

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ABSTRACT

Discharging a patient that is admitted to a hospital (Inpatient) is a complex, multidisciplinary process, including cooperation among physicians, nurses, chiefs, floor managers, ward secretaries, and other professionals within the organization. Effective and positive collaboration and coordination among staff can streamline the patient discharge cycle and patient results. Patient discharge is impacted by hierarchical elements, individual elements and teamwork elements.

The reason why the discharge process in a hospital is important is that this is the last point of contact between the patient before they leave the place. If the patient is not satisfied with the time efficiency, it leaves behind a lingering distaste for the entire organization. Since the demand for hospital beds is increasing, healthcare institutions focus on reducing the Length of Stay (LOS) of each patient to cater to the demand and to improve patient satisfaction in general. With an aim to observe the process of discharge in Apollo Hospitals, BG Road, Bangalore, to identify gaps in the process and to suggest effective solutions to mitigate these gaps, the study is carried out.

The average turnaround time from January to May was 4 hours 34 minutes, compared to the standard 2 hours for a cash discharge. Similar to this, the normal TAT for an insurance discharge is set at 4 hours 30 minutes, however the average accomplished TAT is 7 hours 2 minutes. Apart from the time needed to complete the discharge summary, other process TATs are also significantly longer than desired. For enhanced service quality, appropriate measures should be put in place to minimize the deficiencies of the hospital's current discharge procedure. In addition to increasing inpatient satisfaction at the time of discharge, reducing inpatient discharge turnaround time has also been shown to shorten the wait for patients who are to be admitted to the hospital.

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ABBREVIATIONS

NABH	National Accreditation Board for Hospitals
QCI	Quality Council of India
TAT	Turnaround Time
LOS	Length of Stay
DMAIC	Define Measure Analyse Implement Control
ICU	Intensive Care Unit
OT	Operation Theatre
CSP	Care Suite Persona
MM	MedMantra
CCU	Critical Care Unit
FIFO	First In First Out
IT	Information Technology

REDUCTION OF INPATIENT DISCHARGE TURNAROUND TIME (TAT)

1. Introduction

NABH defines discharge as “the process of activities that involves the patient and the team of individuals from various disciplines working together to facilitate the transfer of the patient from one environment to another”¹

Discharging a patient admitted to a hospital (Inpatient) is a complex, multidisciplinary process, including cooperation among physicians, nurses, chiefs and heads of the departments, floor managers, ward secretaries, and other professionals within the organization- adapting an interprofessional team approach. Effective and positive collaboration and coordination among staff can streamline the patient discharge cycle and patient results. Patient discharge is impacted by hierarchical elements, individual elements, and teamwork elements.

Each discharge is unique, owing to the nature of the condition of each patient. Needless to say, the ultimate goal of an efficient, well-put discharge planning process is to improve the quality of life of the patient in the care continuum and also reduce the rate of unplanned readmissions owing to complications.

The discharge process in a hospital is important because this is the last point of contact between the patient before they leave the place. If the patient is not satisfied with the time efficiency, it leaves behind a lingering distaste for the entire organization. A properly planned discharge is an added advantage to ensure patient loyalty to the same healthcare facility, in case of readmission.

National Accreditation Board for Hospitals (NABH) by Quality Council of India (QCI), recognized by the Ministry of Health and Family Welfare, Government of India has standard timings set for different parts of the discharge process for efficient hospital processes. Setting a NABH-approved discharge TAT for hospitals also generates a sense of competition in terms of service excellence among corporate hospitals. This also motivates them to adopt a more methodical approach to well-planned processes.

India is estimated to have nearly 7,14,000 beds in the public sector and 11,85,240 beds in the private sector. ² Despite this, the demand for hospital beds has been steadily increasing. With mammoth advancements in science and medicine, we have successfully increased the life expectancy of people. This also means that there are people living with

chronic conditions and in need of urgent hospitalizations, leaving the healthcare institutions to focus on reducing the Length of Stay (LOS) of each patient to cater to the demand and to improve patient satisfaction in general.

1.1 Aim

To understand the discharge process of Apollo Hospitals, BG Road, Bangalore and to identify the factors that contribute to the delay in discharge of patients from the Inpatient Department.

1.2 Objectives

- To manually track the discharge process of cash and insurance patients.
- To identify the time-consuming parts of the process which contribute to the increase in overall Discharge Turn Around Time (TAT)
- To suggest measures to reduce the Inpatient Discharge Turn Around Time

1.3 Rationale

Discharge of patients, being the final step to achieving stellar patient satisfaction rates demands a special emphasis when it comes to hospital processes. This study is mandatory to understand the corporate process in place so that suggestions can be made with relevance to current industry standards and to develop ideas at par with the competitors.

2. Review of literature

S.No	Author	Year	Study location	Objectives	Conclusion
1	Daniela C Gonçalves-Bradley, Natasha A Lannin, Lindy Clemson, Ian D Cameron, Sasha Shepperd	2022	Data from CENTRA L, MEDLIN E, Embase and two other registers	To assess if the discharge planning process for individual patients is effective	Designing a unique discharge plan for each patient reduces the Length of Stay to an extent but there is uncertainty with respect to the health status of the patient and the healthcare expenditure.

2	Matthew H. Shapiro, Denise M. Goodman, Victoria A. Rodriguez	2022	US pediatric hospitals	To discuss the incorporation of a framework to use NAM quality norms into current discharge processes of hospitals	Incorporating a framework for NAM quality norms is equitable, patient-centered timely, safe and both effective and efficient.
3	Rodrigo E. Peimbert-García, Luis Meave Gutiérrez-Mendoza, Heriberto García-Reyes	2021	Mexican public academic medical centre	To reduce the time taken for discharge from the Internal medicine department by incorporating lean management techniques to eliminate wastes.	Reduction in time taken for discharge from 6 hours to 3 hours. They were able to eliminate non-value-added activities by 57% and were able to eliminate errors in the process by 70%. Further scope of the study to observe the long-term impact of applying the lean management- quick changeover method.
4	Joseph A. Moo-Young, Francisco A. Sylvester, Ria D. Dancel, Sheryl Galin, Heidi Troxler, and Kathleen K. Bradford	2019	Inpatient gastroenterology department of an academic hospital	To increase the percentage of patients getting discharged before 1 pm from Inpatient pediatric gastroenterology department by 20%	Significant improvement in LOS index was observed. This also offered further scope for interventions related to quality improvement.

5	Francesca M. Nicosia, Linda G. Park, Caroline P. Gray, Maayan J. Yakir, Dorothy Y. Hung	2018	241 bedded community hospital in Northern California, United States	To understand the perspectives and suggestions of nurses on the implementation of lean process improvement to reduce the discharge time.	The importance of the voice of nurses in process improvement for discharge is recognized and is used for lean redesigns to reduce the discharge timing.
6	Angela M. Stalin, Amanda C Schondelmeyer, Joanna E. Thomson, Laura H. Brower, Blair Davis, Jacob Redel, Julie Hausfeld, Karen Tucker, Denise L. White, Christine M. White	2016	Cincinnati Children's Hospital Medical Centre, Cincinnati, Ohio	To improve discharge efficiency in medically complex pediatric patients	Due to nature of complexity and the age group of patients, there is a necessity for a multidisciplinary support team. This requires defining medical goals and discharge needs early with designated roles for team members, ensuring all the discharge tasks are completed by the time the patients are medically ready for discharge.

7	Ghada R. El-Eid, Roland Kaddoum, Hani Tamim, Eveline A. Hitti	2015	American University of Beirut Medical Centre, Beirut, Lebanon	To assess the effectiveness of six sigma methods to improve patient discharge process	Six sigma methods combined with other internal organizational factors like leadership, commitment and support, front-line engagement and repeated interventions to improve the process all the while monitoring the process can bring about immense improvement in discharge process and successfully reduce the discharge turnaround time for inpatients
8	Theodore T. Allen, Shih-Hsien Tseng, Kerry Swanson, Mary Ann McClay	2010	204 bedded tertiary care hospital, Alliance, Ohio	To define, measure, analyze, improve and control (DMAIC) patient discharge at a community hospital.	With the data-driven Six sigma approach, a Reduction in Discharge TAT from 3.3 to 2.8 hrs was achieved. Satisfaction of nurses with reduction of clarification phone calls. Development of a tool for discharge planning and medication reconciliation on discharge.

9	Hannah Wong, Robert C. Wu, George Tomlinson, Michael Caesar, Howard Abrams, Michael W. Carter, Dante Morra	2009	UHN Toronto General Hospital, Downtown Toronto, Canada	To determine the effect of the day of the week, public holidays, team admissions, attending physicians and their length of coverage on daily team discharge rates	Day of week and holidays along with team organization and scheduling have a significant effect on the daily discharge rates. Having a greater holiday and weekend capacity and reorganizing the internal processes for these days play a major role in optimizing these daily rates.
10	Christopher G. Maloney, Douglas Wolfe, Per H. Gesteland, Joe W. Hales, Flory L. Nkoy	2007	Primary Children's Medical Center (PCMC), Salt Lake City, Utah	To establish a strategy for an efficient discharge process warranting efficient usage of beds in an academic hospital	Developed and tested a 'Patient tracker' software- an interdisciplinary communication tool to efficiently coordinate inpatient flow.

3. Methodology

This study tries to understand the Discharge process of Apollo Hospitals, BG Road, Bangalore. Furthermore, there is also an emphasis on identifying the areas that contribute to the delay in the discharge of patients from the Inpatient Department of the hospital. The entire discharge process is initially observed with the GEMBA walk to identify areas that might cause wastage of resources or time alongside daily data collection.

With a descriptive observational study design, the inpatients of the hospital from the month of January 2022 to May 2022 are chosen as the study population. The study population is inclusive of General ward beds, Twin sharing rooms, Private rooms,

Platinum Suites, Executive Suites, ICU beds and Day-care beds. Transit ward beds and Emergency ward beds are excluded from the study owing to the stark difference in discharge processes that cannot be classified under a category. For the study, secondary data is collected daily from Apollo's MedMantra and then transferred to MS Excel for ease of calculation.

With the exclusion criteria, a total of 7084 samples are taken into the study which included 2143 cash patients and 4941 insurance patients. It is determined that a sample size of 365 or more is required to have a confidence interval of 95% leaving a $\pm 5\%$ margin of error. The study samples are classified into two strata- Cash and Insurance. Since randomization is the key to achieving unbiased and accurate measurements, it is determined that 500 samples be selected from each of the above-mentioned strata. Hence, the sampling technique used here is stratified random sampling. A random number is allotted to each entry of the study population on excel which is then sorted in ascending order. The first 500 samples are thus randomly selected for the study.

For each patient, there are six timings that are captured by the MedMantra that are used for the study. These are:

- The time at which the discharge is initiated by the ward secretaries
- The time at which the discharge is intimated to the patient
- The time at which the discharge summary is finalized by the patient's doctor
- The time at which the final interim bill is generated
- The time at which the final bill is settled by the cash patient or the time at which the final bill is cleared by the insurance company if the patient's mode of payment is credit
- The time at which the patient is checked out by the nurse.

From these captured timings, the discharge turnaround time is calculated. Discharge TAT is defined as the overall time taken for the checkout from the time of discharge intimation to the patient.

Discharge TAT over 24 hours are deemed to be outliers which occur as a result of complications due to which the discharge is interrupted and the patient is asked to stay back, even after the discharge has been intimated. These values do not offer clarity in terms of general factors causing a delay in discharge. Hence, these are refrained from being part of the sample. There are 98 outliers for cash discharges and 305 outliers for credit discharges from January to May.

In addition to the overall discharge TAT, five other TATs are calculated to identify the exact area where the delay happens. This is to also check if each part of the discharge process adheres to the expected corporate timing.

- TAT-1 is the time taken for the discharge to be initiated from the time discharge is intimated to the patient.
- TAT-2 is the time taken for the discharge summary to be finalized by the patient's doctor from the time discharge is intimated to the patient.
- TAT-3 is the time taken for the generation of a final interim bill by the billing department from the time discharge is intimated.
- TAT-4 is the time taken for the settlement of the bill by the patient if the patient pays by cash or the time taken for the insurance company to clear the final bill of the patient from the time the final interim bill is generated by the Billing department.
- TAT-5 gives the time taken for the patient to finally checkout (which is then logged in by the nurse) from the time the final bill is settled by the patient or cleared by the insurance company.

4. Results

Table-1: Target TAT for cash patients and achieved TAT from the study

Process	Target	Samples: Jan 2022- May 2022			
		Achieved numbers	% Achieved	Achieved average TAT in mts	Remarks
Total cash discharges		500			
Discharge TAT	120 min 90%	110	22%	274 min	Above Target
TAT-1	20 min	153	31%	114 min	Above Target
TAT-2	60 min	395	79%	55 min	Within Target
TAT-3	20 min	125	25%	71 min	Above Target
TAT-4	20 min	214	43%	69 min	Above Target
TAT-5	20 min	221	44%	77 min	Above Target
% of planned discharges (Previous day)	90%	76	15%		Above Target

Table-2: Target TAT for insurance patients and achieved TAT from the study

Process	Target	Samples: Jan 2022- May 2022			
		Achieved numbers	% Achieved	Achieved average TAT in mts	Remarks
Total Insurance discharges		500			
Discharge TAT	270 min 70%	129	26%	422 min	Above Target
TAT-1	20 min	92	18%	60 min	Above Target
TAT-2	60 min	353	71%	48 min	Within Target
TAT-3	20 min	63	13%	91 min	Above Target
TAT-4	170 min	267	53%	196 min	Above Target
TAT-5	20 min	225	45%	73 min	Above Target
% of planned discharges (Previous day)	90%	54	11%		Above Target

Table-1 and Table-2 furnish the detailed results of the study along with the targets set by the corporate. It can be observed that for both cash and insurance patients, the time taken for the discharge summary to be finalized by the doctor from the time of intimation is the only parameter that is within the target.

On analyzing the 500 study samples of cash patients, the achieved overall discharge TAT is 4 hours 34 minutes or 274 minutes (Fig-1) whereas the target set by the corporate for cash patients is 2 hours or 120 minutes. The achieved TAT is higher than the target TAT by 154 minutes which is identified as a major gap.

Similarly, analyzing the 500 study samples of insurance patients, the achieved overall discharge TAT is calculated to be 7 hours 2 minutes or 422 minutes (Fig-1) whereas the corporate has set 4 hours 30 minutes or 270 minutes as the target. In this case, the achieved TAT is higher than the target TAT by 152 minutes which is nearly similar to the difference observed in cash patients.

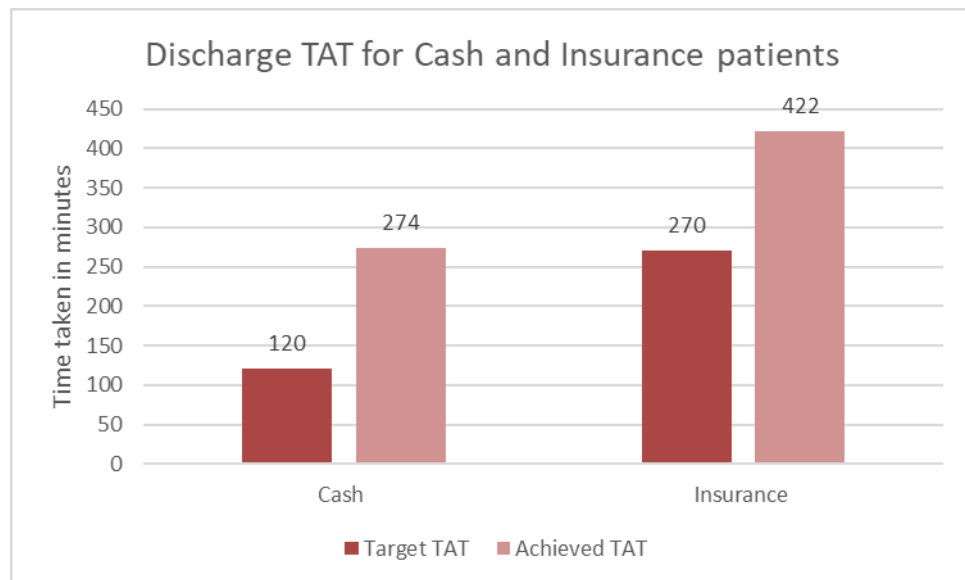


Figure-1: Target and achieved Discharge TAT for cash and insurance patients

Process TATs were calculated for the 500 study samples of cash patients (Fig-2). This revealed,

- TAT-1 is 114 minutes which is higher than the 20 minutes target.
- TAT-2 is 55 minutes which is well within the target time of 60 minutes.
- TAT-3 is 71 minutes which is higher than the target time of 20 minutes.
- TAT-4 is 69 minutes which is higher than the target time of 20 minutes.
- TAT-5 is 77 minutes which is again higher than the target time of 20 minutes.

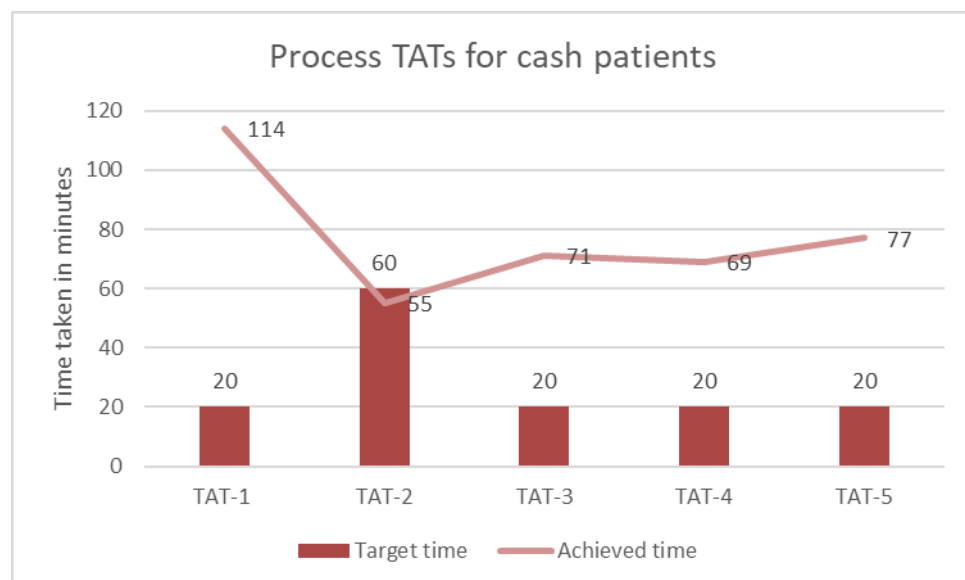


Figure-2: Target and achieved Process TATs for cash patients

Similarly, process TATs were calculated for the 500 study samples of insurance patients (Fig-3).

This revealed,

- TAT-1 is 60 minutes which is higher than the 20 minutes target.
- TAT-2 is 48 minutes which is well within the target time of 60 minutes.
- TAT-3 is 91 minutes which is higher than the target time of 20 minutes.
- TAT-4 is 196 minutes which is higher than the target time of 170 minutes or 2 hrs 50 minutes.
- TAT-5 is 73 minutes which is again higher than the target time of 20 minutes.

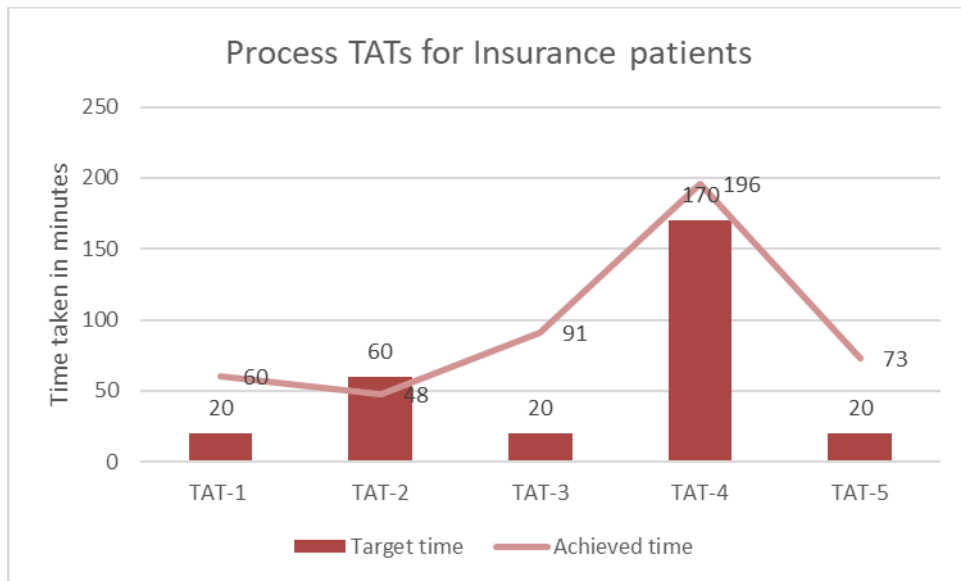


Figure-3: Target and achieved process TATs for Insurance patients

The analysis also gives clarity in terms of the percentage of planned discharges (Fig-4). It is observed that out of 500 cash discharge samples, only 76 discharges are planned in advance, a day prior. The remaining 424 discharges are unplanned and are confirmed only on the day of the discharge. This shows that only 15% of the discharges are planned. Similarly, out of the 500 insurance discharge samples, only 54 discharges are planned one day prior to the date of discharge. The remaining 446 discharges are unplanned which leaves the percentage of planned insurance discharges to be 11%.

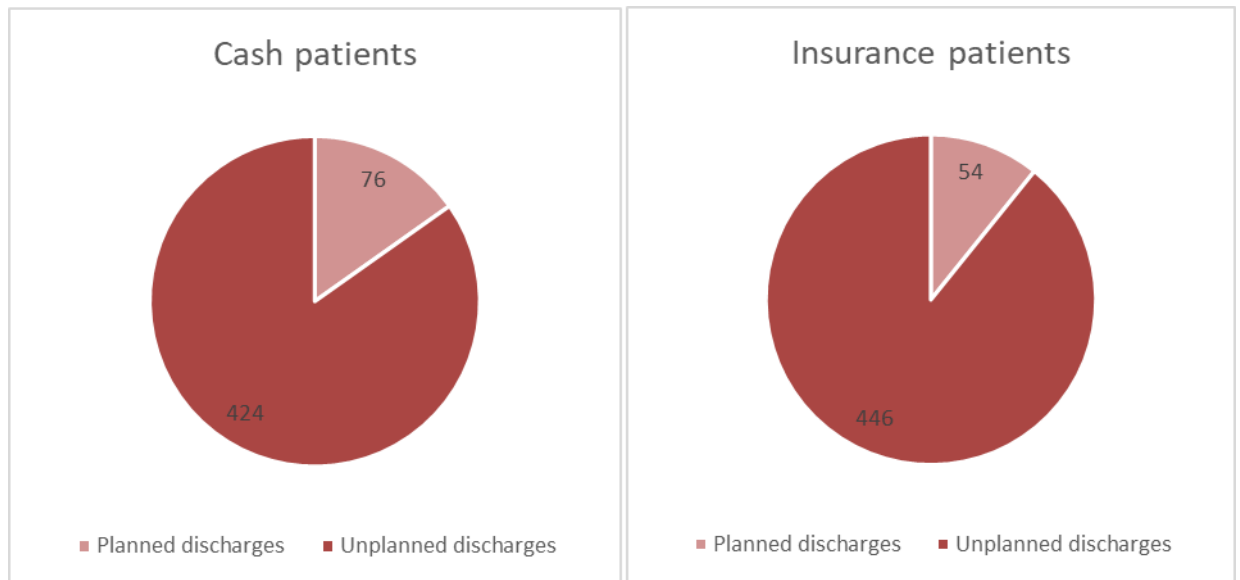


Figure-4: Planned discharges and unplanned discharges for cash and insurance patients

5. Discussion

The discharge process in Apollo hospitals follows a set standard (Fig-5). This process suggests that the discharges be planned a day prior so that the involved team can start the documentation required to give a head start which is expected to reduce the overall TAT.

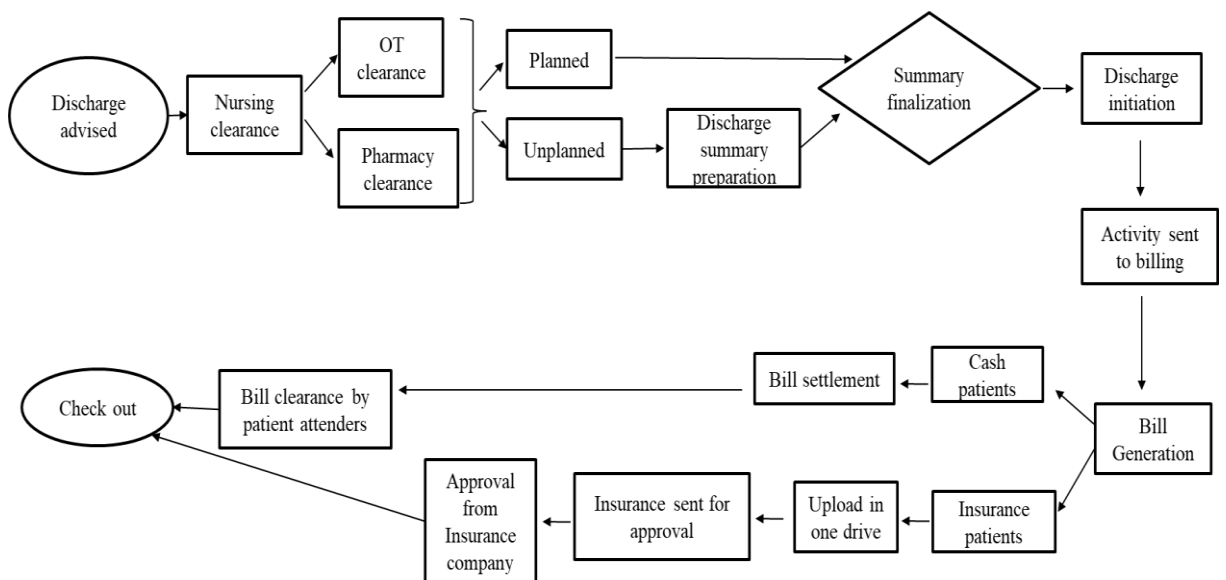


Figure-5: Discharge process of Apollo Hospitals, BG road, Bangalore

The process is such that a list of planned discharges is sent to the respective stakeholders before 5 pm, the previous day. Once this is done, the ward secretaries prepare the discharge summary one day prior and keep it ready for when the doctor comes for ward

rounds the next day. This essentially reduces the time taken for summary finalization from the time discharge is intimated to the patient the next day.

In case of unplanned discharges, the doctors confirm the date and time of discharge during morning ward rounds which is also mentioned in the notes section of the patient file. This time is considered to be the discharge intimation/discharge advice time.

Following this, the nursing team and the ward secretaries close the activities with OT, Cath lab along with OT stores and Cath stores, obtaining consumption declaration and then check with the pharmacy for returns if any. They also check if there are any pending laboratory or radiological investigations and clear them.

This is followed by getting the discharge summary ready. In the case of planned discharges, the discharge summary is already ready whereas in the case of unplanned discharges, a part of the discharge notes is typed by the ward secretaries and the summary is typed by the consultants or ward doctors. This is then signed by the doctor of the team which is captured as Discharge summary finalization time.

The discharge process is then initiated by the ward secretaries which is intimated to the billing department. The interim final bill is generated by the billing team after verifying the billing card and actual procedure details. They check for implants and consumables and check with the consultants for professional charges/surgical fees. Here, they also add consultation charges based on the number of visits to the doctor.

Once the bill is generated, the billing staff informs the patient attender through the ward secretaries. The patient is provided with the updated bill and is requested to settle the bill. If the patient is paying by cash, they reach the cash counter, settle the bill amount, and then submit the bill to the ward secretaries following which they are allowed to checkout. If the patient is covered under insurance, the summary and the bill is sent to the TPA companies for approval. Following approval, the patient is allowed to checkout.

The following table gives an insight into the type of activities and the team of people who are responsible for each step of the process:

Table-3: Discharge process and the primary team involved

S.No	Process	Activity type	Team involved
1	Discharge Planning	Sequential	Doctors
2	Discharge advice	Sequential	Consultants/ Ward Doctors
3	Discharge initiation	Parallel (Like closure of consumption from various departments)	Nursing / Ward Secretaries /OT/OT stores/Pharmacy/ Cath lab/ Cath stores/ labs/ radiology
4	Summary Finalization	Parallel (Like summary finalization and discharge initiation being two parallel activities)	Primary Doctors / Referral Doctor / Ward Doctor / Typist / Ward Secretaries
5	Interim Final Bill generation	Sequential	Billing Team with inputs from doctors/ CSP
6	Bill settlement	Sequential	Billing team, patient attendants/ ward secretaries
7	Checkout	Sequential	Nursing/ Security
8	Insurance approval for Insurance patients	Sequential	Billing team/ Insurance/ Attendant

On observation, a multitude of causes was found to be responsible for the delay in discharge TAT for both cash and insurance patients which is entailed in Table-4.

Table-4: Issues causing a delay in Discharge TAT

Area	Personnel involved	Issues
Ward	Ward secretary	• Failure to follow up on the bill clearance by patient • Delay in discharge initiation after finalization of summary due to lack of staff
	Consultants	• No specific time for rounds • Advice discharge and review/tests at the same time – patient only follows up on the discharge • Requesting changes in the summary after summary finalization or discharge initiation which increases the TAT.
	Nurses	• Delay in pharmacy returns due to a shortage in manpower • Failure to update the advised discharge to the ward secretary • Nursing clearance is done only after it is prompted by the ward secretary
	OT, Cath lab nurse	• Delay in providing the clearance of procedure being performed (MM indent pending)
	Pharmacy	• Delay in pharmacy clearance even after informing through a personal call, in addition to MM prompt • IP pharmacy takes the return of medicines which is supposed to be returned to CCU pharmacy
	Miscellaneous	• Lack of communication to the patient regarding bill generation • Patient attendees are not aware of 30 min check out time post the bill clearance • IT issues • Delay in moving the activity (patient file) to the billing due to ward boy not being present on the floors at times
Billing	Staff	• Delay in interim bill generation • Low manpower • Lack of training • Lack of FIFO adoption
	Miscellaneous	• IT issues

Insurance	Insurance staff	• No medical expert present in the department • Delay in replying to queries • Approval of insurance is not frequently checked • Tasks are not allotted individually
	Doctors	• Delay in replying to the medical queries (requires a letter by the doctors)
Miscellaneous	Patients	• Waiting for the transport facilities or the attenders after clearing the bill • Delay in checking out because of lack of awareness, lack of preparedness • Delay in arranging cash

(Agrawal & Pandey, 2018) recommends that everyone who is involved in the discharge process should be aware of the targets which would motivate them to enable the completion of each part of the process in time. It is also suggested that there is a strict environment¹ for following the set standards.

This could be achieved by allocating a person with the sole responsibility of coordinating and live-tracking the discharges from the time they are advised. This person should also be able to communicate with the different departments in case a delay is identified during the live-tracking process. In addition to this, each executive can be assigned an additional task to supervise and manage each part of the discharge process, and report to the coordinator for discharges.

(Garg & Pathan, 2018) suggests that any update with the patient such as treatment or procedure prescribed should be logged in by the doctors daily. This could also help with reducing the time taken to type the discharge notes in the end especially if it is a planned discharge.

As we also know that planned discharges considerably reduce the TAT, we are encouraged to adopt a different approach. The suggestion is to track the patients from the time of admission keeping the tentative date of discharge in check. This arises from the perception that the length of stay of a patient can be tentatively calculated depending on the procedure/ treatment that the patient is admitted for, the morbidity of the patient and finally their cooperation with their doctors. When an alert is set on the system for an intimation prior to the tentative date of discharge it becomes easier for the ward

secretaries/ nurses to get in touch with the doctors to start preparing for the process. This also helps in increasing the number of planned discharges.

In case of surgeries scheduled and completed for the patients, the nurse in charge should also be assigned the duty to perform OT or Cath store returns and obtain the clearance instead of waiting till the time discharge is advised. This will reduce the time taken to initiate the discharge process.

To avoid patient confusion and to prepare them better for arranging cash, the outstanding bill amount can be updated to them by the end of each day. This offers them a general idea regarding the total bill amount to be settled by them by the end of their stay in the hospital.

The billing department must also be encouraged to adopt the FIFO (First In First Out) method to be just to the patients. In order to answer the medical queries put forth to the Insurance/ Billing department, a person with medical knowledge or prior experience with the same could be diverted for a particular duration of time in the day when the discharges happen the most.

This study is limited in the fact that it is observational in nature and the interventions by the corporate to reduce the discharge TAT could have contributed to the improvements observed from Jan to May. A robust discharge program was in place prior to the start of this project and no formal efforts to intervene with the program happened during the duration of the study. However, the suggestions given above could further optimize the process, further decreasing the overall Discharge TAT and help in achieving the set targets.

The study serves as a baseline for any further interventions with the discharge process by the corporate or by an educational team to undertake projects to improve process efficiency.

6. Conclusion

The standard time taken for a cash discharge is set at 2 hours whereas, the achieved turnaround time from January to May on an average is 4 hours 34 minutes. Similarly, for an insurance discharge, the standard TAT is set at 4 hours 30 minutes whereas, the achieved TAT on an average is 7 hours 2 minutes. Apart from the time taken to finalize the discharge summary, other process TATs are also way above the target. There should be proper measures in place to mitigate the shortcomings of the current discharge process

in the hospital for better service excellence. Reduction of Inpatient Discharge Turnaround Time has not only proved to improve inpatient satisfaction during their time of departure but also pave way to reduce the waiting time of patients who are to be admitted in the hospital.

References

- 1- Agrawal A, Pandey PK. Comparative assessment of discharge procedure of Tertiary hospitals with respect to guidelines of NABH [Internet]. International Journal of Science and Research (IJSR). 2018 [cited 2022Jun06]. Available from: <https://www.ijsr.net/archive/v9i5/SR20515150826.pdf>
- 2- [Internet] 2020 [updated 2022 Mar 14; cited 2022 Jun 06]; Available from: <https://www.statista.com/statistics/1128673/india-number-of-public-and-private-hospital-beds-estimated/>
- 3- Garg R, Pathan D. Implementation of Six Sigma to Improve the Discharge Process [Internet]. International Journal of Medical Science and Innovative Research (IJMSIR). 2018 [cited 2022Jun19]. Available from: <https://www.ijmsir.com/asset/images/uploads/1556876204113.pdf>
- 4- Gonçalves-Bradley DC, Lannin NA, Clemson L, Cameron ID, Shepperd S. Discharge planning from hospital. Cochrane Database of Systematic Reviews 2022, Issue 2. Art. No.: CD000313. DOI: 10.1002/14651858.CD000313.pub6 [cited 2022Jun06].
- 5- Shapiro MH, Goodman DM, Rodriguez VA. The Perfect Discharge: A Framework for High-Quality Hospital Discharges. *Hosp Pediatr*. 2022 Jan 1;12(1):108-117. doi: 10.1542/hpeds.2021-006100. PMID: 34961884. [cited 2022Jun06]
- 6- Peimbert-García RE, Gutiérrez-Mendoza LM, García-Reyes H. Applying lean healthcare to improve the discharge process in a mexican academic medical center. *Sustainability*. 2021 Oct 1;13(19):1-11. 10911. <https://doi.org/10.3390/su131910911>
- 7- Moo-Young JA, Sylvester FA, Dancel RD, Galin S, Troxler H, Bradford KK. Impact of a Quality Improvement Initiative to Optimize the Discharge Process of Pediatric Gastroenterology Patients at an Academic Children's Hospital. *Pediatr Qual Saf*. 2019 Sep 27;4(5):e213. doi: 10.1097/pq9.0000000000000213. PMID: 31745516; PMCID: PMC6831046.
- 8- Nicosia FM, Park LG, Gray CP, Yakir MJ, Hung DY. Nurses' Perspectives on Lean Redesigns to Patient Flow and Inpatient Discharge Process Efficiency. *Global Qualitative Nursing Research*. January 2018. doi:10.1177/2333393618810658.

Annexure

First draft of dissertation-

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