A CROSS-SECTIONAL STUDY TO IDENTIFY AND ANALYZE FACTORS CONTRIBUTING TO DELAYS IN INPATIENT DISCHARGE TURNAROUND TIME IN A 170-BEDDED TERTIARY CARE FACILITY-CARE HOSPITAL, RAMNAGAR, VISAKHAPATNAM FROM MARCH 2025 TO APRIL 2025

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ABSTRACT

Background: Efficient discharge is vital for patient satisfaction, operational performance, and timely bed turnover. Discharge delays reflect systemic and coordination challenges.

Objectives: To identify and analyze the reasons that are contributing to the increased overall IPD discharge TAT and to analyze the following TATs in detail

- TAT1: Discharge Intimation
- TAT2: Summary Preparation
- TAT3: Pharmacy Clearance
- TAT4: Bill Preparation
- TAT5: Bill Settlement
- TAT6: Bed Release

Methodology:547 discharges (Cash: 97, Insurance: 115, PSU: 335) analyzed using SOPEONOW + direct observation.Data processed in SPSS; chi-square test used ($p \leq 0.05$ considered as significant).

Key Result : Cash -Significant TAT2, TAT4 delays; high unplanned discharges; Insurance: Significant TAT2, TAT3, TAT4, TAT5 delays; PSU: Significant TAT1, TAT2, TAT4, TAT5, TAT6 delays; unplanned cases.

Conclusion: Standardize consultant round timings to reduce variability,streamline pharmacy and billing processes. improve coordination among billing, nursing, PREs, and attenders.Introduce EMR and digital tracking for real-time process visibility.

Keywords: IPD Turnaround Time (TAT), Discharge Process, Discharge Summary, Pharmacy TAT, Billing TAT, Bed Release, Delay Factors, Operational Efficiency.

OVERVIEW OF CARE HOSPITAL

CARE Hospitals, part of the Evercare Group, is a leading multispecialty healthcare provider in South Asia and Africa, founded in 1997 in Hyderabad. With 16 hospitals across 6 states in India, CARE serves over 25 million people, focusing on affordable, accessible care in non-metro cities

IPD Floor-wise Overview & Discharge Workflow – CARE Hospitals

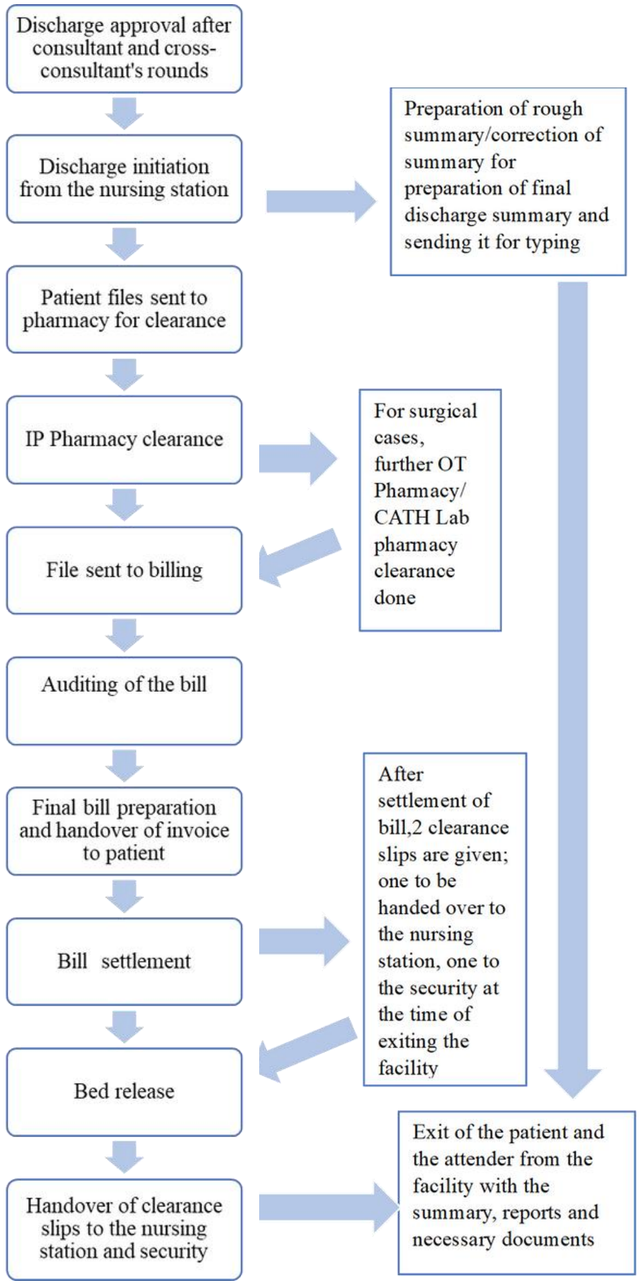
- Ground to Third Floor:
  - Ground Floor: MICU (12+4 isolation beds), Emergency Dept. (10 beds)
  - First Floor: CATH lab (10 beds), 41-bed wards, Dialysis, Admin & Nursing Stations – caters to PSU/package patients.
  - Second Floor: 4 OTs (Cardiac/Neuro), 55 ICU+ ward beds, IP pharmacy – no duty doctor.
  - Third Floor: General OTs, Post-anaesthesia & Neuro ICU (16 beds), 22 private beds.
- Discharge Workflow:
  - Initiated post consultant approval.
  - Planned discharges (night billing): Summary/billing prepared in advance for faster processing.
  - Unplanned discharges: Delay due to pending billings/documentation.
  - Discharge initiated by nursing station → Summary typed → Pharmacy clearance → Billing audit → Bill handed to attenders → Clearance slips issued → Security exit.
  - PRE coordinates the entire process, ensuring communication with pharmacy, billing, and nursing.
  - Medicines (if included in package) are pre-arranged by inpatient pharmacy.

INTRODUCTION

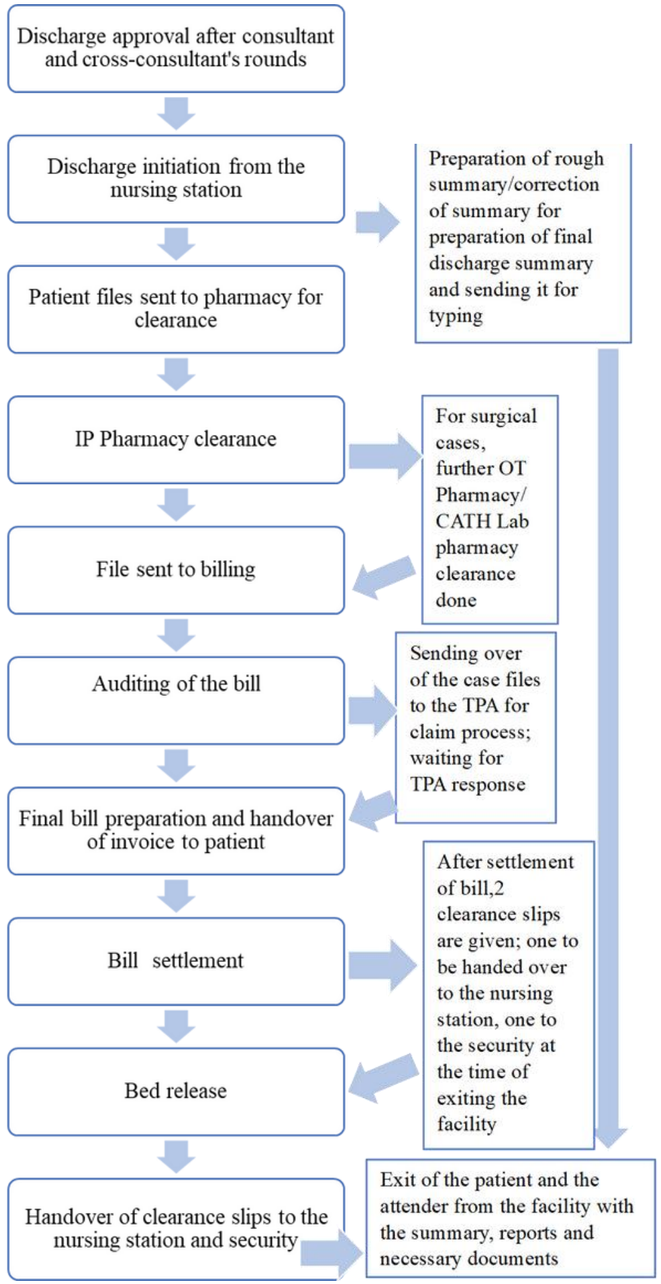
Inpatient care involves admission, treatment, and discharge—the latter being a complex, multi-step process requiring coordination across clinical and administrative teams.[1–2] Delays in discharge affect hospital efficiency, bed availability, patient satisfaction, and increase the risk of hospital-acquired infections.[2–5] Common bottlenecks include incomplete documentation, pending billing, and poor interdepartmental communication.[2,6–9] Patients are broadly classified as cash/self-pay or insurance-covered.[17] Insurance includes public schemes like Rajiv Gandhi Aarogyasri (AP), BSKY (Odisha), Aarogya Sahayata, Aarogya Bhadrata, CGHS, ESI, and ECHS, as well as private insurance with cashless or reimbursement options.[10–19]

S. No	TAT	CASH	INSURANCE	PSUs
1	Discharge intimation TAT	10 mins	10 mins	10 mins
2	Discharge Summary TAT	20 mins	20 mins	20 mins
3	Pharmacy Clearance TAT	10 mins	10 mins	10 mins
4	Bill Preparation TAT	20 mins	20 mins	20 mins
5	Bill Settlement TAT	30 mins	150 mins	60 mins
6	Bed Release TAT	30 mins	30 mins	30 mins
	TOTAL DISCHARGE TAT	120 mins	240 mins	150 mins

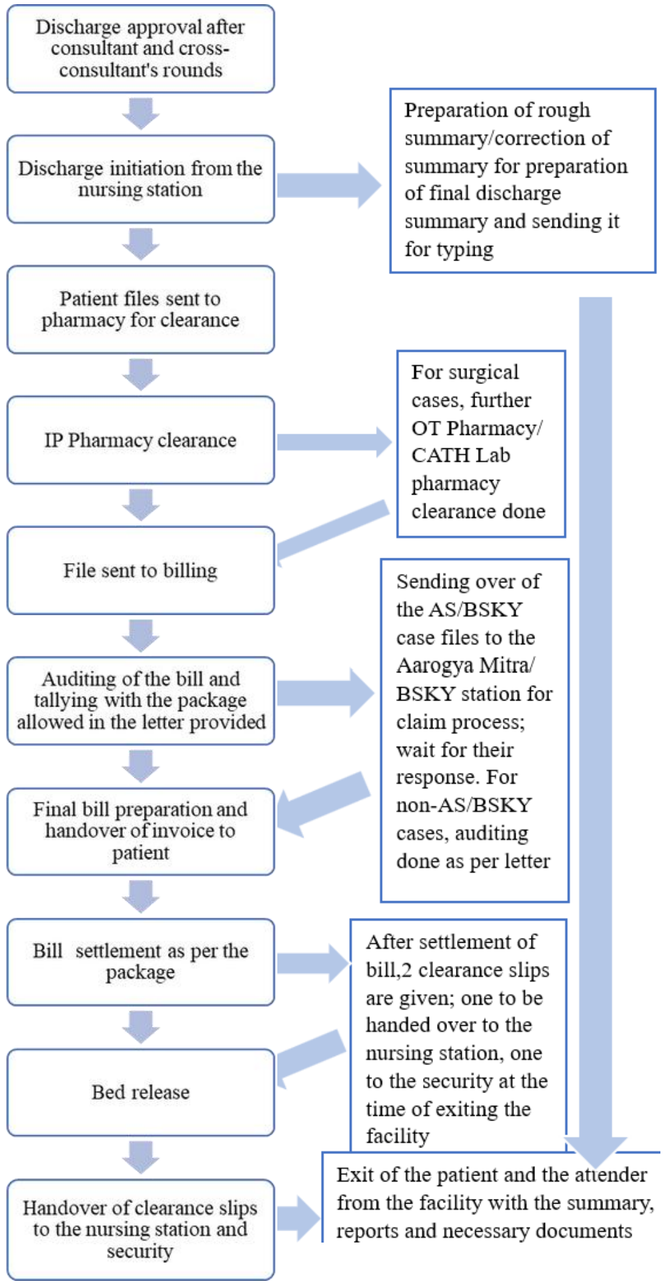
PROCESS FLOW FOR CASH PATIENTS



PROCESS FLOW FOR INSURANCE PATIENTS



PROCESS FLOW FOR PSU PATIENTS



RESEARCH QUESTIONS

Broad research question-

What are the reasons contributing to the delays in the IPD discharge leading to an increase in the discharge TAT?

Specific research questions-

1. What are the reasons leading to the increase in the TAT of discharge intimation?
2. What are the reasons leading to the increase in TAT of discharge summary preparation?
3. What are the reasons leading to the increase in pharmacy clearance TAT?
4. What are the reasons leading to the increase in bill preparation TAT?
5. What are the reasons leading to the increase in bill payment TAT?
6. What are the reasons leading to the increase in bed release TAT?

OBJECTIVES

Broad Objective-

To identify and analyse the reasons that are contributing to the increased IPD discharge TAT. (TAT0)

Specific Objectives-

1. To identify and analyse reasons that are contributing to the increase in the discharge intimation TAT. (TAT1)
2. To identify and analyse reasons that are contributing to the increase in the discharge summary preparation TAT. (TAT2)
3. To identify and analyse reasons that are contributing to the increase in the pharmacy clearance TAT. (TAT3)
4. To identify and analyse reasons that are contributing to the increased bill preparation TAT. (TAT4)
5. To identify and analyse reasons that are contributing to the increased bill payment TAT. (TAT5)
6. To identify and analyse the reasons that are contributing to the increased bed release TAT. (TAT6)

HYPOTHESIS

- TAT1H0: TAT1 has no effect on TAT0
- TAT2H0: TAT2 has no effect on TAT0
- TAT3H0: TAT3 has no effect on TAT0
- TAT4H0: TAT4 has no effect on TAT0
- TAT5H0: TAT5 has no effect on TAT0
- TAT6H0: TAT6 has no effect on TAT0
- TAT0H0: The nature of the discharge (planned/unplanned) has no effect on TAT0

REVIEW OF LITERATURE

ARTICLE	YEAR
Kumar J. A study of the causes of delay in patient discharge process in a large multi-speciality hospital with recommendations to improve the turn around time. QAI Journal for Healthcare Quality and Patient Safety. 2022 Jan 1;3(1):13-20.	2022
Hendy P, Patel JH, Kordbacheh T, Laskar N, Harbord M. In-depth analysis of delays to patient discharge: a metropolitan teaching hospital experience. Clinical Medicine.2012 Aug 1;12(4):320-3.	2022
Sharma MR,Kapadia N, Raval MS, Shah MS, Patel MA. A STUDY OF DISCHARGE PROCESS WITH STRATEGY TO REDUCE THE TURN AROUND TIME IN TERTIARY CARE HOSPITAL	2022
Chaudhari PS, Shinde V, Gudhe V. A Study on Reducing the Discharge Turnaround Time of IPD Patients at AVBRH.	2021
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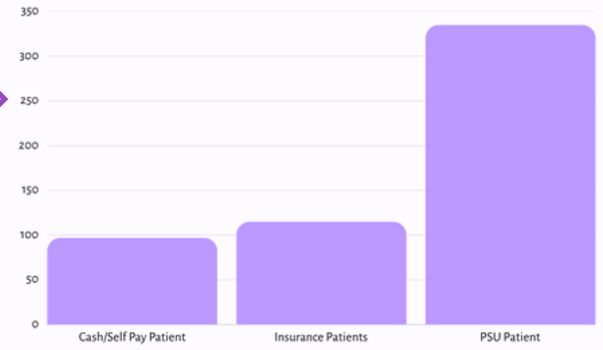
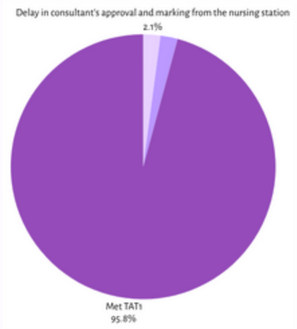
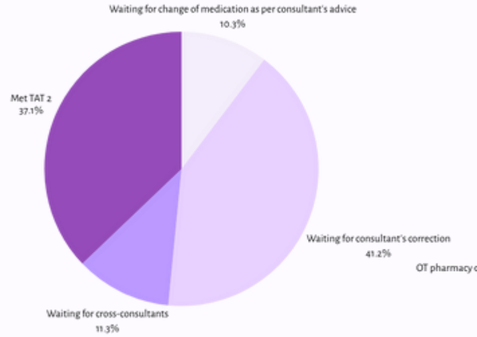
METHODOLOGY

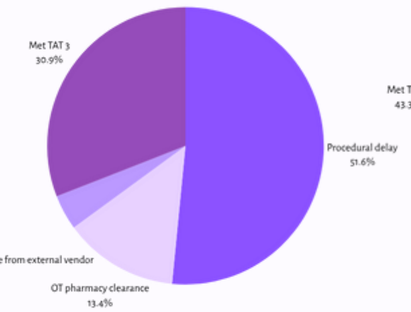
Study Design: Cross-sectional, real-time observational study at CARE Ramnagar IPD (Mar 10–Apr 10, 2025).
Scope: Cash, insurance, and PSU patient discharges from IPD, HDU, CCU, and CATH labs.
Sample size and sampling method: 10% of total Dec–Feb discharges → 547 cases; 97 cash, 115 insurance, 335 PSU using convenience sampling method.
Inclusion criteria- IPD Discharges between 10 Mar–10 Apr 2025, **Exclusion criteria-** Discharges before/after study period, discharges on Sundays or for daycare procedures
Data Collection: SOPEONOW software for real-time data+ direct observation for delay causes; TATs (TAT1–TAT6) logged daily in Excel.
Analysis: Descriptive stats + chi-square ($p \leq 0.05$) using IBM SPSS 27.
Ethics: Confidentiality ensured, permissions taken, verbal consent obtained.
Bias Control: Only directly observed data used; minimal observer influence.
Limitations: Single-center, short duration, excluded Sundays & daycare discharges.

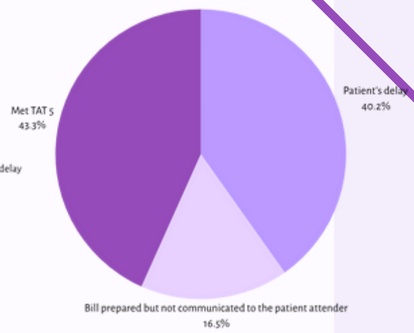
RESULT-CASH









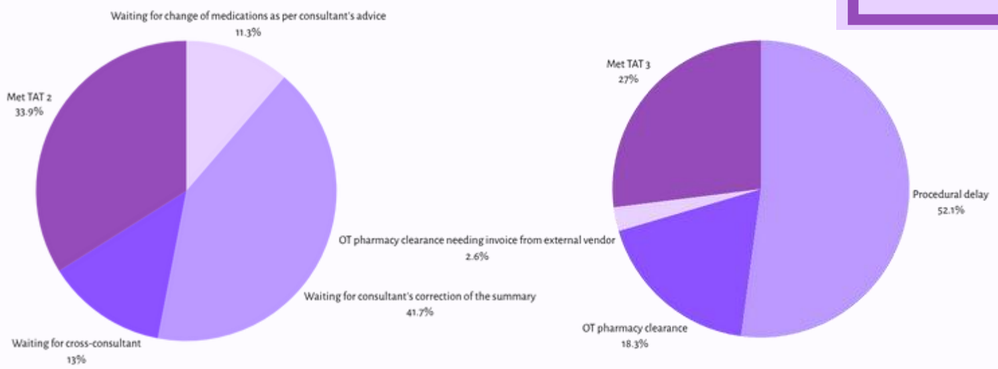


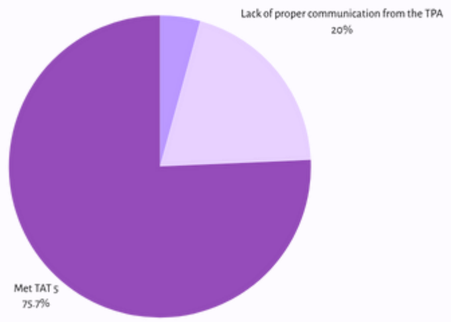
TAT stage	Cases met KPI (%)	Median time (mins)	IQR	Minimum Time (mins)	Maximum Time (mins)
TAT1	95.9	1	1	0	459
TAT2	37.1	60	172	1	10198
TAT3	30.9	17	21	3	87
TAT4	58.8	17	37	0	1513
TAT5	43.3	49	125	0	4378
TAT6	90.7	0	11	0	94
TAT0	21.6	224	302	38	10238

Variable	Frequency of cases within TAT of the step and met overall IPD TAT	Total cases within TAT of that particular step	*p-value*
TAT1 (Discharge Intimation TAT)	20	93	0.868
TAT2 * (Discharge Summary TAT)	18	36	**<0.001**
TAT3 (Pharmacy clearance TAT)	7	30	0.788
TAT4 * (Bill preparation TAT)	17	57	**0.02**
TAT5 (Bill settlement TAT)	13	42	0.052
TAT6 (Bed release TAT)	20	88	0.42
**p≤0.05*			

KPI (Met/Not Met)	Planned/Unplanned		Total	
	Planned	Unplanned		Asymptotic Significance (2-sided) (*p-value*)
Met KPI	5	16	21	**0.042***
Not Met KPI	15	61	76	
Total	20	77	97	
**p≤0.05*				

RESULT-INSURANCE



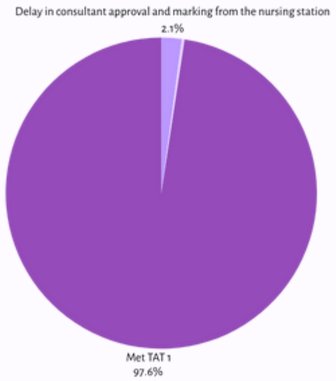


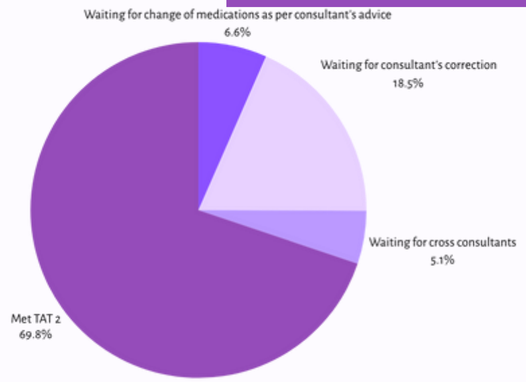
TAT stage	Cases met KPI (%)	Median time (mins)	IQR	Minimum Time (mins)	Maximum Time (mins)
TAT1	95.7	0	1	0	841
TAT2	33.9	47	138	0	4586
TAT3	27	16	19	3	1061
TAT4	4.3	184	152	0	1053
TAT5	75.7	52	129	0	3919
TAT6	89.6	1	10	0	135
TAT0	17.4	407	423	4	4967

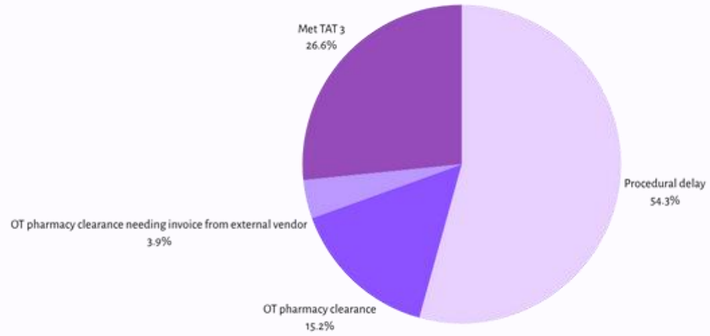
Variable	Frequency of cases within TAT of the step and met overall IPD TAT	Total cases within TAT of that particular step	*p-value*
TAT1 (Discharge Intimation TAT)	19	110	0.875
TAT2 * (Discharge Summary TAT)	12	39	**0.007**
TAT3 * (Pharmacy clearance TAT)	9	31	**0.045**
TAT4 * (Bill preparation TAT)	7	13	**0.01**
TAT5 (Bill settlement TAT)	*20*	*87*	***0.005***
TAT6 (Bed release TAT)	20	103	0.093
**p≤0.05*			

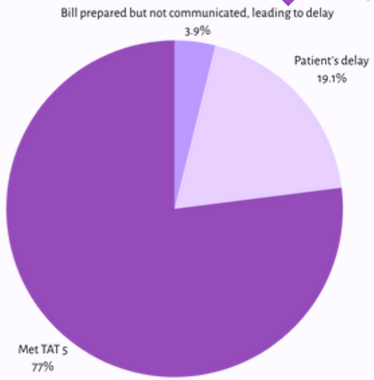
KPI (Met/Not Met)	Planned/Unplanned		Total	
	Planned	Unplanned		Asymptotic Significance (2-sided) (*p-value*)
Met KPI	10	10	20	0.2
Not Met KPI	33	62	95	
Total	43	72	115	
**p≤0.05*				

RESULT- PSU







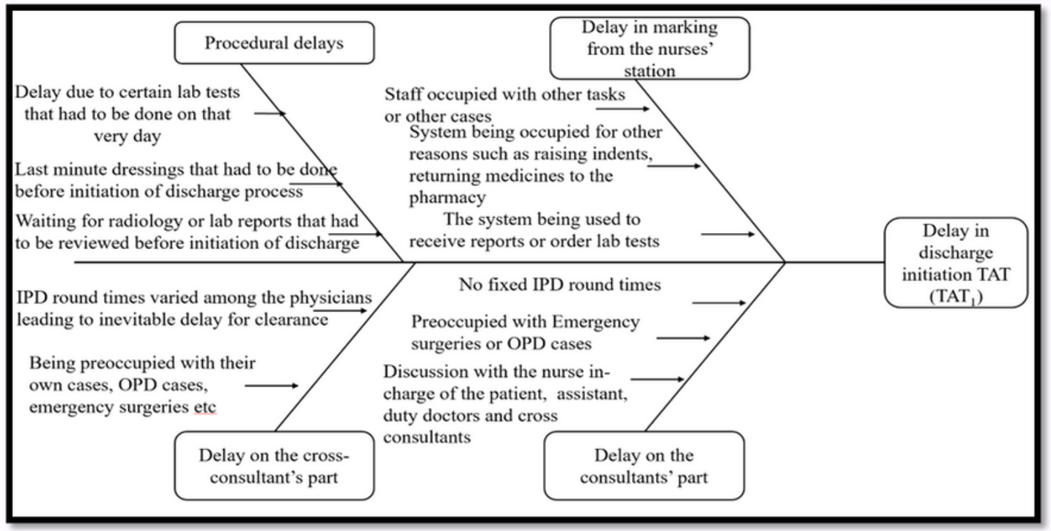


TAT stage	Cases met KPI (%)	Median time (mins)	IQR	Minimum Time (mins)	Maximum Time (mins)
TAT1	97.6	0	1	0	7087
TAT2	69.9	0	42	0	11668
TAT3	26.6	17	19	1	1244
TAT4	71.9	4	27	0	1282
TAT5	77	4	45	0	3753
TAT6	85.7	4	14	0	361
TAT0	59.1	105	204	9	12594

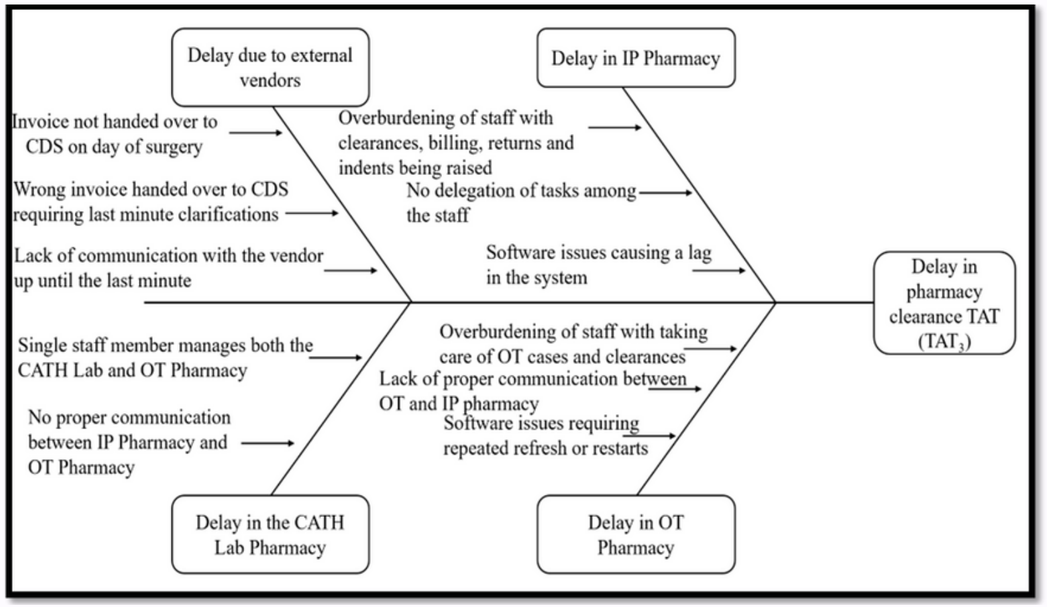
Variable	Frequency of cases within TAT of the step and met overall IPD TAT	Total cases within TAT of that particular step	*p-value*
TAT1 *(Discharge Intimation TAT)	196	327	**0.047**
TAT2* (Discharge Summary TAT)	176	234	**<0.001**
TAT3 (Pharmacy clearance TAT)	59	89	0.108
TAT4* (Bill preparation TAT)	164	241	**<0.001**
TAT5 *(Bill settlement TAT)	182	258	**<0.001**
TAT6 *(Bed release TAT)	178	287	**0.008**
*p≤0.05			

KPI (Met/Not Met)		Planned/Unplanned		Total	
		Planned	Unplanned		Asymptotic Significance (2-sided
	Met KPI	104	94	198	**0.036***
	Not Met KPI	56	81	137	
Total		160	175	335	
*p≤0.05					

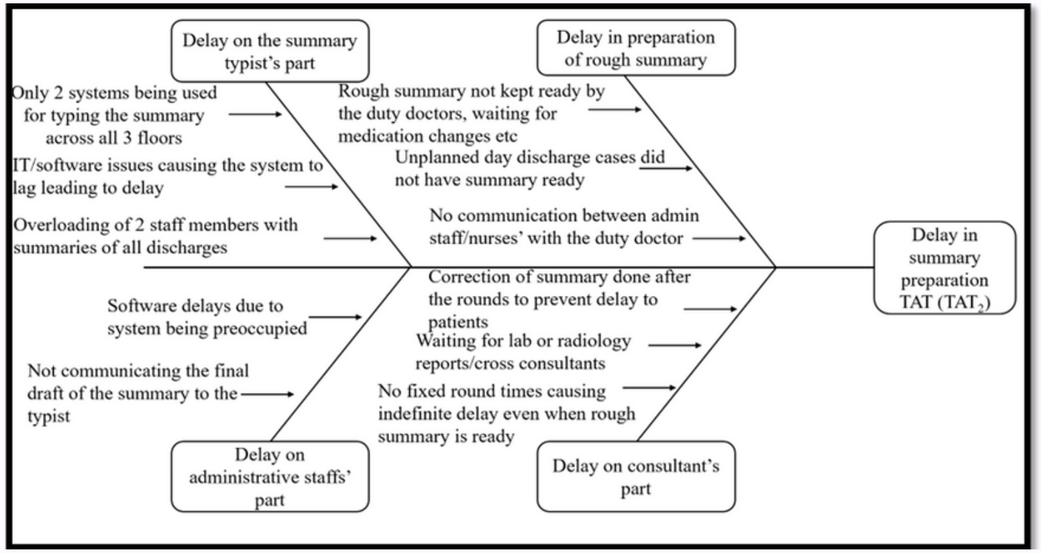
DISCUSSION



Fishbone diagram depicting factors contributing to delay in discharge initiation

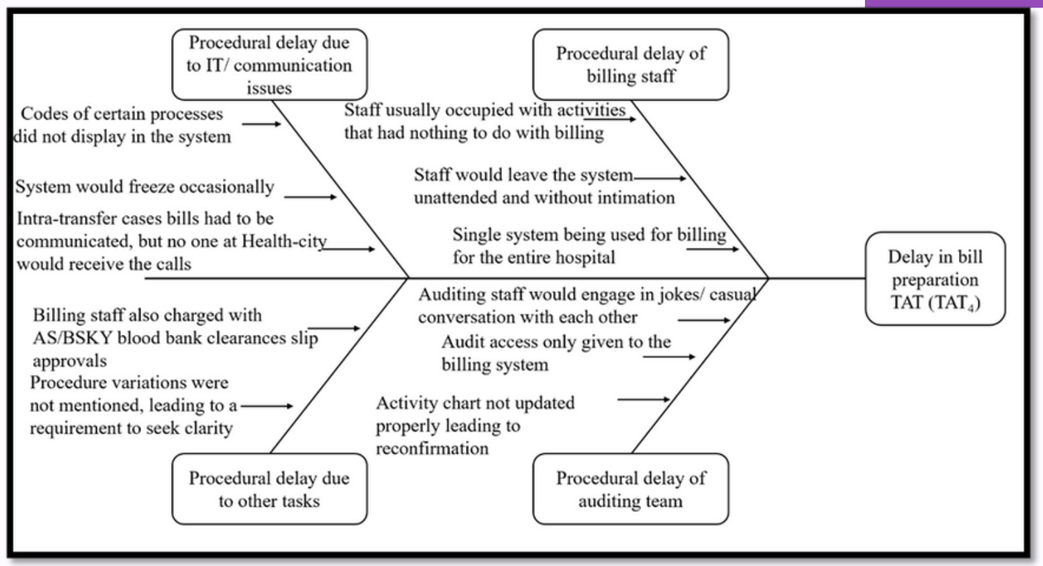


Fishbone diagram depicting factors contributing to delay in pharmacy clearance

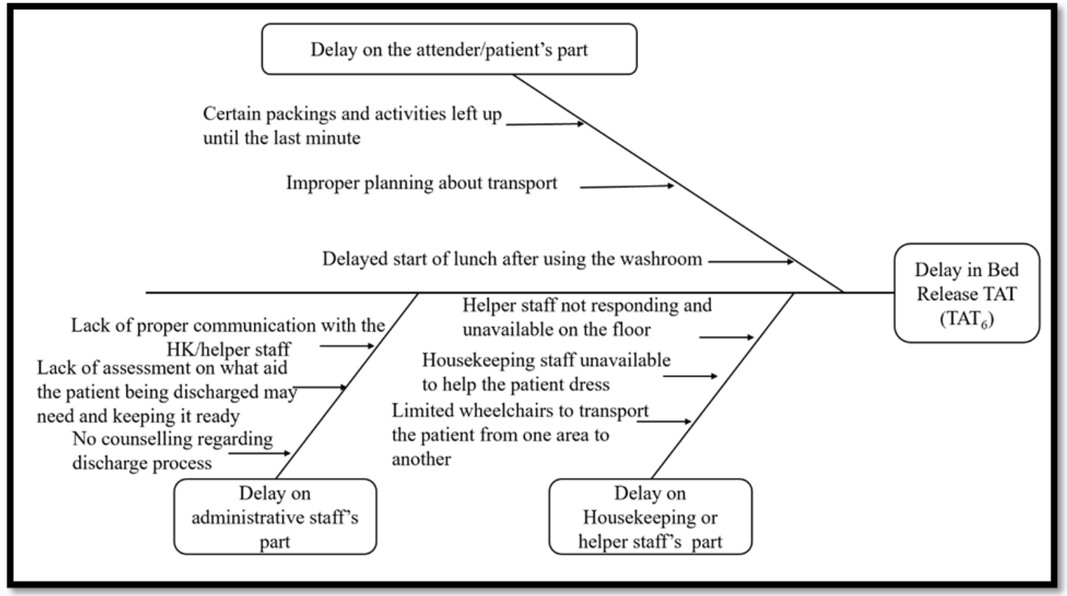


Fishbone diagram depicting factors contributing to delay in discharge summary preparation

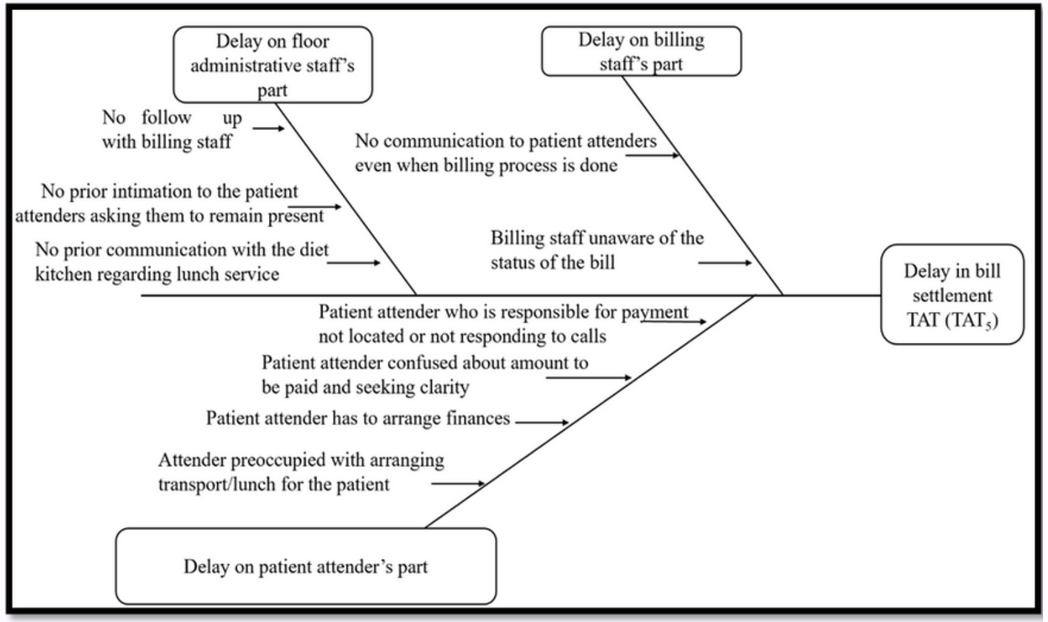
DISCUSSION



Fishbone diagram depicting factors contributing to delay in bill preparation



Fishbone diagram depicting factors contributing to delay in bed release



Fishbone diagram depicting factors contributing to delay in bill settlement

RECOMMENDATIONS

Discharge Intimation & Summary Preparation

- Structured consultant rounds: Scheduled timing (early afternoon) with no OPDs to allow planned discharges.
- Pharmacy coordination: PREs must inform pharmacy a day prior, advance tests and dressings: Labs/radiology pre-booked early in the morning.
- Early summary preparation: Summary typing initiated post rounds; typist slots fixed.
- Digital consultant approval: Remote clearance in case of consultant unavailability.
- Prioritization at nursing stations: Discharge-related tasks get precedence in non-emergency times.
- EMR integration: Long-term transition to digital summaries and billing.

IP/OT/Cath Lab Pharmacy

- Task delegation: Dedicated billing personnel.
- Staff sufficiency: Minimum two members for busy units like OT/CATH lab.
- Same-day OT billing: Materials billed on surgery day.
- Vendor coordination: Immediate submission of outsourced item invoices.
- Central communication: Discharge coordination via WhatsApp or phone group.
- Nursing support: Material catalog shared with nursing stations.
- Barcode system: For consumption tracking and billing accuracy.

Billing Department

- Discipline enforcement: Strict SOPs for absenteeism, negligence or unproffesional behaviour
- Sufficient billers: Two active billers during peak hours.
- Advance file auditing: Pre-submission of discharge files.
- Task division: Segregation of roles—blood bank, insurance, credit letter management.
- Auditing separation: Audit team functions independently from billing.
- Auto-billing & EMR: Tech-driven efficiency and error reduction.

Doctors and Nursing

- Clear documentation: Legibility, dating, and sign-offs made mandatory.
- Written orders: Replace verbal communication with proper records.
- Nursing handovers: Next-day discharges reviewed during every shift change.

Patient Relations Executives (PREs)

- Complete case awareness: Know payment method, case details, and package.
- Family counselling & coordination: Discharge planning communicated to families.
- Technology-enabled tracking: Discharge dashboards for real-time coordination and updates.

CONCLUSION

This study analyzed the discharge turnaround time (TAT) at CARE Hospitals, Ramnagar, focusing on process inefficiencies and delays across departments for cash, PSU, and insurance patients. It aimed to identify bottlenecks and recommend sustainable improvements to enhance bed turnover, operational efficiency, and patient satisfaction.

Key Findings

- Unstandardized consultant rounds delayed discharge initiation, affecting downstream tasks.
- Pharmacy and billing delays due to procedural gaps, poor planning, and limited manpower.
- Insurance patients faced the longest delays due to multi-step TPA approval processes.
- Discharge summaries were often delayed, relying heavily on consultant availability.
- Lack of real-time coordination among consultants, nurses, PREs, pharmacy, and billing teams.
- External vendor issues (e.g., late invoice submission) added last-minute delays.

Conclusion & Recommendations

- Discharge delays are systemic, not isolated; require cross-functional reform.
- Implement a standardized, proactive, tech-enabled discharge ecosystem.
- Ensure predictive planning, shared accountability, and seamless communication across departments.

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THANK YOU

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