



Identifying and Reducing Dispensing Errors in IPD

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INTRODUCTION

- Mistakes in dispensing medicines in hospital pharmacies are a major challenge to both the safety and quality of healthcare.
- Narayana Hospital's in-patient pharmacy receives hundreds of medications orders every month, increasing the possibilities for problems that might affect how patients feel.
- Error in the dispensing of medicine happens even after new methods have been implemented.

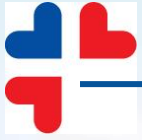






AIM & OBJECTIVES

The Aim of this study is to examine, categorize and reduce dispensing errors and delays within the IPD pharmacy of Narayana Hospital.



Objectives of this Study

- To assess the frequency and types of dispensing errors and delays in IPD pharmacy.
- To propose and implement strategies to reduce dispensing errors and delays.
- To evaluate the impact of the corrective measures implemented



Dispensing process of IPD pharmacy, Narayana Hospital

- In the Narayana Hospital, the In-Patient Department (IPD) pharmacy forms a vital part of the hospital's medication organization. It serves as a main centre for handling, preparing and providing medications to patients in different departments.
- There are few steps which are presently used in medication distribution at Narayana Hospital's IPD pharmacy.



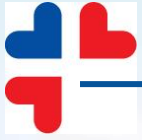
1 Step

Receipt and Processing of Indents

Aatma software

The screenshot displays the Aatma software interface on a Lenovo monitor. The browser address bar shows 'narayanahealth.com/pharmacy-dispense'. The page title is 'Pharmacy > IP Dispense'. Below the title, there are tabs for 'PHARMACY ORDERS', 'DISPENSED', 'CANCELLED', 'AMMUNITION', 'PARTIALY', and 'RENEW'. A search bar and an 'Advanced' link are also present. The main content area is a table with the following columns: Order No., Date, Patient Details, Patient Name, Entered By, Dispensing/Ordering HSC, Item Count, and Status. The table contains several rows of data, with the first three rows having a status of 'Ordered' and the remaining five rows having a status of 'Partially Dispensed'.

Order No.	Date	Patient Details	Patient Name	Entered By	Dispensing/Ordering HSC	Item Count	Status
PHH1506250300142	14/06/25	M. Pradeep Kumar	M. Pradeep Kumar	Harshita Kumar	MPH1506250300142	9	Ordered
PHH1506250300085	14/06/25	M. Eugene Alexander	M. Eugene Alexander	Lakshmi	MPH1506250300085	2	Ordered
PHH15062503000338	14/06/25	M. D. Jagan Chandra	M. D. Jagan Chandra	Harshita Kumar	MPH15062503000338	2	Ordered
PHH15062503000225	14/06/25	M. D. Jagan Chandra	M. D. Jagan Chandra	Harshita Kumar	MPH15062503000225	1	Partially Dispensed
PHH15062503000222	14/06/25	M. D. Jagan Chandra	M. D. Jagan Chandra	Harshita Kumar	MPH15062503000222	1	Partially Dispensed
PHH15062503000221	14/06/25	M. D. Jagan Chandra	M. D. Jagan Chandra	Harshita Kumar	MPH15062503000221	1	Partially Dispensed
PHH15062503000018	14/06/25	M. D. Jagan Chandra	M. D. Jagan Chandra	Harshita Kumar	MPH15062503000018	1	Partially Dispensed
PHH15062503000016	14/06/25	M. D. Jagan Chandra	M. D. Jagan Chandra	Harshita Kumar	MPH15062503000016	1	Partially Dispensed
PHH15062503000015	14/06/25	M. D. Jagan Chandra	M. D. Jagan Chandra	Harshita Kumar	MPH15062503000015	1	Partially Dispensed

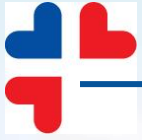


2
Step

Medication Dispensing

**Pharmacy staff marks
the indent as dispensed
in the software**



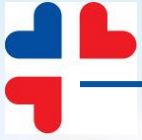


3
Step

Basket Placement

**GDA staff places the
baskets on the trolley**



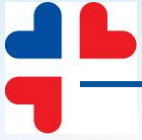


4
Step

Medication Transport

**GDA transports the
medication trolley to the
respective floors**



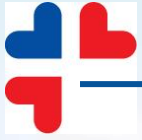


5
Step

Medication Handover

**Handover of medication
to the nursing staff**

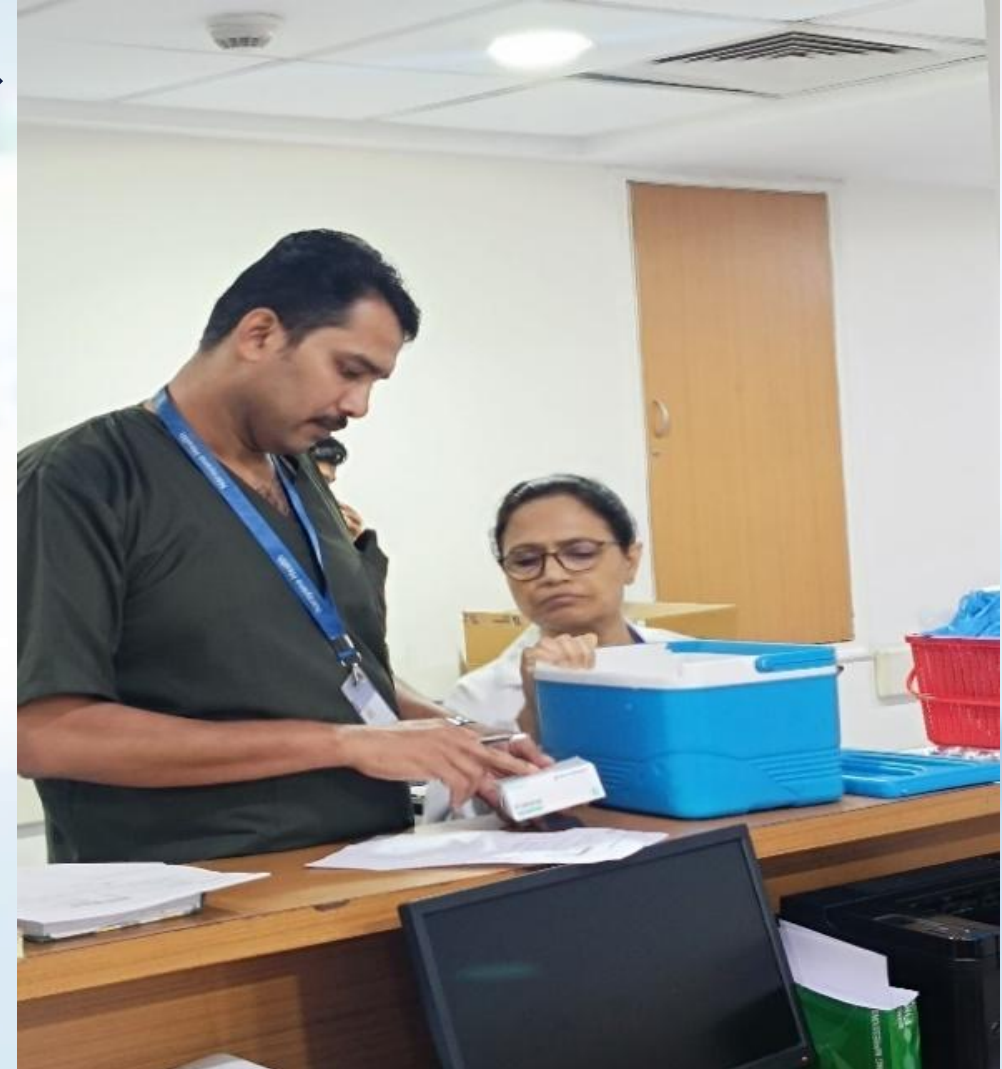


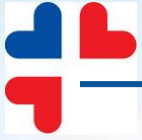


**6
Step**

Medication Verification

**Cross checking
medication by the
nursing staff**



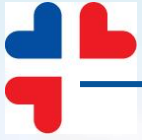


7
Step

Basket Return

**Returning the baskets to
the GDA**





8
Step

Documentation of Receipt

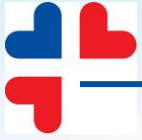
**Signature of medication
received by the nursing
staff with time and date for
record**





DISPENSING ERRORS

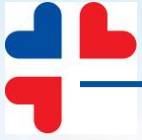
Many medication-related issues happen in the India and dispensing errors are responsible for around 21% of them. They cause important issues in the outcome. They are responsible for many cases of sickness and death. They lead to a rise in costs for healthcare and the economy



Categories of dispensing errors

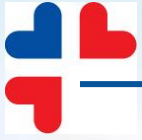
**Storage of medication
without labelling**





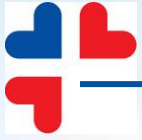
Improper storage of medication in pharmacy





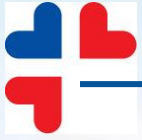
Unorganized/Cluttered working station





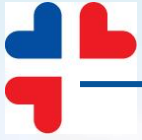
**No
categorization/separation
of red coloured (urgent
indents) baskets from the
other coloured baskets**





GDA Staff waiting for the dispensing trolley to get filled up - leading to delays in the dispensing process





GDA staff helping the pharmacy staff in the dispensing process which leads to increased dispensing errors and delays.





Some Strategies for Minimizing Dispensing Errors

Ensure correct entry of the prescription

Implement systematic patient identity
verification procedures during computerized
prescription entry

Enhanced Clinical Decision Support

Confirm that the prescription is correct and
complete



METHODOLOGY

I. RESEARCH QUESTION

Q1. What are the primary causes of dispensing errors and delays in the IPD pharmacy at Narayana Hospital?

Q2. How can these errors and delays be minimized?



II. RESEARCH DESIGN

To identify the primary causes and delays of dispensing errors in the IPD pharmacy at Narayana Hospital

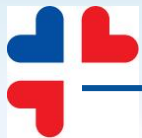


An observational study



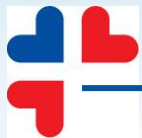
Pre-post intervention design was employed.





III. STUDY SETTING





IV. STUDY POPULATION

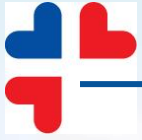
3647 Indents

9-day Observation period

Pre data collection period: **25th March-
2nd April 2025**

Post data collection period : **24th April-
2nd May 2025**



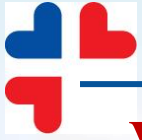


V. RESEARCH PROCEDURES/APPROACHES

Both quantitative and qualitative methods are used to evaluation

Study Design

- The research follows a Pre-post observational study design without a control group.
- Data was collected before and after the implementation
- Aimed at reducing dispensing errors & delays in the IPD Pharmacy



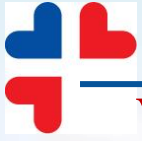
VI. INTERVENTIONS PERFORMED

◆ 1. Staff Training & Sensitization

- Pharmacists: Trained in cross-verification, urgent indent prioritization, and clear documentation.
- Nursing Staff: Sensitized on reducing unnecessary/single indents, urgent indent tagging, and correct pack size selection.
- GDA Staff: Trained on transportation SOPs, urgent basket identification, and delivery record maintenance.

◆ 2. Workspace Organization

- De-cluttered and reorganized pharmacy stations for better accessibility.
- Introduced color-coded baskets (e.g., Red for URGENT) to reduce confusion and ensure priority dispensing.



VI. INTERVENTIONS PERFORMED

◆ 3. Improved Storage & Labelling

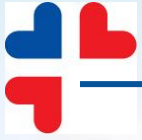
- Separate designated racks for consumables vs medications.
- Proper labelling introduced in both pharmacy and central store areas to minimize picking errors.

◆ 4. SOP Implementation

- GDA SOP: Clearly defined wait time, basket count threshold before dispatch, and rules against assisting in dispensing.
- Nursing SOP: Guidelines for placing indents, return management, and communication during shortages.
- Pharmacy SOP: Urgent indent marking, real-time dispensing in AATMA, use of duty phones for escalation, and tracking undispensed items.

◆ 5. Roster & Manpower Optimization

- Ensured minimum of 4 pharmacists and 2 GDAs at all times with backup rosters.
- Additional manpower recruitment initiated for both GDA and pharmacy roles.

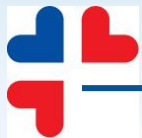


Sampling Techniques

Purposive Sampling

Study Instruments

A structured data abstraction form was designed



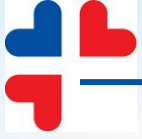
Sample Size Calculation

76 Indents



Tool used for Data Collection

Field	Description
Indent ID	Unique identifier for each indent
Ward/Department	Name or code of the ward/department
Urgency (Normal/Urgent)	Tag as URGENT or NORMAL as per indent
Time Indent Received	Exact time the indent was received
Time Dispensed	Time at which medicines were dispensed
Time Left Pharmacy	Time medicines left the pharmacy
Time Delivered to Ward	Time of actual delivery to ward
Pharmacist Name	Name of the pharmacist responsible
GDA Name	Name of the GDA delivering the basket
Medication Error (Y/N)	Was there a dispensing error?
Error Type (if any)	Specify wrong drug, quantity, etc.
Delay (Y/N)	Was there any delay in delivery?
Delay Duration (mins)	How long was the delay (in minutes)?
Remarks/Root Cause	Notes or cause of error/delay
Verified by Nurse (Y/N)	Did nurse verify & sign upon receipt?

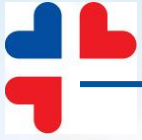


RESULT



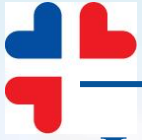
Pre Intervention Indents- Statistics - 25th March to 2nd April,2025

Date	Indents	Patients	Per patient indent	Single line indents	Avg. Line items/indent
25	375	138	2.7	92	6.0
26	425	129	3.2	105	4.6
27	365	92	3.9	98	5.5
28	377	102	3.6	85	5.8
29	488	85	5.7	86	4.7
30	406	65	6.2	84	5.4
31	250	101	2.4	93	5.2
1	486	108	4.5	78	5.3
2	475	101	4.7	87	4.8
AVG.	406	102	4	90	5.2



Post Intervention Indents- Statistics - 24th April to 2nd May,2025

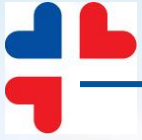
Date	Indents	Patients	Per Patient Indent	Single Line Indents	Avg. Line Items/Indent
24	360	140	2.6	86	4.6
25	372	132	2.8	93	4.7
26	355	125	2.8	90	4.5
27	368	110	3.3	88	4.9
28	340	115	3.0	75	4.6
29	355	98	3.6	83	4.4
30	360	108	3.3	81	4.8
1	365	105	3.5	82	4.5
2	350	109	3.2	84	4.7
AVG.	359	115	3.1	84.6	4.6



Indents – Time Distribution - 2025

Time	Indents/day
8 am - 9 am	15
9am - 10 am	22
10 am - 11 am	30
11 am - 12 pm	28
12pm - 1 pm	31
1 pm - 2pm	25
2pm - 3pm	27
3pm - 4 pm	20
4pm - 5 pm	23
5pm - 6 pm	27
6pm - 7 pm	20
7pm -8 pm	15
8pm - 8 am	80
Total (24 hrs)	363
During Day (8-8)	283

Peak hours

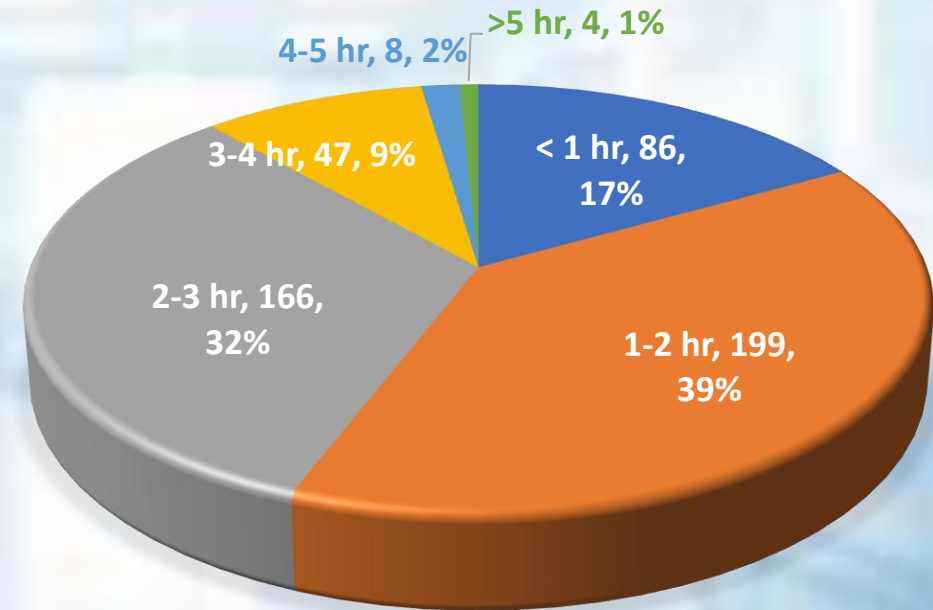


Dispensing TAT 2024

Indents	Period	Avg. TAT
505 indents	1-14 th Oct	01:54:00
(T1 – Indent time ; T2 – Delivered on floor time)		

TAT	No. of indents	Percentage of Indents
< 1 hr	86	17%
1-2 hr	199	39%
2-3 hr	166	32%
3-4 hr	47	9%
4-5 hr	8	2%
>5 hr	4	1%

INDENTS DELIVERED WITHIN TIME



Approx 44% indents are delivered beyond 2 hrs



1





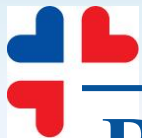
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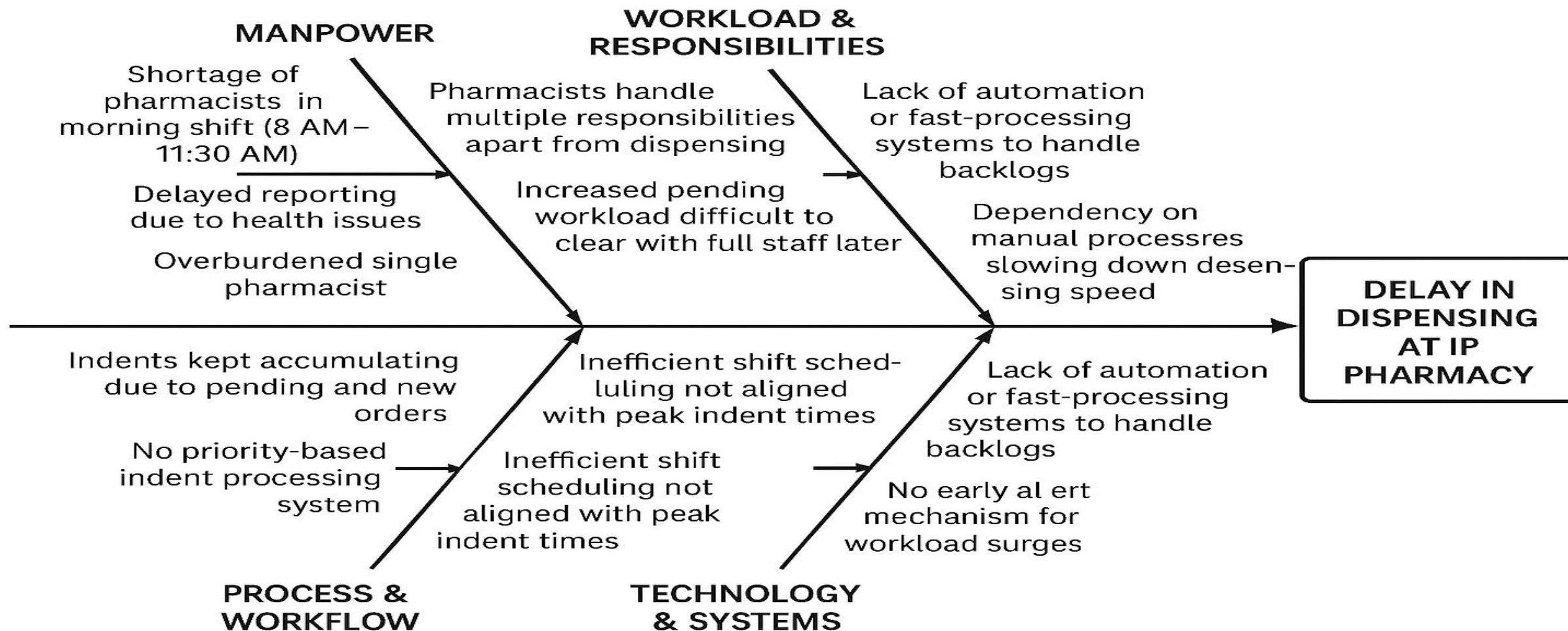
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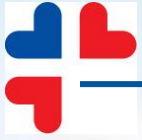
Incidents Reported	
Month	Dispensing Errors
Dec 2024	24
Jan 2025	12
Feb 2025	27
March 2025	17
Intervention Performed	
April 2025	2
May 2025	5

From 20 to 2:
Impact of process
improvements on
Dispensing Errors



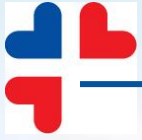
Root Cause Analysis of IP Pharmacy Dispensing Delays – Incident on 1st April 2025





Key Findings from Data Analysis

- High TAT for dispensing: Many indents took >2 hours to be processed.
- Even after 3 pharmacists joined at 12:00 PM, delays persisted due to backlog accumulation.
- Errors in medication dispensing indicate a need for better verification procedures.
- Service lift constraints further delayed medication transportation.



Preventive Measures & Recommendations

✓ Staffing & Workload Management

- Ensure minimum two pharmacists on duty at all times.
- Implement a backup roster system to handle absenteeism.

✓ Process Optimization

- Train nursing staff to delay non-urgent indents during peak backlog times.
- Define SOPs for GDAs to focus on timely medication transport, not packaging.
- Establish a waiting time limit for GDAs to ensure continuous medication flow.

✓ Technology & Infrastructure Improvements

- Allocate a dedicated service lift for pharmacy movement or set priority times.
- Implement barcode verification to minimize medication errors.



Preventive Measures & Recommendations

✓ Inventory & Medication Handling

- Train pharmacists for double-check verification before dispatch.
- Ensure correct use of color-coded baskets to prioritize urgent medication.

◆ Outcome: Reduced dispensing delays, improved workflow, and enhanced patient safety.



Dispensing Time Average (2025)

Dispensing time		
Check & Print	0:40 sec	
Dispense & pack	4:00min	6 line items
Total	4:40 min	
Indents 1 pharmacist can dispense in 1 hr	12	



1



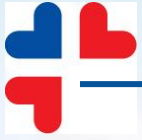
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1



1



Manpower Distribution (Pharmacists)

Time distribution (2025 Data)	
Time	Indents/day
8 am - 9 am	15
9am - 10 am	22
10 am - 11 am	30
11 am - 12 pm	28
12pm - 1 pm	31
1 pm - 2pm	25
2pm - 3pm	27
3pm - 4 pm	20
4pm - 5 pm	23
5pm - 6 pm	27
6pm - 7 pm	20
7pm -8 pm	15
8pm - 8 am	80
Total (24 hr)	363
During Day (8-8)	283

Current manpower distribution (2025) (Pharmacists - 6+1)							
P 1	P 2	P 3	P 4	P5	P6	Total	Supervisor
1						1	
1						1	
1	1					2	1
1	1					2	1
1	1	1	1	1		5	1
1	1	1	1	1		5	1
1	1	1	1	1		5	1
	1	1	1	1		4	1
	1	1	1	1		4	1
		1	1	1		3	
		1	1	1		3	
					1	1	

Weekly off is not considered in this*

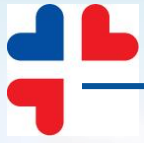


Indents can be dispensed by Pharmacists

Time distribution	
Time	Indents/day
8 am - 9 am	15
9am - 10 am	22
10 am - 11 am	30
11 am - 12 pm	28
12pm - 1 pm	31
1 pm - 2pm	25
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Total (24 hrs)	363
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Manpower distribution (Pharmacists - 6+1)								Indents can be dispensed by pharmacist
P 1	P 2	P 3	P 4	P5	P6	Total	Supervisor	
1						1		12
1						1		12
1	1					2	1	24
1	1					2	1	24
1	1	1	1	1		5	1	60
1	1	1	1	1		5	1	60
1	1	1	1	1		5	1	60
	1	1	1	1		4	1	48
	1	1	1	1		4	1	48
		1	1	1		3		36
		1	1	1		3		36
					1	1		—
								—
								480

Note : Assuming no pharmacists is on leave and lunch time is also not considered



Activities (other than dispensing) performed by Pharmacists

1. Emergency Clearance
2. Dialysis clearance
3. Discharge Clearance
4. Returns (Avg. time taken for 1 return 5-6 items - 5 mins) 55 returns/day (50% during day approx.)
5. Phone calls - Which item code ; patient in 1 area, indent to be dispatched to other area ; urgent
6. Receive bulk stock – Night
7. Stock Audit - Occasionally
8. Proper stock arrangement, timely updates, and expiry checks.
9. Assigned racks for accountability, regular stock checks, and timely replenishment.
10. Supply stock to OT pharmacy and coordinate with SCM for replenishment.

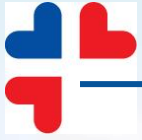


GDA Distribution and delivery time

Time distribution (2025)	
Time	Indents/day
8 am - 9 am	15
9am - 10 am	22
10 am - 11 am	30
11 am - 12 pm	28
12pm - 1 pm	31
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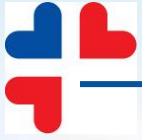
Manpower Distribution (GDA - 3+1) 2025					
GDA 1	GDA 2	GDA 3	GDA 4	Total	Indents can be dispensed by GDA
1	1			2	20
1	1			2	20
1	1	1		3	30
1	1	1		3	30
1	1	1		3	30
1	1			2	20
1	1			2	20
1	1			2	20
1	1			2	20
1	1			2	20
1	1			2	20
			1	1	
Note: 1 GDA dispenses 10 indents in 1 hr					
					270

Note : Assuming no GDA is on leave and lunch time is also not considered



Other Activities performed by GDA

- 1 Bulk Stock arrangement
- 2 Medicines or stock to be brought from General Store or other area.



Most Common Types of Dispensing Errors/Delays Observed

1. Stock Issues:

- Example: Tablet unavailable but still dispensed.
- Impact: Medication error, potential patient harm.
- Solution: Pharmacy must inform nursing staff before dispensing.

2. Incorrect Medication Quantity:

- Example: Extra or fewer medications dispensed (e.g., Pantoprazole & Tramadol extra).
- Impact: Overdosing or incomplete treatment.
- Solution: Pharmacists to double-check indents before dispensing.



Most Common Types of Dispensing Errors/Delays Observed

3. Late or Missed Delivery :

- Example: GDA staff did not deliver medications on the same day.
- Impact: Delay in patient treatment.
- Solution: Train GDA staff to adhere to TAT and deliver medications within the same day.

4. Wrong Item Dispensed:

- Example: Syringe indent had 2, but only 1 sent due to stock issues.
- Impact: Incomplete procedure, treatment delay.
- Solution: Inform nursing staff immediately about stock shortages.

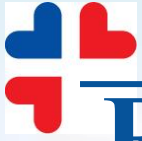


Bottlenecks Identified

- Lot of returns during daytime (Avg. time taken for 1 return 5-6 items - 5 mins) 55 returns/day (50% during day approx.)
- Wrong pack size indent
- GDA waiting on floors as indent is checked by same nurse who has put indent
- Dispensing done first from system - no mechanism to track missed indents, items
- Workplace not organized, small cluttered work station - chances of errors
- No cross checking before dispensing
- Receiving of indents is manual and not through HIS
- Even morning indents are delivered after 10 only by GDA
- Lot of clearances
- Phone ringing in case of busy also and the staff is required to attend those calls.
- Only 1 service lift used for transportation of medicines, leading to a lot of delays.

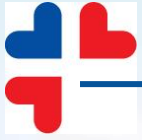


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Recommendations

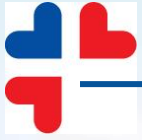
1. Nursing sensitization on:
 - a. Reducing no. of indents (12-1)
 - b. Reducing single indents
 - c. To put urgent indent in urgent and not call
 - d. Returns as far as possible less and during night time
 - e. Indent correct pack size - in system and refer shared excel with pack size
 - f. Check medicines and free GDA on priority
 - g. Indent to be put in correct service code (refer excel)
 - h. Train/Inform nursing staff of atleast 1 floor to delay the indents by an hour except the urgent indents, whenever due to
some reason pharmacy staff is insufficient
 - i. Train nursing staff in informing the nursing staff if medication is not available in stock.
2. Doctors sensitization on:
 - a. Planned discharges



Recommendations

3. Pharmacy :

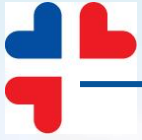
- a. Organized work station and work place with segregation – Reduce errors
- b. Urgent indents to be marked as U and expedited. Separate buckets for both.
- c. Dispensing to be done in ATHMA at time of real dispensing. When GDA is taking medicines that time, can be dispensed from system.
- d. Register for tracking of medicines not dispensed
- e. GRN to be done on time
- f. Crosschecking before dispensing
- g. Can use Duty Cell Phone
- i. In case of any new code, pharmacy to put same in group to inform all nursing
- j. Morning indents to be delivered in morning only
- k. Approved Manpower of 6, but only 4 are permanent – recruitment to be expedited
- l. Rosters should be made in such a manner, that even if some staff is on leave, at least 4 pharmacist are always present in IP Pharmacy
- m. Use small baskets for single indent, it will lead to less confusion among nurses in receiving process. Also will be convenient for pharmacy staff to dispense and pack, it will reduce dispensing errors.
- n. Proper labelling for all types of medications and consumables should be done in the pharmacy as well as in the store.



Recommendations

4. GDA:

- Make proper rosters for GDA allotted specifically for the IP Pharmacy, there should be atleast 2 all the time.
- Provide training to staff to pack urgent indents in red baskets and give priority to urgent medications/indents.
- Recruitment to be expedited- atleast 3 GDA should be allotted to the IP Pharmacy for full day.
- Provide training to the GDA for not packing 2 or more small/single indents together in 1 basket.
- GDA should maintain proper record of baskets delivered and brought back to the pharmacy in 1 round.
- Provide extra attention to the evening indents, whether they are delivered on the same day by the GDA or not.
- Provide training to the staff regarding maintaining record of time of receiving indents at different departments.



Recommendations

5. Management :

- There should be a way within the ATHMA, that even after dispensing the indents, the pharmacy staff is able to identify urgent indents and prioritise them. (TAT-<30MINS).
- There should be a SOP for GDA staff for the transportation of medication, i.e either specific waiting time in pharmacy or specific number of baskets ready for delivery to reduce the delays.

RESULTS & CONCLUSION

This study aimed to reduce dispensing delays and errors in the IPD pharmacy at Narayana Hospital, Gurugram. During the pre-intervention phase (25th Mar–2nd Apr 2025), 76 indents showed a 17.1% delay rate, with urgent indents taking an average of 42.5 minutes and routine ones 105–115 minutes. Over 44% of deliveries exceeded 2 hours, and 485+ medicine returns were recorded in just nine days.

Post-intervention (24th Apr–2nd May 2025), delays dropped to 7.9%, urgent indents were delivered within 30 minutes, and routine indents within 70–72.5 minutes, with returns reduced to 407.

Dispensing error incidents dropped by 90% in April after implementing targeted interventions.

Key interventions included clear SOPs, staff training, task redistribution, color-coded bins, and improved coordination.

The study highlighted that systemic inefficiencies—staff incapability—were the root cause, and structured processes, teamwork, and regular monitoring significantly enhance patient care quality.

