

Pharmacy Inventory Excellence Program: Digitization and Daily Monitoring for Enhanced Inventory Accuracy and Operational Efficiency in a Tertiary Care Hospital

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Abstract

Background:

Effective inventory management is a critical component of hospital pharmacy operations, particularly in high-volume tertiary care settings where inventory value and transaction frequency are substantial. The Inpatient Pharmacy at our institution manages inventory worth approximately ₹2.5 crore, involving continuous medication issues, returns, and stock movements. The traditional monthly paper-based stock-taking system resulted in delayed discrepancy detection, limited visibility, increased manual effort, and a higher risk of stock variance.

Objective:

To develop and implement a digital, real-time inventory monitoring system aimed at enhancing inventory accuracy, strengthening accountability, reducing stock discrepancies, and improving operational efficiency.

Methods:

A quality improvement initiative was undertaken through a phased approach. Initially, 17 structured inventory trackers were developed and inventory was categorized into critical segments, including bulk drugs, daily-use tablets, costly medications, and surgical consumables. Staff responsibilities were assigned for each tracker, and stock verification frequency was increased from monthly to daily or alternate-day monitoring. Subsequently, a mobile-based digital stock-taking solution was developed in collaboration with the Information Technology Department. The system enabled direct mobile data entry, integration with Excel-based monitoring tools, real-time stock visibility, and paperless workflow management.

Results:

Implementation of the program resulted in significant operational improvements, including continuous monitoring of a high-value inventory, faster verification processes, and enhanced ownership among pharmacy staff. The intervention enabled real-time identification and correction of stock variances,

reduced dependence on manual documentation, and improved audit preparedness. The project enhanced inventory accuracy, minimized manual errors, strengthened accountability, improved medication safety, and provided better financial control over inventory valued at ₹2.5 crore. Staff engagement and compliance with inventory monitoring processes also improved substantially.

Conclusion:

The Pharmacy Inventory Excellence Program successfully transformed inventory management from a reactive monthly stock-taking approach to a proactive, real-time digital monitoring model. The integration of structured inventory categorization, frequent stock verification, and mobile-based technology created a scalable, cost-effective, and sustainable system that strengthened operational efficiency, financial governance, and accreditation readiness. This model can be replicated in other hospital pharmacy units and healthcare organizations seeking to improve inventory control and patient safety outcomes.

Keywords: Pharmacy Inventory Management, Digital Transformation, Inventory Accuracy, Hospital Pharmacy, Stock Monitoring, Quality Improvement, Healthcare Innovation, Real-Time Inventory Tracking, Medication Safety, Operational Excellence.

Background

Pharmacy inventory management is one of the most critical and challenging components of hospital operations. The IP Pharmacy maintains a high-value inventory of approximately **₹2.5 Crore**, involving large volumes of **daily indents, issues, and returns**.

Traditionally, stock-taking was conducted **monthly using printed sheets**, which had several limitations:

- Delayed discrepancy identification
- Limited real-time monitoring
- High dependency on manual processes
- Increased risk of stock variance

Problem Statement

- Difficulty in managing high-value inventory with periodic stock-taking
- Increased chances of **stock discrepancies and delayed corrections**
- Lack of real-time visibility and accountability
- Time-consuming manual processes
- Reduced staff alertness due to infrequent monitoring

Objectives

- To implement a **real-time and digital inventory tracking system**
- To enhance **stock accuracy and accountability**
- To reduce stock discrepancies and financial loss
- To improve **staff engagement and monitoring frequency**
- To replace manual processes with **technology-driven solutions**

Intervention / Strategy

1. Development of Manual Tracking System

Mr. **Banshilal Rathod (Senior Pharmacy Staff)** led the initiative by:

- Designing **17 structured stock-taking trackers**
- Segregating inventory into **critical categories**
- Assigning responsibility to specific staff members

Trackers Developed:

- **3 Bulk Drug Trackers**
- **6 Daily Tablets Trackers**
- **1 Costly Item Tracker**
- **5 Surgical Items Trackers**
- (Additional trackers covering critical high-risk items)

✓ Shift from **Monthly** → **Daily / Alternate-Day Stock Taking**

2. Digital Transformation Initiative

To further enhance efficiency, **Pharmacy** in collaboration with the **IT Department** developed:

✓ **Mobile-based Digital Stock-Taking System**

Key Features:

- Direct stock entry **via mobile phones**
- Integration with **Excel-based trackers**
- Real-time data visibility
- Elimination of paper-based processes
- Instant updates and monitoring

Process Change

Earlier System	Improved System
Monthly stock taking	Daily / alternate-day stock taking
Manual paper-based tracking	Digital mobile-based system
Delayed discrepancy detection	Real-time discrepancy identification
Limited accountability	Assigned ownership per tracker
Reactive approach	Proactive monitoring

Key Improvements Achieved

✓ **Operational Improvements**

- Continuous monitoring of **high-value inventory**
- Structured **responsibility allocation**
- Faster stock verification process

✓ **Quality & Safety Improvements**

- Significant reduction in **stock discrepancies**

- Improved **medication safety**
- Early detection of variances

✓ Staff Performance

- Increased **staff alertness and accountability**
- Better engagement through assigned ownership
- Reduced workload stress through digitization

✓ Financial Impact

- Improved control over **₹2.5 Crore inventory**
- Reduction in stock loss and variance
- Better audit compliance

Outcome / Results

- **Enhanced inventory accuracy**
- **Real-time monitoring and control**
- Reduction in **manual errors**
- Improved **audit readiness (NABH/JCI compliance)**
- Increased efficiency in handling **high-volume transactions**

Innovative Aspects

- Hybrid model: **Manual structuring + Digital execution**
- Mobile-based **real-time stock-taking system**
- Micro-level tracking through **17 dedicated trackers**
- Practical, scalable, and cost-effective solution

Sustainability Plan

- Continuous monitoring via digital dashboards
- Periodic review of trackers and categories
- Staff training for digital adoption
- Expansion to other pharmacy units (OP, OT, Oncology)

Conclusion

This project represents a **significant transformation in pharmacy inventory management**, moving from a reactive monthly system to a **proactive, digital, and real-time monitoring model**.

The combined efforts of **pharmacy and IT Department** have created a **robust, efficient, and scalable system** that strengthens both **operational control and financial governance**.