Pharmacy Inventory Management & Perpetual Inventory

Michael Cushner, CPhT
SUNY Upstate Medical University

Learning Objectives

➢ Explain the importance of the Pharmacy Buyer regarding inventory management
➢ Identify basic causes for inventory inaccuracies (Receiving, Dispensing, and Refilling)
➢ Explain different processes that can be implemented to greater enhance inventory “turns” and reduce the amount of waste/expired medications

Inventory Management….Why We All Care

“We want to turn our inventory faster than our people.”
James Sinegal

➢ Importance of inventory management
  ➢ Budget (Healthcare Expenses)
  ➢ Patient Safety
  ➢ Drug Traceability (DSCSA)

Impact of Inventory Management

➢ Budget
  ➢ Prices continually increase, meaning that more inventory turnover is needed to continue to remain profitable
  ➢ Dispensing patterns and drug selection choices may have a direct effect on the affordability of care. Utilizing drugs that are non-contracted or not on the formulary may be more costly to the patient or may result in a lower than expected reimbursement.

Patient Safety

➢ In a national survey performed by the Institute for Safe Medication Practices, 20% of practitioners surveyed reported that adverse patient outcomes occurred because of a lack of inventory management and monitoring of supply levels.

➢ Pharmacy Buyers are the front line in communicating shortages

Drug Supply Chain Security Act (DSCSA)

➢ "Outlines steps to build an electronic, interoperable system to identify and trace certain prescription drugs as they are distributed in the United States. This will enhance FDA's ability to help protect consumers from exposure to drugs that may be counterfeit, stolen, contaminated, or otherwise harmful. The system will also improve detection and removal of potentially dangerous drugs from the drug supply chain to protect U.S. consumers."
Drug Supply Chain Security Act (DSCSA)

- 3 T's
  - T.I. - Transaction information
  - T.H. - Transaction history
  - T.S. - Transaction statement
- Maintenance of Records
  - Physical copies held for 6 years
  - Electronic copies

Audience Engagement

- For each of the following Invoices:
  Identify the 3 T's required for DSCSA compliance

No DSCSA documentation required- Not a medication

What is unique about this medication?

Perpetual Inventory vs. Periodic Inventory

The measure of ending inventory can be determined by using one of these 2 varying inventory systems:

- Periodic Inventory System: There is no daily detailed record of inventory; Rather a physical inventory is counted at the end of a set period of time.
- Perpetual Inventory System: Daily detailed and updated records of transactions in "real-time". Inventory is maintained by a transaction to transaction basis throughout a set period of time.
Perpetual Inventory Systems

- Provides a running count of inventory on hand
- Can constantly record the following:
  - Number of units purchased and cost amount
  - Number of units dispensed to automated dispensing unit
  - Real time QOH and current cost
- Better Inventory Control:
  - Purchasing and Inventory systems are incorporated with accounts receivable and sales
- Physical counts occur once a year
  - A double check method to ensure accuracy of ending inventory

Advantages of Perpetual Inventory System

- Real-time Inventory Accuracy
- Dependable base for purchasing accuracy
- Continuous information is provided about the quantity of medications at various automated dispensing machines
- Provides information necessary to maintain minimum and maximum levels by proper timing of medication purchases
- Transparency in inventory tracking, transactions, and accountability
- Helps in explanation of Loss/Gain Factors

Disadvantage of Perpetual Inventory System

- Time consuming
  - Review of daily transactions that send “red-flags”
  - Review of daily cycle counts that are greater than 5 units

Review of Cycle Count Variance

Automated Unit based Cabinet

- Automated medication dispensing system supports decentralized medication management with various features for safety and efficiency. The system helps accurately dispense medication, while supporting pharmacy workflows.
- Barcode scanning:
  - Enabled for all refills into cabinets.
  - Ensures accuracy of refills, does not ensure the accuracy of quantity nor expiration date

Automated Unit Based Cabinet

PROS

- Maintains "standard stock" medication - no delay in patient care
- Easy removal of medication for patients
- Holds several medications
- Tracks inventory and expiration dates

CONS

- Malfunctions
- Not every medication is located in machine - delay in patient care
- Size constraints
- Refilled multiple times daily
Refilling Automated Unit Based Cabinets

- Every inpatient unit is refilled twice daily (Batch refills)
- Hourly Refills - Every hour technicians fill units that have stock outs or new medication loads.

Limitations:
- Medication may not be available in main pharmacy
- Sufficient quantities may not be available
- Human error - Expiration dates may have been entered incorrectly and when refilling a medication that says “Expected 10 tablets” but there are only 8 tablets available can cause inventory discrepancies.

Inspections of Automated Unit Based Cabinets

Purpose: To verify accurate inventory and expiration dates in each automated cabinet.

- Who: Designated Pharmacist or Technician
- What: Verify current inventory and expiration dates - select 10 random medications to verify
- When: Monthly
- Why: Inventory Management and Patient Safety

Limitations:
- Staffing
- Size of unit
- Timeframe
- Number of units to be checked
- Human Error

Dispensing of Medications

Loading Medication Into Automated Dispensing Cabinets

Benefits:
- Transaction Tracking
- Limits the delay in patient therapy
- Prevention of lost medications

Disadvantages:
- Requires multiple refills daily
- Incorrect QOH
- Incorrect Expiration Dates

Patient Specific Doses

Benefits:
- Transaction Tracking
- Sending of 1 time doses (prevention of unnecessary loading)

Disadvantages:
- Lining of Medication
- Multiple charges
- Incorrect Dispensation quantities

Receiving of Daily Orders

- Daily Orders are received and restocked into a decentralized inventory system
- Pharmacy Buyer helps to put the order away and to help identify any shortages/overages that may be sent from the wholesaler.
- Pharmacy Buyer links new NDC #’s (2nd check done by other Pharmacy Buyer) when primary options are not available
- Sometimes the inventory management software does not drop the correct quantities into the restock queue, causing inventory discrepancies if not paid attention to.

What Happened?

Primary NDC = 100 count boxes (200)
Shipped NDC = 14 count boxes (84)
Discrepancy of 116 packets if scanned w/out change

Procedures That Have Been Implemented

- Maintain a backorder list on wholesalers website
- Daily Cycle Counts
- Static Ordering
- 80/20 Report
- Unit Dose (UD) vs Bulk Bottle (BB)
- Prepackaging Evaluation
Cycle Counts
- Inventory of each Medication done Monthly
- High $ Medications q14 days (Factor Products)
- Inventory Discrepancies reviewed daily by Purchaser
- Approximately 65 cycle counts to be completed daily
- Audience Engagement

Complete the following Cycle Count

A. 3,690iu  B. 3,310iu  C. 3,320iu  D. 3,590iu

Correct Answer: 3,590iu VWF

570(3) + 470(4) = 3,590

Cycle Count Variance
* Based on 1860 items counted monthly

Daily cycle counts off by 1 unit or greater
- June 17: 401
- July 17: 231
- August 17: 261
- September 17: 221
- October 17: 100
- November 17: 186
- December 17: 181
- January 18: 160
- February 18: 118
- March 18: 152
- April 18: 123

Daily cycle counts > 5 units
- June 17: 401
- July 17: 231
- August 17: 261
- September 17: 221
- October 17: 100
- November 17: 186
- December 17: 181
- January 18: 160
- February 18: 118
- March 18: 152
- April 18: 123
Static vs. Dynamic Ordering

Static Ordering
- Pros:
  - Hard min/max levels set
  - Easily changeable to accommodate change in usage
  - No ordering unnecessary medication
  - No guess work involved
- Cons:
  - Weekend Ordering
  - Ordering the same medications daily

Dynamic Ordering
- Pros:
  - Ensures QOH of fast-movers
  - Triggers medication to be ordered that otherwise may not be needed
- Cons:
  - Ordering of medications not needed at the time
  - Orders received are larger than needed
  - Medications may no longer be considered a fast mover

Minimum & Maximum Par Levels

- Static Ordering: A set min/max level for each medication that is stored in the pharmacy. Once a minimum level is reached the item is queued for re-order.
- Dynamic Ordering: Min/Max levels for each medication is set, but can be queued for re-order based on historical purchases, without reaching a minimum level.
  - “Fast movers”: a medication that moves often and in high volume.

Line Items Received

Interpretation
- A change to hard min/max levels has decreased the number of line items received daily
- Benefits:
  - Less inventory on shelves
  - Greater inventory turnover = Less waste/spoilage
  - Less burden on the stock receiver, technicians putting away the order in a timely manner

80/20 Report
- A report created to rotate stock in the automated unit based system
  - Why: To reduce waste/spoilage, to recycle high $ medications, prevent from ordering excess amounts of medications
  - What: A Report that shows the top 80% of medications purchased within a set timeframe (Previous Month).
  - How: Filter out the medications that are not located in the automated units, as well as under a set $ value ($100 per unit or >, i.e. Esmolol PM, Procrit, Dornase)
  - Run report of medication locations throughout the hospital that have not been used within X amount of days (21)
  - Bring back the product and return to pharmacy inventory
  - Reduces inventory in automated units, and enables same medications to be used on floors with active orders
- Limitations:
  - Not always done monthly due to staffing constraints

Unit Dose (UD) vs. Bulk Bottle (BB) Prepackaging
- As an institution, the decision was made that any UD product that is within 20% price of BB the change was to be made, to lessen the burden on the MAK technician
- Pros:
  - Maintain the integrity of the product
  - Maintain the expiration date
  - No excess cost involved (prepackaging materials + time/labor)
- Cons:
  - Often times more expensive
  - UD more likely to go on B/O rather than a BB

When does purchasing UD make more sense than ordering a BB or vice versa?
Levetiracetam 500mg/5ml Oral Solution

Manufactured UD Cups

- Manuf. 1: 40x5ml = $142.25
- Manuf. 2: 40x5ml = $146.65
- Manuf. 3: 50x5ml = $208.08

AMU = 475 syringes
Cheapest cost = $1,564.75
11 purchases of Manuf. 1 = 440 syringes

Prepackaging of Bulk Bottle

- Cost of 1 bottle (473ml [$13.91]) = $69.95
- Cost of supplies (Syringes [$0.11], Labels [$0.02]) = $61.75
- Cost of technician labor (2hr) = $50
- Cost of RPh labor (1/2hr) = $50
- Total Cost: $231.30 for approx. 475 syringes
- Total Monthly savings = $1,333.45

Acetaminophen 325mg tablets

AMU: 23 (10x100 tablets)

Bulk Bottle

- Manuf. 1 = $1.85 per bottle of 1,000 ($88.55)
- Manuf. 2 = $4.81 per bottle of 1,000 ($110.63)

Preferred Unit Dosed Manufacturer

- $13.97 per 10x100 tablets
- Average Monthly Cost: $231.31
- Medication cost is > but when
  - time/labor is factored in UD, is
    - more sensible

Calculating Inventory Turns

- Cost of goods sold: Sum of all purchases during a specific time frame (Calendar year, Fiscal year, Quarterly)
- Total Inventory on hand
- Formula: Inventory Turns = Cost of Goods Sold / Inventory on Hand
- The resulting figure should be more than 10

Example Of Inventory Turns

- On Coca-Cola’s historical income statement from 2017, the cost of goods sold was $13.256 million. Coca-Cola’s average inventory value between 2016 and 2017 was $2.665 million, found by calculating the average of the balance sheet inventory from two points in time, 2016 and 2017, by summing the two inventory values together then dividing by two = 4.974 inventory turns per year.
- Compared to:
  - Dr. Pepper= 10.75 turns for 2017
  - Pepsi= 9.77 turns for 2017

SUNY UPSTATE Medical 2017

- Total Spend = $50,405,385.13
- Total Inventory on hand (Pharmacy + Automated cabinets) = $4,161,041.43
- Inventory Turns for 2017 = 12.11
- Number of days to complete 1 turn = 30.14
  - 365 days in a year / 12.11 ( # of turns)
- Goals for 2018 - maintain # of turns, and decrease # of days to complete a turn

Summary

- Pharmacy Buyers do more than just buy drugs
- There are several variables in the pharmacy that can cause discrepancies in inventory
- Various processes can be implemented to increase the number of turns for a pharmacy which allows for greater profitability
References


Thank you!

> Questions/Comments?