Medication Inventory Management

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Learning Objectives

- Definition of Inventory Management?

- Inventory Management System in Context

- Stock Records and Standard Report

- Stock Counts

- Cyclic Counting

- Activity Report and Performance Monitoring

- Stock and Item Selection

- Safety Stock and Service Levels

- Inventory control and Reorder Frequency

- The Inventory Control Model

- Replenishment Policies and Inventory Planning

- Service Level and Safety Stock In Inventory Planning Process

What is inventory management?

- Inventory management for pharmaceutical supply may sound easy…
    - order – receive – store – issue – reorder but in reality it is not so simple

- Inventory management is a primarily about specifying the outline and placement of stocked goods.
- It is required at different locations within a facility or within many locations of a supply network to precede the regular and planned course of production and stock of materials.
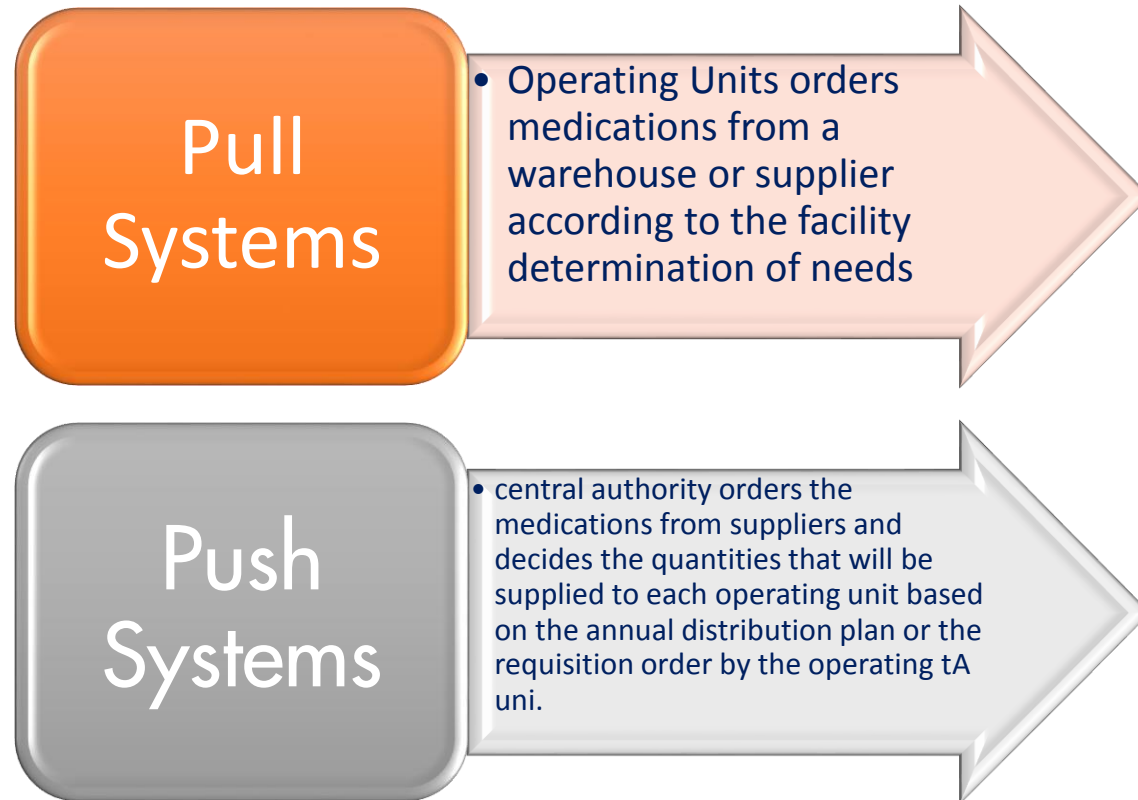
Inventory Management System in context - 01

The context in which an inventory management systems operates depends on two factors

❑ **Independent demand systems:** Applicable to the management of procurement and distribution of finished goods. The order intervals and quantities are derived from forecast based on

    Historical consumption of clients

    Knowledge of expected changes in consumption

    Inventory levels are set to provide a defined level of service to clients at an acceptable cost

❑ **Dependent demand systems:**

    Manage inventory for raw materials with supplies based on the production needs for production in a manufacturing or repackaging settings

    Ordering intervals, quantities and inventory levels depend on projected production schedule

Inventory Management System in context - 02

As our major audience here is involved mainly in the procurement and distribution of finished pharmaceutical products, our focus would be on the independent system.

Pull Systems

- Operating Units orders medications from a warehouse or supplier according to the facility determination of needs

Push Systems

- central authority orders the medications from suppliers and decides the quantities that will be supplied to each operating unit based on the annual distribution plan or the requisition order by the operating tA uni.

Focus on complex systems involving multiple levels of storage, e.g. a central health facility, both systems may be at work in different level of the systems or be used at the same time for a limited period.

Introduce a limited push system to supplement supplies while addressing inefficiencies in the pull system or vice versa.

Stock Record and Standard Reports

The type of stock records forms the foundation of effective inventory management

❑ **Stock Records:**

➢ Core records in Inventory management system.

➢ Primary source of information used in various reordering formula

➢ Source of data used to compile performance reports

➢ Can be either manual or computerised

❑ **Manual Stock Records**
➢ Vertical file cards – File cards stored vertically in alphabetical or numerical order in a file card or drawer

Stock Record and Standard Reports

❑ **Kardex System:** Cards are stored in a visible –edge record-tray system with names and stock numbers on the lower edge , overlapped to provide an index

❑ **Bin Cards:** File cards are physically kept with the stock. This system makes a visual spot check easy, can serve as a reminder to keep accurate records and can serve as a backup to the earlier mentioned. If a product has different batches and expiry dates, two sets of bin cards can be maintained. However, only one stock card containing information on both batches need to be used.

❑ **Ledger system:** Records are kept on ledger sheets in a bound or loose-leaf book

Many supply system maintain two stock records to improve accuracy and accountability

Stock Record and Standard Reports

❑ Computerisation: Most desirable if the facility can afford and support automation.

- ➢ Efficient way to manage inventory (perpetual or periodic purchasing)

- ➢ Information retrieval and reporting easier

- ➢ Depends on type of software program

- ➢ How well the system is operated

- ➢ Accuracy of data entry

❑ Key point about stock records (manual or computerised) should be current and accurate

❑ Managing reordering process is impossible with inaccurate stock records.

# Factors Contributing to Inaccurate Stock Records

- ❖ High volume, repetitious entries

- ❖ Similar medications in different forms / strength

- ❖ Duplicate entries for receipts or issues

- ❖ Spoiled or junk stock destroyed but not written off the records

- ❖ Pilferage except when records are deliberately altered to conceal theft

- ❖ Irregular physical stock counts

- ❖ Sloppy storekeeping or warehouse practice especially when stock of the same items are stored in different locations

- ❖ Staff (training, pay, motivation)

- ❖ Poor supervision

- ❖ Automation and newer technologies like bar coding can reduce above inaccurate stock problems

Stock Count

❑ This is Important for re-ordering purposes and knowing the inventory value.

❑ Some pharmaceutical supply systems still do not count stock relying totally on inventory records.

❑ Stock count should be conducted at least bi-annually.

❑ Best approach is Cyclic Counting (Continuous counting or Perpetual Inventory.

  ➢ Entire inventory is divided into counting groups

  ➢ Groups counted weekly /monthly/quarterly with immediate reconciliation of discrepancies

  ➢ This ensures that every item is counted at least once a year

  ➢ Regular cyclic stock count is generally superior to annual stock

  ➢ Annual stock count can shut down the whole warehouse or distribution operations for days even up to a week

    ✓ Disrupts the supply system prone to mistakes due to rushing

    ✓ Tracking of discrepancies difficult – records simply corrected to reflect actual stock and any losses written off.

Advantages of Cyclic Counting

❑ Eliminates shut down and interruption to normal operations

❑ Eliminates annual inventory adjustments

❑ Allows causes of errors to be identified and corrected

❑ Reduces pilferage

❑ Maintain integrity (staff who receive stock should differ from those who perform the stock count and the ones who reconcile the discrepancies)

❑ Maintains accurate inventory records

❑ Continuous improvement
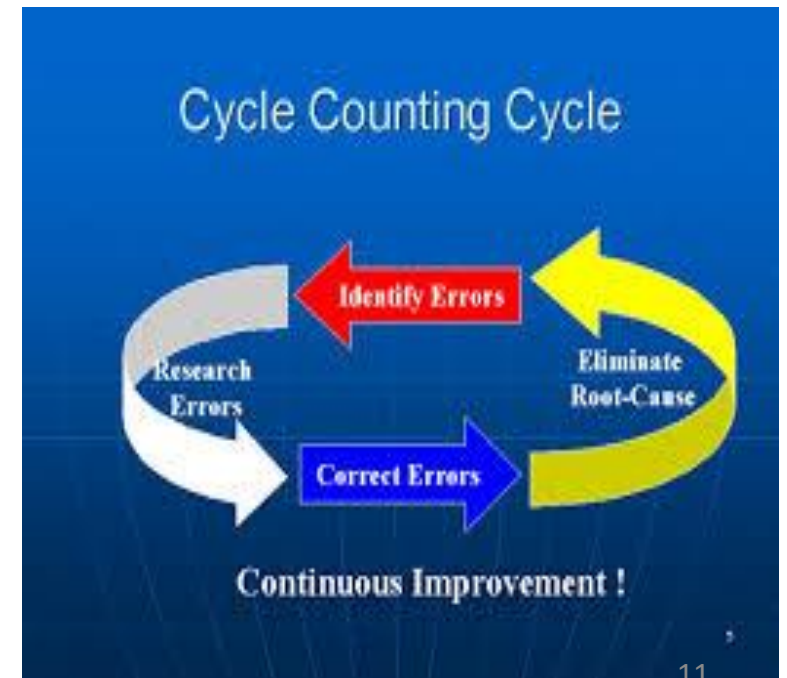
Activity Reports and Performance Monitoring

The most accurate stock records have little value if the information is not compiled in reports for use to make purchasing and stock management decisions.

❖ Two similar but separate reports are useful

❖ Periodic Analysis: this lists performance indicators

❖ Routine reports: Produced monthly or quarterly mostly in computerised system or at least annually in manual systems

❖ Stock position

❖ Beginning and ending inventory values

❖ Values of all supplies received and issued during the reporting period

❖ Value of stock adjustment during reconciliation

❖ Consumption pattern for all stock items

❖ Short dated stock that are likely to expire before it can be used up

❖ Expired stock cost and disposal to reflect actual stock and any losses written off.

Stock and Item Selection

Stock must be held for the following reasons

❑ To ensure availability – demand forecast cannot be done with complete accuracy. Proper inventory management allows absorption of fluctuation in supply and demand and reduces the risk of stock outs

❑ To maintain confidence in the system – if stock outs occurs regularly, loss of confidence of patients in the system

❑ To reduce unit cost of medications – ordering in bulk allows quantity discounts from suppliers and reduces shipping / clearing cost

❑ To avoid shortage costs – if emergency orders are needed to cope with stock –outs cost might be higher than for regular orders. Clients may go else where for their medications

❑ To minimise ordering cost – purchasing costs increases when items are ordered frequently. These costs include staff salaries, and other costs associated with tenders and regular orders.

❑ To minimise transport cost – Less frequent deliveries reduces transportation cost. These resources can be channelled to other demands

❑ To allow for fluctuation in demand

Selection of Items to be held in Stock 1

Common practice

- Stock all items on the formulary or essential medicines list

- Items not on the formulary regularly requested by Physicians also routinely held in stock

No differentiation made between vital and essential items, between high /low cost items and fast moving/rarely used item.

Look at records of stock movement and identify the high volumes that definitely needs to be stocked and slow moving items

Selection of Items to be held in Stock 1

ABC Analysis Consumption This categorises items by volume and value of consumption during a specific period usually one year.

Class A- Items
- Goods which annual consumption value is the highest; the top 75-80% of the annual consumption value of the company - accounts for only 10-20% of total inventory items.(Fast moving items)

Class B- Items
- 30% of total inventory items and 15-20% of the annual consumption (Medium Consumption)

Class C- Items
- 60-80% of total inventory items and 5-10% of the annual consumption (low volume /slow consumption).

Selection of Items to be held in Stock 2

VEN System

- ❖ Vital, Essential, Non-Essential items
- ❖ Prioritise procurement when not enough funds exist to purchase all items requested.
- ❖ Not all medicines have to be stocked at each level
  - Classifying stock/Non stock according to approved level of use (Paracetamol vs Chemo drugs)
  - Local availability
  - Vital to patient needs
  - Lead procurement time
  - Periodically re-evaluate stock status (Computerised systems)

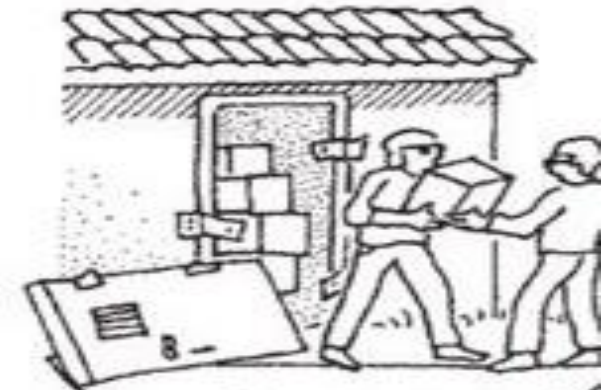# Balancing the Benefits and Cost of Inventory Management

BENEFITS

➤ Minimize life-threatening shortages
➤ Facilitate bulk purchasing
➤ Increase transportation efficiency
➤ Protect against seasonal fluctuations

COSTS

➤ Capital cost
➤ Expiration
➤ Spoilage
➤ Obsolescence
➤ Storage
➤ Pilferage

Service Level and Safety Stock

❖ **Service Level (Fill rate)** - %age of individual items ordered from a supplier or warehouse issued from stock at hand
#items issued / items requested x 100

- Percentage of items requested that are delivered within the promised lead time
- Every percentage point decrease in service level by a supplier or warehouse – a corresponding increase in shortages at the facility

A public sector pharmaceutical supply system should strive for a 100% service level at least for vital items.

❖ **Safety Stock**

Safety stock is an additional quantity of an item held in inventory in order to reduce the risk that the item will be out of stock. Safety stock acts as a buffer in case the sales of an item are greater than planned and/or the supplier is unable to deliver additional units at the expected time.

Service Level and Safety Stock
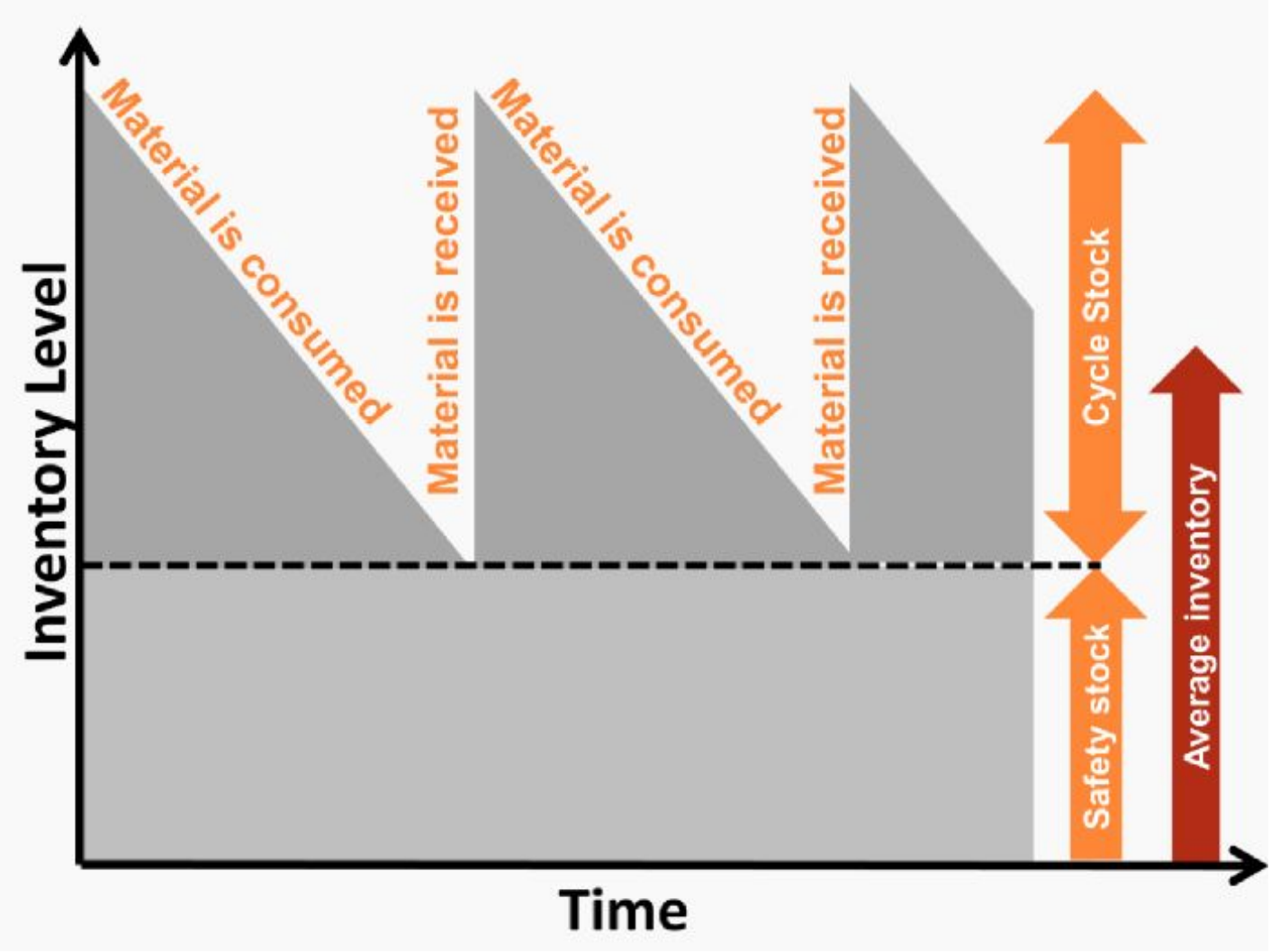
Inventory control and Reorder Frequency

Factors to Consider in Calculating Reorder Quantity

❑ Average Consumption

❑ Lead Time

➢ Time between initiation of purchase order and receipt in the warehouse by the selected supplier

❑ Safety stock

➢ Stock that should always be on hand to prevent stock-out

❑ Reorder Level

➢ The quantity of remaining stock that should trigger reorder of the item (Minimum stock levels)

Average lead time x average quantity consumed

❑ Maximum Stock Level

➢ Target stock that satisfy demand until next order is received

❑ Stock Position (Working stock + safety stock)

❑ Procurement Period - Time until next order is placed

❑ Storage Capacity

Inventory control and Reorder Frequency

In pharmaceutical supply systems the most common inventory control models are

❖ Annual Purchasing

❖ Scheduled Purchasing

➢ Prescribed intervals weekly, Monthly Quarterly, Biannually

❖ Perpetual Purchasing

➢ Stock levels reviewed each time stock is issued and orders placed whenever stock level falls below Minimum level

Annual Purchasing

Procurement is carried out once a year. Best suited for new programs, donor support and local supplies limited.

❖ **Advantages**

✓ Easier to manage than more frequent purchases

✓ Prices per unit usually lower – inflation cost not affecting unit cost (Bulk Purchasing)

✓ Staggered deliveries to storage facilities with even cash flow arrangement

❖ **Disadvantages**

✓ Actual consumption different from annual forecast (shortages or surplus)

✓ Average stock level and inventory cost higher

✓ Local suppliers that win annual contract may find it difficult to cope with huge single delivery

✓ More storage space required

✓ Fund to pay may e difficult to obtain

✓ Workload in the procurement office and receiving points uneven

Scheduled Purchasing

Procurement is carried out at scheduled intervals (Monthly, quarterly, Bi-annually)

❖ **Advantages**

✓ Estimated quantities rather than fixed contract is supported

✓ Prices per unit usually lower – inflation cost not affecting unit cost (Bulk Purchasing)

✓ Less storage space required

✓ Local suppliers can spread the demand over the year

✓ Procurement team can respond more quickly to program needs

❖ **Disadvantages**

✓ Orders placed late in the Fiscal year may not be complete before end of the year

✓ Inflation can affect already fixed contract prices

Perpetual Purchasing

Perpetual inventory record is held for each item

❖ **Advantages**

  ✓ Can be used where lead time for virtually all items in 1-2 days (Developed countries)

  ✓ Even workload for procurement, warehousing and distribution offices

  ✓ Safety stock might be lower than scheduled purchasing

  ✓ Less storage space required

❖ **Disadvantages**

  ✓ Increased purchasing cost but this can be offset by decreasing inventory holdings

  ✓ Inflation can affect cost of items

Combination of Annual, Scheduled and Perpetual purchasing can be used using the ABC analysis.

The Inventory Control Model
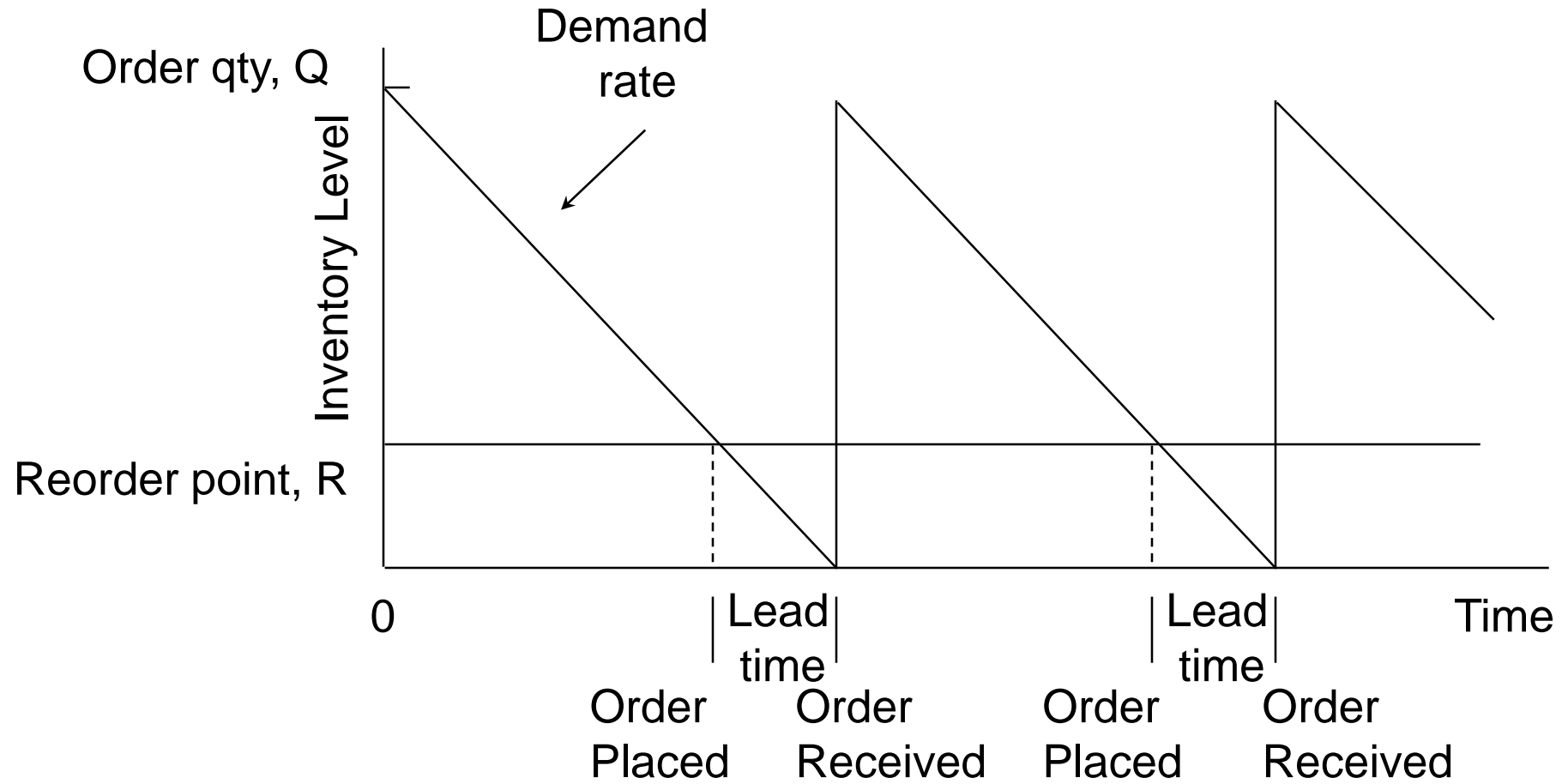
Replenishment Policies and Inventory Planning

❖ Replenishment or Reordering

Reordering or replenishment process needs to define review period for reordering, and an ordering quantity..

❖ Continuous Review
- ✓ The inventory levels are continuously reviewed, and
- ✓ As soon as the stocks fall below a pre-determined level (usually called, reorder point, or reorder level), replenishment order is placed.

❖ Periodic Review
- ✓ The inventory levels are reviewed at a set frequency.
- ✓ If the stock levels are below the pre-determined level, then an order for replenishment is placed, otherwise it is ignored till the next cycle.
- ✓ Provides a viable process alternative to the continuous review by segmenting the merchandise into review buckets.

Service Level and Safety Stock In Inventory Planning Process