Introduction to Logistics Management

Dr. Emmanuel Kumah

Objectives

In this session, we will learn the following:

- A definition of logistics
- Why logistics is important for healthcare operations
- Different components of a logistics system and how they fit together
- Definitions of key logistics terms

Introduction

- In all facets of our lives, goods and services are transported from the place they are produced to the place they are consumed
- This exchange process is the cornerstone of all economic activity
- In the case where there are many exchanges taking place between producers and consumers , the firms which are involved in bringing the products or services to the market are aligned in a network called supply chain

Introduction

Over time, the profession of supply chain management has evolved to meet the changing needs of the global supply chain

According to the Council of Supply Chain Management Professionals (CSCMP)

- Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement and all logistics management activities

Supply Chain Management

- It includes coordination and collaboration with channel partners - suppliers, intermediaries, third party service providers, and customers

- It integrates supply and demand management within and across companies/organizations

What is Logistics Management?

- The part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirement (CSCMP, 2011)

- Considered as the operational component of supply chain management, including quantification, procurement, inventory management, transportation and fleet management, and data collection and reporting

- Supply chain management includes the logistics activities plus the coordination and collaboration of staff, levels, and functions

- The supply chain includes global manufacturers and supply and demand dynamics, but logistics tends to focus more on specific tasks within a particular health system

Why Logistics Matters

- The goal of a health logistics system is much larger than simply making sure a product or a service gets where it needs to go

- The ultimate goal of every health logistics system is to help ensure that every customer has commodity/service security - when every person is able to obtain and use quality essential health supplies and services whenever he or she needs them
- A properly functioning logistics system is a critical part of ensuring commodity security

Why Logistics Matters

- Logistics increases program impact - Customers feel more confident about the health program when they have a constant supply of commodities
- Logistics enhances quality of care - Well-supplied health workers can use their training and expertise fully, directly improving the quality of care for clients
- Logistics improves cost efficiency and effectiveness - It reduces losses due to overstock, waste, expiry, damage, pilferage, and inefficiency

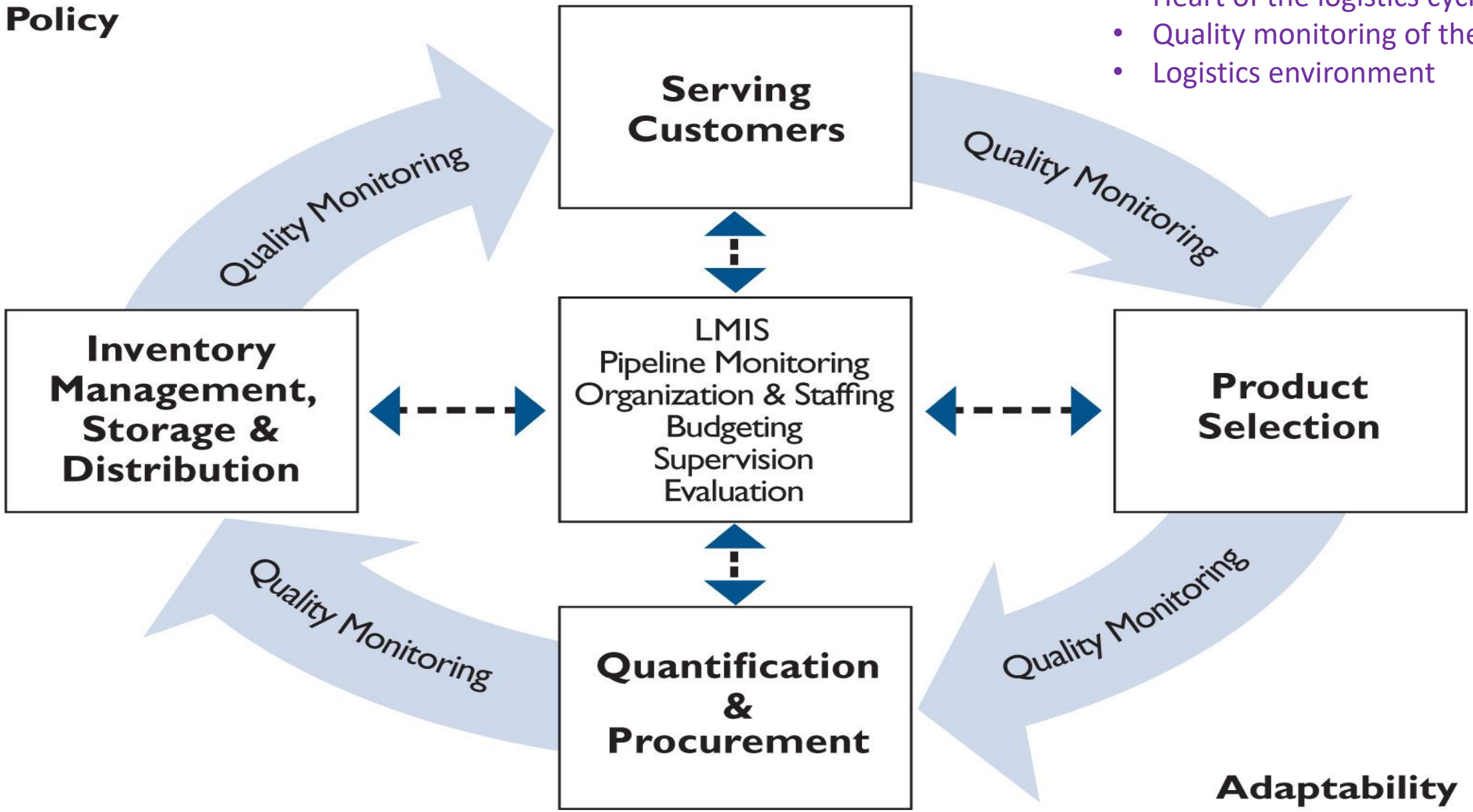
The Six Rights of Logistics

- The **RIGHT** goods
- In the **RIGHT** quantities
- In the **RIGHT** condition delivered
- To the **RIGHT** place
- At the **RIGHT** time
- For the **RIGHT** cost

The Logistics Cycle

Divided into:

- Major activities
- Heart of the logistics cycle
- Quality monitoring of the activities
- Logistics environment

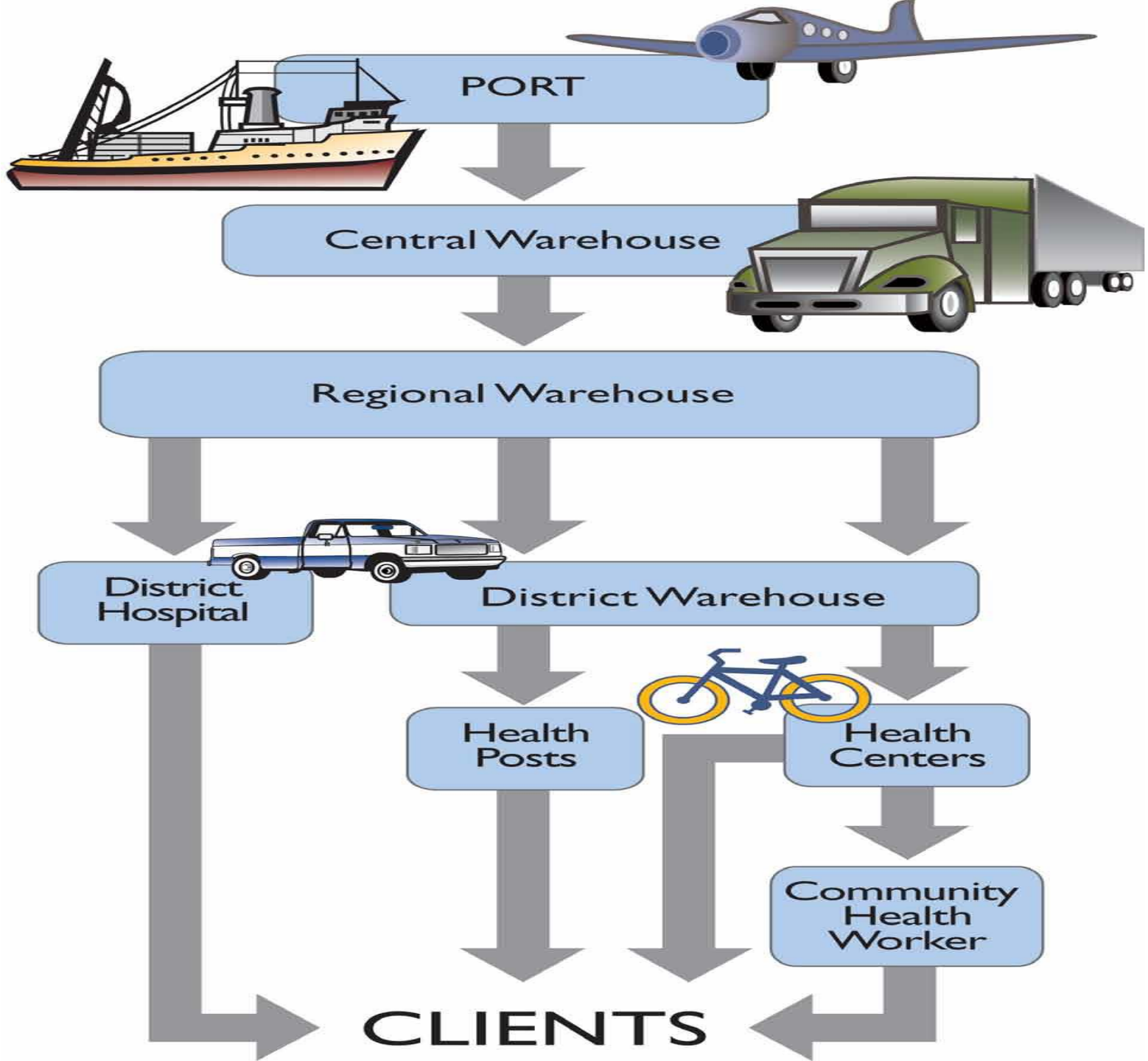


Key Logistics Terms

- **Supplies, commodities, goods, materials, products, and stock** (used interchangeably) - All items that flow through the logistics system
- **Users, patients, clients, and customers** - The people who receive or use supplies
- **Service delivery point (SDP)-** Any facility where clients receive supplies
- **Pipeline** - The entire chain of physical storage facilities and transportation links through which supplies move from the manufacturer to the user, including port facilities, central warehouse, regional warehouses, district warehouses, all SDPs, and transport vehicles

  - **Like a water pipeline, the logistics system has tanks and physical pipes (the warehouses and means of transportation) that store and move water (the product) to the home (the SDP)**

Typical Public Sector In-Country Supply Pipeline



Logistics Terms

- **Lead time** - The time between when new stock is ordered and when it is received and available for use
- **Requisition system** – Where the person receiving the supplies calculates the quantities of supplies required
- **Allocation system** - The person issuing the supplies calculates the quantities of supplies required
- **Rationing –** This is when commodities are not in full supply, and the higher level determines how to fairly distribute what is available

Logistics Management Information Systems

Dr. Emmanuel Kumah

Objectives

In this session, we will learn the following:

- Purpose of a logistics management information system
- Essential data needed for logistics management
- The three types of logistics records and the data they must contain

Logistics Management Information Systems

- Information is the engine that drives the entire logistics cycle
- We collect information to make decisions
- The better information we have, the better decisions we can make

- **A logistics management information system (LMIS)** is the system of records and reports used to collect, organize, and present logistics data gathered across all levels of the system

- LMIS enables logisticians to collect the data needed to make informed decisions that will ultimately improve services for client

Similarities & differences between health management information system (HMIS) and logistics management Information system (LMIS)

	HMIS	LMIS
Data collected	• Data about patients' health conditions or health services rendered	Data about commodities, i.e., quantities issued, dispensed, used, received, lost/stolen/damaged, ordered, etc.
Frequency of data collection	• Data is collected and recorded daily, and usually compiled and reported monthly or quarterly	Data is collected and recorded daily, and usually compiled and reported monthly or quarterly
How frequently data is used to make decisions	• Data collected may be analyzed monthly or quarterly to determine disease patterns • Data may be used annually, or every few years, to track disease patterns or health service usage	• Data are analyzed daily to assess stock status • Data are analyzed and used monthly or quarterly to determine resupply or order quantities • Data are used annually to conduct quantification exercises

Essential Data for Decision-making

To make logistics decisions, a logistics manager needs three essential data items:

(1) stock on hand,

(2) consumption, and

(3) losses and adjustments.

Essential Data for Decision-making

DATA ITEM	DEFINITION	EXAMPLE
Stock on hand	The quantities of usable stock available	The hospital has 300 bottles of paracetamol in the store on the last day of the month
Consumption	The quantity of stock dispensed to users or used during a particular time period	In the last month, the hospital dispensed 1,045 condoms to clients
Losses and adjustments	Losses are the quantity of stock removed from the pipeline for any reason other than consumption by clients (e.g. expiration, theft, damage, etc.) Adjustments are the quantities of stock issued to or received from other facilities at the same level of the pipeline	In the past month, the district hospital had • 30 male condoms expired (loss) • 4 IUDs stolen (loss) • Loaned another health facility 12 packages of oral rehydration salts (negative adjustment) • Received 20 treated malaria nets from another health facility (positive adjustment)

Types of Logistics Records

- From a logistics point of view, only three things can happen to supplies in a pipeline— they can be stored, moved (in transit), or consumed (used)
- Because we want to monitor products at all times in the pipeline, we need three types of logistics records to track the products :

1. **Stockkeeping records** - Holds information about products in storage
2. **Transaction records** - Holds information about products being moved
3. **Consumption records** - Holds information about products being consumed or used

Stockkeeping records

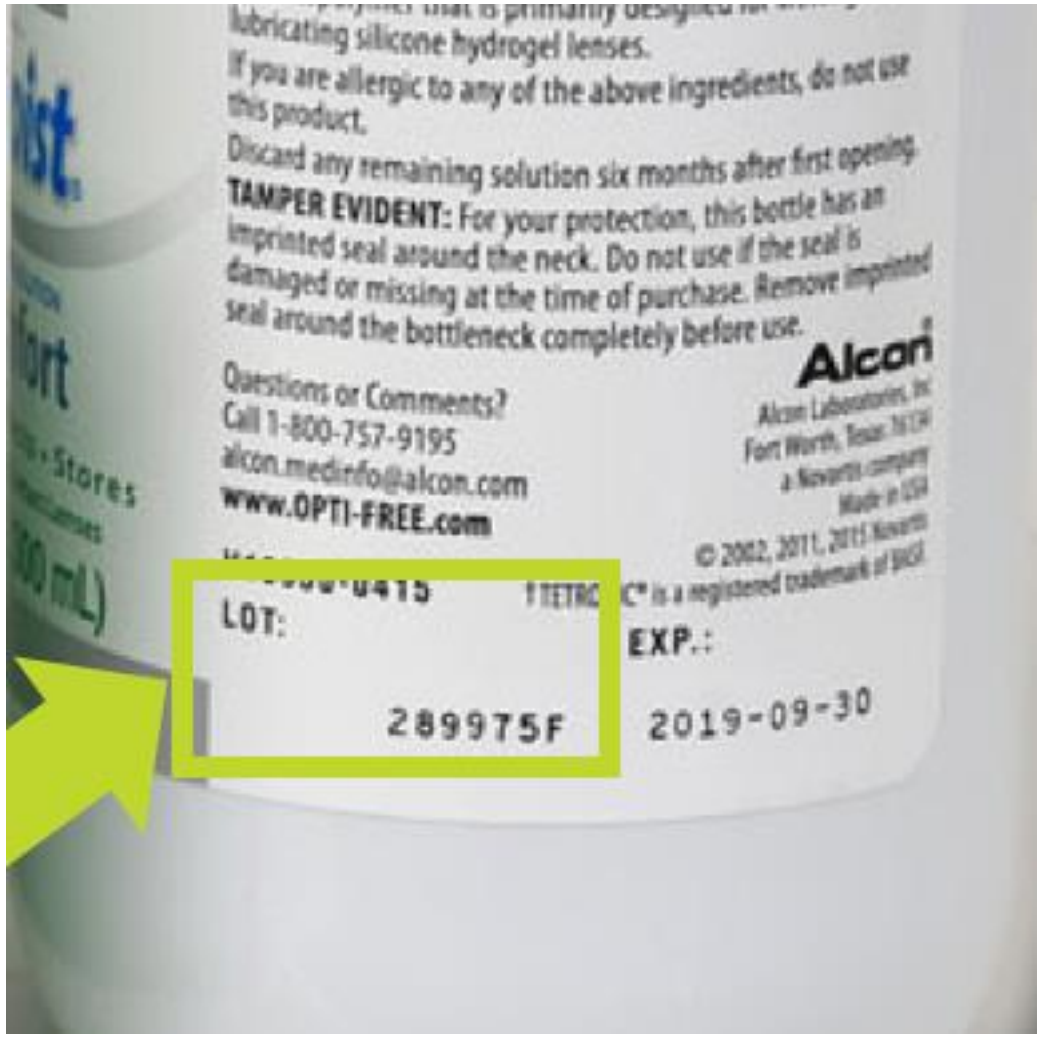
- They must contain the quantity of stock on hand; the quantity of losses; and the quantity of adjustments, by individual product
- Entries are recorded on the stockkeeping record whenever products are received or issued
- Entries are also recorded when stock is counted during a physical inventory, or as soon as a loss is noticed
- When the stockkeeping record is full, a new record is started, using the ending balance from the previous record
- The most common formats for stockkeeping records are stock cards (bin cards, inventory control cards) and stores ledgers

Bin Card

- It is an individual stockkeeping record that holds information about a single product by lot number or batch number
- Every item in that lot will have the same expiration date

BIN CARD								
Commodity Lot/ Batch No.:				Proct Name & Description:				
Unit:				Expiry Date :				
Date	Transaction Reference	Received from/Issued to	Quantity Received	Quantity Issued	Losses	Adjustments	Quantity on Hand	Initials

Lot/batch number example



Inventory Control Card

- It is an individual stockkeeping record that holds information about all the lots of a single product
- May be a summary of many bin cards for a particular product

INVENTORY CONTROL CARD								
Product Name:								
Unit:				**Product Code :**				
Date	**Transaction Reference**	**Received from/Issued to**	**Quantity Received**	**Quantity Issued**	**Losses**	**Adjustments**	**Quantity on Hand**	**Initials**

Stores Ledger

- A stockkeeping record that contains the same information as the inventory control card
- Unlike inventory control cards, a stores ledger is bound like a book
- However, the ledger format is less desirable than individual cards, because it is easy to run out of space for an individual produc

Transaction records

- Used to record information about the movement of stock from one storage facility to another
- In addition, transaction records are proof of requisition, issue, and/or delivery
- E.gs, bills of lading; issue vouchers; receipt vouchers; and combined requisition, issue, and receipt vouchers

Bill of Lading

- A legal document issued by a carrier to a shipper that details the type, quantity, and destination of the goods being carried
- A bill of lading also serves as a shipment receipt when the carrier delivers the goods at a predetermined destination
- It must accompany the shipped products and must be signed by an authorized representative from the carrier, shipper, and receiver

Short Form of Bill of Lading

Carrier: _____ **Date:** _____
Bill of Lading #: _____ **PO #:** _____
Order #: _____
Shipper/Consignor: _____
_____
Consignee: _____
_____
Instructions: _____
_____

Item Code	Details	Quantity	Weight (Unit)
	Total		

Terms **Prepaid** ☐ **Collect** ☐ **Other** ☐

Shipper: **Pick Up Date:** _____

Signature: _____

This section is to make it sure that all materials are properly classified, described, packaged, marked and labeled and are in good condition to be transported and according to the applicable regulations of transporting department.

Carrier: **Pick Up Date:** _____

Signature: _____

Carrier acknowledges receipt of packages and that they are properly described as above and are in good order except as noted.

Received in Apparent Good Order

Received By: _____ *(Signatures)*
Print Name Here: _____
Date: _____

Issue and receipt voucher (IRV)

- An IRV lists the items and quantity issued to a facility
- It also includes a separate column for the quantities received in case any items are lost or damaged en route
- An IRV is completed in triplicate (three copies)

ISSUE AND RECEIPT VOUCHER

Issue Voucher No.: _____

Date: _____ Ship to: _____

_____

_____

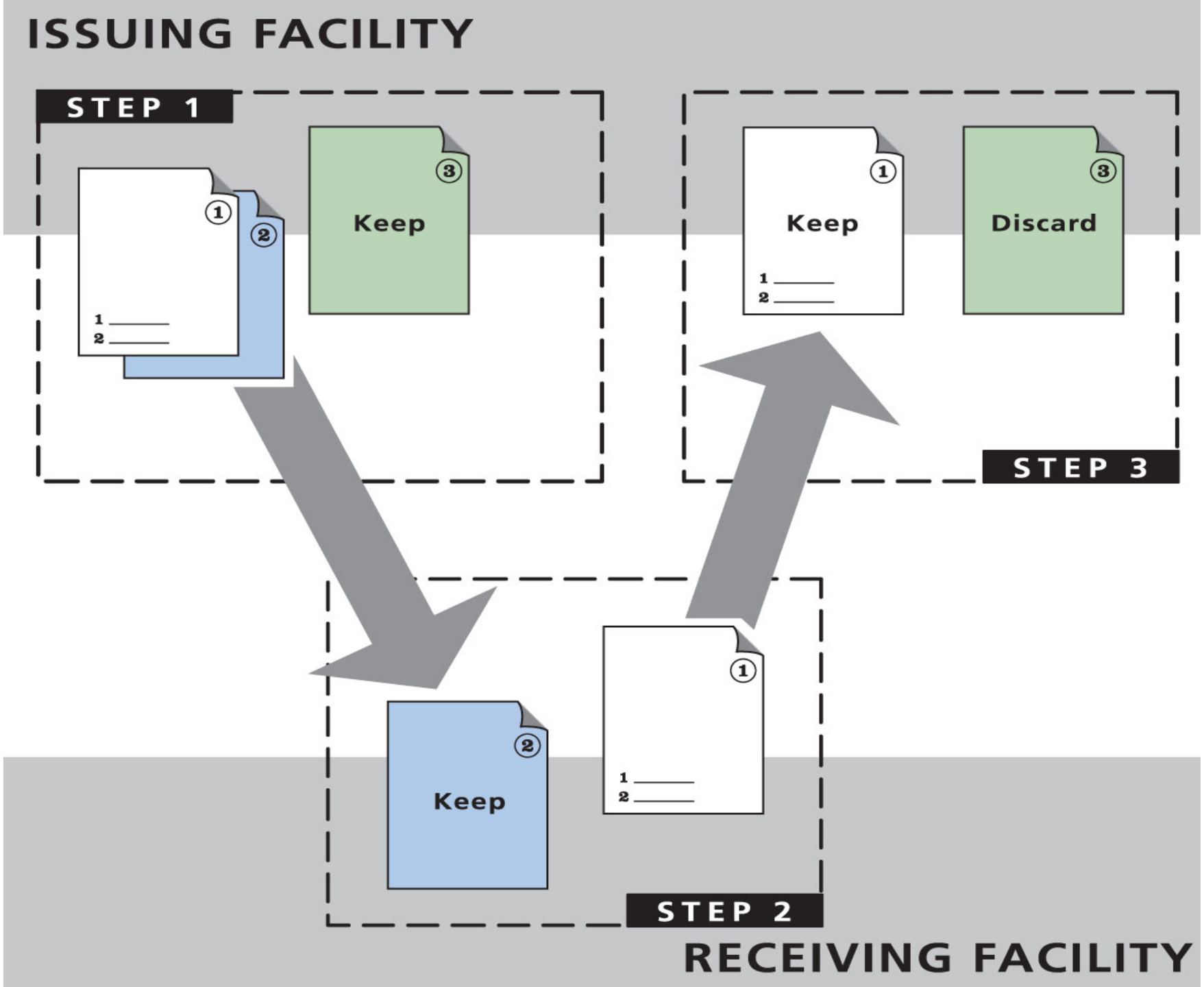
	ARTICLE	Quantity		REMARKS
		Issued	Received	
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Approved by: _____ Date: _____

Shipped by: _____ Date: _____

Received by: _____ Date: _____

Issue and Receipt Voucher Flow



Requisition, issue and receipt voucher (RIRV)

- Similar to an IRV, except that the RIRV is used only in a requisition system
- An RIRV lists the items and quantities requested by a facility
- It also includes a column for the quantity actually issued
- Like an IRV, the RIRV includes a column for the quantity received, which helps to account for any losses or damage en route

REQUISITION, ISSUE, AND RECEIPT VOUCHER

Issue Voucher No.: _____

Date: _____ Ship to: _____

_____

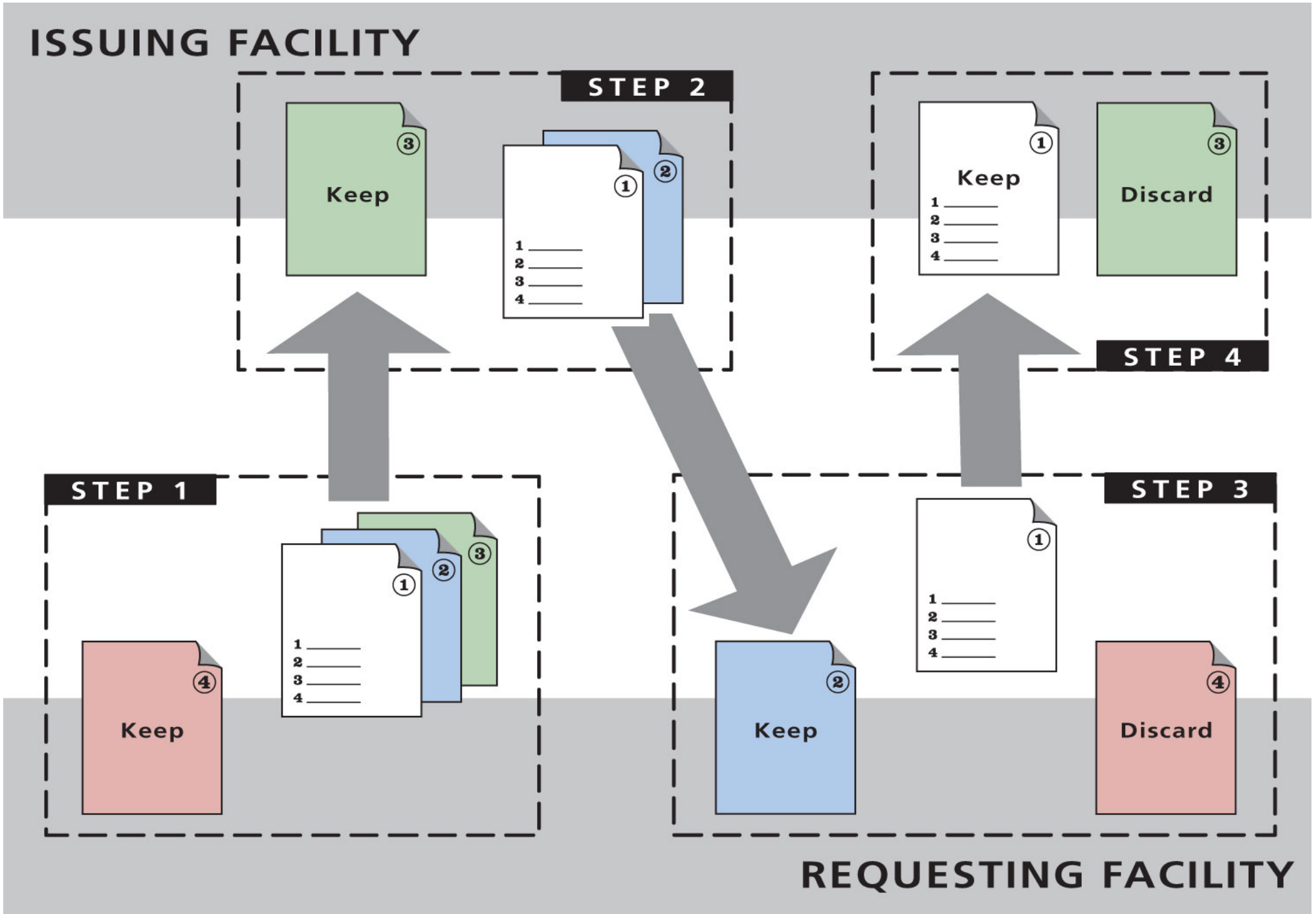
_____

	ARTICLE	Quantity			REMARKS
		Requested	Issued	Received	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Approved by: _____ Date: _____

Shipped by: _____ Date: _____

Received by: _____ Date: _____


ISSUING FACILITY
STEP 2
Keep
1
2
3
4
STEP 4
Keep
Discard
STEP 1
Keep
STEP 3
Keep
Discard
REQUESTING FACILITY

Consumption records

- They are used to record the quantity of each product used by or dispensed to end users, or used at an SDP when services are provided
- Common formats include daily activity registers (DARs), pharmacy dispensing registers, daily usage registers or logs, and tick sheets

Assessing Stock Status

Dr. Emmanuel Kumah

Objectives

In this session, we will learn the following:

- The purpose for assessing stock status
- Data needed to assess stock status
- How and when to assess stock status

Assessing Stock Status

- You are asked to assess the stock status of a supply of aspirin in a health facility
- You found 100 aspirin tablets
- With this information, could you tell if the health facility has:
    - Too much aspirin?
    - Too little? or
    - Just enough?

- You do not want to know, ***How much aspirin does the health facility have?***
- But, ***How long will the health facility's supply of aspirin last?***
- When you answer this question, you are <u>assessing your stock status</u>

➢ The purpose of assessing stock status is to determine <u>how long supplies will last</u>

- Assessing stock status is a management function
- Stock status is primarily assessed to make decisions related to resupply
- Based on your stock status assessment, you may place an order or, in some cases, place an emergency order
- If from the assessment you see that you do not need to place an order, you can return to your other duties confident that your supplies will last until your next order

How to Assess Stock Status

Specific data needed:

- Stock on hand, and
- Rate of consumption

The general formula for assessing stock status:

Stock on Hand ÷ Average Rate of Consumption

Stock on hand

- Stock on hand data can be found in stockkeeping records (inventory control card, bin card, stores ledger; or a computerized system)

- The most accurate source is a physical inventory - counting, by hand the total number of units of each commodity in your store or health facility, at any given time

Average consumption

- The average of the quantities of product dispensed to users or patients
- Determined using consumption data obtained form consumption records (daily activity registers, daily usage logs, or tick sheets)

For example, if during the last three months, the number of blisters of artemether+lumefantrine (ALu) 1×6 dispensed, each month, in a hospital was :

April 1,250
May 1,364
June 1,255
Total 3,869

The average monthly consumption is :

$$\frac{\text{3,869 (total number of blisters)}}{\text{3(3months of data)}} = 1{,}289.6 \text{ or } 1{,}290 \text{ blisters}$$

Putting the formula to use

If the stock on hand for ALu 1×6 is **3,225**, and we calculated the average monthly consumption to be **1,290** blisters a month, we have the data to assess stock status:

$$\frac{3{,}225.\text{blisters}}{1{,}290.\text{blisters/month}} = 2.5 \text{ months of stock on hand}$$

Thus, If new stock is not received before 2.5 months have passed, the facility is at risk of a stockout and, ultimately, clients will not be served

E.g. Assess the Stock Status of each of the ff. FP commodities

Product	Stock on hand	Last three months consumption		
		April	May	June
Injectable	2,580	714	857	882
UCDs (Copper T)	1,250	205	400	375
Implants (Jadelle)	1,570	526	428	595
ECP (Postinor 2)	250	102	87	115
Female Condoms	447	167	185	144

When to Assess Stock Status

- You should regularly assess the stock status of each product in your storeroom
- Monthly assessment s highly recommended

Maximum-Minimum Inventory Control Systems

Dr. Emmanuel Kumah

Objectives

In this session, we will learn the following:

- Purpose of an inventory control system
- Key terms in inventory control
- Types of max-min inventory control systems
- How to set max and min stock levels

INVENTORY CONTROL

ABHILASHA CHAUDHARY

Also called stock control, is the process of ensuring the right amount of supply is available in an organization

The Purpose of an Inventory Control System

An inventory control system informs an organization:

- When to order,
- How much to order, and
- How to maintain an appropriate stock level of all products

To avoid shortages and oversupply

IDENTI
MEDICAL DATA SENSING

SCMS

Vehicle Fuel Gauge Indicators

A vehicle’s fuel gauge helps in maintaining stock level

Key Inventory Control Terms

- **Maximum-minimum inventory control system** - Designed to ensure that the quantities in stock fall within an established range
- **Maximum stock level -** The level of stock above which inventory levels should not rise, under normal conditions (set as a number of months of stock)
- Max**imum quantity** – Calculated by multiplying the average monthly consumption by the max level (number of months)
- **Min stock level/min quantity** - The level of stock at which actions to replenish inventory should occur under normal conditions

Inventory Control Terms

- **Review period** - The routine interval of time between assessments of stock levels to determine if additional stock is needed
- **Review period stock** - The quantity of stock dispensed during the review period
- **Safety stock level** - The additional buffer, cushion, or reserve stock kept on hand to protect against stockouts caused by delayed deliveries, markedly increased demand, or other unexpected events

Inventory Control Terms

- **Lead time stock level** - The level of stock used between the time new stock is ordered and when it is received and available for use
- **Emergency order point (EOP)** - The level of stock that triggers an emergency order

Types of Max-Min Inventory Control Systems

Three main types of a max-min inventory control system distinguished by when an order is placed:

- **Forced-ordering system** - Order is placed at the end of the review period
- **Continuous review system** - Order is placed when the facility reaches the minimum level
- **Standard system** - Order is placed at the end of the review period for commodities that are at the minimum level

Determining How Much to Order

The following formula is used:

Quantity to Order = Max Stock Quantity– Stock on Hand

Where…

- Max stock quantity = average monthly consumption × max stock level
- Average monthly consumption = average of the quantities of product dispensed to users or patients in the most recent three months, as appropriate

Determining When to Place an Order

Forced-ordering max-min system

- At the end of each review period, review all stock levels and order or issue enough stock to bring the levels up to the maximum
- Place an emergency order if the stock level for any item falls below the emergency order point before the end of the review period

The decision rule is simple – order every item at the end of the period

E.g.

- Imagine a health facility where the supply officer/storekeeper knows that his max level is three months
- His review period is monthly, and it is the end of the month—time to order
- He calculates that his average monthly consumption (AMC) is 100 condoms/month.
- He then calculates his max quantity: 100 condoms (AMC) × 3 months (max level) = 300 condoms (max stock quantity)
- At the end of the month, he has 200 condoms on hand
- With this information he calculates his order quantity: 300 (max quantity)–200 (stock on hand)=100condoms
- Based on his calculations, he needs to order 100 condoms this month.

Continuous review max-min system

- Review the stock level of each item every time you make an issue
- If the stock level is at the min, or has fallen below the min, order enough stock to bring the level up to the max
- The review period is not fixed
- A decision about whether to order is made each time a product is issued

Standard max-min system

- Review all stock levels at the end of each review period
- Products that are at or have fallen below the minimum, order stock quantities up to their maximum levels
- When to make an order or issue new stock is based on the min stock level and the review period

Setting Max-Min Levels

For any max-min system:

- You should set the max and min levels high enough to avoid stockouts
- Yet low enough so you do not increase the risk of expiration or damage
- It is possible that the stock balance will, at times, go below the min; but, ideally, it should never go below the emergency point
- The goal is to avoid stockouts of essential health products
- The system should also ensure that emergency orders are rarely placed

Setting minimum stock level

To set your minimum stock level, you must determine three key components:

- Lead time,
- Review period, and
- Safety stock.

As a general guideline, the safety stock level should equal at least half of the review period

The formula for setting the min stock level for forced-ordering and continuous review is the same:

Min stock level = lead time stock level + safety stock level

Min Level Formula for a standard system:

Min stock level = lead time stock level + safety stock level + review period stock level

Setting Max Level

- After the min has been set, setting the max is relatively easy

- Max Level Formula:

Max stock level ≥ min stock level + review period stock level

Inventory Control Methods and strategies

Dr. Emmanuel Kumah

Introduction

- Proper inventory management is crucial for optimizing operations, reducing costs, and meeting customer demands efficiently

- There are several methods and strategies that businesses can use for managing their inventory effectively

Just-in-Time (JIT)

- A method where inventory is ordered and received only when it is needed for production or to fulfill customer orders

- The goal is to minimize holding costs and reduce excess inventory levels

First-In-First-Out (FIFO)/Last-In-First-Out (LIFO)

First-In-First-Out (FIFO)

- In this method, the oldest inventory items are sold or used first
- This approach is commonly used in industries where perishable goods or products with expiration dates are involved, as it helps prevent inventory spoilage

Last-In-First-Out (LIFO)

- LIFO is the opposite of FIFO
- It means that the newest inventory items are sold or used first

Vendor-Managed Inventory (VMI)

- In VMI, the supplier is responsible for managing the inventory levels at the customer's location

- The supplier monitors stock levels and replenishes products when needed, reducing the customer's burden of inventory management

Periodic Inventory Management

- In this approach, physical inventory counts are performed at regular intervals (e.g., monthly or annually), and inventory levels are adjusted accordingly

Economic Order Quantity (EOQ)

- Economic Order Quantity (EOQ) is a concept used in inventory management to determine the ideal order quantity that minimizes total inventory costs

- It helps strike a balance between holding too much inventory (resulting in higher holding costs) and ordering too frequently (leading to higher ordering costs)

- The primary goal of EOQ is to find the quantity that minimizes the sum of both carrying (holding) costs and ordering costs

The EOQ formula is as follows: $$EOQ = \sqrt{\frac{2(Annual\ Demand * Cost\ per\ Order)}{Annual\ holding\ cost\ per\ unit}}$$

Example:

A hospital needs to manage its inventory of a particular medication used for a chronic condition. The hospital's annual demand for the medication is 1,200 units. The cost of placing an order (ordering cost) is GHS40 per order, and the holding cost for each unit of medication per year is GHS2.

- Annual demand = 1,200 units
- Ordering cost per order= GHS40
- Holding cost per unit per year = GHS2

$$EOQ = \frac{\sqrt{2(1200*40)}}{2}$$

$$=219.09 = 219$$

This means that the hospital should order around 219 units of the medication each time it places an order to minimize its inventory costs

Reorder Point

- In the context of inventory management, the **Reorder Point** is a critical level of stock at which a new order should be placed to replenish inventory before it runs out
- It is designed to prevent stockouts and ensure a continuous supply of goods, in this case, healthcare products or medical supplies

- To calculate the reorder point, you need to consider three primary factors:

1. **Demand Rate (or average rate of consumption)**: The average number of units consumed or used per unit of time
2. **Lead Time**: The time it takes for a new order to be delivered after it has been placed
3. **Safety stock:** The additional buffer, cushion, or reserve stock kept on hand to protect against stockouts caused by delayed deliveries, markedly increased demand, or other unexpected events

The formula for calculating the reorder point is: ROP = (Demand Rate * Lead Time) + Safety Stock

Example

Suppose a hospital's surgical department uses an average of 50 pairs of surgical gloves per day. The lead time for replenishing surgical gloves is 5 days. The hospital wants to maintain a safety stock equivalent to the average usage for 2 days.

1. **Demand Rate =** 50 pairs of surgical gloves per day
2. **Lead Time =** 5 days
3. **Safety Stock =** 2 days' worth of usage (50 pairs/day * 2 days) = 100 pairs

Now, let's calculate the reorder point:

Reorder Point = (Demand Rate * Lead Time) + Safety Stock = (50 * 5) + 100 = 350

Meaning, when the hospital's surgical glove inventory reaches 350 pairs, a new order should be placed to restock the gloves to avoid stockouts during the lead time

The ABC method

- The ABC method of inventory control is a technique used to categorize and manage inventory items based on their **value** and **usage**

- The method classifies items into three categories: A, B, and C, each representing different levels of importance and control

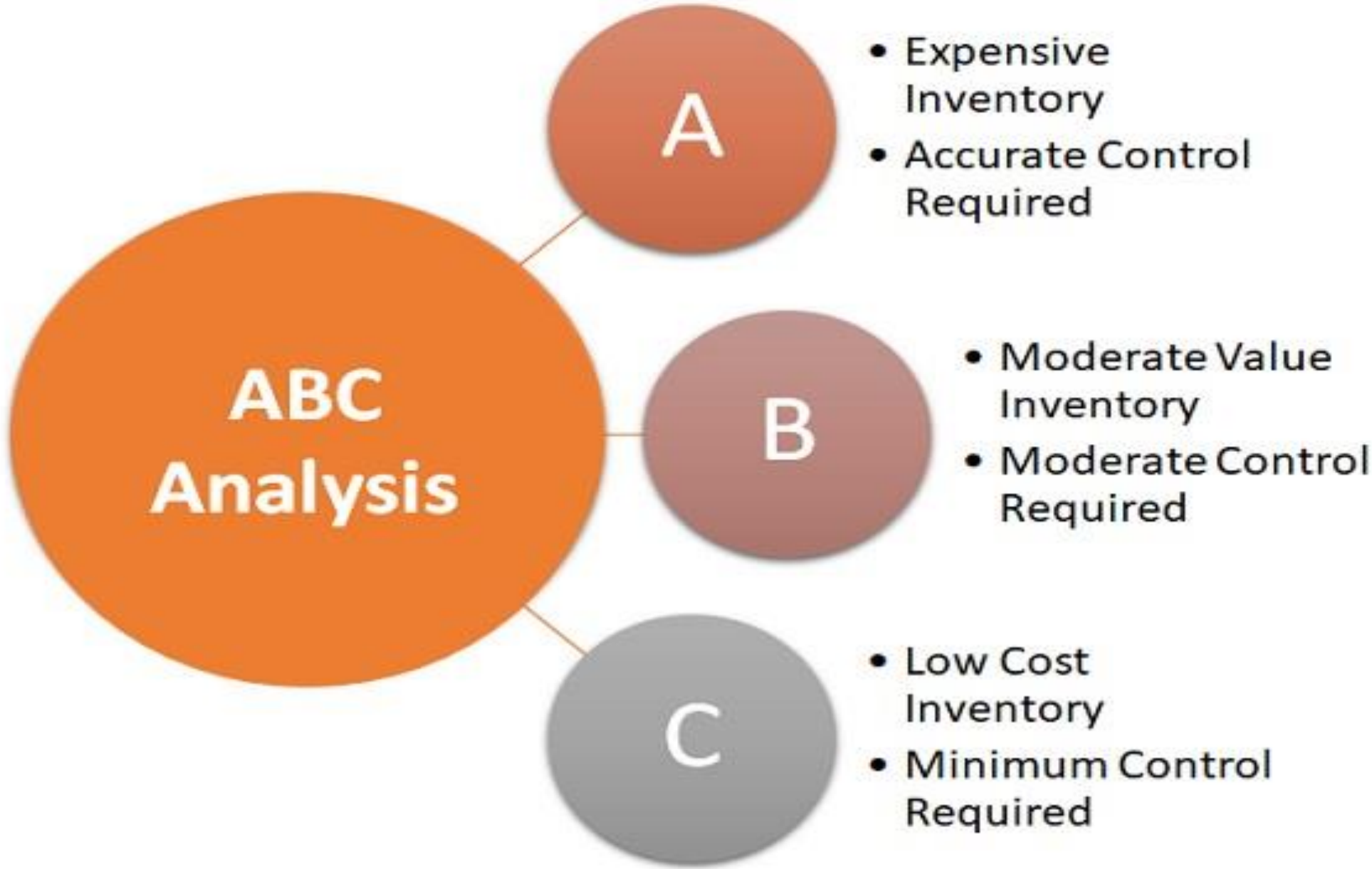
- This approach helps organizations efficiently allocate resources, focus on critical items, and optimize inventory management to reduce costs and improve overall efficiency

The ABC method: Classification of items

- **Category A**: High-value items with a relatively low annual consumption quantity -These items represent a significant portion of the total inventory cost and require strict control

- **Category B**: Moderate-value items with a moderate annual consumption quantity- They have a medium impact on inventory costs and need reasonable control

- **Category C**: Low-value items with a high annual consumption quantity- Though they have a low individual impact on inventory costs, their cumulative effect should not be overlooked


ABC Analysis
A
• Expensive Inventory
• Accurate Control Required
B
• Moderate Value Inventory
• Moderate Control Required
C
• Low Cost Inventory
• Minimum Control Required

The ABC method

ABC	Number of items	% of items	Total annual expenditure	% annual expenditure
A	342	22.1	292,135	79.96
B	491	31.88	54,945	15.04
C	707	45.91	18,281	5.004
Total	1,540	100	365,361	100

VED analysis

- VED analysis is an inventory management technique used to categorize items based on their criticality in healthcare settings
- The analysis classifies medical items into three categories: Vital, Essential, and Desirable
- This classification helps healthcare facilities prioritize their inventory management efforts and ensure the availability of critical items when needed most

Vital Items

- Vital items are those that are crucial for the continuous functioning of the healthcare facility and have a significant impact on patient care
- These items are typically characterized by high consumption rates and/or high costs
- Managing the inventory of vital items is of utmost importance to avoid stockouts and disruptions in patient services

E.g. Medical Oxygen for a hospital's Intensive Care Unit (ICU)

Essential Items

- Essential items are important for smooth healthcare operations but might not directly impact patient care as critically as vital items
- These items have a moderate level of consumption and significance

E.g. Intravenous (IV) sets used in various departments of the hospital

Desirable Items

- Desirable items are generally non-critical and have a lower impact on healthcare operations or patient care
- They may include items that are used infrequently or have relatively low consumption rates

- E.g. Decorative items for a hospital's reception area

VED analysis for a hospital's inventory

Step 1

- Collect data on the consumption rate and criticality of each item
- This information may be obtained from historical usage records, medical staff inputs, and clinical guidelines

Step 2

- Categorize items based on the collected data, Categorize each item into V, E, or D category

VED analysis for a hospital's inventory

Step 3

Prioritize inventory management with the VED classification as follows:

1. **Vital items**: Keep a higher safety stock level, monitor closely for potential stockouts, and ensure timely reordering to avoid disruptions in critical patient care
2. **Essential items**: Maintain an adequate stock level to meet regular demand and prevent frequent stockouts
3. **Desirable items**: Manage these items with a lower priority since they have a relatively lower impact on patient care and healthcare operations

Storage and Disposal

In this lesson, students will learn:

- Guidelines for proper storage of medicines and other health commodities
- Definition for visual inspection and instructions on how and when to conduct a visual inspection
- Purpose of a physical inventory count and how and when to conduct a physical inventory count
- Disposal of goods & equipment in the logistics cycle

Storage

- Products are stored at every facility in the pipeline
- Almost everyone working in the supply chain is responsible for product storage
- Storage ensures the physical integrity and safety of products and their packaging, throughout the various storage facilities, until they are dispensed to clients.

Key storage activities

Material receiving and incoming inspection

- This activity occurs during the unloading of vehicles and includes the visual inspection of delivered packages to ensure that products were not damaged during transport

- It is also important during this activity that you verify the quantities of products received against the packing slip or shipping invoice

Key storage activities

Put away

- This process includes moving products from the unloading dock, or receiving area, after they are released for storage; and assigning them to their designated storage area (rack, shelf, floor, etc.)
- It is important that every product moved into or out of the racks, shelves, or any storage area is correctly recorded on the stockkeeping records
- An inventory control system helps you manage them
- Whether the process is manual or automated, the best practice is to put away products the same day they are received

Shelf life

- The length of time from manufacturing date to the final date a product can be safely used, or the length of time that product can be stored without affecting its usability, safety, purity or potency
- All pharmaceuticals have a shelf life, usually specified by the manufacturer
- Contraceptives are relatively stable products, with a shelf life of four to five or the length of years.
- The shelf life for essential medicines varies: anywhere from six months to more than five years, depending on the medicine.
- Pharmaceuticals must be stored and distributed in a way that ensures customers can receive them in without affecting good condition and in time to use them before their expiration dates

Storage Guidelines

- Clean and disinfect storeroom regularly.
- Store supplies in a dry, well-lit, and well-ventilated storeroom, out of direct sunlight.
- Secure the storeroom from water penetration.
- Ensure that fire safety equipment is available and accessible, and that personnel are trained to use it.
- Store latex products away from electric motors and fluorescent lights.
- Maintain cold storage, including a cold chain, for commodities that require it.
- Keep narcotics and other controlled substances in a locked area.

Storage Guidelines

- Store flammable products separately, using appropriate safety precautions.
- Stack cartons at least 10 cm (4 in) off the floor, 30 cm (1 ft) away from the walls and other stacks, and no more than 2.5 m (8 ft) high.
- Store medical supplies separately, away from insecticides, chemicals, old files, office supplies, and other materials.
- Arrange cartons so that arrows point up; ensure that identification labels, expiry dates, and manufacturing dates are visible.
- Store supplies in a manner accessible for FEFO, counting, and general management.
- Separate and dispose of damaged or expired products without delay.

Visual Inspection

(The process of examining products and their packaging to look for obvious problems with product quality)

When to conduct a visual inspection

- Receive products from the manufacturer (usually at the central level)
- Warehouse or health facility receives supplies
- Conduct a physical inventory count
- Dispense products to a client
- Issue products from one level to another
- Receive complaints from lower levels or customers
- Products are about to expire
- Products show signs of damage
- products have been kept under improper storage conditions

Checking for quality: What to look for in a visual inspection

Products may have two basic types of damage during shipping and storage that affect their quality: mechanical and chemical.

- ***Mechanical damage*** is caused by physical stresses, such as crushing or tearing when the products are loaded, off-loaded, or when cartons or inner boxes are stacked.

- ***Chemical damage*** is more difficult to detect and is usually not obvious during a visual inspection.
  - Laboratory testing is usually required
  - Some indications of chemical damage may include changes in the color, odor, or consistency of the product
  - Remove chemically damaged items from inventory, and remove all like items (i.e., from the same lot) from inventory; quarantine and destroy them using per local disposal procedures.

Physical inventory count

- A physical inventory count is used to compare actual stock on hand for each commodity with the amount recorded on the stock card.
- While conducting the physical inventory count, be sure that you compare the quantities on hand with the quantities that have been entered in stockkeeping records (for example, inventory control cards).
- A physical inventory count enables you to confirm how much stock you have and whether forms are being completed correctly

Options for conducting inventory counts

1. Cycle counting - Physical inventory count is conducted for a fraction of items each month.

- By the end of the year, all items have been counted.
- At the beginning of the following year, the process starts again.
- Regular cycle counting can keep physical inventory up-to-date without disrupting store operations

2. Vital, essential, or nonessential (VEN) analysis - Involves counting the most essential items, more often

- This analysis categorizes products as vital, essential, or nonessential, enabling you to assess stocks of vital items more often than nonessential items

3. ABC analysis - In this process, divide products into three categories, based on monetary value

- As a logistician, you might also use an ABC analysis that is not based on cost, but on how often a receipt or issue is made
- Antibiotics can be issued more often from the warehouse, whereas x-ray equipment may be rarely issued
- In this situation, count and assess antibiotic supplies more often.

Health care Waste Management

- Health care waste (HCW) products are generated at health care facilities, laboratories, and research facilities during diagnosis; and during the immunization of humans and animals, medical treatment and research, and the production or testing of biological products.
- Sharps (including used needles), used gauze, blood/IV lines, gloves, infusion sets, scalpels, blades, and broken glass are examples of HCW.
- Expired drugs, laboratory reagents, and cleaning solvents are also HCW products

Health care Waste Management

- The primary objective is to protect health workers and facility staff, the community, and the environment.
- A well-functioning logistics system is fundamental to the proper management of HCW at various levels in the logistics system, including adequate storage, handling, and transport from the originating facility to the final HCW disposal

Classification of Health Care Waste

Two broad categories of health care waste:

- General or non-hazardous waste not contaminated with blood, body fluids, or other harmful agents or materials (also referred to as domestic wastes, such as paper, fabrics, glass, food residues and containers)
- Wastes considered hazardous due to their potential for creating a variety of health risks as a result of their actual or presumed biological, chemical and/or radioactive contamination.
- Due to their potentially hazardous nature, these wastes require care from the point of generation until final disposal

Hazardous waste could be further categorized into:

- Infectious hazardous
- Non-infectious but hazardous

Color Coding

Color coding of waste containers and plastic bags should be used to facilitate efficient segregation of waste.

The recommended color coding scheme for Ghana is as follows:

- **BLACK** - General waste (e.g. kitchen waste, paper, cardboard, sweeping, etc)
- **YELLOW** - Infectious waste (e.g. sharps, patient waste, human/animal tissue and cultures/specimens) with the biohazard label, radioactive waste with the radioactive symbol.
- **BROWN** - Hazardous waste (e.g. expired drugs, vaccines, chemicals, etc).

Disposal of Goods & Equipment in the Logistics Cycle

- Section 83 of the Public Procurement Act,(663) mandates the Head of Procurement Entity to dispose of stocks that become obsolete, redundant and unserviceable or surplus to requirement, in an orderly and systematic manner

Definitions of unserviceable, obsolete or surplus stores, plant and equipment

- **Obsolete**: Any item of stores plant and equipment which is rendered incapable of further effective use by developments in technology, incompatibility with associated items, or where the annual maintenance and breakdown costs can be certified to exceed 30% of the estimated cost of a new replacement item

- **Unserviceable**: Any item of stores, plant and equipment which cannot be used for the intended purpose in its present condition due to major defects or damage, and is beyond economic repair (i.e., repair cost >50% of the current market price of a new replacement item)

- **Surplus**: Any stores item which has not moved for a period in excess of two years, or any item of plant or equipment which has remained unused for a period in excess of one year, and where no potential use for the item can be envisaged within the Entity

Authority to Dispose

In accordance with the provisions of the Public Procurement Act, 2003 (Act 663):

The Heads of a Procurement Unit shall arrange for periodical survey at quarterly interval of all stocks and equipment held by the Unit, to ascertain whether any item has become obsolete, unserviceable or surplus to requirement

The survey shall be undertaken by a team of at least three persons, comprising the following:

- A representative from the Procurement Entity's Administration//Finance department
- The Storekeeper or Stockholder
- A senior officer from any public or private institution with special knowledge of the items to be surveyed as a Technical Person to the committee

- The reason for any item becoming surplus, obsolete and unserviceable shall be explained and recommendations submitted on the mode of disposal

- The Board of Survey's recommendations shall be approved by the Head of Procurement Entity and the items shall be disposed of as approved

Disposal Options

1. Transfer to Government Department or Other Public Entity

Transfer to other government departments or other public entities with or without financial adjustment is applicable where an asset can be usefully deployed by another procurement entity

2. Sale by Public Tender

- Items with an initial cost of GHC 50million or more must be disposed of by Public tender, unless the item is more than 10 years old

- Sale by Public tender shall also be conducted where the estimated value of the asset, or group of asset packaged together, is of sufficient value to justify the cost of conducting a public tender

3. Sale by Public Auction

- Disposal by public auction shall be conducted for items that have an estimated value of less than GHC 5 million, and also
- When sufficient items can be assembled for disposal to justify the costs of conducting the auction process

4. Destruction, Dumping or Burying

- Disposal by destruction, dumping or burying shall be used where the asset has no residual value and cannot be converted into any other form which subsequently give it value
- To ensure that the destruction, dumping or burying is proper executed, it is recommended that a committee of at least three persons supervise the process

What about disposal of defective and expired drugs?

- Supervised by the FDA

REQUIREMENTS

- No person shall dispose of any product unless with permit from the FDA
- Approval of application and sanctioning of disposal of any product shall be sought from the Authority
- The application shall state the nature of products and the reasons for the destruction
- The application shall include an inventory of the products to be destroyed

Disposal of defective and expired drugs

- The applicant shall pay a prescribed fee for destruction
- The applicant shall, with technical assistance from the Authority, sort or separate the products into various categories for which different disposal methods are required
- The applicant shall arrange with the appropriate waste management authority to assist in the destruction
- The applicant shall arrange the means of conveyance of the products to the site of destruction
- Where necessary, representatives from the Environmental Protection Agency, Customs, Excise and Preventive Services & Domestic Tax Revenue Divisions of the Ghana Revenue Authority, Audit Service, The Judiciary, Ghana Police Service and the applicant shall be present as witnesses

FDA to destroy Tamale Teaching Hospital expired medicines

(GRAPHIC ONINE Date: Jun - 23 - 2017 , 09:09 BY: Samuel Doudu)

- The Food and Drugs Authority (FDA) will by the end of this month destroy expired medicines it discovered at the Tamale Teaching Hospital (TTH).

- This follows investigations by the FDA into recent media reports that the hospital was administering expired medicines to unsuspecting patients

- The Northern Regional Director of the FDA, Mr Martin Kusi, who disclosed this to journalists at a day's workshop in Tamale last Wednesday, said the authority found a lot of expired medicines at the hospital during the investigations and that arrangements were being made for their safe disposal

- Mr Kusi said the FDA would complete the audit of the expired drugs found at the TTH this month, to be followed by their safe disposal

- He explained that the authority had to follow administrative procedures, including taking inventory of the expired medicines, saying that once that was completed, the next action would be to safely dispose of the expired medicines.