Summer Training at
Indraprastha Apollo Hospital,
New Delhi

Inventory Management
HAZMAT

By
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Under the guidance of
Dr. Susmit Jain

MBA Hospital and Health Management
2015-2017

The IIHMR University, Jaipur
2016

INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Dr. Archit Zomin Prashad,** student of **MBA Hospital and Health Management** from the IIHMR University, Jaipur has undergone summer training at **Indraprastha Apollo Hospital, New Delhi** from 1st April to 31st May, 2016.

The Candidate has successfully carried out the study designated to him during summer training and his approach to the study has been sincere, scientific & analytical.

The Internship is in fulfilment of the course requirements.

I wish him all success in all his future endeavours.

Col. (Dr.) Ashok Kaushik
Dean (Academics & Student Affairs)
The IIHMR University, Jaipur

13/6/16

Dr. Susmit Jain
Assistant Professor
The IIHMR University, Jaipur

Indraprastha Medical Corporation Limited

(Indraprastha Apollo Hospitals, New Delhi - A Joint Sector Venture of Govt. of Delhi)
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Corporate Identity Number : L24232DL1988PLC030958
Phones : 91-11-26925858, 26925801, Fax : 91-11-26823629
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Date: May 31, 2015

To Whom So Ever It May Concern

This is to certify that Dr. Archit Zomin Prashad, student of " Institute of Health Management Research, Jaipur" has successfully completed two months internship, which is a part of his course curriculum, in MBA-Health & Hospital Management program, from April1, 2016 to May31, 2016 at Indraprastha Apollo Hospitals, New Delhi.

During this Period he was posted in the Department of Materials and was involved in following studies / projects:

- Did a complete study on protocol of Handling the spillage of Hazardous materials (HAZMAT)
- Did a study on Inventory Management System (Reorder Level and Reorder Quantity)

Besides this he has also been actively involved in assisting various other activities of the Department.

for **Indraprastha Medical Corporation Limited**
(Indraprastha Apollo Hospitals)

Anupam Srivastava

Anupam Srivastava
Manager – T&D

Acknowledgements

A summer training is a golden opportunity for learning and self-development. I consider myself very lucky and honoured to have so many wonderful people lead me through the completion of the project.

The satisfaction that accompanies that the successful completion of any task would be incomplete without the mention of people whose ceaseless cooperation made it possible, whose constant guidance and encouragement crown all efforts with success.

And my project guide Mr. Sachin Patidar for the guidance, inspiration and constructive suggestions that helps me in the preparation of this project. I also thank our team in the department of Materials who have helped in successful completion of the project.

Mr. Jose Mani J(Sr. Manager, Materials), Mr. Saurabh Aggarwal (Sr. Manager, Materials), Mr. Gagan (Manager, Engineering), Mr. Narsimma Readdy (Deputy Manager, O.T. Store), Mr. Raj Kumar Singh (Asst. Manager, Medical Store), Mr. R. Raj Kumar (Assistant, F&B Store), Mrs. Reeta Chauhan (Assistant, P&S Store).

I am grateful to Dr. Ashok Kaushik (Dean, Academic & Student Affairs) and my mentor Dr. Susmit Jain (Assistant Professor, IIHMR) for their valuable support and guidance during my summer internship.

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Acronyms/Abbreviations

CLOSE QTY	Closing Quantity
HAZMAT	Complete Detail of Hazardous Material in the Hospital
ISSD QTY	Issued Quantity
MAX QTY	Maximum Quantity
MIN QTY	Minimum Quantity
OPN QTY	Opening Quantity
ROQ	Re Order Quantity
UOM	Unit Of Measure

Main Text

i) Observational Learning:

SECTION - 1

Introduction

The Mission Of The Hospital

The mission is to bring healthcare of international standards within the reach of every individual. We are committed to the achievement and maintenance of excellence in education, research and healthcare for the benefit of humanity.

Apollo Hospitals Group – India

About Indraprastha Apollo Hospital

Indraprastha Apollo Hospitals, New Delhi is the First Hospital in India to be Internationally Accredited by Joint Commission International (JCI) consecutively for the fourth time. It is one of the best multi-speciality tertiary acute care hospitals with over 700 beds in India and the most sought after destination in SAARC region for healthcare delivery.

A state of the art modern facility in the heart of the capital, it is spread over 15 acres and has a built-up area of over 600,000 square feet. Currently the hospital has 695 beds with a capacity to expand to 1000 beds. Right from the infrastructure to the latest medical technology acquisition, Indraprastha Apollo Hospitals has always kept its patients first and strived to deliver not world class but the world's best care to its patients since its inception in 1996

Indraprastha Apollo Hospitals, New Delhi successfully performs a Split Liver Transplant in two adults, a first in the city and second in the country.

Indraprastha Apollo Hospitals, Delhi was ranked the 6th best private hospital in India for Cardiology by the WEEK-A C Nielsen, Best Hospital Survey 2013

Few of the Salient Aspects of this Flagship Institution of Apollo Hospitals:

Apollo Hospitals, Delhi won the first position in the Poster Presentation for "Minimizing Medication Errors".

Apollo Hospitals Delhi won the FICCI Healthcare Excellence Awards 2013 in the category of Operational Excellence (Private - Multispecialty Hospital) for the project "Pressure Ulcers - Zero Tolerance".

Indraprastha Apollo Hospitals, Delhi was ranked the 5th best private hospital in India for Neurology Paediatrics by the THE WEEK-A C Nielsen, Best Hospital Survey 2013.

Accreditations

NABL

JCI

NABL - National Accreditation Board For Testing And Celebrations Laboratories.

JCI - Joint Commission International.

Specialities

- 52 Specialties under one roof.
- First Hospital in India to perform a Paediatric Liver Transplant in 1998 and one of the busiest Liver Kidney transplant programs in the country.
- Maximum number of ICU Beds in a Private Hospital in India.
- NABL accredited clinical laboratories.
- Experienced and renowned doctors in Cardiac sciences (Cardiology & Cardio-thoracic Surgery) and Neurological sciences (Neurology & Neuro-surgery).
- Largest Sleep Lab in Asia.
- One of the largest Dialysis Units in India.
- Apollo Cancer Institute is a Comprehensive Cancer care centre with management of cancers as a multi-speciality concerted approach including the most advanced Radiation Oncology Centre with Novelise TX, Clinac iX and HDR-Brachytherapy.
- 6 bed dedicated Bone Marrow Transplant Unit with stringent infection control practices.
- Latest and Best-in-Class Medical technologies like PET-MR, PET-CT, Da Vinci Robotic Surgery System, Brain Lab Navigation System, Portable CT Scanner, Novelise TX, Tilting MRI, Cobalt based HDR Brachytherapy, DSA Lab, Hyperbaric Chamber, Fibro scan, Endosonography, 3 Tesla MRI, 128 Slice CT scanner and many more are used to provide world-class care.
- Indraprastha Apollo Hospitals, New Delhi successfully performs a Split Liver.

- A 90-year old woman fully recovered from a stroke after she was treated with Thrombolysis at Apollo Delhi.

Achievements

- Indraprastha Apollo Hospitals successfully treated a 64 years old woman, who was suffering from three kinds of cancer - Uterus, Breast and Oesophagus.
- A 68 Year old woman underwent Total Knee Replacement for both the knees using patient specific instrumentation at Indraprastha Apollo hospitals.
- Bilateral total hip replacement surgery was done on a 29 year old Nigerian lady suffering from sickle cell disease at Indraprastha Apollo Hospitals.
- A 110 year old Kashmiri patient successfully underwent surgery for stomach cancer at Indraprastha Apollo Hospitals.
- A 16 year old girl suffering from scoliosis underwent a 7 hour surgery without blood transfusion at Apollo Hospital, New Delhi.
- Successful hip replacement at the age of 94 was performed at Indraprastha Apollo Hospitals.
- Doctors at the Indraprastha Apollo Hospital successfully treated the eleventh member of a Pakistani family for an orthopaedic problem.
- The Apollo Hospitals, New Delhi was the medical partner of JPSI, organizer of India's fastest racing event, the 2013 Indian Grand Prix. Dr. Priyadarshini Pal Singh was nominated as the 1st Indian Chief Medical Officer for the event.
- The Apollo Hospitals Group marked the 15th anniversary of its Liver Transplant program with a gathering of transplant patients and their family members at the hospital. The event was graced by the presence of His Holiness, The Dalai Lama, who spoke on the wisdom of compassion to patients and staff of the hospital.
- In 2011, the hospital got JCI re-accredited consecutively for the fourth time making it the first hospital to do so in the country. Without doubt the hospital has been an industry leader in Healthcare Quality and Patient Safety. It currently has the International Patient Safety Goals implemented and has an in-house developed protocol to optimize patient safety known as CAPS scoring. The hospital also monitors its outcomes and various clinical parameters through ACE@25 (Apollo Clinical Excellence) to stay abreast and above the world's best medical Institutions.
- Apollo Hospitals was inaugurated in 1983 by Shri Giani Zail Singh (President of India). The first Apollo Hospital was in Chennai. The hospital commenced commercial operations the next year.
- 1983 - First Cardiac Surgery (Atrial septal Defect) First Apollo Health check.
- 1984 - First kidney transplantation at Apollo Chennai First Coronary Artery Bypass Graft Surgery.
- Dr. Prathap Reddy has always maintained that comprehensive health insurance is essential to optimize the medical equation. Apollo Hospitals, under his guidance, was always the fore runner in this field. As early as 1986, a medical insurance scheme was introduced, in collaboration with United India Insurance Company Limited.

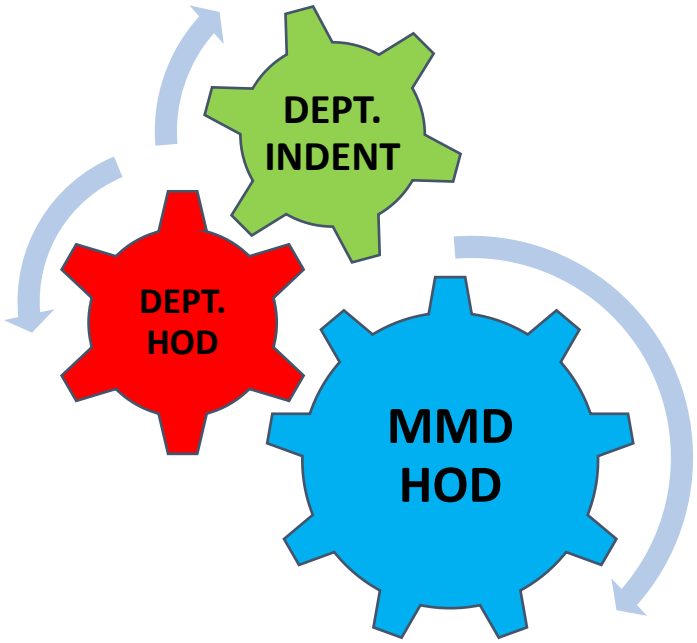
- The group showed great promise, and blossomed very fast. Within three years of operation, they announced their first dividend and by 1988 had expanded to Hyderabad.
- 1988 - Introduced Coronary Artery Stenting for the Ist time in India.

SECTION - 3

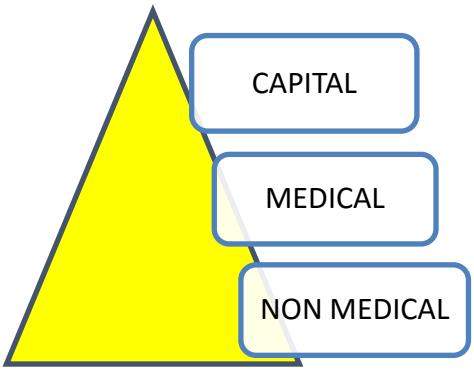
General Findings Within The Departments

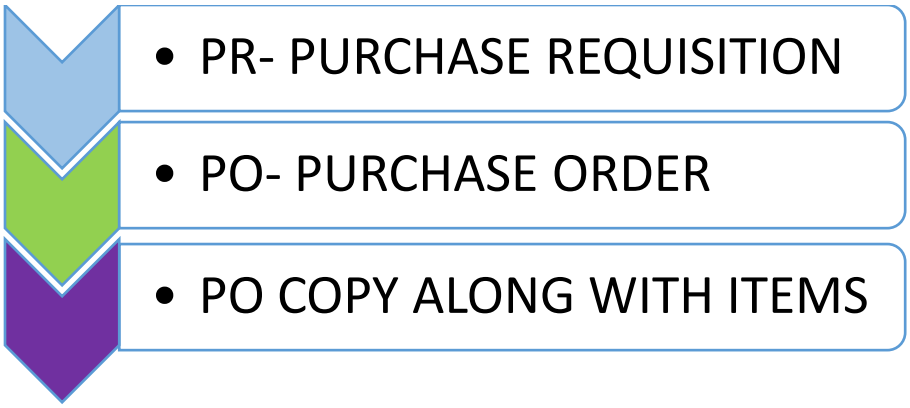
Observational Learning

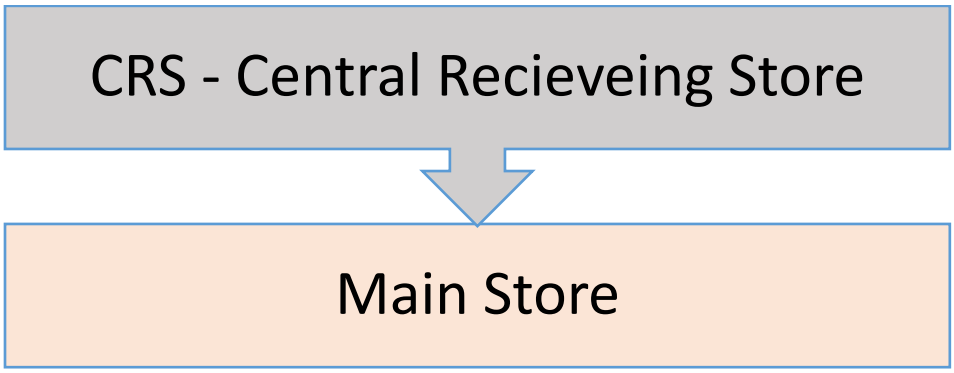
- Working of Materials Department

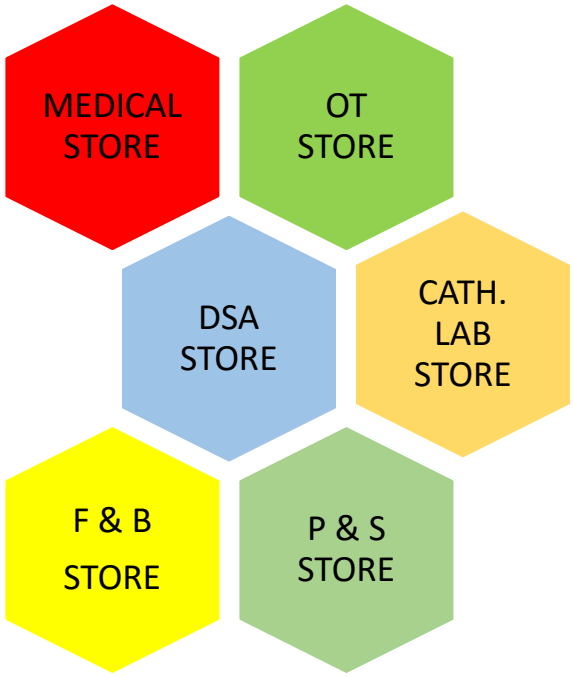


Three Types Of Items Purchase




• PR- PURCHASE REQUISITION
• PO- PURCHASE ORDER
• PO COPY ALONG WITH ITEMS


CRS - Central Recieveing Store
Main Store


MEDICAL STORE
OT STORE
DSA STORE
CATH. LAB STORE
F & B STORE
P & S STORE

Working of the O.T. Store

- To provide the material in the operation theater.
- To make indent for the main store for the materials.
- 30% of the materials are kept in the O.T Store which are in regular use. E.g.: Suturing materials, ICU Materials, O.T. Materials.
- Narcotic drugs are also been kept in the O.T. Store.
- O.T Store also provides material at the time of emergency during the operation.
- O.T Store issues the materials from the main store.
- Billing process of the issued items is also been done in the O.T Store.
- Apart from this O.T. Store also takes charge of the verification of the MRP of every particular items present in the store and update it on the computer.

Purchase Requisition (PR)

- Purchase requisition is a document that defines the need for goods and services.
- The PR is an internal document, it does not constitute a contractual relationship with any internal party.
- It is a document generated by an organization to notify the purchasing department of items it needs to order, their quantity, and the time frame for completing the order. It may also contain the authorization to proceed with the purchase.

Purchase Order (PO)

- A purchase order is a commercial document and first official offer issued by the buyer to seller, indicating types, quantities, and agreed prices for products or services. It is used to control the purchasing of products and services from external suppliers.

- Acceptance of a purchase order by a seller forms a contract between the buyer and seller, and no contract exists until the purchase order is accepted.

- Although a typical purchase order may not contain contract language (in fact most contain little more than a list of the goods or services the buyer desires to purchase, along with price, payment terms, and shipping instructions), the purchase order is a specially regarded instrument regulated by the Uniform Commercial Code or other similar law which establishes a purchase order as a contract by its nature.

- Yet despite the nature of the Purchase Order as a contract, it is common to accompany the acceptance of a purchase order with a legal document such as the terms & conditions of sale, which establish specific or additional legal conditions of the contract.

Returning Procedure

- When the material comes to O.T Store it gets verified and if the material is okay it is automatically used.

- If there is any problem in the material or product than it will be sent back to the supplier for the correction.

- Materials for exchange from the sub store goes back to the main store. The main store sends it to the CRS.

- By showing the gate pass and the letter signed by the HOD of dept. CRS releases the product.

- The gate pass are of two types' returnable and non-returnable.

- In case of returnable materials the material comes again to the CRS and the returnable gate pass copy gets verified and then the material sent back to the main store for further process.

- In case of non-returnable material a credit note is issued by the CRS in order to deduct the credit from the main balance.

Imprest Material System

- Materials which are been out sourced but we are not the owner of the material.

- In this procedure the seller keeps the material in the departmental store for the use without any caution money by the hospital.

- Whenever the material is used the hospital will pay the money to the seller.

- The seller can take the material from the hospital at any time he needed.

SECTION - 3

Suggestions for Improvement

- ROL & ROQ should be implemented regularly to reduce the human error.

- Fi-Fo system should be implemented. Whenever the new batch of the material comes old batch should be removed first from the inventory so that there is no variation in the inventory.

Project Report 1

Inventory Management

Introduction

What is Inventory Management?

Inventory Management is a science primarily about specifying the placement of stocked goods. It is required at different location within a facility or within many locations of a supply network to precede the regular and planned course of production and stock of materials.

It is the overseeing and controlling of the ordering storage and use of component that a company will use in the production of the items it will sell as well as the overseeing and controlling of the quantities of finished products for sale. An inventory is one of its major assets and represents an investment that is tied up until the item is sold or used in the production of an item that is sold. It also costs money to store and insure inventory. Inventories that are mismanaged can create significant financial problems for a hospital, the mismanagement results in an inventory guilt or an inventory shortage.

What Is Re Order Level?

Reorder level (or reorder point) is the inventory level at which a company would place a new order or start a new manufacturing run.

Reorder Level = Lead Time in Days × Daily Average Usage

Lead time is the time it takes the supplier or the manufacturing process to provide the ordered units.

Daily average usage is the number of units used each day.

If a business is holding a safety stock to act as buffer if daily usage accelerates the reorder level would increase by the level of safety stock.

Reorder Level = Lead Time in Days × Daily Average Usage + Safety Stock

What Is Re Order Quantity?

EOQ is the purchase order quantity for replenishment that minimizes total inventory costs. The purchase order is triggered when the inventory level hits the reorder point. The EOQ is calculated in order to **minimize a combination of costs** such as the purchase cost (which may include volume discounts), the inventory holding cost, the ordering cost, etc. The order quantity optimization is complementary to the safety stock optimization that focuses on finding the optimal *threshold* to trigger the reorder.

Reorder Quantity = Lead Time in Days × Daily Average Usage × 10% of the Stock.

What Is Minimum Quantity?

- Minimum quantity is the level of inventory, below which the stock of materials should not fall. If the stock goes below minimum level, there is a possibility that the supply may be interrupted due to shortage of materials.
- In other words, the minimum level represents the minimum quantity of the stock that should be held at all times.
- To calculate the minimum quantity 1st we need to know the lead time and average consumption per day of each item.
- To avoid stock out of unanticipated delay in supply we take extra margins of 5 days of stock.
- The formula we use to calculate minimum quantity is = Avg. consumption per day * Lead time + Lead time * Avg. consumption divided by 2.

What Is Maximum Quantity?

- Maximum quantity is that level of stock, which is not normally allowed to exceed from this point. Beyond the maximum stock level, a blockage of capital should be exercised to check unnecessary stock.
- The store should not keep materials more than the maximum stock level. It increases the carrying cost of holding unnecessary inventory level. It is the opportunity cost of holding inventory.
- To calculate the maximum quantity 1st we need to know the lead time and average consumption per day.
- We fix maximum quantity equal to two times of product of lead time and average consumption per day.
- Formula = 2 * Lead time * Avg. consumption per day.

What Is Lead Time?

- A *lead time* is the delivery time which supplier commits to deliver the goods after in receipt of the PO.

What Is Unit Of Measurement?

- A unit of measurement is a definite magnitude of a physical quantity, defined and adopted by convention or by law, that is used as a standard for measurement of the same physical quantity. Any other value of the physical quantity can be expressed as a simple multiple of the unit of measurement.

Objectives

- To find the minimum level of the stock.
- To find the maximum level of the stock.
- To find the consumption per month.
- To find the consumption per day.
- To find the re order level of the stock.
- To find the re order quantity of the stock.

Methodology

Study Type: Cross sectional study

Study Participants: Staff of Apollo Hospital

Study Technique: Observation

Study Tool: Previously compiled data of 1 year from O.T. Store, Medical Store and Cath. Lab Store from 1st march 2015 to 31st march 2016.

Procedure: To arrive the ROL & ROQ of any item we to first determine the minimum quantity and the maximum quantity in our hospital.

Analysis: Done with the aid of MS-Excel sheets. The data was entered in sheet item wise and then analysed it with the help of formula.

Ethical Consideration: The confidentiality of the data given by Apollo Hospital was mentioned.

Data Analysis

- Gather the last year data of all the items present in the O.T. Store, Medical Store and Cath. Lab Store from 1st march 2015 to 31st march 2016.
- From the gathered data we analyse the consumption per month of each individual items present in the store i.e. dividing the issued quantity by 30.
- From the consumption of 1 month data we calculated the level of consumption per 10 days i.e. dividing the monthly consumption by 10.
- After analysing the consumption for 10 days we calculated the consumption per day i.e. dividing the monthly consumption by 30.
- After that we calculated the maximum stock taking 10 days as a lead time i.e. multiplying 2 * Consumption per day * Lead time (10 days).
- After calculating the maximum stock for 10 days we calculated the minimum level of stock for 10 days i.e. Consumption per day * Lead time + Lead time divided by 2 * Consumption per day.
- On the basis of above analysis we calculated the **Re Order Level** i.e. Consumption per day * Lead time + minimum 10 days stock divided by 2.

- After calculating the ROL we take out 10% unanticipated safety stock if in case the supply goes beyond the limit of the safety stock.

- In the end we calculated the **Re Order Quantity** i.e. Lead Time * Consumption per day + 10% of the safety stock.

Conclusion

Inventory is the physical asset of the hospital that create problem of shortage and supply, inventory constantly changing as quantities are sold or replenished.

Hence it can be understood that positive inventory control can take the hospital to new heights otherwise it ruins it. Hospitals are highly in tensed on domestic market and it increase the market level of the hospital because domestic market is changing very fast.

This study provides insights to the management of high value items. Analysis was carried out to identify the fast moving, non-moving and important item the hospital has to periodically review the inventory to avoid production loss.

The result of this study can be used for further implementation.

Project Report 2

HAZMAT

Introduction

What is HAZMAT?

HAZMAT is an abbreviation for "hazardous materials"—substances in quantities or forms that may pose a reasonable risk to health, property, or the environment. HAZMATs include such substances as toxic chemicals, fuels, nuclear waste products, and biological, chemical, and radiological agents.

While these materials may be beneficially used in laboratories, they may also have the capacity to cause inadvertent damage to people (both to those using them and to bystanders exposed to them), and to other creatures and objects in the environment. It is advisable to know what to look for when purchasing or specifying laboratory chemicals, and what to watch out for when using them.

Thousands of medical and diagnostic tests and services are performed on a daily basis, even in small labs serving healthcare facilities. These services can include:

- Haematology
- Microbiology
- Chemistry
- Blood bank
- Surgical pathology
- Histology

Why It Is Necessary In The Hospital?

- To perform some kinds of test and surgery we need to buy this kind of materials. Usage of these materials cannot be avoided but utmost care and precaution is taken while using hazardous materials to avoid the risk of exposure.

- Hazardous chemicals are present all around us at work in the hospital. So, it is important to learn about the chemical hazard to safeguard ourselves, our co- workers and the environment.
- It is important to be prepared for both of the situations by gathering the information from the sources:

- Material Safety Data Sheets (MSDS).

- The chemicals container labels – warning labels.

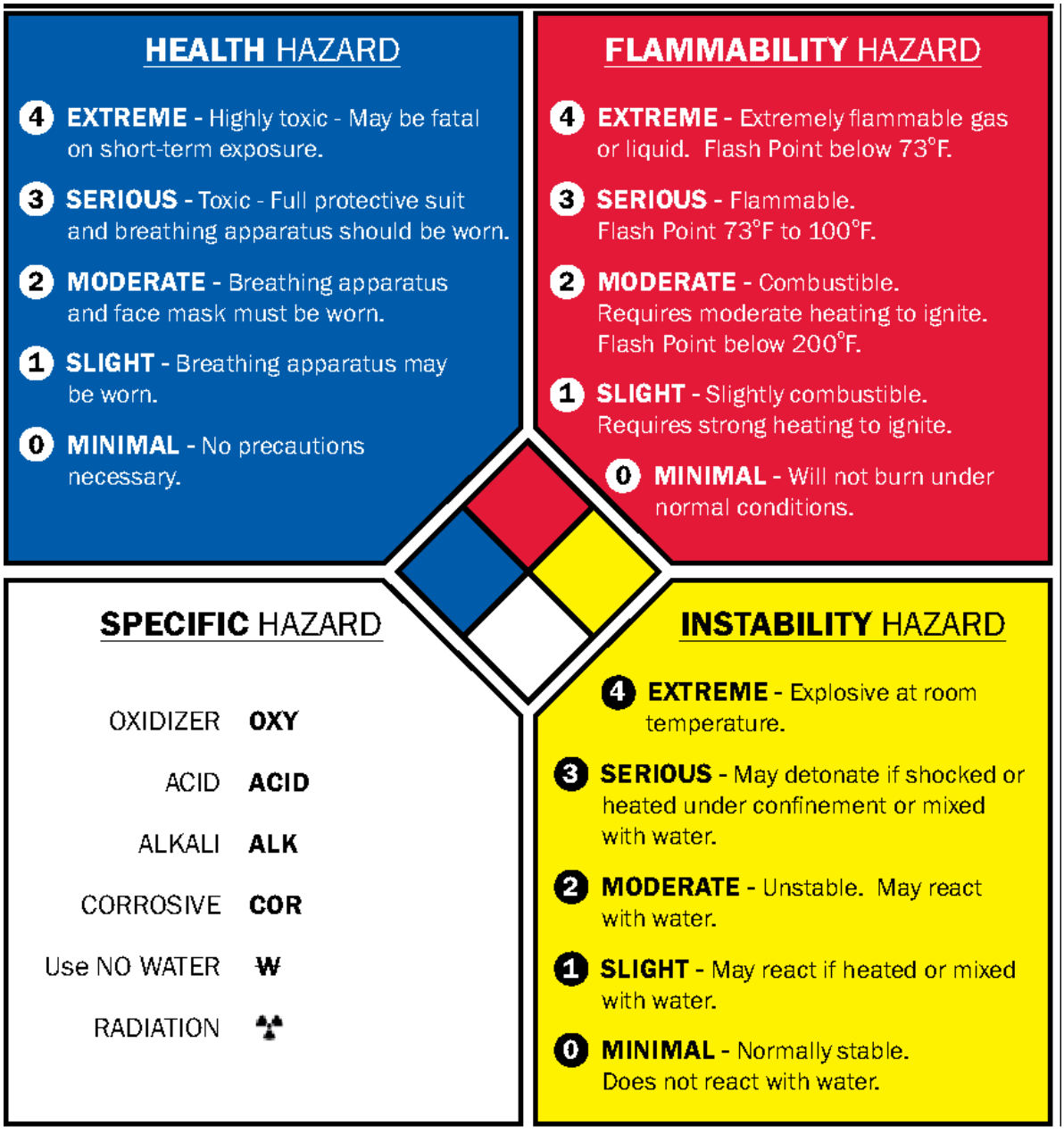
Material Safety Data Sheet (MSDS)

- Name of the chemical (written name, chemical formula + hazard rating)

- Hazardous ingredients & the exposure limits.
- Manufacture address & emergency phone numbers or that of the responsible party.
- Physical + chemical characteristics – such as melting, boiling and freezing points.
- Fire and exposion hazardous.
- Reactivity data – such as conditions to avoid materials.
- Health hazard data – including primary routes of entry into your body.
- Precautions for safe handling, storage and use.
- First aid procedures.
- Spill or leek procedures.
- Control measures.

Hazardous Identification System

- Governed by NFPA 704: "National Fire Protection Association"



Objectives

- To identify all the hazardous material which are used in every department of the hospital.
- To indentify the new hazardous materials present in the hospital.
- To identify the hazardous materials which are discontinued in the hospital.

- To prepare an updated MSDS (Material Safety Data Sheet) of each items and deliver it to the departments of the hospital.

Methodology

Study Type: Cross sectional study

Study Participants: Senior Staff of all departments.

Study Technique: Observation.

Study Tool: To study previously analysed data of 1 year from every department of the hospital for the updating.

Procedure: To update the hazardous materials of any department we first study the detailed list and then update with the latest MSDS.

Analysis: Done with the aid of MS-Excel sheets. The data was entered in sheet item wise.

Ethical Consideration: The confidentiality of the data given by Apollo Hospital was mentioned.

Data Analysis

- Gather the last year data of all hazardous material departments wise.
- Analyzed the one year data of all the items departments wise and after that identify the new hazardous materials which are running in the departments.

- Analyzed all those items which are been used in the past and are discontinued in the departments.

- After this procedure we made the fresh and updated list of with addition and deduction of the items.

- After the updating of the HAZMAT list collect the material safety data sheets of the new items which are added in the list.

- After collecting all the material safety data sheets send them to their respective departments.

Conclusion

In any hospital it is very important to know about the hazardous materials which are been used in our departments. As an employee we must have the knowledge of the hazardous materials for being safe. Hazardous materials can be solid, liquid or gas. The chemical name, material safety data sheet, manufacturer emergency phone numbers are to be kept in the department in terms of health fire reactivity and special hazards. Being safe in the workplace is EVERYONE'S JOB…!!!!!

Reference

- Material Management Book – By Rajendra Mishra
- Material Management – By S. D. Aphale
- www.inventory.com