Standard Operating Procedures for Storage and Inventory Control

By EDSP in Collaboration with DFID and WHO

TheNetwork for Consumer Protection

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(Final Draft)

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TheNetwork for Consumer Protection

Emergency Drugs Supply Project of TheNetwork for Consumer Protection in Pakistan
for
Government of NWFP & Balochistan

EDSP is committed towards strengthening of the drug management system in Pakistan.

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Preface

There is an imperative need for improvement in drugs dispensing and storage practices in our country. A baseline survey conducted by the Emergency Drug Supply Project for NWFP and Baluchistan illustrates that drugs storage practices are not satisfactory in either of the two provinces. The survey findings showed that storage conditions are not satisfactory including temperature, hygiene and pest control. Almost none of the drugs storage facilities have a proper manual available that details storage procedures and responsibilities of the personnel working in those facilities. Stock handling is not uniform particularly dealing with expired drugs is a problem. A need for taking appropriate steps (development of Standard Operating Procedures (SOPs) and training modules for concerned staff) exists to improve the existing conditions.

EDSP has developed standard operating procedures for stock handling and storage of drugs. This document provides definitions of important terms related to storage of medicines and contains, in detail, the Standard Operating Procedures for storage of medicines. It has information on ideal conditions of a drug storage facility and its maintenance. The SOPs specify all the necessary steps that should be taken by personnel when receiving a consignment of drugs, how to quarantine the newly received stock and finally how to store the medicines in a store.

It is expected that this document will prove to be a helpful tool for personnel concerned with stock handling and storage at all types of health facilities. The information provided is practical and can easily be practiced in our setups and it aims to upgrade the drugs storage practices in Pakistan.

Foreword

The drug management in health sector of our country leaves much to be desired. It was realized by a group of motivated individuals that this issue needs to addressed actively. In order to collect information on various dimensions of drug use and management, a baseline survey was carried out by EDSP, with cooperation from the Governments of Baluchistan and NWFP. Three areas, namely prescribing, storage and dispensing practices were identified as key areas that need to be improved and for which standard guidelines or operating procedures have to be developed. For this purpose, brain storming sessions were conducted and responsibilities were delegated inside and outside EDSP to collect available national and international literature on these aspects of drug management.

After collection of relevant literature, workshops to review these documents were conducted, which led to the development of initial drafts. Further workshops were conducted in which the existing drafts were thrashed out word-by-word to make these documents more practical and relevant to our country's conditions. These revised drafts were sent to different stakeholders for their expert comments. In the light of these comments, final drafts were prepared. After some minor modifications, the documents took their current final shape that is to be used in training workshops for technical personnel involved in storage, dispensing and formulary development. This document shall be revised after six months and improvements will be made, taking into consideration the experiences gained in the upcoming training workshops.

The following resources were consulted during the process:

- **Managing Drug Supply: The Selection, Procurement, Distribution And Use Of Pharmaceuticals**
Second Edition, revised and expanded. Published 1997
- **E - drug**
E-DRUG is the English version of SATELLIFE's electronic discussion groups on essential drugs. E-DRUG is used by health care professionals, researchers and policy makers to obtain and discuss current information on essential drugs, policy, program activities, education and training. Members also use E-DRUG to announce and learn of upcoming conferences or courses in their field.
(www.essentialdrugs.org/edrug)
- **British National Formulary (BNF 44)**
Published September 2002 by the British Medical Association and the Royal Pharmaceutical Society of Great Britian.
- **WHO model formulary 2002**
Publisher: WHO, Published: November 1, 2002.
The WHO Model Formulary presents formulary information of over 300 medicines included on the WHO Model List of Essential drugs, as a reference for national and institutional drugs and therapeutic communities.
- **Armed Forces Technical Instructions**
This is a document that outlines the medical procedures' protocols for the armed forces of Pakistan
- **MSH**
Management Sciences for Health (MSH) is a private, nonprofit educational and scientific organization working to close the gap between what is known about public health problems and what is done to solve them.
(www.msh.org)
- **Medical Journals(BMJ, JAMA, Lancet, NEJM,AJHP)**
- **Cochrane database**
www.cochrane.org
- **US Pharmacopoeia and the National Formulary (USP 26 - NF 21)**
Book and Supplements Edition (November, 2002)
(One main edition and two Supplements)
USP-NF provides clear and concise standards of identity, strength, quality, and purity as well as packaging, storage, and labeling for drugs, dietary supplements, and other healthcare products.
- **American Hospital Formulary**
A Drug Information Reference from the American Society of Health-System Pharmacists. Published: 2000, Edition: 01.
- **WHO website**
www.who.int
- **NIH US**
www.nih.org

Message by Director General Health, Balochistan

It gives me a great pleasure to state that the Emergency Drugs Supply Project (EDSP) has done a commendable job over the last six months. The EDSP, funded by the Department for International Development (DFID) UK, was initially designed to supply medicine to the provinces of Baluchistan and N.W.F.P with a view to cater for the needs of the local population and also to share the burden on the health system due to the massive influx of Afghan refugees. The Technical Assistance component of the project was executed by The Network dealing with rationalizing of the drug management cycle. The development of Standard Operating Procedures (SOPs) is considered a major step towards strengthening of essential drugs management in the province. In this regard, the EDSP team has conducted a baseline survey of three districts in Baluchistan. Based on the findings of this survey, they identified various areas and SOPs were developed for storage, dispensing and formulary development. I am pleased to say that EDSP has disseminated the findings of the baseline survey to the three districts and at present is conducting trainings of tutors for dispensing and storage practices, and development and maintenance of formulary.

I must confess that these tasks seemed Herculean in the beginning, especially considering the short period of this project, but I congratulate the EDSP team for completing all these tasks in such a short time and developing comprehensive and feasible SOPs. I extend my full support and cooperation to EDSP and these SOPs would be incorporated into the healthcare management system of the province of Baluchistan. I once again congratulate the EDSP team for their hard work and wish them every success.

Dr. Pir Mohammad Khawajakhail
Director General Health Services
Balochistan, Quetta.

Date: 20th December 2002

Message by Director General Health, NWFP

It is indeed a pleasure to write these few lines about the document, which has resulted from a DFID supported project executed by The Network for Consumer Protection and deals with the issues of rational use of drugs, appropriate storage conditions and development of Standard Operating Procedures (SOPs). The issues and the problems are same in all developing countries of the world and Pakistan is no exception to it. It is a tragic irony that the situation is more of a grave nature and has received very little or no attention in the past. While recognizing this, efforts have been made to come up with a recipe, which suits out local conditions and environment.

I must acknowledge and commend the hard work that has gone into the development of these protocols but this should not be considered as an end, but a start, rather beginning of the start. With this vision in mind we must now focus our attention to bring changes in the attitudes of health care providers so that the protocols developed under this project are utilized for the welfare of the patients. In order to achieve this, a more sustained and consistent effort is needed towards capacity building and skills development of health care providers.

Finally, for ensuring rationalized use of drugs as a policy as well as a practice, will require more commitment and resources and must figure more prominently in national health plans and health reform programs.

Brigadier Habib-ur-Rehman
Director General Health Services
NWFP

Date: 23rd December 2002

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Acknowledgements

The document has been written with an overall view to improve the quality of care in our health systems. The preparation owes a great deal to many individuals and organizations.

The funding of the project was provided by Department for International Development (DFID) U.K Department of Health N.W.F.P and Balochistan were extremely helpful in facilitating the whole process. WHO also was closely involved throughout the process of SOP development and provided their technical input.

A number of seminars, workshops, meetings, discussions and opinion sharing sessions were conducted during the three months period. We would particularly like to express our gratitude to the Federal Minister of Health Dr Abdul Malik Kasi, Minister of Health NWFP Dr Meher Taj Roghani and Minister for Health Balochistan Mr Agha Abdul Zahir for their patronage during the whole exercise. Secretary Health Balochistan Mohammad Arshad Bhatti, Director General Health Dr Pir Jan Khawjakhail, Director Public Health Dr Mohammad Sharif Lodhi deserve a special thanks for their whole hearted support. Secretary Health NWFP Mr Arshad Mirza, Additional Secretary Health NWFP Muhammad Ishfaq Khan, and Director General Health, Brig Dr Habib-ur-Rehman were extremely helpful with their comments and feedback. We are also grateful to Country Representative WHO Dr Khalif Bile Mohamud and his team for taking keen interest in the development of SOPs. Ms Elizabeth Smith and Dr Inayat Thaver from DFID were always available for our help whenever needed. I would like to acknowledge with gratitude the role of the whole EDSP team in Islamabad, NWFP and Balochistan, without their hard work and dedication this Herculean endeavor would not have been possible. A special mention of guidance & efforts of Dr Zafar Mirza Executive Coordinator of TheNetwork for Consumer Protection, Mr Ayyaz Kiani Deputy Executive Coordinator of TheNetwork and Mr. Khalid Saeed Director Pharmacy Services Children's Hospital Lahore, is pertinent here who were always accessible, willing to contribute and their input indeed made a difference.

We acknowledge every effort however small it may have been, towards the achievement of our ultimate goal, which is improvement in quality of health care for our people. The list attached is a re-collection of the names, which took part in the process of developing of this SOP, but there would be many more that may not have been included here. However, each and every endeavor is thankfully recognized by EDSP.

Dr Assad Hafeez
Emergency Drugs Supply Project

Department of Health, Government of _____	
SOPs for Storage and Inventory Control	Revision# _____
Document Code # EDSP/S.I 01	Issue Date: 30th Dec. 2002
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Prepared by: EDSP	Approved by: Department of Health, Government of _____

1. Purpose of SOPs:

- To improve the quality of existing storage practices of medical supplies.
- To improve the capacity of staff involved in drug management.
- To keep the medicines effective and potent at all levels of health care delivery system.

2. Scope:

- Medicine stores of primary, secondary and tertiary level health care facilities.

3. Responsibilities:

- Store Keepers/Dispensers
- DMS (stores)
- Pharmacist
- EDO (Health)
- Policy Makers/Health Care Managers

4. Definitions:

- **Store**
  Store is an area allocated for keeping goods for the time being and for further distribution.

- **Temperature Recorder**
  Equipment used for recording of temperature of any room/Vessel/Container/Refrigerator/Freezer. This can be ordinary room thermometer or automatic temperature recorder which records the temperature 24 hrs a day, 7 days a week and 365 days a year.

- **Room Temperature** 15 - 30°C

- **Cool Temperature** 10 - 20 ° C

- **Cold Temperature** 2 - 8 ° C

- **Freezing Temperature** -20 - (-10) ° C

- **Temperature log**
  Is a chart / document on which temperature is recorded manually or automatically after certain intervals of time or continuously (in case of automatic)

- **Storage Tools**
  1. Pallets
  2. Racks
  3. Exhaust Fans/Ceiling Fans
  4. Refrigerator
  5. Air Conditioner
  6. Temperature Recorder
  7. Temperature Log
  8. Generator
  9. Fire Fighting Equipment
  10. Mouse Traps
  11. Stock Registers
  12. Issue Registers
  13. Indent Forms
  14. Type Writers/Computer with Printer
  15. Claim Forms
  16. Defective Product Report Form
  17. Expiry Calendar

- **Manufacturing Date:**
  The date when a product is manufactured.

- **Expiry Date:**
  The date after which any product should not be used in any case.

- **Storekeepers**
  Storekeeper is a person who is responsible to look after each and every item kept in the store

- **Pharmacist**
  Pharmacist is the person who is an expert on drugs/medicines; he/she uses knowledge to maximize treatment outcomes, procurement, preservation, storage, compounding, manufacturing, controlling, issuing, dispensing and distribution of medication to hospitalized and ambulatory patients and provides unbiased drug information to health professionals and patients/care providers.

- **Pallets**
  Pallets are rack-like shelves present in the store that may be either wooden or metallic. The boxes or cartons are placed / stacked on them. Pallets are usually at 4-6 inches in height from the ground. This allows better cleaning of floors and easy lifting of cartons.

- **Racks**
  The racks serve to store items separately. The racks may be wooden or

metallic.

- **Shelves**
  The racks are provided with shelves so that the items could be stored easily and separately.

- **Quarantine Facility**
  Quarantine is an area where received stocks are placed before qualitative and quantitative inspection is performed as per specifications mentioned in the purchase order.

- **Purchase Committee**
  A committee constituted for the purchase of medicines in demand and other articles. This committee is comprised of pharmacists, one physician, one surgeon, budget and account officer and a representative of the administration. This committee will make purchases as per specifications developed / mentioned by the Pharmacy and Therapeutic Committee of the health care facility.

- **Inspection Committee**
  Inspection committee includes a minimum of three members with at least one pharmacist having sufficient knowledge about the purchased medicines / articles. Its members should be different from those in the purchase committee.

- **Stock Register**
  A register in which all the received stock is entered by name of the medicine, strength, date of receiving, expiry date and from where it is received.

- **Indent**
  Demand / request book for the issuance of medicines / articles from the store.

- **Invoice**
  Invoice is the paper received with stock, which includes specifications of the products supplied by the supplier and the price with warranty.

- **Hygroscopic**
  Those compounds/medicines/drugs which absorb moisture from air at normal moisture level, like Ammonium Chloride Powder, vitamin C Tablets, Aspirin Tablets etc. These products need extra care during storage to maintain their potency/stability.

- **Desiccators**
  Are those compounds which absorb moisture from the medicine container, these are small bags usually present in bottles containing hygroscopic tablets e.g. Silica Gel.

- **Maximum Stock Level**
  It is the level of stock approved by the authorities to be in stock at any health facility according to their requirement keeping in view seasonal variation and disease pattern.

  Maximum stock level = Minimum stock level + Reorder level.

- **Reorder level**
  It is the stock level where new order for the stock is placed
  Reorder level = Minimum stock level + buffer stock

- **Minimum stock level**
  The level of stock where intervention is needed to plan the issuance of stock.

- **Lead Time**
  Time between the ordering and receiving of stock.

- **Buffer Stock**
  Stocks used during the lead time.

- **Critical Stock level**
  It is the stock level at which the issuance is stopped and under very special circumstances i.e. disasters/ war etc.

- **Shelf life**
  The period/time between the date of manufacturing and the date of expiry of the drug

$$\text{Percentage of shelf life} = \frac{\text{Remaining period before the expiry of drug}}{\text{Total time period between manufacturing date and expiry date}} \div X \quad 100$$

- **Claim Form**
  The performa filled by the store keeper at the time of receiving of stocks in case of any deficiency/breakage and handed over to suppliers or their representative.

- **Defective Product Report Form**
  This form is provided by the stores to the issuing places for informing the store of any defective product received

- **Expiry Calendar**
  It is a calendar, with the help of which, the store keeper/store incharge can check the drugs expiring in the coming months, at one glance. (Sample is annexed).

- **FIFO**
  First in first out.
  (Stocks received first should be issued first)

- **FEFO**
  First expiry first out.
  (Stocks that are expiring first should be issued first)

- **LMIS**
  Logistic Management Information System.

- **Batch number**
  Quantity of medicines/articles in which all processes are completed in one single cycle. In one batch quality remains the same/homogeneous.

5. Procedure:

5.1 General Layout
5.2 Ordering drugs
5.3 Receiving stock
5.4 Positioning Stock
5.5 Storage order of the stock
5.6 How to run (Maintenance of temperature)
5.7 Issuance
5.8 Indenting
5.9 Reporting
5.10 Management of expired drugs

5.1 General Layout:

a. Roof should be leak proof and constructed keeping in view the climate and condition of the area. *A leaking roof may allow water to drip on the stocks resulting in spoilage of cartons, packaging, labels etc. Further more, it influences the temperature inside the store.*

b. Rain/flood water should not enter the store and all those items, which can be affected by water, should be stored at a higher level in the store. *Almost all the medicines and materials are packed in cartons made of paper that is not resistant to water and moisture. If the rainwater enters the stores, it will damage the stocks on the lower level. On absorption of water, the cartons may become limp and the stack may fall down, which could damage the glass bottles and other fragile packing.*

c. The store flooring should be high from the ground level, enough to avoid entering of water during rains and floods. *Whenever stores are acquired, special attention should be paid to the floor level. The level of the store's floor should be high enough that in any case of emergency, storms, floods etc. the water does not enter the stores.*

d. The store should have the capacity to keep the stocks separately i.e. medicines, linen, disposable items, medical gasses, chemicals and condemned items as specified on their labels. *If the store's capacity is less than the stocks to be stored, it will result in the muddling of stacks, mixing of stocks, and handling and maintenance problems.*

e. Metallic (painted) pallets are advised for the stacking of stocks. *Metallic*

pallets are preferably advised for stacking purposes. The metallic pallets are also good but they are expensive and heavy in handling. Stacking of supplies on pallets helps in case of accidental entry of water, moisture, and termite attacks etc.

f. Sunlight should not enter directly in the store. *The sunlight contains rays, exposure to which can affect the efficacy of the medicines. Furthermore, entry of direct sunlight also affects the maintenance of required temperature. However, every effort should be made to provide entry of sufficient natural light in the store.*

g. The store must be well ventilated. *The standard store should have safe windows, exhaust fans and ventilators to allow the cross ventilation and air conditioners to control the temperature (wherever required). Circulation of air in the stores helps in reducing moisture, termites, bad smells, humidity and suffocation. Electricity failure is a common phenomenon; the electricity cost can be reduced if the stores are properly ventilated. All the stores, at least those in teaching hospitals & DHQ hospitals should have air-conditioning facility to regulate the temperature throughout the year, as storage temperature has a strong influence on the quality of medicines, X ray films etc.*

h. Floor of the store must be cemented (Pakka) /vinyl flooring and absolutely flat. The corners of the store walls and roof (wall to wall, wall to roof) should be angled sharply. *Mud floors always contain moisture and also erode with the passage of time. Further, soil deterioration may cause disarray / unbalancing of the stacks. The cartons packing always have the tendency to absorb moisture, therefore; cemented stores should be the first priority.*

i. Store should be kept very clean and tidy. *Clean environment generates a good impression and makes the place congenial for working. Further, if the store is not clean, it may invite insects, rats and other creatures.*

j. Whitewash should be arranged periodically (preferably once a year) *Whitewash in regular intervals helps in reducing the colonies of germs, spiders and cobwebs. Further, the smell developed in stores with the passage of time due to spillage of syrups etc can also be eliminated with regular white wash.*

k. Store must have palettes, racks/shelves and almirah available. *Pallets, preferably metallic, are the prerequisite of a good store. They help in straight stacking, demarcation of stacks, prevent moisture and termites. Racks and shelves are required for medicines that are expensive and are in small quantities. Double locked cupboards / almirahs should be made available in the store for narcotics, intoxicants, expensive life saving drugs etc.*

l. Appropriate fire fighting equipments including extinguishers, sand buckets, water heads, fire alarms / smoke alarms / detectors in good working condition must be available in the store. *Fire breaks in the stores usually due to short circuits, careless disposal of live cigarette butts etc, therefore, the fire extinguishers should be selected to cope up with any type of fire.*

These fire extinguishers must be maintained in good working condition with display of type, date of filling and expiry. Furthermore, the store staff should be aware of how to use the fire equipment. Necessary fire drills under the supervision of a qualified person should be conducted on regular intervals to keep the knowledge of the staff fresh. Effective and sensitive smoke and fire detectors and alarms should also be installed in the stores to draw attention of concerned people in any case of smoke and fire.

m. Temperature / humidity recording machine should be available and temperature log must be maintained for the room and the refrigerators / freezers. *This helps in the maintenance of required standards according to which the remedial action for saving drugs can be initiated.*

n. The store should have safety signs clearly displayed. No smoking, don't spit, no flames, no entry of unauthorized personnel etc. signs should be displayed in stores. *If the store has the categories, they should be clearly mentioned i.e. Intoxicants, Narcotics, Highly Inflammables etc. All the corrosive chemicals / acids / alkalis should be stored in safe wooden / painted metal racks in double jacket bottles. In case the facility is not equipped with the above mentioned conditions, then all such articles should be kept in wooden crates filled with sand.*

o. Narcotics (Morphine, Pethedine) shall be kept under strict supervision of the in-charge of the pharmacy. *Narcotics and intoxicating agents should be in the safe custody of the store's in-charge. The daily opening and closing, counting of the stocks and entering in the logbook, preferably in the presence of another person's witness, helps in avoiding pilferage and misuse of the narcotics.*

p. Space should be provided for used vials/ampoules/bottles. *Separate space should be allocated for storage of used vials/ampoules/bottles to avoid pilferage and recycling. In addition to the space, machinery/equipment should also be installed to properly dispose off the vials/ampoules/bottles.*

q. Mousetraps should be installed in stores. *Rats are rodents that cannot be stopped from entering the stores. Rats damage cartons and medicines. It is advised that instead of rat killing medicines, mousetraps should be used to trap rats and other crawling creatures.*

r. At the time of closing, the stores should be locked (sealed wherever required: depends on the situation and the kind of stock e.g. controlled drugs) in the presence of the store's in-charge. If padlocks are used, paper or other delicate materials should be wrapped around the lock, signed on the joint and sealed by a sealer. Store closing and opening time sheet should also be used. This practice helps in reducing theft and pilferage in case of duplicate keys.

s. Refrigerator should be available in the store to keep specialized items. Specialized items like biological and life saving drugs need proper cold chain storage to maintain the potency. *A specifically designed storage refrigerator should be dedicated to vaccines and life saving medicines. Domestic refrigerators are not recommended. There may be a need for an aux-*

iliary vaccine storage refrigerator / ice liner to cover periods of particularly high usage (e.g. the influenza immunization period). Standby arrangements (generator) should be made available to be used in case of power shut down.

5.2 Ordering Drugs:

a. To make an order, the store in-charge must know:
   i. The stock position of the store.
   ii. Supply period, how often order can be placed (weekly, monthly, quarterly or yearly).
   iii. Monthly consumption of each item (keeping in view the seasonal variations and changes in patterns of consumption in the facility with respect to expertise available)
   iv. Delivery time, store in-charge must have information about the time required between generation of demand and receiving of stock.

b. Minimum stock level is that level after which the in-charge has to take measures to avoid the stock from running out completely. These measures can include issuing for only emergency purposes, if he does not receive new stock.

c. Reorder level is the level of stock at which the in-charge has to place a new order for supply of stocks. This can be calculated by minimum stock level + stock use during delivery time.

d. Store in-charge will not place any order that crosses the maximum stock level. This can be calculated by: reorder level + order of quantity. This will help to avoid any article from expiring / over stocking.

e. Order quantity must comply with the difference between reorder level and maximum stock level. This is also the quantity used during one delivery time.

5.3 Stock Receiving

a. After placing the demand / procurement under the guidelines for making the demand.
   Prior to purchasing or placing the demand, storekeeper inputs should be taken to verify stock position. Storekeeper makes the demand at the reorder levels of stocks (already set for that product)

b. On receiving the stock, it should be placed in the quarantine area and the storekeeper will record the condition / temperature of supplied stock. In case of specific conditions, he will also verify whether the transporting vehicle / container were according to the specifications of product transportation. (For maintenance of cold chain). *At this point no entry should be made in the stock register.*

c. The storekeeper will match the specifications of the supplied stock with purchase order / supply order specifications e.g. brand name, strength, and dosage form, manufacturer's name etc. Most important is the **shelf life**. He will keep the received stock in quarantine area, especially

marked for this purpose. *Supplied stock should be kept in quarantine in such a way that its quality does not deteriorate.*

d. The storekeeper will report to the inspection committee for stock arrival and make arrangements for inspection. *This inspection committee especially constituted for inspection of received stock should not include any person from store / purchase committee to avoid any conflict of interest.*
e. Inspection committee will inspect the supplied stock as per their SOPs by considering things like shelf life, quantity, physical quality etc and issue the inspection certificate of acceptance or rejection of supplied stock *preferably in the presence of supplier / representative. Inspection committee can ask to send the samples of supplies for quality testing / analysis to any recognized laboratory.*

f. In case of committee's issue acceptance certificate, the stocks will be shifted from quarantine to store area. In case of any deficiency/brakeage, store keeper will fill a claim form and handover to suppliers representative who should be presented at the time of inspection/receiving of stocks at least at supplies at EDO level or hospital where stocks are directly received from suppliers.

g. On receipt of the item and its endorsement in the stock register, the entries of all columns are made as mentioned in the standard stock register *(as standardized in HMIS).*

h. Stock Register should be properly maintained for all the items, which are being received in the store. Any material, against which the payment has been made, needs to be entered in the record and every entry will be countersigned by the pharmacist/DMS (if pharmacist is not available). *The stock register is the basic record in which all the received and stored items and all the transactions of the items in store are registered. The stock register should reflect a clear-cut picture of all the transactions made, whether they are received, issued or discarded. Items received along with dates, quantity, manufactured / supplied by, supply order number, invoices and delivery challan numbers, date of manufacture and expiry, number of batches with DOM and DOE should be entered properly. This practice helps in reducing file works, eases the job of pharmacists or store keeper in any case of mishap and while tracing an item. The stock register should carry a certificate reflecting the number of pages in the register. This certificate must be given on a numbered page of the register, signed by the pharmacy in-charge and countersigned by the institution's executive. This is the prerequisite for any register. All the pages in the stock register should have printed numbers. This ensures the safety of the pages of the register and it becomes traceable if pages are torn or taken away from the register. Usually the following statement is used "certified that this stock register contains pages from 001 to 400. All the pages have been checked and found intact". Further if the attesting authority endorses initials on each page of the register, any chance of forgery becomes negligible.*

i. Sufficient number of pages should be available at the beginning of the register for making the index. Index is the quick reference guide for

locating items. Index can be made according to the therapeutic nature of the medicines, dosage forms, or alphabetically. Generally, the stock registers are maintained alphabetically, which is a good practice. Maintaining an index helps in quickly locating the page number of medicines without fumbling with the pages.

j. Different colored pens should be used for different nature of entries. Colored entry system should be adopted for easy checking of records. Receipts should be endorsed with red pen while issuance should be made with blue / black pens. This will make it very easy for an official to differentiate between receipts and issuances. Pharmacist should use green colored pen for countersigning the entries of the stock register *(internationally, pharmacists always use a green pen, this helps in identifying the pharmacist's input.)*

k. The following important entries should be mentioned in the stock register while receiving items at the stores.

- Date on which the items are received.
- Quantity /number of items received in predetermined units and batch number of supplied stock.
- The page should be allocated on generic name however the trade name should be given in brackets.
- Name of supplier, donor or counterpart that supplied the item, along with the reference number and dates of the delivery challan, invoice and supply order reference.
- The storekeeper should sign in front of each entry. The storekeeper will verify the entry by putting initials after every transaction.
- The stores in-charge shall verify the issuance or receipt vouchers after confirming the entry and initials of the storekeeper against each transaction and authenticates the entry by putting his initials against every transaction.
- Details of batches supplied should be reflected in the stock register.
- The date of manufacture and expiry should be written against each batch. This practice helps in tracing the supply in case of any mishap.
- On receipt of the item and its endorsement in the stock register, the inspection committee should inspect the supplies to check whether the supplies made are in accordance with the terms and conditions of the supply order or not and then issue the inspection certificate.
- All entries in the stock register should be self-explanatory. The relevant record of the procured items i.e. supply orders, invoices, delivery chalans etc are filled after stocks are received and payment has been done. Endorsement of each and every detail in the stock register will accelerate thorough checking of records for any query in the future.

l. Use the checklist while receiving supplies at the store. It should have the following information:

- Price of the item (s)
- Quantity to receive
- Number of items received
- Number shown in the invoice.
- Due date of receipt

- Date supply received
- Accompanied by invoice/warranty
- Received per supply order number and date
- Name of manufacturer
- Name of supplier
- Batch number
- Date of manufacturing
- Date of expiry
- Number of damages/breakage observed
- Shelf life of the product

Errors are expected from any human. If the checklists are used, probability of errors can be minimized. Furthermore, the checklist may serve as an instant reference for any query.

m. A committee should physically verify the stocks and carry out inspections to avoid any inconsistencies in the stores. It will help to keep the record of store up-to-date and all the things in proper order.

5.4 Positioning Stock

a. Cartons of medicines/supplies must be placed on metallic pallets, 3 feet (L) X 3 feet (W) X 4 inches (H) in size. The pallets may vary in size from case to case but the most convenient size of the pallet is given above. The minimum distance between the floor and pallets should be 4 inches. Stacking on pallets helps in easy counting of stocks, keeps them straight, and saves them from moisture and termites.

b. There should a minimum space of 12 inches between the stacks and the wall. If this distance is not kept it may give rise to formation of cobwebs, moisture, termite attacks etc. Moreover, this space helps in counting, inspecting and maintenance of stacks.

c. Stacks should be kept straight. *There should be no inclination to any side. Every effort should be made to erect the stacks straightly. The cartons have a natural tendency to absorb moisture. If a stack is mildly leaning to one side, with the passage of time the cartons may absorb moisture and the stacks will fall causing damage.*

d. Cartons should be placed in stacks. Height of the stack should not be higher than 6 feet. *If the height is more than 6 feet, it becomes difficult to keep the stacks straight. The higher the stack; the more weight would be on the lower cartons, which may cause breakage or leakage. Incase of heavy stocks i.e. I/V fluids Glass bottles height should not be more than three cartons and preferably these should be stored in racks as single carton. Moreover, at the time of dispatch the staff may face difficulties in downloading. In case of heavy articles like infusions, there should not be more than 3 cartons in one stack; otherwise the plastic bottles may be punctured in the lowest carton due to high pressure.*

e. A space of about 3 feet should be maintained between the stacks. This helps the store staff in physical verification, location of batches, loading

and unloading etc. If the distance is less than required, loading and unloading would become difficult.

f. Cartons should be placed right side up so that label is visible and can be read easily. Every effort should be made to keep the carton in upright position. Almost every carton bears the sign of an upward arrow, glass, umbrella etc. to help the staff in keeping the carton in the correct manner. If instructions are not adhered to the syrups may leak, details on the cartons may not be readable etc.

g. Each and every stock should have bin cards. Bin card is the mirror of the stack. Bin card is the instant reference guide of all the transactions that take place in the particular stock. If there are different batches in one item, separate bin cards must be displayed with one master bin card. These may be placed on the stacks, on shelves and/or on racks. Bin cards should reflect the following essential information.
   i. Name of the item in generic; brand name in brackets with strength.
   ii. Date when the item was received.
   iii. Quantity of the stock received.
   iv. Batch number of stock
   v. Minimum stock level
   vi. Reorder level
   vii. Maximum stock level
   viii. Date of manufacture and expiry
   ix. Date and quantity of items issued out of stock
   x. Balance
   xi. Sign of in-charge

h. All entries regarding receipt and issue should carry initials of the store-keeper and duly authenticated by the in-charge of pharmacy/store on the bin card, after physical checking / verification after every 15-30 days. Properly maintained bin card become a duplicate record of the stock register. If every entry is properly endorsed, signed and counter-signed, it may help in endorsing proper entries in the stock register.

i. The balance shown on the bin card must correspond with the balance in the stock register and the physical balance of the stock. As discussed earlier, the bin card is a mirror of the stack and a duplicate record. If the physical balance does not tally with stock register or bin card, it shows missing of entry or less or over issuance, which can be rectified at the earlier stage. Therefore, the bin card should be updated with regular intervals (daily, weekly, fortnightly, monthly), keeping in view the number of personnel in the store, workload and pace of transactions.

j. There should be a policy of making up of stock differences between physical stock and theoretical. *It is practically impossible that the physical and theoretical stocks match every time because of many factors. For this purpose, tolerance levels can be set for different categories of different dosage forms. This recommendation is subject to the approval of authority.*

k. All stocks present in the store should be defaced to avoid any pilferage.

5.5 Storage Order of the Stock

a. Medicines should be kept in a separate store. The medicines store should be remote and separate from stores of other usable commodities, pesticides, inflammables etc. The categorization of stores helps in taking precautionary measures, safety of stocks and working conditions for the store officials.

b. The order of storing various medicines should be in therapeutic or alphabetical order, or based on utilization or as convenient. The chemist shop contains a variety of medicines but chemists do not find any difficulty in locating any medicines because they are kept in a certain order. It might be alphabetical, therapeutic or category wise. If the stores are maintained in any sequence, it helps in locating the medicines and eliminates wastage of time.

c. The medicines should be positioned, based on the principle of FIFO (First in first out) and FEFO (First expiry first out). FEFO method should be applied in case of different batches having different expiries. Optimum efforts should be made to consume the stocks, which have earlier expiries, and they should be stored in a manner that the items with earlier expiry items should be issued on first priority.

d. Insecticides, chemicals and other fluids should be kept in a separate room. Insecticides and chemicals are usually highly inflammable items and cause bad smell when they vaporize. The vapors of these chemicals may affect the medicines and can cause problems for the store's staff. Therefore, the chemical stores must have very good ventilation systems, fire extinguishers, facemasks and items for first aid.

e. Expired materials, un-usable machinery and equipment should be placed in separate rooms. The expired materials and unusable machinery and equipments are usually dumped and no care is taken to maintain them due to which unusable stores becomes unarranged and messy.

5.6 How to Run (Maintenance of temperature)

a. Inflammable materials should be stored in a separate space to avoid any emergency.

b. Empty Vials and bottles should be stored in a separate space for safe disposable. Exhaust fans should run all the time in this area. Usually in stores, bad smell is caused due to breakage of bottles and spillage of syrups. Further fumes and vapors are produced in different cases; therefore, exhausts fans are the best way to circulate the air in stores.

c. Fresh air should enter into the store/room at all times. Electricity failure is very common and the cost of electricity is much higher due to which it sometimes becomes difficult to run the exhaust fans round the clock or due to human negligence, one may forget to switch on the

exhaust fans. In such cases, ventilated stores minimize the risks of accumulation of fumes, vapors, bad smells, humidity and moisture. In case of a stock that needs storage at a specific temperature, air conditioner or other controlled temperature equipment should be used.

d. Thermometer should be displayed on the wall. A certain temperature is required for storage of medicines that may vary subject to the nature of medicines, which is usually indicated on the packaging and literature of the medicines. Thermometers help in maintaining the required temperature conditions and may indicate the steps to be taken for maintaining the required temperatures.
e. Both, minimum and maximum temperatures should be recorded at least twice a day. Recording temperature at least twice a day will ensure the safety of medicines. If temperature is not maintained according to the standards, corrective measures should be taken to stabilize it.

f. Temperature record should be maintained on a separate temperature sheet. This sheet is usually displayed alongside the thermometer for endorsing temperatures. This data will help keep the medicines' efficacy unaffected.

5.7 Issuance

a. Previous consumption, based on genuine demand should be the basis of issuing various items. Previous consumption trends can be set on a period or season etc. This trend helps in calculating demands and issuance. If a demand is received that seems exaggerated or unjust, it can be verified and issuance can be made on the basis of previous trends and current circumstances. For this purpose, meeting / contact between supervisor of store and supervisor of demanding department can solve this issue immediately.

b. The supplies / medicines should be stamped as "government property not for sale" (It should be clearly mentioned in TORs of the supply order). It is a common public complaint that the hospital inventory medicines are being sold in the market. If this monogram is displayed on the packing of every medicine, the pilferage and misuse can be reduced, even eliminated. Instructions in the purchase order / supply order should contain the institution's name and the stamp of "Government property not for sale". This will help in controlling pilferage; if supplier does not mention these on the packing, then it is the duty of the store staff to deface all materials present in the store. If man power is present then every issue should be marked with the name of facility to whom this stock is issued.

c. A register should be properly maintained for issuing various items. If immediately after any issuance, an entry is not endorsed in the register, the chances are that it will be forgotten, which will result in shortage of the stock. Therefore, instant entries should be made in register after every issuance.

d. Whenever an entry is made for issuing of any item, a signature should be made on the register. This practice is helpful when there are two or more persons handling the store and the stock register. The chances of mistakes, pilferage and forgery are avoided.

e. While issuing items from the store, the following important entries should be made in the register.
   i. Reference number of demand or indent.
   ii. To whom the items are issued?
   iii. How much quantity is issued?
   iv. What is the balance at the store after this issuance?

If the above noted entries are properly maintained, the scrutiny of records becomes easier, otherwise for verification of each entry, an auditor or official would have to consult the record, which is time consuming and very difficult.

f. The entries should be verified from the logistics' in-charge. The stores or logistics in-charge verifies every entry after checking the related vouchers. This becomes a double check on errors and responsibility is shared.

g. Authorized register should be used instead of using hand written register. Almost every organization has their own printed stationary for such purposes. If unauthorized registers are used, the validity of records becomes doubtful. Further, authorized registers should be used for uniformity of the records.

h. Issues should be made on a proper Issue Receipt Voucher in triplicate (Indent Book). Triplicate voucher system should be used for issuance. This voucher / indent should have the name of the department, quantity previously issued, stock in hand and quantity demanded. The storekeeper will keep full signature with stamp of indenting personnel and one copy of this indent after taking signature on received stock. One copy will be sent to the store officer / executive and a third will remain with the indenter. This indent book should be printed, numbered, and issued by some authority in the health facility. These procedures will help in audit of the store and indenting place (wards outpatient pharmacy, laboratories, radiology department etc.)

i. Overall accountability of the storage management should be of the store in-charge.

j. Proper security of the store must be assured.

5.8 Indenting

a. Proper demand for supplies should be made to the main / bulk store. If the lower stores present exaggerated or unjust demand of items, it would become difficult for them to store and utilize. The items may expire or other factors can affect the efficacy of the medicines. Therefore, proper demand that can be consumed in a specific period

should be made. For this purpose, maximum stock level, reorder level and minimum stock level of every item for every store should be set and expiry calendar must be prepared, which should always be present in front of the storekeeper and the store in-charge. For computerized inventory, software can be used to indicate expiry dates of a year, six months, three months and six weeks, so that the store in-charge can take necessary action to liquidate / return to suppliers.

b. While demanding supplies from the main / bulk store, the following points should properly / fully explained:
   - Name of the item.
   - Quantity received in the previous demand.
   - Date on which the item was received.
   - Quantity of the item consumed / issued.
   - Disease pattern, whether it has seasonal variations or migrations.
     - *Amount consumed will be used in case of peripheral level while amount issued can be used in case of district and provincial stores.*
   - Balance of that particular item in hand.
   - Quantity of item required / demanded through this indent.
     - *If the above mentioned factors are not observed, chances of wrong issuance of items and differences in quantity are expected, which may give rise to over or under stocking, delivery of wrong medicines etc. Therefore, every care should be observed while making a demand.*

5.9 Reporting

a. Reporting / inventory or LMIS (Logistics Management Information System) is essential for quick examination of how many medicines / commodities are moving and are available / not available through the programme / district / health facility / unit. The items available at the district stores should be circulated to all the health facilities within the district on a monthly basis. Maintenance of effective information system is a prerequisite for a good logistics system. If an effective LMIS is not maintained, the situation of overstocking, under stocking, stock outs etc. may arise, which will adversely affect the system. A proper LMIS reflects the factual position of stocks, receipts, issuances, balances, and consumption trends and the base record for generation of demand for the next period.

b. It should reflect various levels of the programme / system. At the provincial level, various tiers would be the districts and agencies to which the supplies are issued. In case of the hospitals (Tertiary, DHQs), various levels would be different wards to which medicines and other supplies are issued. In case of the peripheral health facilities, medicines are issued to OPDs.

c. Monthly reports should reflect the number of items received and issued / consumed during the particular month.

d. A cumulative report should reflect the number of medicines / items received and issued up to date during the current year.

e. The data should be used for planning, guidance and resource allocation purposes.

5.10 Management of Expired Drugs

a. Store keeper will keep a record of dates of expiry with the help of an expiry calendar; he/she will inform the store incharge at least six months prior to the expiry of stock. The store incharge will take necessary action for the disposal of short expiry drugs by informing the prescribers, or circulating the drugs to other health facilities for exchange, where permissible.

b. Store incharge will ask the supplier for change of a stock nearing its expiry if it is in TORs of the supplier's order.

c. In case the stocks expire, the store keeper/store incharge will inform the authorities and a committee will be constituted for condemnation of expired stocks. The expired stock will be disposed off through incinerator (preferably) or breakage to avoid any misuse/reuse.

d. Disposal of large quantities can be made as suggested by WHO in its relevant manuals.

ANNEXURE

Check lists

Proper Positioning of Stock

- Cartons of medicines/supplies must be placed on metallic pallets, 3 feet (L) X 3 feet (W) X 4 inches (H) in size.
- There should a minimum space of 12 inches between the stacks and the wall.
- Stacks should be kept straight. Cartons should be placed in stacks.
- A space of about 3 feet should be maintained between the stacks.
- Cartons should be placed right side up so that label is visible and can be read easily. Each and every stock should have bin cards.
- Bin cards should reflect the following essential information.
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    - Minimum stock level
    - Reorder level
    - Maximum stock level
    - Date of manufacture and expiry
    - Date and quantity of items issued out of stock
    - Balance
    - Sign of in-charge
    - All entries regarding receipt and issue should carry initials of the storekeeper and duly authenticated by the in-charge of pharmacy/store on the bin card.
    - The balance shown on the bin card must correspond with the balance in the stock register and the physical balance of the stock.
- There should be a policy of making up of stock differences between physical stock and theoretical.

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- The order of storing various medicines should be in therapeutic or alphabetical order, or based on utilization or as convenient.
- The medicines should be positioned, based on the principle of FIFO (First in first out) and FEFO (First expiry first out).
- Insecticides, chemicals and other fluids should be kept in a separate room.
- Expired materials, un-usable machinery and equipment should be placed in separate rooms.

Maintenance of Temperature.

- Inflammable materials should be stored in a separate space to avoid any emergency.
- Exhaust fans should run all the time in this area. Fresh air should enter into the store/room at all times.

- Thermometer should be displayed on the wall.
- Both, minimum and maximum temperatures should be recorded at least twice a day.
  Temperature record should be maintained on a separate temperature sheet.

Procedures for Issuance of Drugs

- Previous consumption, based on genuine demand should be the basis of issuing various items. Previous consumption trends can be set on a period or season etc. This trend helps in calculating demands and issuance.
- The supplies / medicines should be stamped as "government property not for sale".
- A register should be properly maintained for issuing various items.
- Whenever an entry is made for issuing of any item, a signature should be made on the register.
- While issuing items from the store, the following important entries should be made in the register.
  - Reference number of demand or indent.
  - To whom the items are issued?
  - How much quantity is issued?
  - What is the balance at the store after this issuance?
- The entries should be verified from the logistics' in-charge.
- Authorized register should be used instead of using hand written register.
- Issues should be made on a proper Issue Receipt Voucher in triplicate (Indent Book).
- Overall accountability of the storage management should be of the store in-charge.

Indenting Procedures

- Proper demand for supplies should be made to the main / bulk store.
- While demanding supplies from the main / bulk store, the following points should properly / fully explained:
  - Name of the item.
  - Quantity received in the previous demand.
  - Date on which the item was received.
  - Quantity of the item consumed / issued.
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    - *Amount consumed will be used in case of peripheral level while amount issued can be used in case of district and provincial stores.*
  - Balance of that particular item in hand.
  - Quantity of item required / demanded through this indent

Inventory/ Reporting Procedures

- Reporting / inventory or LMIS (Logistics Management Information System) is essential for quick examination of how many medicines / commodities are moving and are available / not available through the programme / district / health facility / unit.

- It should reflect various levels of the programme / system.
- Monthly reports should reflect the number of items received and issued / consumed during the particular month.
- Accumulative report should reflect the number of medicines / items received and issued up to date during the current year. The data should be used for planning, guidance and resource allocation purposes.

BATCH AND EXPIRY CALENDER
FOR TABLETS/SYRUPS/CREAMS & OINTMENTS/INJECTABLES

	January	February	March	April	May	June	July	August	September	October	November	December
2003												
2004												
2005												
2006												
2007												
2008												

STOCK REGISTER

Name of medicine _____

Specification _____

1	2	3	4	5	6	7	8
Date	Particulars	Price	Quantity			Name & signature	Remarks
			received	Struck off	Balance		

DAILY EXPENSE REGISTER

Month _____

Year _____

Name of article	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

DEMAND FORM

District/Agency_____

S.No	Name of item	Quantity received from PHQ	Issued	Balance	New demand

TEMPERATURE LOG

Name of store:_____ Month:_____

Year: _____

Date	Temperature		Signature
	Morning	Evening	

STOCK REGISTER

Medicines/supplies
Name of article: _____ Unit _____

1	2	3	4		5	6	7
Date	Received from/issued to and reference	Quantity in units				Name and signature	Remarks
		Received	Issued		Balance		
			For care	Discarded			

CHECKLIST TO BE USED WHEN NEW SUPPLY ARRIVES

Name of item _____

Date supply received _____

Name of supplier _____

Supply order number _____

Supply order date _____

Name of supplier _____

Accompanied by invoice/warranty Yes ☐ No ☐

Quantity/number mentioned in the invoice _____

Quantity/number received in supply _____

Name of manufacturer _____

Date of manufacturing _____

Batch Number _____

Date of expiry _____

Number of damages/breakages observed _____

INSPECTION REPORT

S.No	Particulars	Status
1	Date of inspection	
2	Name of item	
3	Name of supplier	
4	Supply order number	
5	Supply order date	
6	Invoice number	
7	Invoice date	
8	Delivery challan number	
9	Delivery challan date	
10	Quantity ordered	
11	Quantity supplied	
12	Name of manufacturer	
13	Batch number	
14	Date of manufacturing	
15	Date of expiry	
16	Consignment received on	

Certified that the said supply conforms with the specified standards communicated to this office and approved sample of the said item.

Signatures of members of Inspection Committee

Acknowledgements Annex

Dr. Nek Dad Afridi, Mr. Abid Hayat, Mr. Sabir Ali, Mr. Khurshid Ahmad Sheikh, Dr. Laeeq Ahmad, Dr. Ayoub Rose, Dr. Roohullah, Dr. Hifzurrehman, Dr. Waheed Khan, Dr. Muhammad Riaz, Dr. Muzaffar Khan Kundi, Dr. Aimal Khan, Mr. Nazar Husain, Mr. Mujtaba, Mr. Muhammad Jalil Anwar, Dr. Yousaf Parvez, Mr. Abid Hayat, Dr. Mudassir Bangash, Mr. Javed Muhammad, Mr. Saleem Khan, Mr. Abdurrashid, Mr. Bakht Karam, Dr. Muhammad Iqbal, Dr. Amanulah, Dr. Khalid Iqbal , Dr. Jalil-ur-Rehman, Dr. Sajid Shaheen, Dr. Muhammad Iqbal Afridi, Mr. Muhammad Ishfaq Khan, Brig. Dr. Habib-ur-Rehman, Brig. Dr. Farrukh Seir, Dr. Muhammad Saeed Akbar Khan, Dr. Saadullah Khan Afridi, Dr. Muhammad Iqbal, Dr. Fazal Mahmood, Dr. Khurshid Ali, Dr. Abdul Ghafoor, Dr. Shaheen Afridi, Dr. Ali Ahmad, Dr. Saeed Khan, Dr. Maqsood, Dr. Jumma Khan, Dr. Samim Khan Durrani. , Prof. Nirmal Dass, Mrs. Ishrat Bukhari, Dr. Masood Noshirwani, Dr. Abdul Rahman. Dr. Ilahi Bukhsh, Dr. Allah Nawaz Bugti, D.M. Jamali, Dr. Arshad Mahmood, Mr. Jamshed Qureshi, Dr. Zaeem-ul-Haq, Mr. Azhar Hussain, Dr. Farrukh Qureshi, Mr. Shafi Mohammad Zehri, Dr. Azeem Khwajakhel, Mr. Ameer Tariq Zaman, Ms. Ishrat Bukhari, Dr. Rukhsana Bashir, Dr. Khalif Bile, Dr. Zafar Mirza.

EDSP

Dr. Wali Muhammad, Mr. Zahid Shah, Mr. Javed Mohammad, Dr. Imtiaz Malang, Mr. Khurshid Ahmed Sheikh, Dr. Saifuddin, Dr. Kashif Butt, Mr. Amanullah, Dr. Javid Iqbal, Mr. Sajid Bashir, Dr. Humaira Aslam, Dr. Assad Hafeez, Mr. Ayyaz Kiani, Mr. Ahmed Ali, Mr. Francisco D'Sa.

Networking in Development
Advocacy & Consumer Protection
through Quality Publication