KINGDOM OF CAMBODIA

NATION RELIGION KING

MINISTRY OF HEALTH

Department of Drugs and Food

Guidelines for the Good Storage Practice of Essential Medicines and other Health Products

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Introduction

Storage is an important activity in the medicines supply chain management. Medicines save lives and improves health outcome only if they are available, of good quality and properly used. The objectives of these Good Storage Practices Guidelines are to ensure that reliable supplies of good quality appropriate medicines are stored in appropriate facilities and managed by well-trained personnel; and are always available as needed for the people of Cambodia.

Good Storage Practices assist in ensuring the quality, safety and identity of pharmaceutical products throughout the whole supply management cycle up to their point of use. Improper storage of medicines can lead to misplacement of stock and stock expiry, stock-outs and overstocking, and deteriorated quality of medicines; leading to negative health outcomes such as interruption of crucial treatment and resistance to antimicrobials as well as waste of financial sources. Thus storage is one key components of the Pharmaceutical Sector Strategic Plan, 2013-2018 of the Kingdom of Cambodia and its Medicines Policy, 2010.

The guidelines are applicable not only for the public sector (Central Medical Store, Operational District Drug Store, pharmacy store at national and provincial hospitals etc) but also for the private sector (medicines importers, wholesalers, pharmacy drug store).

Good Storage Practices Guidelines is one of guidelines which have been developed by the Department of Drugs and Food, Ministry of Health to guide all pharmacists and health workers in safeguarding the public health and ensuring best practice in the management of medicines.

Acknowledgement

General Requirements

➢ All personnel should receive proper training in relation to good storage practice, regulations, procedures and safety.

➢ Personnel employed in storage areas should wear suitable protective or working garments appropriate for the activities they perform.

➢ Individual responsibilities should be clearly defined and understood by the individuals concerned and recorded as written job descriptions. Certain activities may require special attention such as the supervision of performance of activities, in accordance with these guidelines.

➢ Storage areas should be designed or adapted to ensure good storage conditions. In particular, they should be clean and dry and maintained within acceptable temperature limits. Where special storage conditions are required on the label (e.g. temperature, relative humidity) these should be provided, checked and monitored and recorded.

➢ Medicines and health commodities should be stored off the floor and suitably spaced to permit cleaning and inspection. Storage area should be appropriated in a way that not more than 60% of their space is utilized.

➢ Rejected materials and pharmaceutical products should be identified and controlled under a quarantine system designed to prevent to their use until a final decision is taken on their fate.

➢ Broken or damaged items should be withdrawn from usable stock and separated.

➢ Pharmaceutical products should be transported in such a way that their integrity is not impaired and that storage conditions are maintained.

➢ Chief of Drug Store should conduct a regular shelf-inspection using the checklist (Annex 2, Self-Inspection Checklist) to ensure all requirements are met and improvements are made.

Routine Management or Storeroom Management Tasks

Daily/Weekly

- ✓ Monitor storage conditions
- ✓ Record temperature and humidity
- ✓ Clean receiving, storage, packing and shipping areas
- ✓ Sweep or scrub floors
- ✓ Remove garbage
- ✓ Clean bins, shelves, and cupboards, if needed
- ✓ Ensure that aisles are clear
- ✓ Ensure adequate ventilation and cooling
- ✓ Ensure that products are protected from direct sunlight
- ✓ Monitor store security and safety
- ✓ Check the store roof for leaks, especially during the rainy season and during or after a storm
- ✓ Monitor product quality (visually inspect commodities and check expiration dates)
- ✓ Ensure that products are stacked correctly (are the lower cartons being crushed?)
- ✓ Update stock records and maintain files
- ✓ If cycle counting, conduct physical inventory and update stock keeping records
- ✓ Monitor stock levels, stock quantities, and safety stocks
- ✓ Submit emergency order (as needed, using local guidelines)
- ✓ Update back-up file for computerized inventory control records
- ✓ Update bin cards
- ✓ Separate expired stocks and move to secure area
- ✓ Check for signs of rodents, insects, or roof leaks

Monthly

- ✓ Update stock card
- ✓ Conduct physical inventory or cycle count, and update stock keeping records
- ✓ Run generator to ensure the system is working correctly; check the level of fuel and add fuel, if needed.
- ✓ Inspect the storage structure for damage, including the walls, floors, roof, windows and doors

Every 3 months (quarterly)

- ✓ Conduct physical inventory or cycle count, and update stock keeping records.
- ✓ Use established procedures to dispose of expired or damaged products
- ✓ Visually inspect fire extinguishers to ensure that pressures are maintained and extinguishers are ready for use
- ✓ Asses stock situation
- ✓ Complete and submit requisition form
  Determine issue quantity and issue
- ✓ Receive products
- ✓ Store products using correct procedures; rearrange commodities to facilitate the first-to-

expire, first-out (FEFO) policy. (See section on receiving and arranging products.)
- ✓ Complete required reporting and documentation.

Every 6 months

- ✓ Conduct fire drills and review fire safety procedures.
- ✓ Inspect trees near the medical store and cut down or trim any trees with weak branches.
- ✓ Prepare schedule for detecting insects and rodents.

Every 12 months

- ✓ Service fire extinguishers and smoke detectors
- ✓ Conduct complete physical inventory and update stock keeping records
- ✓ Reassess maximum/minimum stock levels, and adjust if need

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KEEPING YOUR STORE CLEAN AND TIDY MAKES MANAGING YOUR MEDICINES, CONSUMABLES AND HEALTH PRODUCTS EASIER!

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1. Receiving and Arranging Commodities

1.1 Receiving Health Commodities

When you receive health commodities-
- Ensure there is sufficient storage space
- Prepare and clean the areas used for receiving and storing the products
- Inspect packages for damaged or expired products**.**

If	Then
Products are damaged or expired	1. Separate the damaged or expired stock from the usable stock
	2. If damage or expiry is discovered while the delivery truck is still at your site; note the problem (s) on the delivery note.
	If damage or expiry is discovered after the delivery truck
	3. has departed, follow your procedures for handling

damaged or expired stock

4	- Prepare report on defected and expired medicines and send it to Essential Drug Bureau ,Department of Drug and Food (Annex 3) for public sector.

Products are not damaged or expired

1. Count the number of units for each product received and compare to issue voucher and prepare the incoming report.
2. Record the date and quantity received on stock card and bin card (if applicable)
3. Ensure the expiry date is visibly marked on every package or unit especially for medicines.
4. Arrange products in the storage area to facilitate the first-to-expire, first-out (FEFO) and first in first out (FIFO) procedure.
   (See section on stock rotation)

CHECK EXPIRY DATES AND QUALITY OF MEDICINES, CONSUMABLES AND HEALTH PRODUCTS BEFORE PLACING THE ITEMS IN YOUR STORE!

1.2 Arranging Commodities

Arrange the storeroom and shelves as follows:

If using pallets, stack cartons on pallets:

- At least 10cm off the floor
- At least 30cm away from the walls and other stacks
- No more than 2.5m high (general rule)

For all storage:

- Follow the manufacturer or shipper's directions when stacking, and follow labels for storage conditions.
- Place liquid products on the lower shelves or on bottom of stacks.
- Store products that required cold storage in appropriate temperature controlled zones.

- Store high security/high value products in appropriate security zones.
- Separate damaged or expired products from the usable stock without delay, and dispose of using established disposal procedures.
- Always store all commodities in a manner that facilitates FEFO policy for stock management.
- Arrange cartons so arrows point up and identification label, expiry dates, and Manufacturing dates are visible. If this is not possible, write the products name and expiry date clearly on the visible side.

1.3 Stock Rotation

When issuing products, it is important to follow the **FEFO** policy.

Following FEFO minimize wastage from products expiry.

- Always issue products that will expire first, ensuring they are not too close to or past their expiration date. The shelf life remaining must be sufficient for the product to be used before the expiry date.

- To facilities FEFO, place products that will expire first in front or products with later expiry date

- Write expiry date on stock cards, so stock can be sent to facilities at least 6 months before they expire.

*Remember, products you received most recently may expire sooner than the products you received earlier. So, it **is extremely important to always check the expiration dates** and to make sure the dates are visible while the products are in storage.*

1.4 Orderly Arrangement of Essential Medicines

Medical stores must have a system for classifying or organizing medicines, and must ensure that all employees know the system being used.

Some common systems for arranging medicines include:

Alphabetical order by generic name: Often seen in both large and small facilities. When using this system, the labeling must be changed when the Essential Medicines list is received or updated.

Therapeutic or pharmacologic category: Most useful in small storerooms or dispensaries where the storekeeper is very knowledgeable about pharmacology.

Dosage form: Medicines come in different forms, such as tablets, syrups, injectables, and external use products such as ointments and creams. In this system, medicines are categorized according to their dosage form. Within the area for each form, a fixed, fluid, or semi-fluid system is used to store items. Any of the other methods of categorizing can be used to organize the items more precisely.

Frequency of use: Frequently used products that move quickly or often through the store should be placed in the front of the room or closest to the staging area. This system should be used in combination with another system.

Commodity coding: Each item has its own article and location code. This system has the greatest flexibility, but it is also the most abstract. Stores staff do not need any technical knowledge of the products to manage this system because the codes contain the information needed for storing products properly, such as temperature requirements, level of security, and flammability. This system works well in computerized inventory control systems.

ORGANIZING YOUR MEDICINES, CONSUMABLES AND HEALTH PRODUCTS MAKES IT EASIER FOR YOU TO MANAGE!

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2. Keeping Track of Products in Your Storeroom

2.1 Standard List of Stock Items

- Each medical store should maintain a standard list of stock items that includes all products they handle, with their specifications, including form, strength and quantity per package.

- The list should be regularly updated and distributed to sub-stores and units.

- **Don't order products that are not the standard list unless you have special permission. You** should not accept deliveries of products not on the list unless special circumstances have been identified.

- Inventory records should be maintained for all products on the list.

2.2 Stock Card

- The minimal information that should be collected on stock records for medicines and other health products includes
    – product name/description (including the form [e.g. capsule, tablet, liquid suspension, etc.] and strength)
    – stock on hand/beginning stock balance
    – receipts
    – issues
    – losses/adjustments
    – closing/ending balance
    – transaction reference (e.g. issue voucher number or name of supplier or recipient)

- Depending on the system, stock record might also include additional product information such as
    – special storage conditions (e.g. 2◦C - 8◦C)
    – unit prices
    – lot numbers/bin locations
    – item codes
    – expiry dates

Stock card should also include certain calculated data items below:

    – consumption data, such as average monthly consumption (AMC)
    – lead times for ordering/requisition
    – maximum and minimum stock levels
    – emergency order point

- A storage and distribution system may not necessarily use all these forms, but it will need forms to record stock keeping data and product transactions. Standard forms used for inventory control include:

    – stock cards
    – bin cards
    – requisition/issue vouchers
    – receiving forms (packing slip/freight bill)
    – delivery/ issue vouchers
    – expired stock disposal forms
    – Physical inventory forms
    – list of approved medicines and prices

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MAINTAINING ACCURATE RECORDS
MAKES YOUR JOB EASIER!

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2.3 Physical inventory

A physical inventory is the process of counting by hand the number of each type of product in your store at any given time. **A physical inventory helps ensure that the stock on hand balances recorded on stock keeping records match the quantities of products actually in the store**. When conducting physical inventory, count each product individually be generic, dosage form, and strength.

There are two kinds of physical inventory.

> ***Complete physical inventory:*** all products are counted as the same time. A complete inventory should be taken at least once a year. More frequent inventory (quarterly) or monthly) is recommended. For large warehouses, this may require closing the storage facility for a day longer.

> ***Cyclic or random physical inventory:*** Selected products are counted and checked against the stock keeping records on a rotating or regular basis throughout the year. This process is also called cycle counting.

A complete physical inventory is easier to conduct regularly at facilities that manage smaller quantities of products. Cyclic or random physical inventory is usually appropriate at facilities that manage larger quantities of products.

Cyclic physical inventory can be organized in many ways:

Dosage form: count tablets in January, capsules in February, liquids in March, etc.

Location in the storeroom: count shelves 1-4 in January, 5-8 in February, etc.

Time availability: count a few items each day whenever staff have time

Stock on hand: on a periodic basis, count each item for which stock on hand is at or below the minimum inventory level.

If cyclic physical inventory is used, count each product at least once during the year. Count fast-moving items and full supply products more frequently.

Steps in conducting a physical inventory:

> ❶**Plan**
> - For a complete physical inventor, schedule the day(s) and time
> - For a cyclic or random physical inventory, identify which products will be counted

and the corresponding time period for those products.

❷Assign staff

❸Organize the storeroom
- Arrange products according to FEFO
- Make sure open cartons and boxes are visible
- Separate damaged or expired products

❹Count the usable products
- Count products according to the units by which they are issued (e.g. tablet or piece) not by the carton or box
- Estimate quantities in open containers for products packaged in bulk. If a bottle of 1,000 capsules is ⅔ full, estimate 650 or 700 capsules. If you have a one liter bottle of syrup that ½ full, estimate 0.5 liters.

❺ Update the stock keeping records

- Write the date of the physical inventory and the words "Physical Inventory."
- Using a red color ink, write the quantity or the product that you counted during stocktaking.

❻ Take action based on the result of the physical inventory
- If the results of the physical inventory differ from the balance on the stock/bin card, update the balance by adding or subtracting the excess or missing quantities.
- Take off damaged of expired products found during the physical inventory and then prepare a request to dispose them.
- For either of the above, identify, document, and correct the cause of the problem.

❼ Discuss the findings of the inventory with the facility staff
- Congratulate the staff, if appropriate.
- Take corrective actions, if required.

PHYSICAL INVENTORY HELPS YOU TO KNOW HOW MUCH STOCK YOU HAVE ON HAND AND WHEN TO REORDER!

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3. Special Storage Conditions

Some products need storage in an access-controlled environment.

It is important to identify products that are at risk of theft or abuse or have the potential for addiction, and to provide increased security for those items. This includes products that are in high demand or have the potential for resale (black market value).

3.1 Examples of access –controlled storage

The Essential Medicines List, Ministry of Health (2012) includes several narcotics and psychotropic medicines; one or two will be on facility lists. Typical example are:

Narcotic drugs: Morphine, Oxycodone , Tramadol , Codeine , Opium preparations .

Phychotropic substances: The more common being used Diazepam and other medicines in the Essential Medicines List , Carbamazepine used to treat epilepsy, strong tranquilizing medicines, such as chlorpromazine, may also be found under this heading.

Some of the medicines mentioned earlier are controlled substances, which are medicines handled under international control. These medicines need greater attention. There are specific procedures in place for the procurement, reception, storage, dispending, and administration of controlled substances. Special ordering forms should be used.

- Narcotic drugs and psychotropic substances should be stored in compliance with international conventions and national laws and regulations and access-controlled storage must be established. This will probably include storing the products in:

    - A separate locked room, cabinet, or safe, or
    - A locked wire cage within the storage facility

- A warning light of bell will be activated when stores are accessed without permission.
- Entry to the location of the access-controlled products must be limited to the most senior store. Keeper or pharmacist and one other staff member

- Limit the number of keys made for the controlled location and keep a list of people who have keys

> **Note:** Other medicines, including antiretroviral used to treat HIV/AIDS, may need storage in a controlled facility, because they are scarce, expensive, and in high demand.
>
> Organization donating medicines may require that those medicines be stored in a controlled environment. These may be products donated for a specific condition that can also be used for other conditions. Examples include medicines used to treat sexually transmitted infections that might also be on the NEML and used for other conditions; or HIV test kits that may be donated for use in specific programs, such as preventing mother-to-child transmission, but can be used for other purposes, such as ensuring blood safety.

3.2 Material Handling Equipment and Storage:

Shelves and cupboards
Use shelves and cupboards to store smaller products. Adjust the shelves as needed to allow for packages of different sizes.

Table in the packing area
Provide large tables in the packing area for staff to use when assembling and packing shipments. Keep the tables clean.

Pallets
Pallets are used to store bulk items and larger cartons. They keep things off the floor and can be used with forklifts or dollys to move around groups of larger items. Pallets are generally used only in larger facilities because storing and moving pallets left in place to ensure air circulation and keep products off the floor.

If your facility uses pallets, remember to-

- Always inspect pallets before loading them with material. Ensure that pallets are solid and sturdy with no loose or cracked boards and no protruding nails. Damaged pallets can break while being lifted and cause serious injuries and product damage.
- Pile empty pallets neatly and out of aisles.
- If possible, keep pallets indoors, away from elements that can gradually break down the wood
.

Regardless of the material they are made of, pallets increase the risk of fire because they provide open space for oxygen to fuel a fire and a large surface area for a fire to burn. Always follow the safety precautions discussed in the fire protection section of this guide.

Shelves, cupboards, tables, and pallets can be made of wood, metal, and plastic. Metal shelves, cupboards, and pallets may be steel, stainless steel, or aluminum. These tend to cost more, but are stronger, more durable, and less flammable than plastic or wood. Also, they are vulnerable to insect, rodent, or fungus problems.

Forklift and pallet lifters

If you plan to use forklift or pallet lifters in your facility:

- Ensure the floor is even and able to withstand the weight of the loaded lifter
- Ensure the lifter has room to load and unload products.
- Consider the appropriate lifter for your facility. Forklifts and pallets lifters can be powered by gas, diesel, liquid propane gas, or electricity, all or which affect the capacity and cost. Also consider the warehouse ventilation and environment.
- Keep an extra battery or a battery charger, if needed. Ensure the battery can last a full day.
- Ensure the lifter can reach the highest pallet rack.
- Keep a record of maintenance and servicing of the lifter in a secure , visible place.
- Maintain and post picture identification of employees who have been trained and are authorized to operate the lifter.

Pallet lifters come in two types, *walkie* and *seated*, and each has some advantages. Walkies are better when space is limited because the turning radius is smaller. However, they are very slow moving and are not as useful in warehouses. Seated lifters move much faster but are much more expensive.

3.3 Flammables

- Some flammable liquid commonly found in health facilities include acetone, anesthetic ether, alcohols (before dilution) and kerosene.

- Store large supplies of flammables in a separate location away from the main storeroom, preferably outside the main storeroom but on the premises and not less than 20m away from the other buildings. Fire fighting equipment should be easily available. Large supplies of flammables should never be stored in the same areas as medicines.

- A small stock of flammables may be kept in a steel cabinet in a well-ventilated area, away from open flames and electrical appliances. Mark the cabinets to indicate that they contain highly flammable liquids, and display the international hazard symbol. In addition, the shelves of the cabinet should be designed to contain and isolate spillage. Always store flammables in their original container.

- Flammable liquids each have a flash point, which is the minimum temperature at which the liquid gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. The flash point indicates the susceptibility to ignition.

  - Acetone and anesthetic ether have a flash point of -**18◦C.**
  - **Undiluted alcohols have a flash point of 18 ◦c to 23 ◦c**
  - **The flash point for kerosene is 23◦c to 61◦c**

- It is not necessary to store flammables below their flash point, but it is very important to store them in the coolest location possible and never in direct sunlight. It is important to control the evaporation rate and avoid the build-up of pressure.

3.4 Corrosives

- Corrosive or oxidant substances commonly found in hospitals or other high-level health facilities include trichloracetic acid, glacial acetic acid, concentrated ammonia solutions, silver nitrate, sodium nitrate, and sodium hydroxide pellets.

- Always store corrosive substances away from flammables, ideally in a separate steel cabinet to prevent leakage. Use appropriate industrial-type protective gloves and eye-glasses when handling these items.

4.Maintaining the Quality of Your Products

4.1 Monitoring Product Quality

Products of different types show damage in different ways. Some **indicators you can use to detect damage** are:

All products
- Broken or ripped packaging (vials, bottle, boxes, etc.)
- Missing, incomplete, or unreadable label(s)

Capsules
- Discoloration
- Stickiness
- Crushed capsules

Liquids
– Discoloration
– Cloudiness
– Sediment
– Broken seal on bottle
– Cracks in ampoule, bottle, or vial
– Dampness or moisture in the packaging

Pills (tablets)
- Discoloration
- Crumbled pills
- Missing pills (from blister pack)
- Stickiness (especially coated tablets)
- Unusual smell

Injectables

- Liquid does not return to suspension after shaking

Light-sensitive products (such as x-ray film)
- Torn or ripped packaging

Latex products
- Dry
- Brittle
- Cracked

Tubes
- Sticky tubes(s)
- Leaking contents
- Perforations or holes in the tube

Lubricated latex products

- Sticky packaging
- Discolored products or lubricant
- Stained packaging
- Leakage of the lubricant (most or damp packaging)

Sterile products (including IUDs)

- Torn or ripped packaging
- Missing parts
- Broken or bent parts
- Moisture inside the packing
- Stained packaging

Foil packs
- Perforation(s) in packaging

Chemical reagents
- Discoloration

- Damaged products should never be issued to facilities or dispensed to clients. If you are not sure if a product is damaged, check with someone who knows.

- Report any defects and send the defective products back to the facility that issued them to you (at delivery time for the public sector).

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DO NOT ISSUE OR DISPENSE PRODUCTS
THAT YOU SUSPECT ARE DAMAGED!
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4.2 Returned goods and product recall

Returned or rejected goods including recalled goods, should be handled in accordance with approved procedures and records should be maintained.

All returned goods should be placed in quarantine and returned to saleable stock only after this has been approved by a nominated, responsible person following a satisfactory quality re-evaluation.

4.3 Controlling temperature

Humidity
When **product labels say "protect form moisture,"** store the product in a space with no more than 60% relative humidity.

To reduce the effects of humidity consider:

Ventilation: open the windows or air vents of the storeroom to allow air circulation. Ensure all windows have screens to keep out insects and birds, and either have bars or are not open wide enough for anyone to climb in. put boxes on pallets and ensure there is space between pallets and the wall of the storeroom.

Packaging: Secure all lids. Never open a new container unless necessary.

Circulation: use a fan to circulate fresh (outside) air. In bigger storerooms you may need a ceiling fan. Standing fans are more useful in smaller storerooms.

Air conditioners: Use an air conditioner. This is costly, depends on a constant supply of electricity, and requires regular maintenance. Depending on climatic conditions, a dehumidifier may be a less costly option. However, they also need a constant supply of electricity and require regular attention to empty the water containers.

Sunlight
Some health products are photosensitive and will be damaged if exposed to light. These include multiple vitamins, furosemide, chloropheniramine maleate, hydrocortisone, latex products (such as male condoms), and x-ray film.

To protect products from sunlight-
- Shade the windows or use curtains, if they are in direct sunlight.
- Keep products in cartons.
- Do not store or pack products in sunlight.
- Use opaque plastic or dark glass bottle for products that require them
- Maintain trees on the premises around the facility to help provide shade, but check them regularly to ensure that there are not any branches that can damage the facilities.

Heat
Remember that heat will affect many products. It melts ointments and creams and causes other products to become useless. Following the guidelines listed earlier for protecting products form humidity and sunlight will also help protect products from heat.

It is important to have thermometers in various parts of the storeroom to monitor temperature (see section on monitoring temperature).

Monitoring
- Consistently monitor the temperature of the different areas within the storeroom.
- Keep thermometers in various places for monitoring.
- Keep the storeroom well ventilated (see section on humidity). For better ventilation, store boxes on pallets and leave room between rows of stacked boxes (see section on arranging products)
- Keep direct sunlight out of the storeroom

Refrigerators and freezers

- Refrigerators that open on the top are more efficient than vertical ones, because hot air rises while cold air falls.
- The coldest part of vertical refrigerators is at the bottom.
- Store products that are sensitive to freezing or very low temperatures on the upper shelves.
- Always have enough frozen icepacks to transport items requiring cold storage in cold boxes and/ or do not use icepacks prefilled with other liquids, which are usually blue or green. When ordering cold chain equipment, larger facilities should reassess the needs for icepacks and icepack freezer space.
- If there is enough space, place a few plastic bottles of water in the refrigerator. This will help maintain the temperature of a longer period of time if the power is cut off.
- Place refrigerators and freezers with space between and about 20 to 40cm away from the wall. This will increase the air circulation.
- Under ideal conditions, rooms with multiple refrigerators and/ or freezers should have air conditioning. Refrigerators and freezers generate large amounts of heat, which can damage the equipment overtime.
- If it is not possible to have air conditioning, install fans around the equipment to increase airflow. If installing fans, remember to place the fans so the air also flows in the spaces behind the refrigerators.
- Ideally, larger facilities should have a cold room rather than numerous refrigerators.

Power supply

Arrange for a solar panel generator or alternative supply of electricity for cold rooms and refrigerators if the main source of electricity is not reliable. If the generator is not solar-powered, maintain a stock of fuel sufficient to run the generator for at least a few days (see section on storing flammables). Run the generator on a regular basis (at least once a month) to ensure the system is working properly. Larger facilities may want to contract out the maintenance of the generator and electrical system.

If your electricity supply is unreliable, use solar-powered refrigerators.

Common terms

The following term relate to temperature and medical supplies. It is important to follow the **manufacturer's recommended storage conditions for all products as described in** *Annex 1* (Storage and Labelling Conditions).

Store frozen: some products, such as certain vaccines, need to be transported within a cold chain and stored at -20°C (4°F). Frozen storage is normally for longer-term storage at higher-level facilities.

Store at 2°- 8°C (36°-46°F): some products are very heat sensitive but must not be frozen. These are usually kept in the first and second part of the refrigerator (never the freezer). This temperature is appropriate for storing vaccines for a short period of time.

Keep cool: store between 8°-15°C (45°-59°F).

Store at room temperature: store at 15°-25°C (59°-77°F)

Store at ambient temperature: Store at the surrounding temperature. This term is not widely used **due to significant variation in ambient temperatures. It means "room temperature" or normal storage** conditions, which means storage in a dry, clean, well-ventilated area at room temperatures between 15°C to 25°C (59°-77°F) or up to 30 °C, depending on climatic conditions.

Medicines with stability problems under tropical conditions:

Oral solids (tablets)
- Acetylsalicylic acid
- Amoxicillin
- Ampicillin
- Penicillin V

Oral liquids (syrups)
- Paracetamol

Injections/ injectables

- Ergometrine
- Methylergometrine
- Adrenaline
- Reconstituted antibiotic

If you feel **HOT** in your health centre, your drugs are probably **HOT** too! Are they stored in the **COOLEST** spot possible?

- Oxytocin

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FOLLOW THE PRODUCT MANUFACTURER'S

STORAGE INSTRUCTIONS!

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4.4 Preventing Damaging and Contamination

Physical damage

Avoid crushing products stored in bulk. Products should be stacked on more than 2.5m high, as a general rule. Heavier or fragile items (such as those packaged in glass) should be placed in smaller stacks. Bind sharp edges or corners in the store with tape. Most important, ensure that nothing in the store can fall and injure members of the staff.

Dirt:

Write and post the schedule and instructions for cleaning the storeroom in multiple locations around the facility. Sweep and mop or scrub the floors of the storeroom regularly. Wipe down the shelves and products to remove dust and dirt. Dispose of garbage and other waste often, in a manner that avoids attracting pests. Store garbage in covered receptacles

Infrastructure: ensure the storeroom has easy access to a water outlet for cleaning. If no running water is available, set up a system using, for example, several 55 gallon drums on an elevated platform connected to pipes running into the existing storage facility or constructing an a new structure, the structure so water is easily available from any location in the storeroom.

Cleaning materials: keep a budget for buying cleaning material. Use industrial detergents when possible, particularly for larger facilities, although imported detergents can be expensive. Try to use locally available detergents, particularly for smaller or more remote facilities. Clean with chlorine bleach regularly (once a month, for example).

Outside the facilities: Burn garden rubbish and cardboard cartons, etc. when garbage collection is not available. Use the necessary precautions to keep the fire under control, and do not burn materials close to the building. Make sure the wind is not blowing is not blowing toward the building.

4.5 Protecting Against Pests

Prevention inside the storage facility

- Design or modify the storeroom to facilitate cleaning and prevent moisture.
- Maintain a clean environment to prevent conditions that favor pests. For example, store garbage in covered garbage bins. Regularly clean floors and shelves.
- Do not store or leave food in the storage facility.
- Keep the interior of the building as dry as possible.
- Paint or varnish wood, as needed.
- Use pallets and shelving.
- Prevent pests from entering the facility.
- Inspect the storage facility regularly for evidence of pests.
- Packaging and shipping cartons can be treated to prevent pest infestation. For example, cartons can be shrink-wrapped or non-toxic desiccating (dehydrating) agents can be added.

Prevention outside the storage facility

- Regularly inspect and clean the outside premises of the storage facility, especially areas where garbage is stored. Check for any rodent burrows, and be sure that garbage and other waste is stored in covered containers.

- Check for still or stagnant pools of water in and around the premises, and be sure that there are no buckets, old tires, or other items holding water.

- Treat wood frame facilities with water sealant, as needed.

- Use mercury vapor lighting where possible, and locate lighting away from the building to minimize the attraction of pests.

Strategies for specific pests

Rodents: Rodent problems are best solved by prohibiting rodent entry and maintaining a dry, clean facility. Other alternatives include keeping cats; traditional, spring-loaded snap traps baited with food; glue boards, which are disposable plastic or wood trays partially filled with nontoxic, adhesive glue; bait boxes, which are shoe-sized boxes with lids and holes on each end containing toxic rodenticide packets; electronic ultrasonic devices, which emit high-frequency sounds, causing rodents to avoid the area; or rat poison.

Birds or bats: The best prevention is to keep all doors and windows of the storage facility closed or screened off from the outside. Make sure there are no holes in the walls, floor, or ceiling. Insect **electrocuting light traps ("bug zappers,") hanging electric grids that att**ract flying insects via a bright fluorescent or ultraviolet light) may be appropriate in some situation. However, they should be placed away from supplies, since ultraviolet light damages a number of products (especially latex products, such as male condoms).

Flying pests: The best prevention is to keep all doors and windows of the storage facility closed or screened off from the outside. Make sure there are no holes in the walls, floor, or ceiling. Insect **electrocuting light traps ("bug zappers," hang**ing electric grids that attract flying insects via a bright fluorescent or ultraviolet light) may be appropriate in some situations. However, they should be placed

away from supplies, since ultraviolet light damages a number of products (especially latex products, such as male condoms).

Reptiles: Most snake species are innocuous and can be managed with noisemakers and by keeping the outside of the facility clear of bushes. If snakes are an especially difficult problem in your area, you can construct a snake-proof fence around the perimeter of the facility. The fence should be made with heavy, galvanized screen with 6mm wire mesh. The fence should be 90cm tall with the lower end buried at least 10-16 cm in the ground. The above ground portion of the fence should be slanted at a 30° angle outward form the base and away from the building, using supporting stakes inside the fence.

Termites/ structural pests: there are two primary treatments for subterranean termites, but both are expensive and require a specialist. The first treatment involves injecting a termiticide into the soil in the ground beneath the facility. If the problem is severely damaged by structural pests.

There are alternative methods of controlling structural pests-

- Use nontoxic heat or liquid nitrogen treatments
- Build metal barriers into the foundation of a new building. Sheets of metal protrude from between the foundation and walls of the building. The sheets are bent downward at an angle, but not touching the ground. When termites or ants attempt to climb up the foundation, they encounter the metal barrier that they can not climb around.
- Construct sand barriers around the building as a preventative measure. However, the grains of sand must be a specific size, so this method can be expensive.

5.Ensuring Safety and Security

5.1 Protecting Against Fire

To prevent damage to products from fire:

- Make standard fire extinguishers available in every storage facility according to national regulations.
- Visually inspect fire extinguishers every 2-3 months to ensure that pressures are maintained and the extinguisher is ready for use
- Service fire extinguishers at least every 12 months.
- Place smoke detectors throughout the storage facility and check them every 2-3 months to ensure that they are working properly.
- Strictly prohibit smoking in the store. Display no smoking sings in the store.
- Conduct fire drills for personnel every 6 months.
- Clearly mark emergency exits and check regularly to be sure they are not block or inaccessible.
- Display fire precaution signs in appropriate places in the storage facility (especially locations where flammables are stored).
- Use sand to extinguish fires where there are no fire extinguishers. Place buckets of sand near the door.

Four main types of fire extinguishers:

Dry chemical extinguishers contain an extinguishing agent such as potassium bicarbonate (similar to baking soda), and use a compressed gas as a propellant. They are effective for multiple types of fire including combustible solids like wood or paper, combustible liquids like gasoline or grease, and electrical fires.

Water extinguishers contain water and compressed gas and should only be used on ordinary combustibles, such as paper and wood. Never use water on fires caused by liquids (such as gasoline or kerosene) or electrical fires.

Carbon dioxide (CO_2) extinguishers are most effective on fires caused by liquids (such as gasoline or kerosene) and electrical fires, but not on fires caused by combustibles like paper, cardboard, or lumber. The gas disperses quickly and does not leave any harmful residue.

Halon extinguishers are often used in areas with computer equipment or other machinery because they leave no residue. They can be used on common combustibles, flammable liquids, and electrical fires. However, halon is dangerous to inhale and harmful to the environment. They are most effective in confined spaces, but remember that the area will need to be ventilated before it can be reoccupied.

5.2 Protecting Against lost:

During transport
- Verify documents
- Ensure packing seals are used
- Use strong boxes/containers
- Provide reliable/well-maintained vehicles
- Ensure drivers are reliable.
- Ensure rapid clearance at air and sea ports and through on-land borders.

At storage facilities
- Limit access to only designated staff.
- Limit the number of keys made for the facility; keep a list of people who have keys
- Secure all locks and doors.
- Make unannounced spot checks.
- Provide independent stock count/ inventory control

In health centers
- Lock the storeroom/ cupboards
- Have inventory control cards for each product.
- Set maximum dispensing quantities.
- Have dispensers record individual prescriptions and maintain prescription or dispensing registers
- Limit dispensing to authorize staff members only.

Monitor selected products
As additional protection against lost , monitor items that are fast moving, chronically in short supply, in high demand by customers, expensive, life saving, and easy to hide or disguise.

Two techniques for monitoring medicines

Select medicines likely to be stolen or misused (e.g., antibiotics, narcotics, phychotropics, antiretroviral).

1. Check inventory records for stock on hand. Then, conduct a physical inventory (physically count the quantities on hand) and compare the results.
2. Check the inventory records to determine the consumption during a specified period. Then, check medical charts or prescription ledgers and count the number of treatment courses during the same period. Convert treatment courses into dose units and compare this figure with the stock issued from the storage area.

    If you find a significant discrepancy, investigate further.

ALWAYS CHECK THAT SECURITY MEASURES ARE IN PLACE!

6.Annexes :

Annex 1: Storage and Labeling Conditions

Temperature

From Celsius to Fahrenheit $(C * 1.8) + 32 = F$

From Fahrenheit to Celsius $(F-32)/ 1.8 = C$

Normal storage conditions
Storage in dry, well-ventilated premises at temperatures of 15–25 °C or, depending on climatic conditions, up to 30 °C.

Extraneous odours, other indications of contamination, and intense light must be excluded.
Defined storage instructions
Drug products that must be stored under defined conditions require appropriate storage instructions. Unless otherwise specifically stated (e.g. continuous maintenance of cold storage) deviation may be tolerated only during short-term interruptions, for example, during local transportation.
The use of the following labelling instructions are recommended:
On the label Means:

"Do not store **over 30 °C"** from **+2 °C to +30 °C**
"Do not store **over 25 °C"** from **+2 °C to +25 °C**
"Do not store **over 15 °C"** from **+2 °C to +15 °C**
"Do not store **over 8 °C"** from **+2 °C to +8 °C**
"Do not store **below 8 °C"** from **+8 °C to +25 °C**

"Protect from moisture" no more than 60% relative humidity in normal storage conditions; to be provided to the patient in a moisture-resistant container.

"Protect from light" to be provided to the patient in a light-resistant container.

ANNEX 2. Self-Inspection Checklist

A. Physical Conditions Checklist

How does your store match up to the ideal store? Tick (√) the **YES** if the statement describes the conditions in your store. Tick **NO** if the statement does not describe your store. "NO" items will need to be implemented or improved.

	YES	NO	
1.	☐	☐	The store is large enough to keep all of the supplies.
2.	☐	☐	The store structure is in good condition, there are no cracks, holes or sings of water damage.
3.	☐	☐	Air moves freely in the store; fans and screens are in good condition (for public sector).
4.	☐	☐	The windows are painted white or have curtains; windows are secured and have grills (for public sector).
5.	☐	☐	The store is free of pests; there are no pest infestations.
6.	☐	☐	The store is tidy; shelves are dusted, floor is swept, and walls are clean.
7.	☐	☐	Supplies are stored neatly on shelves or in boxes.
8.	☐	☐	Boxes are raised off the floors; on pallets.
9.	☐	☐	The refrigerator is in good condition; there is no staff food in the

B. Storage Procedures Checklist

How well organized is your store? Tick (√) the **YES** if the statement describes the organization in your store. Tick **NO** if the statement does not describe your store. "NO" items will need to be implemented or improved.

10.	☐	☐	Supplies are shelved in groups: externals, internals and injectables.
11.	☐	☐	Tablets, capsules and other dry medicines (such as ORS packets) are stored in airtight containers on the upper shelves.
12.	☐	☐	Liquids, ointments and injectables are stored in the middle shelves.
13.	☐	☐	Supplies, such as surgical items, condoms and labels, are stored on

the bottom shelves.

14. ☐ ☐ Cold-chain items are stored in the refrigerator.

15. ☐ ☐ Controlled substances are kept separate in a double-locked storage space.

16. ☐ ☐ Flammables, corrosives and other special items are stored safe in a separate location away from the main storeroom.

17. ☐ ☐ Controlled substances are kept separate in a double-locked storage space.

18. ☐ ☐ Supplies are arranged on the shelves in alphabetic (or therapeutic or

pharmacologic order etc..) order by generic name.

19. ☐ ☐ Items are grouped in amounts that are easy to count.

20. ☐ ☐ There are no expired items in the store.

21. ☐ ☐ FEFO principles are followed.

22. ☐ ☐ There are no poor quality items on the shelves.

23. ☐ ☐ There are not overstocked or no longer used items on the shelves.

C. Stock Card Checklist

How are stock cards **used in your store? Tick (√) the YES** if the statement describes the organization in your store. If not, tick **NO. "NO" items will need to be implemented or improved.**

24. ☐ ☐ There is a stock card for each item on the store.

25. ☐ ☐ All information on the stock card is current and correct.

26. ☐ ☐ The stock card is kept with the item on the shelf.

27. ☐ ☐ Information is recorded on the stock card at time of the movement.

28. ☐ ☐ A physical count is made at regular intervals, such as once a month.

D. Ordering and Receiving Supplies Checklist

How supplies are are ordered and received in your store? Tick (√) the **YES** if the statement describes the organization in your store. If not, tick **NO. "NO" items will need to be implemented or improved.**

29. ☐ ☐ The reorder level has been calculated for each item in the store.

30. ☐ ☐ The health worker knows it is time to reorder an item when its balance in stock is less than its reorder level.

31. ☐ ☐ The requisition form is complete, accurate and written clearly.

32. ☐ ☐ Deliveries are received in person.

33. ☐   ☐   The outside of the boxes is checked at the time of delivery.

34. ☐   ☐   Expiry dates of all items are checked.

E. Maintaining Quality of Products Checklist

How is the quality of product maintained in your store? Tick (√) the **YES** if the statement describes the organization in your store. If not, tick **NO**. "NO" items will need to be implemented or improved.

35. ☐   ☐   Quality of products is physically checked, such as:
     a. ☐   ☐   Poorly packaged refrigerated items.
     b. ☐   ☐   Discolouration of medicines and vaccines.
     c. ☐   ☐   Broken containers and supplies spoiled by leakage.
     d. ☐   ☐   Unsealed and unlabelled items.

36. ☐   ☐   If deterioration is suspected, products are checked for:
     a. ☐   ☐   Unusual odours of tablets and capsules.
     b. ☐   ☐   Damaged tablets or capsules.
     c. ☐   ☐   Injectables with small particles that reflect light.
     d. ☐   ☐   Expired or poor quality items are not accepted.
     e. ☐   ☐   All discrepancies and quality problems are recorded.

37. ☐   ☐   All poor quality products and returned goods are placed in quarantine.

38. ☐   ☐   Humidity is monitored.

39. ☐   ☐   Photosensitive items are not exposed to light.

40. ☐   ☐   Store is protected from direct sunlight.

41. ☐   ☐   Heat/temperature of the store is consistently monitored and recorded.

42. ☐   ☐   The temperature of refrigerators and freezers are regularly checked.

43. ☐   ☐   Power supply is reliable.

44. ☐   ☐   **Manufacturer's storage instructions are always followed.**

ANNEX 3

Report On Defected and Expired Medicines

Provincial Health Department………….
Operational District……………………
Referral Hospital/Health Center   From……………to………………………….20……
..…………………………………
.
Participants
1……………………………. 4…………………………
2……………………………. 5…………………………
3…………………………… 6…………………………
National Program Drug :…………………………….....   Solving Method:…………………………………...

No	Code	Name of Drug	Form	Strength	Quantity	Unit Price	Total Price	Manufacturer	Lot No	Expiry date	Source	Invoice number dated	Observation

Total amount…………………………………………………………..(Write in word…………………………………………………………………)

Date :…………………………..

Director   **Accountant Chief**   **Reporter**