



# 4

## HOSPITAL PHARMACY PROCUREMENT AND SUPPLY (HOSPITAL PHARMACY STORE)

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## 4. HOSPITAL PHARMACY PROCUREMENT AND SUPPLY (HOSPITAL PHARMACY STORE)

### 4.1 INTRODUCTION

The Hospital Pharmacy Store (HPS) is the key facility in MOH supply chain and distribution for pharmaceutical, medical and surgical inventories. HPS's function as a distribution warehouse for all inventories required for patient care services. Its design, structure, construction, flow, location and built shall meet the 'Tatacara Pengurusan Stor' (TPS), Good Storage Practice (GSP), other relevant guidelines from MOH and other authorities requirements. A strategic planning for logistic, storage capacity and workspace is required to ensure HPS is capable to provide safe, efficient and effective services. The planning of HPS shall take into consideration the broad general functions (Impression, Utility and Amenity) served by any other health facilities.

### 4.2 OBJECTIVES

- 4.2.1 To ensure an adequate storage space and continuous supply of pharmaceutical, medical and surgical inventories to improve customer service.
- 4.2.2 To ensure the facility design, construct and build comply with the requirements of TPS, GSP and other relevant guidelines from MOH and other authorities.
- 4.2.3 To obtain measurable financial performance and customer satisfaction on logistic, procurement and supply processes.

### 4.3 POLICIES

#### 4.3.1 General Operational Policies

- a) HPS is the main store for pharmaceutical, medical and surgical supply.
- b) The HPS shall be headed by a Senior Pharmacist who also supervise other pharmacists in the HPS.
- c) The Senior Pharmacist shall ensure the security of the HPS.
- d) The Senior Pharmacist shall be supported by administrative staff and general workers.
- e) The number of supporting staff shall be proportionate to the workload and budget managed by the HPS.
- f) The HPS shall manage the procurement, storage and supply of all items according to TPS and GSP.
- g) The HPS shall keep Psychotropic Substances / Dangerous Drug under lock and key and controlled in accordance with the Dangerous Drug Act 1952 and Poison Act 1952.

- h) The HPS shall ensure the supply is able to meet the pharmacotherapy and medical needs of the patients.
- i) Adequate space shall be made available so that First-Expire-First-Out (FEFO) can be implemented efficiently.
- j) Mechanical handling equipment and system shall be made available.
- k) Computerised system for the management of HPS shall be made available for procurement, storage, supply and payment so as to meet the requirements of TPS. This is in addition to e-Procurement, Integrated Hospital Inventory System (IHIS), Teleprimary Care (TPC) and other existing systems.
- l) Comprehensive records of all transactions shall be electronically documented, maintained and hard copies shall be generated at regular intervals.
- m) The HPS shall manage all the product recalls according to stated processes and procedures.
- n) All disposals of items and documents shall be carried out in accordance with standard procedures and regulations.
- o) The design of the building shall be rodent and vermin-proof.
- p) Good housekeeping such as cleaning, sanitation and inspection shall be carried out as scheduled.

#### 4.3.2 **General Development & Maintenance Policies**

##### a) **Location**

- i) HPS shall be located at strategic place to allow efficient delivery activities to be carried out.
- ii) It shall have road access to accommodate vehicles of various sizes up to maximum of 12 tonne.
- iii) It shall be conveniently accessible to internal and external clients to allow prompt and timely supplies.
- iv) It shall be located away from public area.

##### b) **Security against theft**

- i) HPS shall be fenced up to control access and avoid trespassing.
- ii) A security post with 24 hours security shall be made available.
- iii) Close Circuit Television (CCTV) shall be installed at strategic locations within the store area and connected to the guard post.
- iv) All doors and gates in the HPS shall be electronically controlled.

c) **Fire security**

- i) Fire fighting systems and equipment such as water hoses, smoke detectors and fire extinguishers shall be installed accordingly.
- ii) Fire alarm system shall be incorporated and connected to the control room of the hospital.
- iii) Fire evacuation plan shall be provided, displayed and adhered to.

d) **Safety from weather hazard**

It shall be built on a raised foundation to allow water to drain away from the store. If possible, the store shall be located on higher ground.

e) **Storage Area**

- i) The storage area of HPS shall be sufficient for keeping all inventories at appropriate stock holding levels in accordance with TPS requirements. Larger space may be required for HPS in Sabah, Sarawak and remote areas considering the elements of supply uncertainty such as lead-time supply, quantity supplied, quality of supply and data accuracy on products supplied.
- ii) There shall be sufficient physically separated areas with appropriate storage conditions for orderly segregation of products namely biological, refrigerated, inflammable and corrosive liquid and solids, medical gases, cytotoxic drugs, Dangerous Drugs and Psychotropic Substances.
- iii) Where controlled storage environment is required, its conditions shall be continuously monitored using appropriate equipment at predetermined intervals. Maximum and minimum temperature of the day shall be monitored and recorded.
- iv) All instrument use for temperature monitoring shall be calibrated and the calibration shall be documented.
- v) Air curtain shall be installed between air conditioned and non-air-conditioned areas.
- vi) Special storage areas shall be well ventilated. Extractor fans shall be provided to remove fumes, gases and moisture.
- vii) Separate areas for receiving and issuing shall be provided to enhance efficiency and security.
- viii) Receiving of goods in the receiving area shall be inspected and entered into the stock recording system that may be manual, computerised or both.
- ix) Items that are not commonly purchased shall be stored at designated transit area before being issued to the requesting units.

- x) Stocks that are stored on pallets, racks or shelves shall be arranged in an orderly manner within the designated area.
- xi) The 5S concept shall be implemented in all HPS.
- xii) In order to ensure HPS as 'a place for everything and everything in its place', the area/space/storage shall follow requirements below:
  - There shall be adequate and appropriate amenity for comfort and ease of staff access and movement.
  - Adequate space for housing all equipment, furniture and office automations.
  - Suitable lockable storage shall be provided for Dangerous Drugs and Psychotropic Substances.
  - Adequate storage space to implement FEFO.
  - All workstation shall be suitable and practical for the work function and condition.
  - An appropriate space for condemned inventory.
  - An appropriate space for disposal items.
  - An appropriate space shall be available for recalled and quarantined inventory.
  - Parking /space for trolleys, forklift, stackers and pallets.
  - Separate loading and unloading bay.
  - Adequate transit space for received and supplied items.
  - Space for IT networking and hardware.
  - Pantry and rest room for staff.
  - Adequate storage for records and filing.
  - Storage for utilities.

#### **4.4 MECHANICAL & ELECTRICAL REQUIREMENT**

- 4.4.1 Material / inventory support equipment such as industrial vehicles e.g. pallet trucks, pallet jack, motorised stackers and forklift shall be supplied according to function, loads & requirement of the facility.
- 4.4.2 Computerised identification system such as bar coding shall be considered for implementation and system equipment shall be provided. It shall be able to identify item code and description, details on the delivery and storage location, all at the same time.
- 4.4.3 The heating, ventilation and air-conditioning (HVAC) system shall be designed to sustain the specific environment requirements under GSP. It shall also take into consideration the indoor air quality.
- 4.4.4 The relative humidity of not more than 60% shall be provided for items that need protection against moisture at normal storage condition.
- 4.4.5 All areas shall be well ventilated especially areas without air-conditioning. All occupied area shall have at least 2 air exchanges of out-door air per hour with the total change of between 6 - 25, depending on the activities carried out in the areas.

- 4.4.6 The temperature and humidity control gauge shall be fixed for effective monitoring of the environment. Automatic triggered alarm shall be linked to the HVAC system to detect changes in temperature and humidity.
- 4.4.7 Standby or emergency power supply shall be connected to all pharmaceutical and medical stores, pharmaceutical refrigerators, freezer, cold room, the back door buzzer and dangerous drugs / psychotropic substances store alarm.
- 4.4.8 Automatic triggered alarm system shall be fixed at dangerous drugs / psychotropic substances storage area.
- 4.4.9 Three-phased outlets shall be provided, with at least 3 points per required area.
- 4.4.10 The inflammable storage room shall be equipped with lighting fixtures, exhaust fan and fire alarm. Spark-proof switches shall be located outside the room.
- 4.4.11 Communication systems such as telephone, fixed line or cordless, pager, public address system, audio-intercom, computerised ordering and supply, are the essential needs of a warehouse to ensure efficient and effective inventory management.
- 4.4.12 Uniform illumination over the entire HPS is required, preferably combining artificial and natural lighting. Localised lighting shall be provided for certain task area. Overall good lighting with appropriate intensity at different task level shall be considered to provide a safe, healthy and effective work place.
- 4.4.13 Sensor spotlight and automatic emergency lighting shall be fixed at appropriate location such as loading bay and main entrance /door.
- 4.4.14 Lighting fixtures shall be integrated into the ceilings. Daylight white tube is preferable and shall provide an optimum lighting ranging from 300-800 lux.

#### 4.5 DESIGN, LAYOUT AND SPECIFICATION

The general design and construction shall take into consideration the functionality of HPS. The location and size shall accommodate anticipated personnel and inventory movement, work processes and activities. Built-in storage and fixed equipment shall be considered to house documents, bulk supplies, dangerous drugs and psychotropic substances, portable medical gas cylinders, refrigerated and cold-chain items. Drainage and sewerage system shall be located outside the building.

##### 4.5.1 Structural Design

###### a) Wall

- i) The walls shall be constructed using non-porous material and plastered both side.
- ii) Wall finishing shall be of washable antifungal paint (indoor) and weather proof paint (outdoor).
- iii) Skirting shall be provided for office and staff areas.

- iv) Walls for cold room require special building material and design so as to prevent condensation.
- b) **Floor**
- i) The floor shall be constructed of concrete and plastered smoothly, finished with non-slippery heavy duty materials to withstand the heavy loads and traffic.
  - ii) The floor shall be non-porous, damp-proof and resistant to detergent.
  - iii) Floor to ceiling height shall range from 15 feet to 30 feet according to the functional area and handling equipments used.
- c) **Ceiling**
- i) The ceiling shall be made of fire-retardant, asbestos-free and non-shedding materials or mineral fibres.
  - ii) The ceiling shall offer acoustic balance and control for the room or space, preferably enhanced with sound absorption and attenuation.
- d) **Roof**
- i) A pitched or a sloped roof shall be designed for preventing heavy rain damage.
  - ii) The roof shall be of asbestos free material, reinforced with wire mesh and provided with adequate insulation.
  - iii) Polycarbonate or equivalent roofing shall be considered for loading/unloading area and lobby.
  - iv) Awning shall be provided for all windows.
  - v) Roof shall be appropriately guttered with proper drainage system.
  - vi) The roof and ceiling shall be designed to prevent theft and break-in.
- e) **Door**
- i) All doors shall be of fire-retardant material.
  - ii) The doors shall be two leaves, broad enough to allow free and easy movement of supplies and handling equipment such as forklifts and stackers.
  - iii) Doors must be strong and reinforced to provide adequate security and fitted with double heavy duty locks.
  - iv) All doors shall be protected with trolley guard.



- v) Doors to all storage areas shall be equipped with electronic access control system.
  - vi) Grille/roller shutters shall be considered to be installed at main entrance and loading bay.
  - vii) All exit doors shall be strategically located and fitted with luminous emergency exit signage.
- f) **Window**
- i) Windows shall not be allowed for storage area.
  - ii) Windows shall be available at workstation, office and staff areas.
  - iii) Window shall be either sliding or swing type.
  - iv) All windows shall be fixed with metal grille

#### 4.5.2 Receiving Area

a) **Loading and Unloading Bay**

- i) Adequate space for loading and unloading bay shall be provided.
- ii) This bay shall be properly sheltered, taking into consideration the height of the vehicle.
- iii) Raised platform shall be provided and equipped with heavy duty rubberised padding at the point of contact with the vehicles.
- iv) Motorised roller shutter shall be installed at the closure between the bay and receiving area.
- v) Door shall be provided adjacent to the roller shutter.
- vi) Sensor spotlight shall be provided.

b) **Receiving Counter**

- i) A receiving counter shall be provided with adequate waiting space.
- ii) The area shall be equipped with appropriate office furniture and equipment.
- iii) Fans shall be provided.

c) **Mechanical Equipment Parking Area**

Parking bay for forklift, pallet truck, trolley, jack and stacker shall be provided. Charger station shall be made available.

d) **Sorting / Unpacking Area**

- i) Space shall be sufficient for goods sorting and checking.
- ii) The space shall be sufficient for the utilisation of forklift.

e) **Transit / Holding Area**

- i) Ample space shall be made available for:
  - Items requiring further clarification / investigation before receiving.
  - Transit items which do not require special storage conditions.
  - Pallets storage.

f) **Disposal Room**

Disposal room shall be made available for discarded items (used boxes, wrappers and plastic covers).

4.5.3 **Storage Area**

a) **General Storage Requirement**

- i) The area shall have 24 hours air-conditioning facilities.
- ii) It shall have effective temperature control (between 160C to 250C).
- iii) The electrical supply to the refrigerators, freezers, cold room and air-conditioning facilities shall be linked to the hospital emergency power supply.
- iv) A computerised alarm system to detect electrical failure of cold chain equipment shall be made available and connected to the main electrical control system of the hospital.
- v) Sufficient space shall be provided for the usage of forklifts, stackers and trolleys.
- vi) Sufficient numbers of pallets, shelves and racks shall be provided.
- vii) The area shall have adequate space to accommodate IT facilities.

b) **Drug Store**

- i) Adjustable, modular, heavy duty open racks shall be provided for storage of packages of different sizes.
- ii) Adequate, designated storage area for bulk items shall be provided.
- iii) Heavy duty plastic pallets shall be provided to store bulk items and larger cartons off the floor and can be used with forklifts to move around groups of larger items.

- iv) Designated area for Cytotoxic Drugs shall be equipped with cautionary signage and Chemo-Spill Kit.
- c) **Dangerous Drugs / Psychotropic Substances Store**

Dangerous Drugs / Psychotropic Substances shall be kept under lock and key in special room / cabinet with alarm system.
- d) **Cold Room / Pharmaceutical Refrigerator / Freezer Bay**
  - i) These facilities shall be provided based on functionality of the hospital.
  - ii) This room / bay shall be provided within the drug store for storage of drugs requiring low storage temperature, which includes vaccines, anti-sera and other biological products.
  - iii) Every cold room / pharmaceutical refrigerator and freezer shall have computerised temperature recorder system.
- e) **Intravenous (IV) Fluid Store**
  - i) Sufficient space shall be made available to accommodate all haemodialysis, peritoneal dialysis solution and intravenous solutions.
  - ii) The space shall be sufficient for the utilisation of forklift.
- f) **Surgical Store**
  - i) Adequate, designated storage area for bulk surgical / consumable / disposable items/ x-ray films shall be provided.
  - ii) Adjustable, modular, heavy duty open racks shall be provided for storage.
  - iii) Sufficient space shall be made available to accommodate bulk items.
- g) **Non-Drug Bulk Store**
  - i) Dispensing bottles, containers, labels and envelopes shall be kept in a designated area.
  - ii) Adjustable, modular, heavy duty open racks shall be provided.
  - iii) Sufficient space shall be made available for movements.

#### 4.5.4 Stores With Special Storage Requirement

- a) **Inflammable Store**
  - i) Inflammable items (ethanol, methanol, acetone, etc.) shall be kept in a store sited at least 10 feet distance away from other adjacent buildings and shall be equipped with fire fighting equipments, smoke detectors and exhaust fans for adequate ventilation.

- ii) The location and design shall ensure maximum air circulation to avoid concentration of fumes or gases.
  - iii) The wall, roof, ceiling and doors shall be made of fire retardant materials and comply with Fire and Rescue Department, Malaysia.
  - iv) Specifications:
    - Wall - 14" thick brick
    - Roof - 9" concrete thickness
    - Door - Iron 0.25" thickness
  - v) All electrical facilities / systems shall comply with the requirements of the Fire and Rescue Departments and Department of Environment.
  - vi.) Adequate ventilation shall be provided.
  - vii) Spark-proof switches shall be located outside the room.
- b) **Corrosive Items Store**
- i) Corrosive items (phenols, hypochlorites) shall be kept here.
  - ii) Special plumbing and drainage system shall be considered.
  - iii) Eye wash station shall be made available.
- c) **Medical Gas Store**
- i) Portable medical gas cylinders shall be kept here.
  - ii) Specifications of the Medical Gas Store shall follow that of the Inflammable.
  - iii) Flooring must be reinforced in order to withstand the weight of the heavy gas cylinders.
  - iv) Loading and unloading bay shall be made available and sheltered. The bay shall be built to facilitate direct loading and unloading of goods.
  - v) All electrical facilities / system shall comply with the requirements of the Fire Fighting and Rescue Departments and Department of Environment.
  - vi) Adequate ventilation shall be provided.
- d) **Quarantined Item Store**
- Designated area / cabinet shall be provided and distinctly labelled.
- e) **Non-Conformance / Condemned Item Store**
- Designated store/ cabinet for expired, obsolete or damaged items shall be provided prior to disposal in accordance with TPS.

#### 4.5.5 Issuing Area

##### a) Temporary Holding Area

- i) Supply to the various departments is carried out here.
- ii) Indents from various departments shall be processed and prepared for supply and kept in this area until collected.
- iii) Designated secured area shall be provided close to the issuing area.

##### b) Issuing Counter

- i) An issuing counter shall be provided with adequate waiting space.
- ii) The area shall be equipped with appropriate office furniture and equipment.
- iii) Sufficient space for material handling equipment is required.

#### 4.5.6 Administrative Area

##### a) Pharmacist In-Charge Office

Room for the pharmacist in-charge to perform administrative work shall be provided. It shall be strategically located to allow supervision.

##### b) Pharmacist Work Station

Designated area for Pharmacist shall be provided. It shall be half-glass panelled to allow supervision. Workstations and computer terminals shall be made available.

##### c) General Office

- i) Designated area for assistant administrative officers and administrative assistants shall be made available.
- ii) Work-stations complete with computer terminals shall be made available.

##### d) Meeting / Discussion Room

Space for discussion and routine administrative meetings shall be made available.

##### e) Document Room

Adequate space/ room shall be available to store files and records.

f) **Stationery Store**

A dedicated storage area for stationery shall be provided.

g) **Reception Counter and Customer Waiting Area**

- i) The area shall be equipped with appropriate office furniture and equipments.
- ii) Customer waiting area shall be equipped with audio-visual facilities, water dispenser and settee.
- iii) Discussion room shall be made available.

4.5.7 **Ancillary Area**

a) **Personnel / Staff Rest Room**

- i) A room shall be made available for staff rest.
- ii) Staff lockers and domestic appliances such as refrigerator, electric kettle, water dispenser, microwave oven, table, chairs and sofa shall be made available.

b) **Wash Room**

- i) Wash rooms for male and female with separate changing room, toilets and shower facilities shall be provided.
- ii) A dedicated toilet for visitor shall be made available.

c) **Muslim Male and Female Prayer Room**

Designated rooms complete with ablution facility shall be made available.

d) **Housekeeping/Utility Room**

- i) The room shall have sufficient space for storing cleaning materials and equipment.
- ii) The room shall have good ventilation for washing and drying of equipment.

e) **Security Guard Post**

- i) Security guard post shall be made available at the main entrance of the store.
- ii) The room shall be equipped with necessary equipments for the security guard's convenience.

#### **4.6 SPACE REQUIREMENT**

Space required for each activity in the store depends on the size and type of the hospital. Refer ***Appendix A4: Space Requirement For Hospital Pharmacy Store.***

#### **4.7 EQUIPMENT REQUIREMENT**

Refer ***Appendix C4: Equipment Requirement for Hospital Pharmacy Store.***

#### **4.8 MANPOWER REQUIREMENT**

Refer ***Appendix D4: Manpower Requirement for Hospital Pharmacy Store.***

APPENDIX A4 : **SPACE REQUIREMENT FOR HOSPITAL PHARMACY STORE** (in square meter)

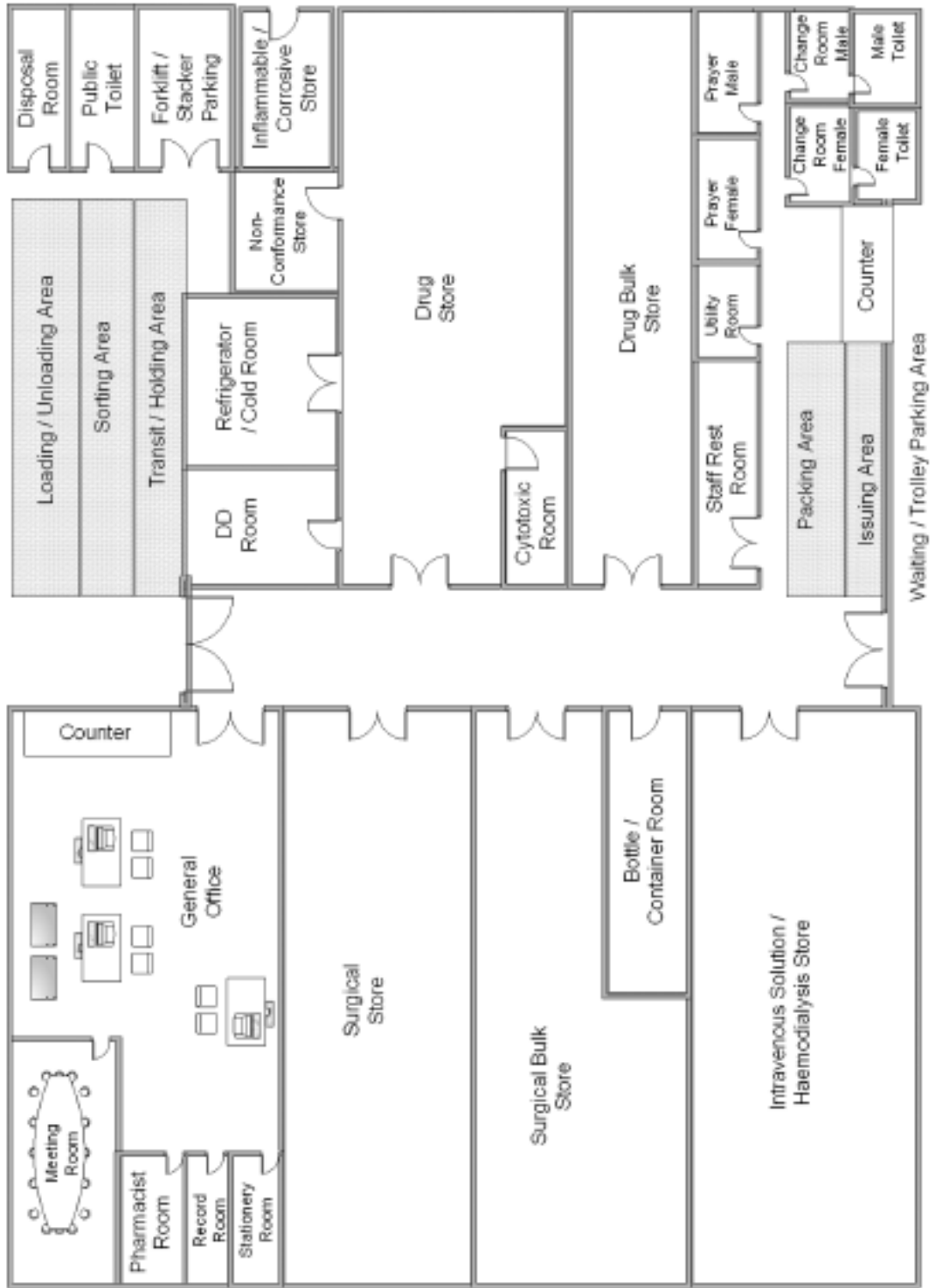
	Store/Area	Hospital Size (No. of Beds)					AC/F*
		> 1,000	701 - 1,000	501 - 700	250 - 500	<250	
1	Loading/Unloading bay	95	95	75	56	28	F
2	Mechanical Equipment Parking Area	14	14	10	10	10	F
3	Sorting / Unpacking Area	65	48	38	18	18	F
4	Transit / Holding Area	38	38	24	24	18	AC
5	Disposal Room	14	14	10	10	10	F
6	Drug Store	465	370	280	186	95	AC
7	Cold Room	18	18	18	14	14	AC
8	Dangerous Drugs / Psychotropic Substances Store	10	10	8	8	8	AC
9	Cytotoxic Drug Store / Designated Area	38	38	24	24	18	AC
10	Drug Bulk Store	186	186	140	95	75	AC
11	Intravenous (IV) Solutions Store	140	140	95	75	56	AC
12	Haemodialysis Solution Store	112	112	75	56	38	AC
13	Inflammable / Corrosive Item Store**	56	56	42	36	28	AC
14	Medical Gas Store**	18	18	14	10	10	F
15	Surgical Store	112	112	95	75	75	AC
16	Surgical Bulk Store	95	95	95	75	56	AC
17	Bottle / Container store	48	48	38	28	28	AC
18	Issuing Area	95	95	75	56	28	AC
19	Non-Conformance Product Store	56	56	56	48	28	AC
20	Stationery Store	18	18	10	8	8	AC
21	Record Room	14	14	10	10	8	AC
22	Packing / Temporary Holding Area	56	56	48	38	28	AC
23	Issuing Area	95	95	75	56	28	AC
24	Waiting / Trolley Park Area	18	18	14	10	10	AC
25	Pharmacist In-Charge Office	18	18	18	18	18	AC
26	Pharmacists Workstation / Person	4 x 10	3 x 10	2 x 10	10	10	AC
27	Assistant Store Officer's Open Office / Person	10	10	10	10	10	AC
28	Meeting / Discussion Room	18	18	18	14	14	AC
29	General Office	95	95	75	56	38	AC
30	Personnel / Staff Rest Room	18	18	14	12	12	AC
31	Wash Room	2 x 18	2 x 14	2 x 14	2 x 14	2 x 10	AC
32	Muslim Male / Female Prayer Room	2 x 18	2 x 14	2 x 14	2 x 14	2 x 10	AC
33	Housekeeping / Utility Room	10	10	10	10	10	F
34	Security Guard Post	18	18	18	18	18	AC
<b>TOTAL</b>		<b>2,175</b>	<b>2,037</b>	<b>1,608</b>	<b>1,230</b>	<b>893</b>	

\* AC= Air-Conditioning; F= Fan

\*\* Inflammable / Corrosive / Medical gas store shall be sited at a safe distance from all adjacent buildings (at least 10 feet away)



APPENDIX B4 : EXAMPLE OF DESIGN AND LAYOUT PLAN FOR HOSPITAL PHARMACY STORE



APPENDIX C4 : **EQUIPMENT REQUIREMENT FOR HOSPITAL PHARMACY STORE**

No.	Equipment	Location
1	Alarm System, Burglar	All areas
2	Alarm System, Cold Chain	Storage area
3	Alarm System, Electric	Storage area
4	Alarm System, Fire	All areas
5	Air-conditioner, Central	Storage area
6	Air-conditioner, Split	Administrative area
7	Bar Code Reader	Storage area
8	Bar Code Labeller	Storage area
9	Board, Notice (Magnetic)	Administrative and storage area
10	Board, Soft	Administrative and storage area
11	Book Shelf	Administrative area
12	Cabinet, Filing	Administrative area
13	Cabinet, Stainless Steel	Drug storage area
14	Cabinet, Dangerous Drug / Psychotropic Substances	Drug storage area
15	Cabinet, storage, build-in	Ancillary areas
16	Calculator	Administrative area
17	Chair, Meeting / Discussion Room	Administrative area
18	Chair, Office	Administrative area
19	Chair, Personnel / Staff Rest Room	Ancillary areas
20	Chair, Visitor	Receiving and issue area
21	Clock	Administrative and storage area
22	Close Circuit TV (CCTV)	All strategic areas
23	Computer, Notebook	Administrative area
24	Computer, Inventory system	Administrative and storage area
25	Cylinder, medical gases	Stores with special storage requirements
26	Dining Set	Ancillary areas
27	Electronic Control for Doors	All areas
28	Eye-wash Station	Inflammable / Corrosive Store
29	Exhaust Fan	Stores with special storage requirements
30	Facsimile	Administrative area
31	Fire Extinguisher	All areas
32	Forklift, Electric	Loading and unloading area
33	Freezer	Drug storage area, Pharmaceutical refrigerator bay
34	Internet Connection (Wireless Broadband)	Administrative and storage area
35	Kettle, Electric	Ancillary areas
36	Labeller, Hand-Held	Storage area
37	Ladder, Aluminium	Storage area
38	Locker, Personnel	Ancillary areas
39	Machine, Photostat	Administrative area
40	Microphone (PA system) for meeting room	Administrative area

No.	Equipment	Location
41	Microwave	Ancillary areas
42	Mirror	Ancillary areas
43	Pallet, Heavy Duty	Storage area
44	Paper Shredder	Administrative area
45	Personnel Protective Equipment (PPE) (for Bulk, Inflammable/Corrosive, Medical Gas Store)	Storage area
46	Pocket PC / PDA	Administrative area
47	Printer, LaserJet	Administrative area
48	Printer, LaserJet, Colour	Administrative area
49	Printer, Dot matrix (Heavy Duty) 24 Column	Administrative area
50	Projector Screen, Motorised	Administrative area
51	Projector, LCD	Administrative area
52	Rack, Heavy Duty	Storage area
53	Rack, Stainless Steel	Storage area
54	Refrigerator, Pharmaceutical 3 door (Glass), with thermometer and temperature recorder	Drug storage area, Pharmaceutical refrigerator bay
55	Refrigerator, Pharmaceutical Single door (Vaccine), with thermometer and temperature recorder	Drug storage area, Pharmaceutical refrigerator bay
56	Refrigerator, Domestic 1500L	Ancillary areas
57	Scanner, computer	Administrative area
58	Settee, Staff & Visitor	Administrative area
59	Shoe rack	Ancillary areas
60	Smoke Detector	All areas
61	Stacker, Automatic	Loading and unloading area
62	Stacker, Motorised	Loading and unloading area
63	Steps, mobile	Storage area
64	Table, Meeting / Discussion Room	Administrative area
65	Table, Office	Administrative area
66	Table, Personnel / Staff Rest Room / Visitors	Ancillary areas
67	Television Set	Issuing area
68	Thermometer, Room	Storage area
69	Toaster	Ancillary areas
70	Trolley, 2-tier stainless steel	Storage area
71	Trolley, Instruments with guard rail	Storage area
72	Trolley, Hand	Storage area
73	Trolley, Multipurpose platform (heavy duty)	Storage area
74	Trolley, Oxygen Cylinder	Stores with special storage requirements
75	Truck, Pallet (heavy- duty)	Storage area
76	VCD / DVD Player	Ancillary areas
77	Water Dispenser	Ancillary areas
78	Water Sprinkler	Storage areas

APPENDIX D4 : **MANPOWER REQUIREMENT FOR HOSPITAL PHARMACY STORE**

Human Resources	No. of Staff				
	Hospital (>1000 beds)	Hospital (701-1000 beds)	Hospital (501-700 beds)	Hospital (250-500 beds)	Hospital (<250 beds)
Pharmacist U52	1	1			
Pharmacist U48	1	1	1		
Pharmacist U44	2	1	1	1	
Pharmacist U41	2	2	2	1	1
Asst. Store Officer N32	3	2	1		
Asst. Store Officer N27	4	2	2	1	1
Store Keeper N26 / Administrative Asst. N26	2	2	1	1	
Store Keeper N22 / Administrative Asst. N22	4	3	2	2	2
Store Keeper N17 / Administrative Asst. N17	12	10	8	6	4
PAR	3	2	2	1	1
Forklift Driver	2	2	2	1	1
PRA	10	8	6	4	2
<b>TOTAL</b>	<b>46</b>	<b>36</b>	<b>28</b>	<b>18</b>	<b>12</b>



# 5

## HEALTH CLINIC OUTPATIENT PHARMACY

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## 5. HEALTH CLINIC OUTPATIENT PHARMACY

### 5.1 INTRODUCTION

Health clinic Outpatient Pharmacy provides outpatient medication services including medicine dispensing in timely and accurate manner, patient medication counseling inclusive of Medication Therapy Adherence Clinic (MTAC) and Home Medication Review (HMR) to improve treatment outcome, dissemination of medicine information to the patients, caretakers, public and other healthcare providers to promote quality use of medicines, compounding of extemporaneous and repacking of medicines.

Medicine dispensing service includes screening of prescriptions, assisting clinicians with therapeutic information and prescribing decisions upon request, correct filling of medicines and counterchecking of filled medicines before dispensing.

### 5.2 OBJECTIVES

- 5.2.1 To ensure the health clinic Outpatient Pharmacy Unit design, build, equipment and maintenance enhance the provision of efficient and effective preventive pharmaceutical care services in primary healthcare.
- 5.2.2 To ensure the facilities are sufficiently equipped with appropriate and adequate resources in order to enhance promotion of quality use of medicines through extended clinical care services and dissemination of unbiased drug information to healthcare providers and general public.
- 5.2.3 To implement technological advances wherever possible to allow the outpatient pharmacy to improve patient medication supply and strengthen patient-focused pharmaceutical care.

### 5.3 POLICIES

#### 5.3.1 General Operational Policies

- a) Health clinics Outpatient Pharmacy services shall be available whenever the clinics in operation. The Outpatient Pharmacy shall be located near the consultation / treatment rooms.
- b) Dispensing of medicines shall be based on an authentic written or on-line prescriptions issued from the clinics / units / departments of hospitals and health institutions within the Ministry of Health, Malaysia (MOH).
- c) "Island Dispensing System" shall be adopted, whereby all prescriptions received shall be screened by pharmacist, medications filled, labelled, counter checked and dispensed to prevent medication error at point of dispensing.
- d) All prescriptions/ order received shall be screened and verified by authorised staff at the specified counter /station.
- e) Screened prescriptions shall be sent to filling workstations for labeling and filling processes.
- f) Any intervention if necessary shall be communicated to the prescriber and rectified.

- g) All filled prescriptions shall be counter-checked and verified by another authorised staff.
- h) Medicines shall be made available in sufficient quantity, stored in appropriate storage condition and handled by trained and qualified personnel. The sub-store shall store not less 4 weeks stock while counter stock not less than 2 weeks stock.
- i) The expiry date of the medicines kept shall be regularly monitored by the Pharmacy staff to avoid expiration in storage. There shall be sufficient space to implement FEFO (First Expiry First Out).
- j) Integrated Drug Dispensing System (IDDS) shall be implemented (refer Garispanduan Sistem Pendispensan Ubat Bersepadu, KKM). All necessary communication and networking equipments shall be installed.
- k) All supply and use of Dangerous Drugs / Psychotropic Substances shall be recorded in accordance to the requirement of relevant Acts and Regulations.
- l) Every health clinic Outpatient Pharmacy shall establish Drug and Poison Information Service (DPIS), medication counseling service, MTAC, HMR and pharmacy education services.
- m) Safety and security of the staff, equipment and medicines shall not be compromised. Fire fighting equipment, smoke detector and automatic trigger alarm system shall be appropriately in place.
- n) Access to pharmacy working area shall be restricted. Access card and electronic safety controlled doors shall be in place and closed circuit televisions (CCTVs) shall be installed. Emergency exit / escape door shall be available with clear signage.

### 5.3.2 General Development & Maintenance Policies

- a) An appropriate conducive space shall be provided for pharmacy waiting area.
- b) All counters shall be of open design and comply with guidelines provided by Pharmacy Services Division, Ministry of Health.
- c) Every counter shall be provided with computer terminal for online dispensing system.
- d) Outpatient Pharmacy counter shall be of open counter design with no barrier between patient and pharmacy staff and between one staff to another.
- e) The Special Pharmacy Care (SPC) counter shall be provided to serve wheel chair bound patients, geriatrics, handicap and mother and children. The counter shall be of sitting position for both patient and staff.
- f) A designated area shall be provided for the storage and dispensing of all filled medicines waiting for collection, which are prepared for patients through appointment systems (e.g. SMS & Take).
- g) Complete and appropriate Queue Management System shall be made available with sufficient quantity of digital calling system display panels located at strategic areas.

- h) Sufficient space shall be provided for storage of all dispensed prescriptions and other documents.
- i) The filling station design shall take into consideration the work flow, the handling material, the equipment, the manpower and the workload of the pharmacy. Adequate storage space with modular storage rack, cabinet or cupboard shall be considered.
- j) Compounding of extemporaneous preparations which are prepared to be dispensed immediately to the patients, shall be done in specified preparation room near to the dispensing facilities.
- k) Repacking of medicines shall be carried out in a designated room properly equipped with necessary equipments.
- l) Outpatient facilities shall be complete and fully furnished with furniture, equipment, telecommunications and networking to meet the service requirement.
- m) Proper signage shall be provided and be fixed at appropriate and strategic locations.
- n) Storage of Dangerous Drugs / Psychotropic Substances shall be in a locked cabinet preferably with intruder alert system and in accordance to the relevant Act and Regulation.
- o) Designated room(s) for patient medication counseling shall be provided to improve patient compliance towards medications.
- p) There shall be a room for Pharmacist in-charge and modular workstations for other pharmacists and supporting staffs.
- q) Appropriate and adequate space shall be allocated for the sub-store. This store shall be equipped with all necessary equipment and furniture to meet GSP requirement.
- r) Drug and Poison Information Service Room and Pharmacy Education Room shall be completely furnished with necessary equipment, networking, references, telecommunications, storage systems and a discussion area. There shall be at least a pharmacist to run the services.

## **5.4 MECHANICAL & ELECTRICAL REQUIREMENT**

### **5.4.1 Power supply**

- a) The heating, ventilation and air-conditioning (HVAC) system shall be designed to sustain the specific environment requirement. It shall also take into consideration the indoor air quality.
- b) Standby or emergency power supply shall be connected to storage rooms, pharmaceutical refrigerators and freezer, the back door buzzer and Dangerous Drugs / Psychotropic Substances storage alarm.

### **5.4.2 Air Conditioning System**

- a) All areas shall be centrally air-conditioned.



- b) The storage areas shall be air-conditioned for 24 hours and two sets of alternating air conditioning system shall be provided for day and night use.
- c) The patient waiting area, office area, and ancillary area shall be air-conditioned during operational hours.

#### 5.4.3 Lighting System

- a) Electrical outlet points shall be adequate for the optimum operation of outpatient services.
- b) Uniform lighting ranging from 300-800 lux over the entire area is required. Localised lighting shall be provided for certain task area such as dispensing, filling and extemporaneous compounding area to minimize medication error during dispensing.
- c) Ceiling lights shall be flush mounted. Daylight white tube is preferable and shall be of optimum average illumination.

#### 5.4.4 Alarm System

- a) Automatic triggered alarm shall be fixed at dangerous drugs / psychotropic substances storage cabinet/area to detect any break-in.
- b) Automatic triggered alarm shall be linked to the HVAC system and pharmaceutical refrigerators to detect changes in temperature and humidity.

### 5.5 DESIGN AND LAYOUT PLAN

The general design and construction shall take into consideration the functionality of health clinic outpatient pharmacy services. The location and size shall accommodate anticipated personnel and inventory movement, work processes and activities. Built-in storage and fixed equipment shall be considered for storing documents, drug and Dangerous Drugs And Psychotropic Substances, refrigerated and cold-chain items. Refer **Appendix B5: Example of Design and Layout Plan for Outpatient Pharmacy in Health Clinics**.

#### 5.5.1 Patient Waiting Area

- a) The area shall be spacious, air-conditioned, with adequate lighting and properly ventilated.
- b) Adequate space shall be provided in front of the receiving/screening counter for patients to queue up to submit their prescriptions.
- c) Pharmacy information corner consisting of a suggestion box with writing facilities, notice board and reading materials shall be made available.
- d) Client's Charter, work flow and instructions to patients shall be displayed at appropriate places.
- e) The area shall be equipped with sufficient chairs, water dispenser (optional) television and DVD player. An electronic information display panel shall also be installed.

### 5.5.2 **General Design Of Prescription Receiving, Screening, Filling, Labelling and Dispensing Counters**

- a) The location and layout of the outpatient pharmacy counter shall take into consideration the operational work-flow as well as personnel and material flow.
- b) Distance from the counter to the patient's seats (first row) shall be at least 96" (2.4 m).
- c) The design and construction of the counter shall reflect the corporate image of the pharmacy.
- d) The number of counters shall be sufficient to cater for the supply of medicines to patients. In a general setting where there is a dispensing load of 100 prescriptions and lower, a minimum of 3 counters shall be built (receiving/screening, dispensing and special pharmacy care (SPC) counter).
- e) An additional counter shall be required for every additional 100 prescriptions dispensed.
- f) No barrier shall be allowed between service staff and patient to ensure effective communication, smoothness and ease in medication collection and instruction.
- g) Air-curtain shall be installed at pharmacy dispensing counter if waiting area is not air-conditioned.
- h) The counter shall be of sitting position at the staff side/back of the counter and standing position at patient/front side of the counter.
- i) The counter top shall be of patient standing height which is about 42" (~1m) from the floor. At one end of the counter, SPC counter shall be provided with both staff and patient sides of sitting position.
- j) The width of the counter staff working bench shall be about 24"- 26" (~0.6-0.65m). The width of the counter top shall be about 20" (0.5m) with about 12" (0.3m) protrusion towards patient to ensure comfortable distance between staff and patient.
- k) The length of the counter shall depend on size of clinic and prescription workload with minimum to cater for 3 working staff (minimum length ~140" [~3.5m]).
- l) If there is a computerised prescription order system, then the width and the length of the counter shall have to be adjusted accordingly to accommodate the computer hardware.
- m) The counter top shall be made from suitable material, smooth and scratch/stain free.
- n) Computerised QMS with Voice Calling System complete with LED display and Public Address (PA) System shall be provided. The QMS shall be able to integrate with the existing computerised dispensing system e.g. Tele-primary Care (TPC).
- o) Facilities adopting online prescribing shall be equipped with a complete workstation (adequate quantity of computer, LCD monitor, labelling printer,

heavy duty printer) to receive and process order. The counter design shall accommodate such hardware.

- p) For security purpose, an electric motorized roller shutter shall be provided to secure the counter after operational hours.

#### 5.5.3 Receiving & Screening Counter

- a) The QMS ticketing and PA system equipment shall be provided at this counter.
- b) The area shall be designated to cater for possible electronic transaction as well as for general enquiries and information.
- c) A telephone shall be provided for prescription enquiries / interventions.

#### 5.5.4 Dispensing Counters

- a) The distance between one dispensing counter staff to another shall be about 48" (1.2m) to maintain comfortable working distance.
- b) The distance between dispensing staff sitting at the counter to medicine filled trolley parking shall be 36" (0.91m) to allow easy movement without having the staff to stand up each time to reach for the filled medicines. This will shorten time to dispense and improve efficiency.

#### 5.5.5 Filling Workstations

- a) The area shall be spacious, air-conditioned, well lit and properly ventilated.
- b) Area for filling prescriptions shall be located near to dispensing counters with sufficient opening space provided to allow transfer of medicines to the dispensing area.
- c) The working area to conduct all operations related to medication filling shall be concealed from the public/patient view, preferably using frosted glass panel.
- d) Filling area shall be equipped with pharmaceutical refrigerators, benches, medication racks and other furniture. Adequate space shall be provided for computer hardware (including LCD monitor, UPS, barcode reader and printers).
- e) The filling workstation shall be equipped with adequate racks for drugs and medication labels and designed in an appropriate manner to facilitate the filling processes and minimise movement of the staff. This will shorten the time of filling process and improve efficiency.
- f) Conveyor belt system shall be considered for outpatient pharmacies with more than 4 dispensing counters. The conveyor belt system shall be designed to meet local requirement, to ease the transfer of filled prescription and expedite dispensing activities.

#### 5.5.6 Repacking Room

- a) The repacking area shall be well lit, well ventilated and dust free.
- b) Repacking of tablet/capsule, internal and external liquid medicines shall be physically separated.

- c) The liquid repacking rooms shall be equipped with:
  - i) A built-in concrete working bench with smooth and acid resistant work surface.
  - ii) A deep stainless steel sink (at least 16 inches deep) to avoid splashing, complete with elbow tap.
  - iii) Stainless steel shelves.
  - iv) 5 µm filter apparatus for hot and cold water outlets.
- d) An area to place tablet counting machine equipped with dust collector shall be provided.

#### 5.5.7 Extemporaneous Preparation Room

- a) A designated area properly equipped with necessary equipments shall be made available for extemporaneous preparation.
- b) The area shall have a built-in concrete working bench with smooth and acid resistant surface suitable for pharmaceutical preparation.
- c) The area shall have a stainless steel sink with an appropriate depth (at least 16 inches deep) to avoid splashing, and 5 µm filter apparatus for hot and cold water outlets, complete with elbow tap.
- d) The area shall have stainless steel shelves.

#### 5.5.8 Storage Area for Medicines (Sub-store)

- a) The area shall have adequate space to accommodate computers, steel cupboards for storing controlled, expensive and attractive medicines, pharmaceutical refrigerator to keep thermo labile medicines, trolleys, sufficient and suitable open racks and monitored by CCTV.
- b) The area shall have air-conditioning facilities working 24 hours maintained between 18-25°C.
- c) Temperature of the storage area shall be monitored, documented and back-up / essential power supply with trigger alarm system shall be made available for pharmaceutical refrigerators and air conditioning facilities.
- d) Pharmaceutical refrigerator/s shall be provided to keep thermo labile medicines such as vaccine, chloramphenicol eye drop and insulin preparation.
- e) Back-up / essential power supply with trigger alarm system shall be made available for pharmaceutical refrigerator and air-conditioning system to ensure cold-chain is maintained.
- f) The size of all doors shall accommodate trolleys. Sufficient space shall be provided for trolley parking inside the store.
- g) The sub-store room shall be locked when the outpatient pharmacy is non-operational.

#### 5.5.9 Patient Counseling Room

- a) Dedicated rooms (refer Appendix A5) shall be located in an area accessible to patients from waiting area and the pharmacist from within the pharmacy.
- b) The room shall be half-glass paneled with blinds.
- c) Conducive counseling environment shall be made available e.g. sofa sets, coffee table etc.
- d) Rooms shall be equipped with suitable racks and cupboard to store educational materials.
- e) Computerised Drug information shall be made available e.g. Micromedex®, Lexicom® etc.
- f) MTAC activities shall also be carried out here if the location is close to the consultation /treatment rooms.

#### 5.5.10 Drug and Poison Information & Pharmacy Education Room

- a) An air-conditioned room shall be provided for Drug and Poison Information and Pharmacy Education Room.
- b) The room shall be equipped with built in cabinets and racks for storage of health educational materials and references.
- c) Personal computers, personal digital assistants (PDA), printers, and telephone with direct line shall be provided.
- d) Internet access shall be provided to resource information from relevant websites, online journals, etc.
- e) Computerised drug information shall be made available e.g. Micromedex(r), Lexicom(r) etc.

#### 5.5.11 Office Area (Head Of Unit, Senior Pharmacist and Pharmacist Office)

- a) All office areas shall be half-glass paneled to allow supervision.
- b) Designated room shall be provided for Head of Unit and Senior Pharmacist.
- c) Open concept shall be applied for Pharmacist office complete with necessary equipments e.g. photocopy machine, fax, and Internet access.
- d) Sufficient work stations shall be provided for pharmacists working in the Outpatient Pharmacy as well as for those who are doing clinical works such as Medication Therapy Adherence Clinic (MTAC) and Home Medication Review (HMR).

#### 5.5.12 Document Room

- a) Sufficient space with racks shall be made available to store all the documents as required by the regulation(s).
- b) The room shall be provided with exhaust fan to prevent accumulation of dust.

#### 5.5.13 Meeting Room

- a) The room shall be air-conditioned and have sufficient space to accommodate appropriate number of person and equipped with suitable meeting table and chairs.
- b) The room shall be equipped with appropriate equipments e.g. LCD projectors, LCD screen and computer.

#### 5.5.14 Staff Areas

- a) Staff rest room shall be complete with pantry and furniture shall be made available.
- b) Toilet and changing rooms complete with staff lockers adjacent to staff rest room shall be provided.
- c) Separate prayer room for male and female complete with ablution facilities shall be provided.
- d) Exhaust fan shall be made available.

#### 5.5.15 Utility Room

A sufficient space shall be provided to store cleaning materials and equipment, and non-medical items meant to be disposed. (e.g. used boxes, used plastic container).

### 5.6 SPACE REQUIREMENT

The requirement of space for the pharmacy outpatient unit in the Health Clinic is as in ***Appendix A5: Space Requirement for Outpatient Pharmacy in Health Clinics.***

### 5.7 EQUIPMENT REQUIREMENT

The requirement of equipment for the pharmacy outpatient unit in the Health Clinic is listed in ***Appendix C5: Equipment Requirement for Outpatient Pharmacy in Health Clinic.***

### 5.8 MANPOWER REQUIREMENT

The requirement of personnel for the pharmacy outpatient unit in the Health Clinic is listed in ***Appendix D5: Manpower Requirement for Outpatient Pharmacy in Health Clinic.***

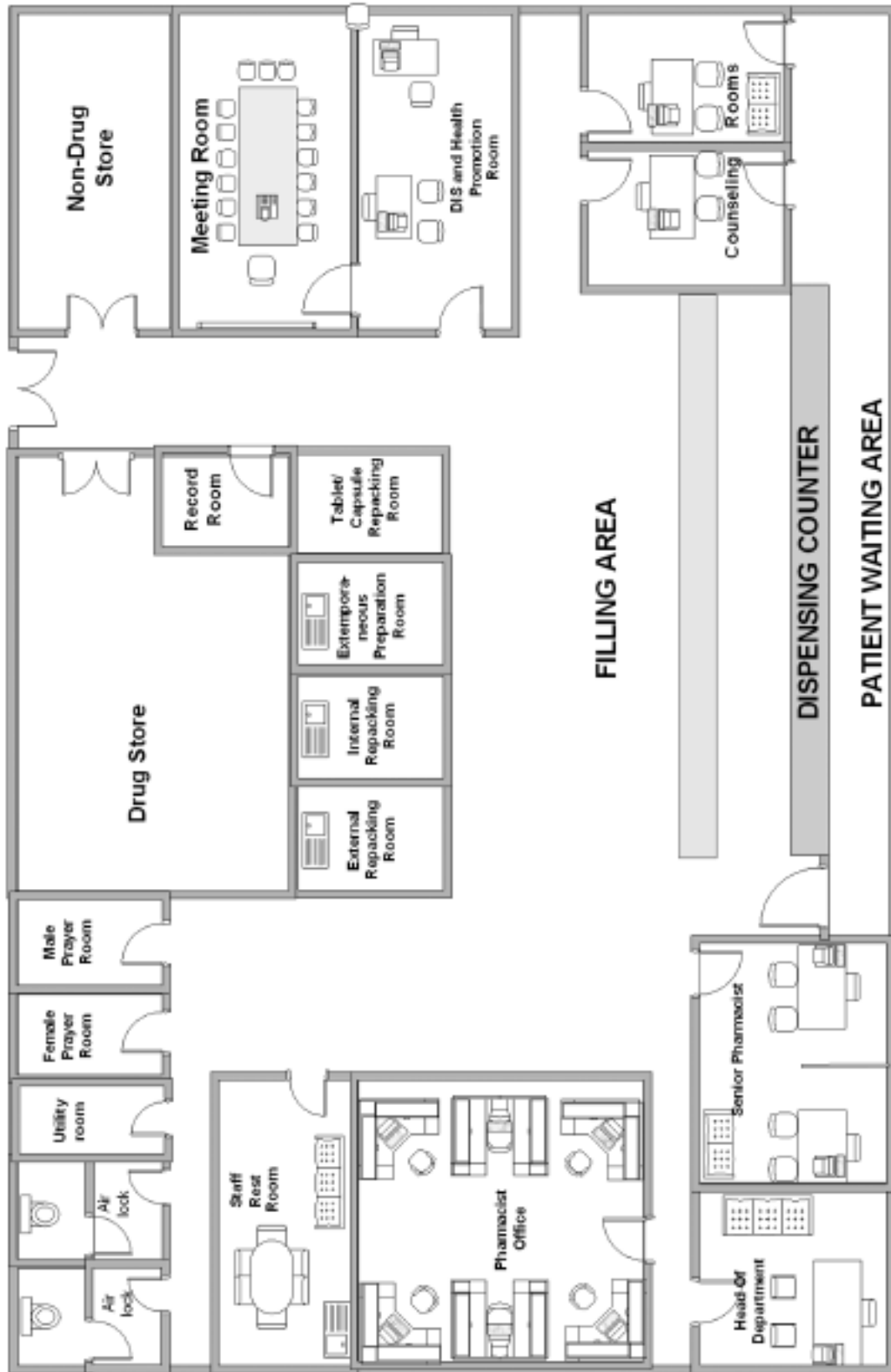
APPENDIX A5 : SPACE REQUIREMENT FOR OUTPATIENT PHARMACY IN HEALTH CLINICS

Types of Health Centres (No. of prescription / day)	Outpatient Pharmacy Area (square meter)											Drug Information & Pharmacy Education	
	Prescription Filling & Dispensing	Patient Waiting	Internal / External Extramorphaneous preparation / repacking	Tablet Re-packing	Record Room	Drugs Storage	Patient Counseling	Head of Department Office	Pharmacist Office	Meeting/ Education Room	Prayer Room		Staff Rest & Toilets
Type I (>800)	140 (8 counters)	140	2 x 14	14	18	75	24 (2 rooms)	18 (1 room for 1U52)	28 (1 room for 2 U48), 150 (Cubicles for 3 U44 + 10 U41)	38	20 (1 male & 1 female)	28	28
Type II (501-800)	112 (6 counters)	112	2 x 14	14	14	70	24 (2 rooms)	16 (1 U48 - HOD)	14 (1 room for 1 U48), 120 (Cubicles for 2 U44 + 8 U41)	28	10	18	28
Type III (301-500)	94 (4 counters)	94	2 x 14	14	14	56	12 (1 room)	14 (1 room for 1 U44)	92 (Cubicles for 1 U44 + 7 U41)	20	10	15	28
Type IV (WM:<300) (EM:151-300)	56 (3 counters)	56	2 x 14	14	10	46	12 (1 room)	14 (1 U44 - HOD)	54 (Cubicles for 6 U41)	Nil	Nil	10	20
Type V (EM:50-150)	38 (3 counters)	38	2 x 14	14	Nil	28	10 (1 room)	Nil	26 (Cubicles for 2 U41)	Nil	Nil	Nil	Nil
Type VI (EM:<50)	20 (3 counters)	28	2 x 14	14	Nil	22	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Legend : (EM= East Malaysia, WM= West Malaysia)

Note : The above space requirement does not include passage way

APPENDIX B5 : EXAMPLE OF DESIGN AND LAYOUT PLAN FOR HEALTH CLINICS OUTPATIENT PHARMACY





APPENDIX C5 : EQUIPMENT REQUIREMENT FOR OUTPATIENT PHARMACY IN HEALTH CLINICS

EQUIPMENT	TYPE OF HEALTH CLINICS					
	TYPE I	TYPE II	TYPE III	TYPE IV	TYPE V	TYPE VI
<b>HEAD OF UNIT / SENIOR PHARMACIST</b>						
Table & chair	3	3	3	3	3	-
Computer, stand alone	3	3	3	3	3	-
Computer, note book	3	3	3	3	-	-
Printer, Laserjet A4	3	3	3	3	3	-
Scanner, computer	3	3	3	3	-	-
Internet Access	3	3	3	3	3	-
Facsimile	3	3	3	3	3	-
Cabinet	3	3	3	3	3	-
<b>PHARMACIST OFFICE</b>						
Table & chair	3	3	3	3	3	-
Computer, stand alone	3	3	3	3	3	-
Printer, Laserjet A4	3	3	3	3	-	-
Internet access	3	3	3	3	-	-
Cabinet	3	3	3	3	3	-
<b>PHARMACY COUNTER</b>						
Q-matics system	3	3	3	3	3	-
Digital Calling system	-	-	-	-	-	3
Public Address System	3	3	3	3	3	3
Computer, stand alone	3	3	3	3	3	3
Printer, Laserjet A4	3	3	3	3	3	-
Refrigerator, Pharmaceutical	3	3	3	3	3	3
Trolley, 2- tier stainless steel	3	3	3	3	3	3
Chair-counter with back rest	3	3	3	3	3	3
<b>PHARMACY WAITING AREA</b>						
Television	3	3	3	3	3	3
DVD player	3	3	3	3	3	3
Electronic Information Display	3	3	3	3	3	3

EQUIPMENT	TYPE OF HEALTH CLINICS					
	TYPE I	TYPE II	TYPE III	TYPE IV	TYPE V	TYPE VI
<b>PHARMACY WAITING AREA</b>						
Patient Waiting Chair	3	3	3	3	3	3
Reading Material	3	3	3	3	3	3
<b>PATIENT COUNSELLING ROOM</b>						
Sofa	3	3	3	3	3	–
Tea table	3	3	3	3	3	–
Table & chair	3	3	3	3	3	–
Cupboard	3	3	3	3	3	–
Computer, stand alone	3	3	3	3	3	–
Printer, Laserjet A4	3	3	3	3	3	–
<b>REPACKING ROOM</b>						
Tablet counting machine	3	3	3	3	3	3
Labeller machine	3	3	3	3	3	3
Trolley, 2- tier stainless steel	3	3	3	3	3	3
Sealer machine	3	3	3	3	3	3
Exhaust Fan	3	3	3	3	3	3
Weighing scale	3	3	3	3	3	3
<b>EXTEMPORANEOUS ROOM</b>						
Water distiller	3	3	3	–	–	–
Water filter	–	–	–	3	3	3
<b>STORE</b>						
Alarm System, Burglar	3	3	3	3	3	3
Alarm System, Electric	3	3	3	3	3	3
Alarm system, Fire	3	3	3	3	3	3
Close circuit TV	3	3	3	3	–	–
Automatic stacker	3	3	–	–	–	–
Forklift	3	3	–	–	–	–
Rack, heavy duty	3	3	3	3	3	3
Trolley, multipurpose platform with cage	3	3	3	3	3	3

EQUIPMENT	TYPE OF HEALTH CLINICS					
	TYPE I	TYPE II	TYPE III	TYPE IV	TYPE V	TYPE VI
<b>STORE</b>						
Freezer, vaccine	3	3	3	3	3	–
Refrigerator, pharmaceutical	3	3	3	3	3	–
Cabinet, Filing	3	3	3	3	3	3
Cabinet, Stainless steel	3	3	3	3	3	3
Cabinet, Dangerous Drug/ Psychotropic	3	3	3	3	3	3
Table & chair	3	3	3	3	3	3
Computer, stand alone	3	3	3	3	3	3
Printer, Laserjet A4	3	3	3	3	3	–
Facsimile	3	3	3	3	3	–
Machine, photostate	3	3	3	3	3	–
Vacuum cleaner	3	3	3	3	3	–
<b>MEETING ROOM</b>						
Chair	3	3	3	3	–	–
Conference table	3	3	3	3	–	–
Microphone( PA system)	3	3	3	3	–	–
Television	3	3	3	3	–	–
VCD/DVD set	3	3	3	3	–	–
Projector, LCD	3	3	3	3	–	–
Projector, screen	3	3	3	3	–	–
<b>DRUG INFORMATION</b>						
Book shelf	3	3	3	3	–	–
Computer, stand alone	3	3	3	3	–	–
Printer Laserjet colour	3	3	3	3	–	–
Computer, note book	3	3	3	3	–	–
Scanner, computer	3	3	3	3	–	–
Internet access	3	3	3	3	–	–
Pocket PC/PDA	3	3	3	3	–	–

EQUIPMENT	TYPE OF HEALTH CLINICS					
	TYPE I	TYPE II	TYPE III	TYPE IV	TYPE V	TYPE VI
<b>RECORD ROOM</b>						
Machine, paper shredder	3	3	3	3	3	–
Cabinet	3	3	3	3	3	–
Rack	3	3	3	3	3	–
<b>GENERAL OFFICE</b>						
Cabinet,, Failing	3	3	3	3	–	–
Table & chair	3	3	3	3	–	–
Computer, stand alone	3	3	3	3	–	–
Printer, Laserjet A4	3	3	3	3	–	–
Facsimile	3	3	3	3	–	–
Machine , Risograph	3	3	3	–	–	–
Machine, photostat	3	3	3	3	–	–
<b>STAFF ROOM</b>						
Sofa	3	3	3	3	3	–
Kettle	3	3	3	3	3	–
Staff locker	3	3	3	3	3	–
Shoe rack	3	3	3	3	3	–
Refrigerator, Domestic	3	3	3	3	3	–



APPENDIX D5 : **MANPOWER REQUIREMENT FOR HEALTH PHARMACY SERVICES**

Human Resource	HOD	PS	DIS & PE	OPD	Coun	MTM	HMR	TOTAL
<b>Type I (&gt;800 Patients)</b>								
Pharmacist (U52)	1							1
Pharmacist (U48)				1		1		2
Pharmacist (U44)		1		2		2		5
Pharmacist (U41)			2	8	2	2	2	16
Pharmacy Assistant (U36)				1				1
Pharmacy Assistant (U32)				2				2
Pharmacy Assistant (U29)				16				16
Store Keeper / Administrative Assistant (N22)		1						1
Store Keeper / Administrative Assistant (N17)		2						2
General Workers (U16/R11)		3		4				7
<b>Type II (501 - 800 Patients)</b>								
Pharmacist (U48)	1			1				2
Pharmacist (U44)				2		2		4
Pharmacist (U41)		1	1	6	2	2	2	14
Pharmacy Assistant (U36)				1				1
Pharmacy Assistant (U32)				2				2
Pharmacy Assistant (U29)				12				12
Store Keeper / Administrative Assistant (N22)		1						1
Store Keeper / Administrative Assistant (N17)		2						2
General Workers (U16/R11)		2		3				5

Human Resource	HOD	PS	DIS & PE	OPD	Coun	MTM	HMR	TOTAL
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### Type III (300-500 Patients)

Pharmacist (U44)	1			1				2
Pharmacist (U41)		1	1	4		2	1	9
Pharmacy Assistant (U32)				1				1
Pharmacy Assistant (U29)				8				8
Store Keeper / Administrative Assistant (N17)		2						2
General Workers (U16/R11)		2		2				4

### Type IV (151-300 Patients)

Pharmacist (U44)	1							1
Pharmacist (U41)		1	3			1	1	6
Pharmacy Assistant (U32)				1				1
Pharmacy Assistant (U29)				5				5
Store Keeper / Administrative Assistant (N17)		1						1
General Workers (U16/R11)		1		2				3

### Type V (50-150 Patients)

Pharmacist (U41)			1			1		2
Pharmacy Assistant (U29)				2				2
General Workers (U16/R11)		1		1				2

### Type VI (<50 Patient)

Pharmacy Assistant (U29)				1				1
General Workers (U16/R11)				1				1

### LEGENDS

<b>HOD</b>	Head of Department
<b>PS</b>	Procurement & Supply
<b>COUN</b>	Counseling
<b>DIS &amp; PE</b>	DIS & Pharmacy Education
<b>OPD</b>	Outpatient Department
<b>MTM</b>	Medication Therapy Management
<b>HMR</b>	Home Medication Review



# 6

## DISTRICT HEALTH PHARMACY PROCUREMENT AND SUPPLY SERVICE

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## **6. DISTRICT HEALTH PHARMACY PROCUREMENT AND SUPPLY**

### **6.1 INTRODUCTION**

The store procures as well as supplies pharmaceutical and consumable items to all units within the clinic and to other requesting clinics in the district under its jurisdiction.

The efficient administration of a health pharmacy store requires a professional approach in balancing the procurement and logistics management with the allocated financial limits of the Health District Office besides observing the principle that no patient with any life-threatening ailment is refused treatment because of budgetary constraints.

### **6.2 OBJECTIVES**

- 6.2.1 To ensure an adequate storage space and continuous supply of pharmaceutical, medical and surgical inventories to improve customer service.
- 6.2.2 To ensure the facility design, construct and build comply with the requirement of TPS, GSP and other relevant guidelines from MOH and other authorities.
- 6.2.3 To obtain measurable financial performance and customer satisfaction on logistic, procurement and supply processes.

### **6.3 POLICIES**

#### **6.3.1 General Operational Policies**

- a) All activities of the District Health Pharmacy Procurement Service shall be in accordance with 'Arahan Perbendaharaan', 'Tatacara Pengurusan Stor', Good Storage Practice (GSP) Guidelines and other relevant Ministry of Health and Ministry of Finance guidelines.
- b) The store shall procure and monitor APPL and non-APPL pharmaceutical and consumable items.
- c) The ordering of the APPL items shall be done at the clinic level and the approval shall be done at the district level by the pharmacist; both using the Clinic Procurement System (CPS). The ordered APPL items shall be delivered by the vendor directly to the designated clinics.
- d) Computerised system for the management of the store shall be made available for procurement, storage, supply and payment so as to meet the requirement of TPS. This is in addition to e-Procurement, Teleprimary Care (TPC) and other existing systems.
- e) Non-APPL items shall be ordered from the nearest main pharmacy store based on the clinics' requirement. The budget for the procurement of these items shall be provided by the District Health Office. The collection of items shall be done by the staff of the requesting clinics.



- f) There shall be at least one pharmacist as the senior management of the store in addition to having pharmacist's expertise all along the procurement chain. The Senior Pharmacist shall ensure the security of the store and supervise all activities in the pharmacy store.
- g) The Senior Pharmacist shall be supported by administrative staff and general workers. The number of supporting staff shall be proportionate to the workload and budget managed by the district.
- h) Stock holding for all goods at any time shall be not more than 2 months of usage.
- i) The expiry date of all items shall be monitored regularly and First-Expire-First-Out (FEFO) shall be implemented efficiently.
- j) Dangerous Drugs and Psychotropic Substances shall be kept under lock and key and controlled under stringent security provisions and shall be handled by pharmacists in accordance to Dangerous Drug Act 1952.
- k) Comprehensive records of all receipts and issues of items shall be maintained and hard copies shall be generated at regular intervals.
- l) The store shall manage all the product recalls according to stated processes and procedures.
- m) All disposals of items and documents shall be carried out in accordance with standard procedures and regulations.
- n) Product complaint shall be handled and procedures describing the actions to be taken in handling of all written and verbal complaints regarding products.
- o) Mechanical handling equipment and system shall be made available.
- p) Good housekeeping such as cleaning, sanitation and inspection shall be carried out as scheduled.

### 6.3.2 **General Development & Maintenance Policies**

- a) The pharmacy store shall be located at strategic place to allow efficient delivery activities to be carried out.
- b) It shall have road access to accommodate vehicles of various sizes up to maximum of 12 tonne.
- c) It shall be conveniently accessible to Outpatient Pharmacy Unit and other units to allow timely and smooth supplies.
- d) It shall be located away from the public area.
- e) Close Circuit Television (CCTV) shall be installed at strategic locations within the store area and connected to the guard post.



- f) All doors and gates shall be electronically controlled.
- g) Fire fighting systems and equipment such as water hoses, smoke detectors and fire extinguishers shall be installed accordingly. Fire evacuation plan shall be provided, displayed and adhered to.
- h) The storage area of the pharmacy store shall be sufficient for keeping all inventories at appropriate stock holding levels in accordance with TPS requirement.
- i) There shall be sufficient physically separated areas with appropriate storage conditions for orderly segregation of products namely refrigerated, inflammable and corrosive liquid and solids, Dangerous Drugs and Psychotropic Substances and disposable items.
- j) All affected stock (product complaint and recall) shall be quarantined in a designated area awaiting results of the investigation.
- k) Where controlled storage environment is required, its conditions shall be continuously monitored using appropriate equipment at predetermined intervals. Maximum and minimum temperature of the day shall be monitored and recorded.
- l) All instruments used for temperature monitoring shall be calibrated and calibration shall be documented.
- m) Air curtain shall be installed between air conditioned and non-air-conditioned areas.
- n) Separate areas for receiving and issuing shall be provided to enhance efficiency and security.
- o) Stocks that are stored on pallets, racks or shelves shall be arranged in an orderly manner within the designated area. The 5S concept shall be implemented.
- p) Good housekeeping such as cleaning, pest control, sanitation and inspection shall be maintained all the time.
- q) All workstation shall be suitable and practical for the work function and condition. There shall be adequate and appropriate amenity for comfort and ease of staff access and movement. Pantry and rest room for staff shall be provided.
- r) Adequate space for housing all equipment, furniture, utilities and office automations.
- s) An appropriate space for condemned, recalled and quarantined inventory shall be provided.
- t) Adequate storage for records and filing shall be provided.

## 6.4 MECHANICAL & ELECTRICAL REQUIREMENT

- 6.4.1 Computerised identification system such as bar coding shall be considered for implementation and system equipment shall be provided. It shall be able to identify item code and description, details on the delivery and storage location, all at the same time.
- 6.4.2 The heating, ventilation and air-conditioning (HVAC) system shall be designed to sustain the specific environment requirement under GSP. It shall also take into consideration the indoor air quality.
- 6.4.3 The relative humidity of not more than 60% shall be provided for items that need protection against moisture at normal storage condition.
- 6.4.4 All areas shall be well ventilated especially areas without air-conditioning. All occupied areas shall have at least 2 air exchanges of out-door air per hour with the total change of between 6 - 25, depending on the activities carried out in the areas.
- 6.4.5 The temperature and humidity control gauge shall be fixed for effective monitoring of the environment. Automatic triggered alarm shall be linked to the HVAC system and pharmaceutical refrigerators to detect changes in temperature and humidity.
- 6.4.6 Standby or emergency power supply shall be connected to all pharmaceutical and medical stores, pharmaceutical refrigerators, freezer, cold room, the back door buzzer and dangerous drugs / psychotropic substances store alarm.
- 6.4.7 Automatic triggered alarm system shall be fixed at dangerous drugs / psychotropic substances storage area / cabinet.
- 6.4.8 Adequate number of electrical power points shall be made available.
- 6.4.9 Three-phased outlets shall be provided, with at least 3 points per required area.
- 6.4.10 Lighting fixtures shall be integrated into the ceilings. Daylight white tube is preferable and shall provide an optimum lighting ranging from 300-800 lux. Localised lighting shall be provided for certain task area.

## 6.5 DESIGN, LAYOUT AND SPECIFICATION

Space required for each activity in the store is depending on the size and type of the health clinic. The general design and construction shall take into consideration the functionality of the pharmacy store. The location and size shall accommodate anticipated personnel and inventory movement, work processes and activities. Drainage and sewerage system shall be located outside the building. (Refer **Appendix B6 Example of Design and Layout Plan for Health Clinic Pharmacy Store**)

### 6.5.1 Structural Design

- a) **Wall**
  - i) The walls shall be constructed using non-porous material and plastered both sides smoothly for easy cleaning.

- ii) The walls shall be permanent and constructed using bricks or concrete blocks.
  - iii) Wall finishing shall be of washable antifungal paint (indoor) and weather proof paint (outdoor).
  - iv) Any opening on the wall shall be designed in such a way as to prevent the entry of rodents and other pests.
  - v) Skirting shall be provided for office and staff areas.
- b) **Floor**
- i) The floor shall be constructed of concrete and plastered smoothly, leveled, finished with non-slippery heavy duty materials to withstand the heavy loads and traffic.
  - ii) The floor shall be non-porous, damp-proof and resistant to detergent.
- c) **Ceiling**
- i) The ceiling shall be made of fire-retardant, asbestos-free and non-shedding materials or mineral fibres.
  - ii) The minimum height between the floor and the ceiling shall be 12 feet to accommodate the height of the racks.
  - iii) The ceiling shall offer acoustic balance and control for the room or space, preferably enhanced with sound absorption and attenuation.
- d) **Roof**
- i) A pitched or a sloped roof shall be designed for preventing heavy rain damage.
  - ii) The roof shall be of asbestos free material which can minimize heat transmission into the building, reinforced with wire mesh and provided with adequate insulation.
  - iii) Awning shall be provided for all windows and loading/unloading area.
  - iv) Roof shall be appropriately guttered with proper drainage system.
  - v) The roof and ceiling shall be designed to prevent theft and break-in.
- e) **Door**
- i) All doors shall be of fire-retardant material.
  - ii) The doors shall be two leaves, broad enough to allow free and easy movement of supplies and handling equipment such as forklifts and trolleys.

- iii) Doors must be strong and reinforced to provide adequate security and fitted with double heavy duty locks.
  - iv) All doors shall be protected with trolley guard.
  - v) Doors to all storage areas shall be equipped with electronic access control system.
  - vi) Grille/roller shutters shall be considered to be installed at main entrance and loading bay.
  - vii) All exit doors shall be strategically located and fitted with luminous emergency exit signage.
- f) **Window**
- i) Windows shall not be allowed for storage area.
  - ii) Windows shall be available at workstation, office and staff areas.
  - iii) Window shall be either sliding or swing type.
  - iv) All windows shall be fixed with metal grille.

#### 6.5.2 **Receiving and Issuing Area**

##### a) **Loading and Unloading Bay**

- i) Adequate space for loading and unloading bay shall be provided.
- ii) This bay shall be properly sheltered, taking into consideration the height of the vehicle.
- iii) Raised platform shall be provided and equipped with heavy duty rubberised padding at the point of contact with the vehicles.
- iv) Motorised roller shutter shall be installed at the closure between the bay and receiving area.
- v) Door shall be provided adjacent to the roller shutter.
- vi) Sensor spotlight shall be provided.

##### b) **Forklift/Mechanical Stacker Park**

- i) Forklift and mechanical stackers with suitable maximum load capacity shall be made available to facilitate storage processes. These lifters / stackers shall be able to reach the highest pallet rack.
- ii) Only trained personnel are authorised to operate the lifters / stackers.

- iii) When not in use, the forklift or stacker shall be parked here for battery charging. This parking area shall be adjacent to the loading/unloading bay.

c) **Sorting/Unpacking Area**

- i) Goods shall be sorted and checked against delivery orders in this area.
- ii) The space shall be sufficient for large consignments to be shifted by using the forklift.
- iii) This area shall be well ventilated.

d) **Issuing Area**

- i) An issuing counter shall be provided with adequate waiting space.
- ii) Items issued from the store shall be kept in a holding area behind the counter prior to collection by the indenting units.
- iii) The counter shall be equipped with shelves, appropriate office furniture and equipment.
- iv) Sufficient space for material handling equipment and trolley parking is required.

e) **Disposal Room**

Disposal room shall be made available for placing ready to discard items (used boxes, wrappers and plastic covers)

### 6.5.3 Storage Area

a) **General Storage Requirement**

- i) The area shall have air-conditioning facilities working 24 hours. Split air-conditioning units shall be provided for contingency in case of centralised air-condition failure.
- ii) Temperature of the storage areas shall be monitored, documented and maintained between 18°C to 25°C.
- iii) The electricity supply to the refrigerators, freezers and air-conditioned areas shall be linked to the health clinic emergency generator.
- iv) A computerised alarm system to detect electrical failure of cold chain equipment shall be made available and connected to the main electrical control system.
- v) The electricity supply to the refrigerators, freezers and air-conditioned areas shall be linked to the emergency generator.

- vi) Sufficient space shall be provided for forklifts, stackers and trolley parking inside the store.
- vii) Passageways between shelves / pallets are required, sufficient for forklifts / stackers to maneuver.
- viii) Sufficient numbers of shelves and racks shall be provided and arranged in lines with a passageway not less than 120 cm wide, to allow passage of trolleys and stackers.

b) **Drug Store**

- i) Adequate, designated storage area for bulk items shall be provided.
- ii) Heavy duty plastic pallets shall be provided to store bulk items and larger cartons off the floor and can be used with forklifts to move around groups of larger items.
- iii) Adjustable, modular, heavy duty open steel racks shall be provided for storage of packages of different sizes.
- iv) Adequate number of pharmaceutical refrigerators shall be located in this area.

c) **Dangerous Drugs / Psychotropic Substances Store**

- i) Dangerous Drugs / Psychotropic Substances shall be kept under lock and key in special room / cabinet with alarm system.
- ii) It shall be located in close proximity to the pharmacist-in-charge office.

d) **Drug Bulk Store**

- i) Sufficient space shall be made available to accommodate all ready-to-dispense medicines and intravenous fluids and large volume solutions.
- ii) The space shall be sufficient for the utilisation of forklift.
- iii) Heavy duty plastic pallets and adjustable, modular, heavy duty open racks shall be provided.

e) **Surgical Store**

- i) Adequate, designated storage area for bulk surgical / consumable / disposable items / rubber goods shall be provided.
- ii) Adjustable, modular, heavy duty open racks shall be provided.

- f) **Bottles and Containers Store**
  - i) Dispensing bottles, containers, labels and envelopes shall be kept in a designated area.
  - ii) Adjustable, modular, heavy duty open racks shall be provided.
  - iii) Sufficient space shall be made available for movements.
- g) **Non-Conformance Item Store**
  - i) Quarantined, expired, obsolete or damaged items shall be kept here prior to approval for disposal or further action.
  - ii) The area / cabinet shall be distinctly labelled.

#### 6.5.4 **Administrative Area**

- a) **Pharmacist In-Charge Office**

Room for the pharmacist in-charge to perform administrative work shall be provided. It shall be strategically located to allow supervision.
- b) **General Office**
  - i) Open office space for pharmacists and administrative staff shall be made available in close proximity to the receiving and issuing areas.
  - ii) Work-stations complete with computer terminals and office furniture shall be made available.
- c) **Meeting / Discussion Room**

Space for discussion and routine administrative meetings shall be made available.
- d) **Document Room**

Adequate space/ room shall be available to store files and records.
- e) **Stationery Store**

A dedicated storage area for stationeries shall be provided.

#### 6.5.5 **Ancillary Area**

- a) **Personnel / Staff Rest Room**
  - i) A room shall be made available for staff rest.
  - ii) Staff lockers and domestic appliances such as refrigerator, electric kettle, water dispenser, microwave oven, table, chairs and sofa shall be made available.



b) **Wash Room**

- i) Wash rooms for male and female with separate changing room, toilets and shower facilities shall be provided.
- ii) A dedicated toilet for visitor shall be made available.

c) **Muslim Male and Female Prayer Room**

Designated rooms complete with ablution facility shall be made available.

d) **Housekeeping/Utility Room**

- i) The room shall have sufficient space for storing cleaning materials and equipment.
- ii) The room shall have good ventilation for washing and drying of equipment.

e) **Security Guard Post**

- i) Security guard post shall be made available at the main entrance of the store.
- ii) The room shall be equipped with necessary equipment for the security guard's convenience.

## 6.6 SPACE REQUIREMENT

Space required for each activity in the store depends on the size and type of the health clinic. (Refer **Appendix A6 Space Requirement for Health Clinic Pharmacy Store**)

## 6.7 EQUIPMENT REQUIREMENT

Refer **Appendix C6: Equipment Requirement for Health Clinic Pharmacy Store.**

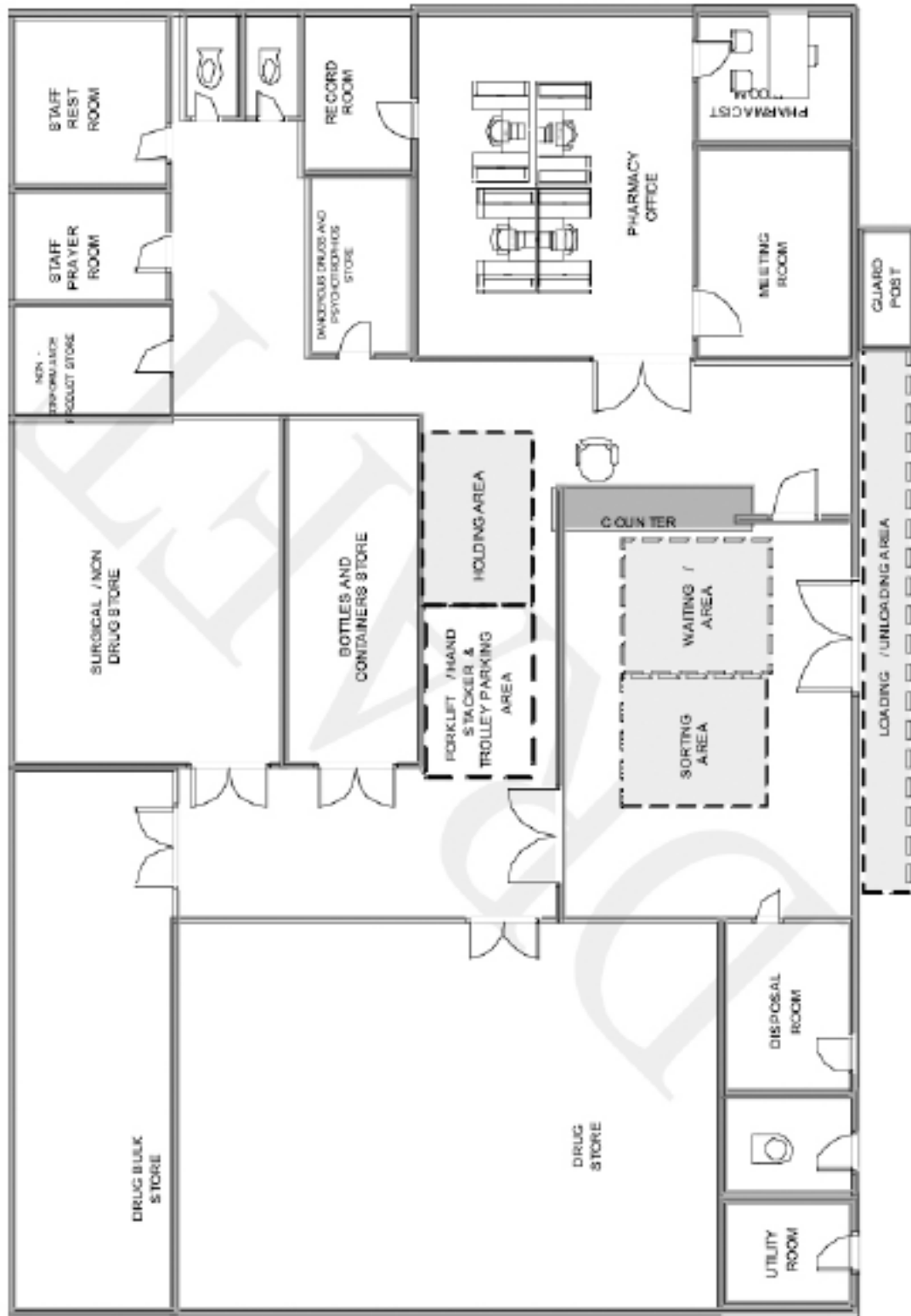
## 6.8 MANPOWER REQUIREMENT

Refer **Appendix. D5: Manpower Requirement for Health Pharmacy Services.**

**APPENDIX A6 : SPACE REQUIREMENT FOR HEALTH CLINIC PHARMACY STORE**  
(in square meter)

Rooms	Types of Clinic			
	Type I	Type II	Type III	Type IV
Loading / Unloading area	28	28	18	18
Forklift / Hand Stacker and Trolley parking area	14	14	14	Nil
Sorting area	18	18	18	14
General office	48	36	28	20
Pharmacist Room	12	12	12	Nil
Drug store	280	232	186	93
Dangerous Drugs and Psychotropics store	10	10	Nil	Nil
Bulk Store - drug	93	74	46	28
Surgical store	46	38	18	18
Bottles and containers store	56	46	28	18
Non conformance product store	12	12	10	8
Record room	12	10	10	8
Utility Room	8	8	6	6
Toilets (male & female)	16	16	8	8
Staff Rest Room	18	14	10	10
Disposal Room	10	10	8	8
<b>TOTAL</b>	<b>681</b>	<b>578</b>	<b>420</b>	<b>257</b>

APPENDIX B6 : EXAMPLE OF DESIGN AND LAYOUT PLAN FOR PHARMACY STORE IN HEALTH CLINICS



APPENDIX C6 : **EQUIPMENT REQUIREMENT FOR PHARMACY STORE IN HEALTH CLINICS**

No.	Equipment	Location			
		Receiving / Issuing Area	Storage Area	Administrative Area	Ancillary Area
1	Alarm System, Burglar	3	3	3	3
2	Alarm System, Cold Chain	3	3	3	3
3	Alarm System, Electrical Supply	3	3	3	3
4	Alarm System, Fire	3	3	3	3
5	Air-conditioner, Central	3	3		
6	Air-conditioner, Split			3	3
7	Bar Code Reader	3	3		3
8	Bar Code Labeler	3			
9	Board, Notice (Magnetic)	3	3	3	
10	Board, Soft	3	3	3	3
11	Book Shelf			3	
12	Cabinet, Filling			3	
13	Cabinet, Stainless Steel		3	3	
14	Cabinet, Dangerous Drugs / Psychotropic Item		3		
15	Calculator	3	3	3	
16	Chair, Meeting/Discussion Room			3	
17	Chair, Office	3	3	3	
18	Chair, Personnel / Staff Rest Room				3
19	Chair, Visitor	3			
20	Clock	3	3	3	3
21	Close Circuit TV (CCTV)	3	3	3	
22	Computer, notebook			3	
23	Computer, desktop			3	
24	Dining Set				3
25	Electronic Control for Doors	3	3	3	
26	Exhaust Fan	3			3
27	Facsimile			3	
28	Fire Extinguisher	3	3	3	3
29	Forklift, Electric	3			
30	Freezer		3		
31	Internet Connection (Wireless Broadband)			3	
32	Kettle, Electric				3

No.	Equipment	Location			
		Receiving / Issuing Area	Storage Area	Administrative Area	Ancillary Area
33	Hand labeller	3			
34	Ladder Aluminium		3		
35	Locker, Personnel				3
36	Machine, Photostat			3	
37	Microwave oven				3
38	Mirror				3
39	Pallet, Heavy Duty	3	3		
40	Paper Shredder			3	
41	Pocket PC / PDA			3	
42	Printer laserjet, Black/Colour			3	
43	Printer, Dot matrix (Heavy Duty) 24 Col			3	
44	Rack, Heavy Duty		3		
45	Rack, Stainless Steel		3		
46	Refrigerator, Pharmaceutical 3 door (Glass), with thermometer and temperature recorder		3		
47	Refrigerator, Pharmaceutical Single door (Vaccine), with thermometer and temperature recorder		3		
48	Settee, Staff & Visitor	3			3
49	Shoe rack				3
50	Smoke Detector	3	3	3	3
51	Stacker, Motorised	3	3		
52	Steps, mobile		3		
53	Table, Office			3	
54	Table, Personnel / Staff Rest Room				3
55	Television Set	3			
56	Thermometer, Room		3		
57	Toaster				3
58	Trolley, 2-tier stainless steel	3	3		
59	Trolley, Instruments with guard rail	3	3		
60	Trolley, Hand	3	3		
61	Trolley, Multipurpose platform (heavy duty)	3	3		
62	VCD / DVD Player	3			
63	Water Dispenser	3		3	3
64	Water Sprinkler	3	3		

# Glossary

<b>APPL</b>	Approved Product Price List
<b>CCTV</b>	Close Circuit Television
<b>CDR</b>	Cytotoxic Drug Reconstitution
<b>CPS</b>	Clinic Procurement System
<b>DPIS</b>	Drug and Poison Information Service
<b>FEFO</b>	First-Expire-First-Out
<b>GPP</b>	Good Preparation Practice
<b>GSP</b>	Good Storage Practice
<b>HEPA</b>	High Efficiency Particulate Air
<b>HIS</b>	Hospital Inventory System
<b>HMR</b>	Home Medication Review
<b>HPS</b>	Hospital Pharmacy Store
<b>HVAC</b>	Heating, Ventilation and Air-Conditioning
<b>IV</b>	Intravenous
<b>ICU</b>	Intensive Care Unit
<b>MOH</b>	Ministry of Health
<b>MTAC</b>	Medication Therapy Adherence Clinic
<b>NICU</b>	Neonatal Intensive Care Unit
<b>TPC</b>	Teleprimary Care
<b>TPN</b>	Total Parenteral Nutrition
<b>TPS</b>	'Tatacara Pengurusan Stor'
<b>UPS</b>	Uninterrupted Power Supply



**PHARMACEUTICAL SERVICES DIVISION**  
MINISTRY OF HEALTH, MALAYSIA