

Part B – Health Facility Briefing & Design

25 High Dependency Unit



*i*HFG

International Health Facility Guidelines
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25 High Dependency Unit (HDU)

1 Executive Summary

This Functional Planning Unit (FPU) covers the requirements of the High Dependency Unit (HDU). This Unit is sometimes referred to as Intermediate Unit or IMU. HDU is part of a broader category of facilities referred to as “Critical Care”. Other Critical Care types are covered by separate FPU’s within these Guidelines, such as Intensive Care Unit (ICU), Paediatric Intensive Care Unit (PICU), Coronary Care Unit (CCU) and Neonatal Intensive Care Unit (NICU). This FPU may be merged or back-to-back with the adult ICU and is also covered under the Intensive Care - General Guidelines.

HDU is a Critical Care unit for the support, monitoring and treatment of patients who are dependent on some life support and high levels of medical and nursing care but at a lower level than ICU. HDU requires a lower nursing ratio of 2:1 (or two patients per nurse) as opposed to 1:1 for ICU. In other words, HDU is a step-down from ICU. A further step-down from HDU would be an Inpatient Unit (IPU).

Patients in the HDU may include adults of all ages, acuity, frailty and all levels of disability. HDU may also deal with patients with co-morbidities such as obesity, diabetes and renal dysfunctions. In smaller hospitals with a lower Role Delineation Levels such as RDL 3, HDU is appropriate. In higher RDL’s HDU may be a stand-alone Unit or provided back-to-back with ICU.

HDU is physically identical to ICU in the planning model, however, unlike ICU some of the beds may be provided in open bays separated by privacy curtains. The only exception is the provision for fully enclosed negative pressure isolation rooms at the ratio of 2 per 14 beds (or one full HDU pod). Older style Intensive Care Units in existing hospitals using open bays with curtains are now closer to the requirements of HDU and may be regarded as HDU. HDU is necessarily provided in a hospital setting and relies on the availability of other hospital resources.

As an option, HDU may be designed in identical manner to ICU but with a lower nursing ratio. This means the same unit at short notice can be operated as ICU only by increasing the nursing ratio.

The Functional Relationship Diagrams provided indicate the ideal external relationships with other key departments and hospital services. This includes relationships with ICU, Emergency Unit, Operating Unit, Inpatient Units, Diagnostic units (such as Medical Imaging and Laboratory) and clinical support units such as Pharmacy and Biomedical Engineering.

Optimum internal relationships are demonstrated in the Functional Relations Diagram according to the functional zones whilst indicating the important paths of travel and requirement for observation.

Design Considerations address a range of important issues including visibility, finishes, clearances and building services requirements. The Schedules of Accommodation are provided using references to Standard Components (typical room templates) and quantities for typical units at Role Delineation Levels (RDL) 3 to 6 with 4, 8 and 12 bed examples. The actual number depend on each facility’s service plan.

Further reading material is suggested at the end of this FPU but none are mandatory.

2 Introduction

The High Dependency Unit (HDU) is a specialised inpatient unit for the management of medical and surgical patients whose conditions require constant close monitoring and do not require mechanical ventilation or admission to the Intensive Care unit but are too unwell to be cared for in the general inpatient unit setting. The Unit will be staffed by specialised doctors and nurses who coordinate technological and therapeutic resources to care for the seriously ill patients.

High Dependency Unit maybe regarded as step-down Intensive Care Unit (ICU) or intermediate service between Intensive Care Unit (ICU) and Inpatient Unit (IPU). HDU is also referred to as an Intermediate Unit or IMU.

HDU is part of a group of facilities broadly classified as Critical Care Units which include ICU, CCU, HDU, PICU and NICU. HDU may be a stand-alone unit or integrated back-to-back with ICU, CCU or PICU and IPU (Inpatient Unit).

HDU may be provided within hospitals from RDL 3 to 6.

3 Functional and Planning Considerations

Operational Models

The HDU will generally operate on a 24 hour per day, 7 days per week basis.

The key difference between ICU and HDU in terms of operations is the Nurse to Patient ratio. In ICU a 1 to 1 patient to nurse ratio is expected. In HDU a 2 to 1 patient to nurse ratio is assumed.

There are a number of operational models applicable to a HDU including:

Combined Critical Care

The Combined Critical Care may include the High Dependency Unit, along with the Intensive Care Unit and/or Coronary Care Unit. This model is often located in smaller hospitals where flexibility of bed usage is a requirement. The rooms within a Combined Unit will be used to manage short and medium term ICU patients when required and HDU and CCU patients at other times.

An Intensive Care Unit may incorporate up to 50% of beds as HDU.

HDU within Hot Floor

The 'Hot Floor' model involves the clustering of Intensive Care services and the HDU with other units on one floor. A 'Hot Floor' model may also include collocation with Operating Unit, Emergency Unit, CCU and Medical Imaging or a satellite of Medical Imaging.

Combined with IPU

This HDU may be colocated with either a medical or surgical inpatient unit, depending on the hospital's operational policies. This model also allows for the flexing up and down on HDU and general Inpatient Unit (IPU) beds as per the patient mix and volume.

If HDU is integrated with IPU all supporting services other than the following can also be shared:

- HDU Bed Bays
- HDU Reporting stations required for direct observation of patients
- HDU Ensuites (minimum 1 per 4 beds)

Note: HDU Isolation can also be shared with IPU as long as the minimum number required for the combination of IPU and HDU are achieved.

Independent HDU

This model comprises separate general or specialty HDUs with an independent management structure. The advantages of this model include independent bed management control whilst encouraging medical, nursing, and other allied healthcare staff to develop sub-specialty skills.

HDU bed numbers

The provision of HDU is not mandatory in the same as the minimum number of ICU beds. The provision HDU is based on the facility service plan and operational policy. The provision of HDU does not remove the minimum requirement for the provision of ICU (refer to the ICU guidelines).

Beds in HDU should ideally be arranged in groups (or pods) of no more than 12 beds (plus/minus 2), in order to optimize and balance efficiency with size, monitoring and close, patient-focused care. If more than 14 beds are required by the Service Plan, then additional pods or groups should be added, each with a staff station and the required set of support rooms.

If the service plan requires an HDU with fewer beds than 12, for example 6 beds, the unit will still require all the support rooms mentioned in this FPU.

Isolation Room Requirements

For each HDU pod (maximum 12 beds plus/ minus 2), at least two negative pressure isolation ICU rooms with ante room should be provided. These isolation rooms will be regarded as part of the total bed count in the pod. For each ICU pod up to 6 beds a single negative pressure HDU room with ante room should be provided. Positive pressure Isolation rooms provision will be subject to the clinical services plan of the hospital and the management policy of the facility.

The design of the HDU isolation room is identical to ICU isolation room. The only difference is the nursing ratio as mentioned earlier.

Planning Models

The HDU should be in a location that eliminates or minimises:

- Disturbing sounds (ambulances, traffic, sirens)
- Disturbing sights (morgue, cemeteries etc.)
- Problems associated with prevailing weather conditions (excessive wind, sun exposure etc.)

The location and design should ideally consider expansion if additional beds are required in the future.

A double corridor (racetrack model for the design of HCU is ideal). HCU can be designed within a building width that is appropriate for both ICU and Inpatient Units). So, HDU, ICU and IPU can be vertically stacked successfully. For this stacking to work, usually the building width of no less than 3 grids (8400mm per grid) or 25,200 (without façade thickness) is recommended.

In the ideal configuration of an HDU, all beds should be visible from the Staff Station. In larger units where this cannot be achieved, decentralised staff / workstations (also referred to as reporting stations) with computer support should be provided at a minimum ratio of one per two adjoining rooms with direct view.

If FPU can be designed to provide natural light to the bedrooms, it will be ideal. However, the minimum required provision is for 50% of the rooms to have access to natural light.

Unlike the requirements for ICU, in HDU beds may be located either in open bed bays separated by privacy curtains or within rooms. HDU beds may also be provided within separate multi-bedded rooms. In all permutations, isolation rooms must be in fully enclosed rooms with ante-rooms (airlocks).

HDU-IPU Swing Beds

For flexibility and added options for utilisation it may be desirable to include provisions for Swing Beds within HDU and adjoining Inpatient Unit (IPU). The swing bed section may be a group of beds that may be quickly converted from one category of use to another (HDU vs IPU) and supervised from another Staff Station. In such arrangements the minimum requirements of HDU must be applied to all swing beds. Furthermore, this model implies that all HDU beds will be in fully enclosed rooms with dedicate ensuite bathrooms and glazed front for observation.

Facility design for swing beds will often require additional doors within the corridor and provision for switching patient/ nurse call operation from one Staff Station to another. Security is also an issue if any of the beds are used for Paediatrics.

HDU-ICU interchange

As an option, HDU may be designed in identical manner to ICU but with a lower nursing ratio. This means the same unit at short notice can be operated as ICU only by increasing the nursing ratio.

Functional Areas

The High Dependency Unit consists of the following Functional Zones:

- Entry/ Reception, which may be shared with adjoining units including:
 - Reception
 - Waiting areas, separate for Males and Females and sized to accommodate family members, with access to public amenities
 - Gown-up/ Gown-down for visitors
 - Meeting room that may be used as a Distressed Relatives Room
- Patient areas with:
 - Single bed bays or single rooms or multi-bedded rooms
 - Isolation rooms, positive and/ or negative pressure
 - Ensuities which are shared with a group of beds
- Support areas consisting of:
 - Staff Station, Reporting Station and write-up areas
 - Beverage Bay and Bays for linen, resuscitation trolley, laboratory facilities and mobile equipment
 - Clean and Dirty Utility Rooms
 - Medication room
 - Store Rooms for equipment, general stock and sterile supplies
 - Biomedical Workshop
- Staff Areas including:
 - Meeting Room
 - Offices
 - Staff Room (or lounge)
 - Storage for files and stationery
 - Change rooms with toilets, shower and lockers

The above zones are briefly described below.

Entry/ Reception Area

As determined by the size of the HCU and hospital operating policy, a Reception and visitor's / relatives' Waiting Areas shall be provided immediately outside the entry to the HDU, but away from patient and staff traffic areas. It is desirable that this area has provision for drinks dispenser, television and comfortable seating. An Interview Room and a separate area for distressed relatives should be available nearby.

The Entry/ Reception Area may be shared between up to 3 closely located HDU or ICU Pods depending on the design. Visitors access to the interior of each HDU from the waiting area should be via visitor Gown-up/ Gown-down rooms. This requirement may be waived by the unit management. However, provision for it must be made.

Patient Areas

Patient Bed Bays, Enclosed Rooms, Isolation Rooms and Ensuities shall be provided according to the numbers in the Service Plan. The beds should be grouped within units which form pods of maximum 12 beds (± 2) including isolation room(s). For each pod up to the maximum size all the support rooms will be required. The ratio of enclosed rooms to bed bays will depend on the hospital preference and the operational policy. As a reminder, when HDU is designed with enclosed rooms, it can be quickly converted to ICU by only changing the nursing ratio from 2:1 for HDU to 1:1 for ICU.

Many patients in HDU are fully conscious and able to use the bathroom and may insist on it. Individual Ensuities should be provided for each enclosed HDU bedroom and each isolation room. For open bed bays and multi-bedded rooms, provide a minimum of one ensuite per 4 beds for the common use of the patients.

If HDU is designed back to back with ICU, open bed bay HDU may comprise up to 50% of the total bed numbers.

The HDU room or bay size should be sufficient to accommodate the patient, necessary personnel, monitoring capabilities, life support equipment and support services with safety considerations.

Work surfaces and storage areas must be adequate to maintain all necessary supplies and permit the performance of all desired procedures without the need for staff to leave the room.

The following design features are highly recommended for the patient areas:

- Enclosed rooms- Almost identical to ICU rooms but with ensuite bathrooms. The wall facing

the corridor should be glazed with sliding glazed doors for access

- Multi-bedded rooms- No more than 4 beds per room with an ensuite bathroom. The wall facing the corridor should be glazed
- Bed bays in an open area with privacy curtains- Consider as a minimum solid side walls with privacy curtain front.

In HDU, unlike in ICU, the services may be provided via a service column at the head of the bed. However, the provision of services via overhead pendants is highly recommended to allow the staff to fully circulate around the bed without any impediments.

Consideration should be given to ease of access for patients transported from areas outside the HDU. Therefore, a separate path towards service lifts will be ideal. There should be a strict separation of service lifts (including bed lifts) and public lifts including the lift lobby and connecting corridors.

In RDL 3 hospitals, ICU beds are automatically regarded as HDU or CCU beds regardless of the enclosed vs semi-open bay arrangement used.

All Patient areas are to comply with Standard Components included in these Guidelines.

Laboratory Facilities

The HDU must have available 24-hour clinical laboratory services. When this service cannot be provided by the central hospital Laboratory, a satellite laboratory within or immediately adjacent to the HDU must serve this function.

Support Areas

Support Areas include Bays for linen, resuscitation trolley, mobile equipment, Cleaners Room, Clean and Dirty Utilities, Disposal Room, Staff Station and Store Rooms for consumable stock, sterile stock and equipment.

The optimum numbers and sizes of these support facilities are provided for an HDU unit of 12 beds (plus/minus 2).

If two or 3 HDU's are provided back to back, the following support services may be merged and provided in one location with access to all HDU pods:

- Staff change rooms
- Offices
- Meeting rooms
- Staff Room (or lounge)
- Pantry and Meal Trolley Bay
- Stat Lab
- Visitors waiting area
- Visitors amenities

All other rooms must be provided separately per HDU pod (of any size).

Staff Facilities

Offices/ workstations are required for senior staff in full time administrative roles according to the approved positions in the Unit. Offices/ workstations for medical staff and some nursing staff (manager/ specialists/ registrars/ educators) may be located as part of the Unit where required for clinical functions or adjacent in an administrative area, to facilitate unit co-ordination, educational and research activities.

A Staff Room (or lounge) shall be provided within the unit for staff to relax during their break hours. Inclusion of a window to the outside is desirable. Gender segregation for Change Rooms that include Toilets, Shower and Lockers is required.

Staff will need close access to the following:

- Toilets and Shower

- Lockers
- Meeting room/s

Functional Relationships

External

A Functional Relationship can be defined as the correlation between various areas of activity which work together closely to promote the delivery of services that are efficient in terms of management, cost and human resources. Correct Functional Relationships are identified below.

It is desirable that the High Dependency Unit has ready access to:

- Intensive Care Unit (ICU)
- Emergency Unit, for urgent admissions
- Operating Unit, for urgent patient transfers
- Coronary Care Unit (CCU)
- Inpatient Units for patient transfers
- Medical Imaging, particularly for chest x-rays and CT scanning
- Laboratory Services (also possible via pneumatic tube)
- Inpatient Pharmacy
- Biomedical Engineering, to ensure availability and functioning of monitoring and life support equipment

Important and desirable External functional relationships outlined in the diagram include:

- Entry for visitor directly from dedicated lifts and public corridor
- Visitor access to the unit only via gown-up and gown-down rooms
- Bed access to/ from key clinical units associated with patient arrivals and transfers via service corridor
- Entry for staff via public or service corridor
- Separate service access for biomedical engineering, materials, catering and housekeeping.

Internal

Optimal internal relationships to be achieved include those between:

- Visitor waiting areas and access to the unit via Gown-up / Gown-down rooms
- Patient occupied areas, forming the core of the unit, which require direct access and observation by staff
- Staff station(s) and associated areas that need direct access and observation of patient areas and ready access to administration areas
- Alternatively, a series of de-centralised Reporting Stations located off the corridor between each pair of ICU rooms for the immediate observation of two bedrooms
- Clinical Support Areas such as Utility and storage areas that need to be readily accessible to both patient and staff work areas
- Shared support areas that should be easily accessible from the units served.

Important and desirable Internal relationships outlined in the diagram include:

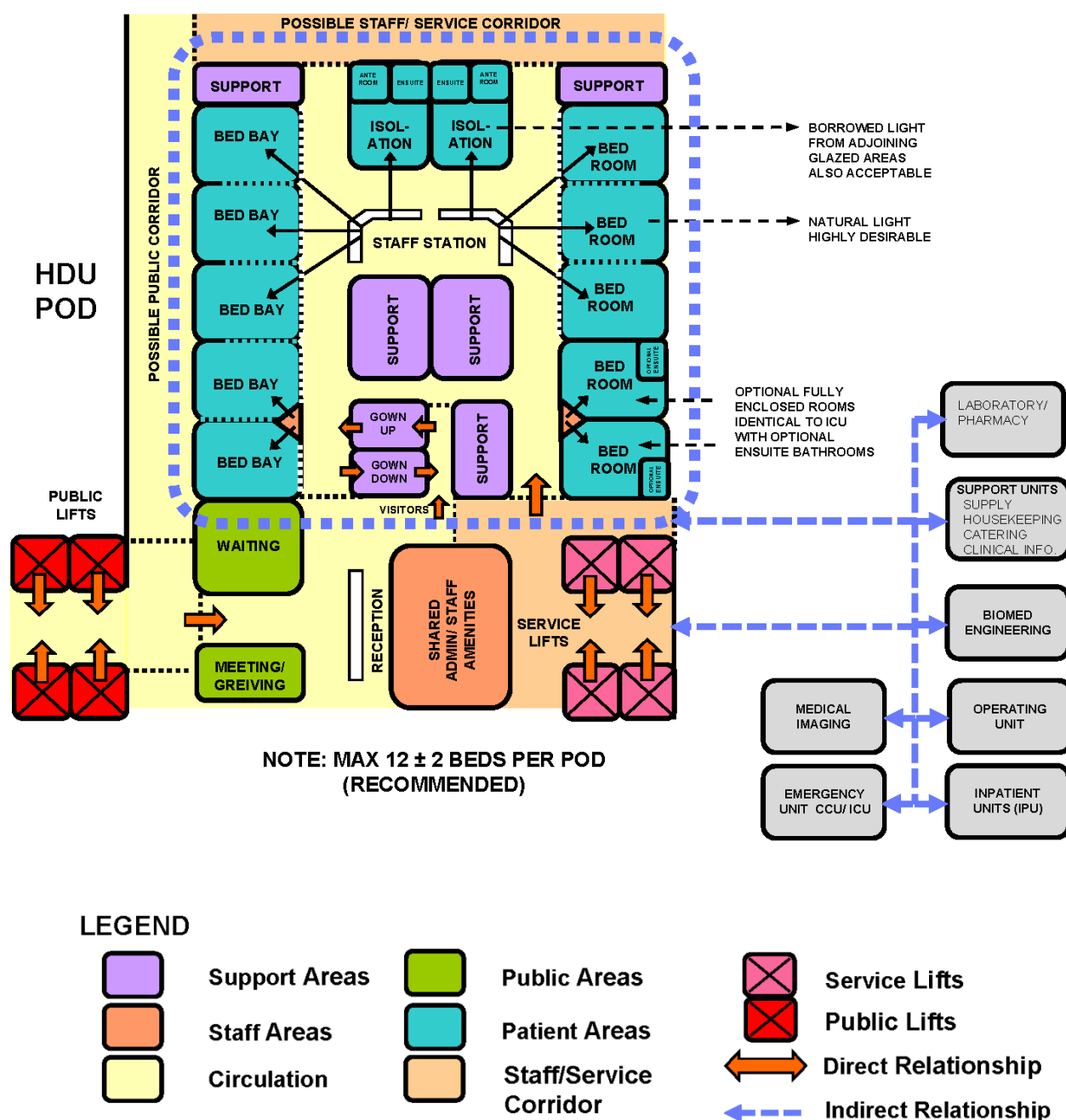
- Bed Room(s) on the perimeter arranged in a double corridor racetrack model (although other models are also possible)
- Staff Station(s) located in such a way as to observe the entry of visitors as well as the surrounding corridors
- Clinical support areas located centrally for ease of staff access

- Administrative areas located at the Unit entry and in staff accessible corridors

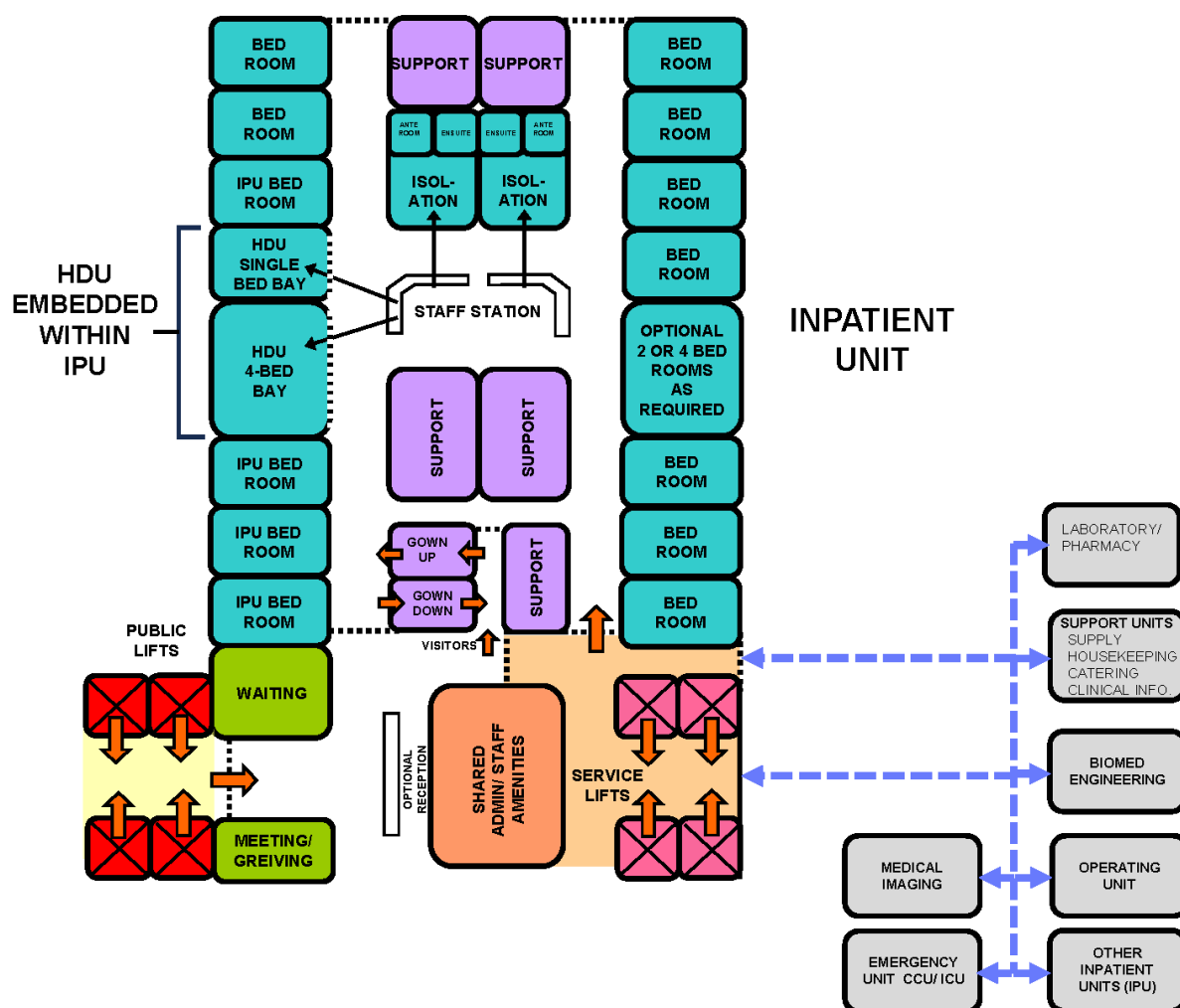
Functional Relationship Diagram

These relationships between the various components within the High Dependency Unit are best described by the Functional Relationships Diagram below.

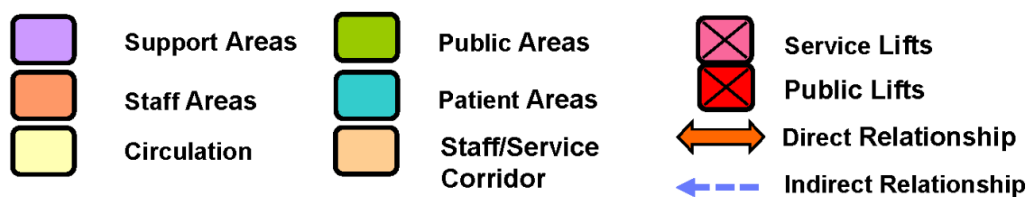
Stand-alone HDU



HDU embedded within an inpatient unit (optional)



LEGEND



4 Design Considerations

General

Patient Areas

Patients must be situated so that healthcare providers have direct visualization, with a variety of monitoring, at all times. This approach permits the monitoring of patient status under both routine and emergency circumstances. The preferred design is to allow a direct line of vision between the Staff Station and the patient's head.

If enclosed bedrooms are provided, sliding glass doors facilitate this arrangement and increase access to the room in emergency situations. Swing doors are also possible, but care should be taken so that the door opening does not clash with any element inside the room. Swing doors should also be glazed for visibility.

If sliding doors are provided, they can be manually or electrically operated. Sliding doors should not have a floor track but only overhead track and a mechanism for the door panels to slide against one another with a reasonable seal between the panels.

Visual privacy is required even as the corridor side of the room is glazed for observation. This may be provided by a privacy curtain behind the glass or through electronic systems commonly referred to as iGlass or Intelligent Glass, where the glass can switch from transparent to opaque.

If open bed bays are provided, then as a minimum privacy curtains should be provided around each bed. As an alternative to open bed bays, solid side walls with curtain front facing the corridor are preferred and recommended.

Where the geometry and the size of the unit does not permit direct observation from the central staff station, then de-centralised reporting stations should be provided between the rooms with direct view of the head of the patient through glass panels. Such reporting stations should be accessed from the corridor rather than inside the room or bed bay.

The patient bed should be floating in the approximate centre of the room, not against a wall.

Ideally, all services such as electrical, data and medical gases should be provided via ceiling mounted pendants, in a way that both sides of the bed (left and right) can be covered adequately. Wall mounted services within a headboard are not preferred. However, for HDU (only) service columns may be provided on one side of the bed head in a way that staff can freely circulate around the bed and reach the head of the patient from different angles.

The angle of the patient bed is variable as long as the patient's head and face is visible from the staff station or reporting station. It is possible to angle the bed in such a way that the patient has a view to the outside whilst the staff can still observe the patient directly.

If multi-bedded room model is employed, then a small staff station or reporting station may be located directly inside such rooms (maximum 4 beds per room).

For maximum clarity, the use of cameras for patient monitoring as an alternative to direct observation is not acceptable.

Renal Dialysis Facilities

Dialysis machines, including provision for reverse osmosis water and drainage, should be provided to patient bedrooms according to the Unit's Operational Policy. As a minimum, dialysis facilities should be provided in each HDU Isolation Room, plus one per pod outside the isolation room. Ideally the remaining rooms, should have water outlets provided. RO water may be provided via portable dialysis units. Refer to Part E - Engineering Services for details on RO water.

Environmental Considerations

Acoustics

The HDU should be designed to minimize the ambient noise level within the unit and transmission of sound between patient areas, staff areas and public areas. Consideration should be given to the location of noisy areas or activity, preferably placing them away from quiet areas including patient bedrooms and bed bays.

Signals from staff call systems, alarms from monitoring equipment, and telephones add to the sensory overload in critical care units. Without reducing their importance or sense of urgency.

For these reasons, floor coverings that absorb sound such as cushioned vinyl should be considered while keeping infection control, maintenance, and equipment movement needs under consideration.

Notwithstanding the consideration of acoustic design issues, the requirements of infection control and permitted finishes supersede all acoustic considerations. In HDU and in the corridors adjoining the rooms, porous surface mounted materials such as typical acoustic drop-in tiles are not permitted. All surfaces must be monolithic with finishes which can be vigorously scrubbed and cleaned.

Any sound isolation between the rooms and through the ceilings should be provided via insulation materials within hollow walls or above the ceilings.

Acoustic treatment is required to the following:

- Patient Bedrooms and Ensuites
- Interview and meeting rooms
- Procedure rooms (if any)
- Staff rooms (or lounge)
- Change Rooms, toilets and showers.

Natural Light

The use of natural light should be maximised throughout the Unit. Windows are an important aspect of sensory orientation and psychological well-being of patients and staff, and as many rooms as possible should have windows to reinforce day/ night orientation.

As a minimum 50% of the beds in the HDU must have direct access to Natural light. Other beds may have access to borrowed natural light via other areas such as a glazed corridors or other rooms or areas which have direct access to natural light. Skylights, light tubes or high-level windows are also acceptable.

Privacy

The design of the HDU needs to consider the contradictory requirement for staff visibility of patients while maintaining patient privacy. Unit design and location of staff stations offer varying degrees of visibility and privacy.

Each bedroom or bay shall be provided with privacy bed screens or iGlass to ensure privacy of patients undergoing treatment. Refer to the Standard Components for examples.

Other factors for consideration include:

- Use of windows in internal walls and/or doors, provision of privacy blinds
- Location of external areas, courtyards or atriums facing bedroom windows to prevent others from viewing into ICU bed and treatment spaces

Interior Décor

Interior decor includes furnishings, style, colour, textures and ambience, influenced by perception and culture. This can help prevent an institutional atmosphere. However, cleaning, infection control, fire safety, patient care and the patients' perceptions of a professional environment should always be considered.

Some colours, particularly the bold primaries and green should be avoided in areas where clinical observation occurs such as bedrooms, treatment areas and corridors. Such colours may prevent the accurate assessment of skin tones e.g. yellow / jaundice, blue / cyanosis, red / flushing.

Space Standards and Components

Accessibility

Ideally there should be a separate and discrete entry or entries for staff, goods and supplies with swipe card or similar electronic access to authorised personnel. Discrete entry for patients on beds or trolleys may also be considered and this should provide:

- Ready access from Emergency Unit, and Operating Unit that may involve transfers via lifts

- Ready access to and from Diagnostic Imaging areas

There should be only one point of public entry overseen by a ward clerk / receptionist during extended daytime hours to:

- Monitor and / or prevent access by visitors depending on the patients' condition
- Advise visitors if patients have been moved or are out of the unit for any reason
- Monitor visiting staff and direct them to the appropriate staff member or patient
- Monitor patient movements in and out of the unit

Doors

Door openings to HDU Bedrooms shall have a minimum of 1400mm clear opening to allow for easy movement of beds and equipment.

Ergonomics/ OH&S

For all ergonomic standards refer to Part C of these Guidelines.

Size of the Unit

Bed Spacing/ Clearance

In HDU enclosed bedrooms a minimum of 1200 mm clearance around both sides and the foot of the bed is recommended. At the head of the bed, sufficient clearance should be provided against any fixed obstruction or wall to allow the staff to circulate around the bed. The only exception is a possible service column on one side of the bed head.

Drug Storage

Drugs prescribed at the hospital should not be stored in the patient bedrooms or bed bays. All drugs should be managed by the responsible nurses via a Medication Room.

Medications may be manually stored and managed, or alternatively automated Medication Management systems may be utilised.

Controlled, semi-controlled or narcotic drugs as per the Country's Laws must be kept in a secure cabinet within the Medication Room with alarm. The room requires controlled staff only access and may include CCTV surveillance.

A refrigerator is required to store restricted substances and must be lockable or housed within a lockable storage area. All drug refrigerators must be alarmed and the signal should be sent to a staff station which is manned at all times.

The Medication Room must have space for parking a medication trolley.

Safety and Security

The HDU shall provide a safe and secure environment for patients, staff, and visitors, while remaining a non-threatening and supportive atmosphere conducive to recovery.

The facility, furniture, fittings, and equipment must be designed and constructed in such a way that all users of the facility are not exposed to avoidable risks of injury.

Security issues are important due to the increasing prevalence of violence and theft in healthcare facilities.

The arrangement of spaces and zones shall offer a high standard of security through the grouping of like functions, control over access and egress from the Unit and the provision of optimum observation for staff. The level of observation and visibility has security implications.

Entrance doors need to be secured to prevent unauthorised access. A video intercom with speech should be provided from the entrance and exit door to main staff reception complete with door release button for staff access control. Security surveillance of the Unit may include CCTV cameras and monitors.

Finishes

Floor Finishes

Wall finishes

Wall Protection

The following factors should be considered in the selection of finishes:

- Durability
- Ease of cleaning
- Infection control
- Fire safety
- Acoustic properties
- Movement of equipment; floor finishes should be resistant to marring and shearing by wheeled equipment

In all areas where patient observation is critical, colours shall be chosen that do not alter the observer's perception of skin colour.

Wall protection should be provided where bed or trolley movement occurs such as corridors, patients' bedrooms, equipment stores, linen storage and treatment areas.

Fittings, Fixtures & Equipment

Window Treatments

Each window shall have partial blackout facilities to allow patients to rest during the daytime. If blinds are to be used the following applies:

- Vertical blinds and Holland blinds are preferred over horizontal blinds as they do not provide numerous surfaces for collecting dust
- Horizontal blinds may be used within a double-glazed window assembly with a knob control on the bedroom side

Privacy bed screens must be washable, fireproof and cleanly maintained at all times. Disposable bed screens may also be considered.

Bedside Monitoring

Bedside monitoring equipment should be located to permit easy access and viewing, and should not interfere with the visualisation of, or access to the patient. The bedside nurse and/ or monitor technician must be able to observe the monitored status of each patient at a glance. This goal can be achieved either by a central monitoring station, or by bedside monitors that permit the observation of more than one patient simultaneously. Neither of these methods is intended to replace direct bedside observation.

Weight-bearing surfaces that support the monitoring equipment should be sturdy enough to withstand high levels of strain over time. It should be assumed that monitoring equipment will increase in volume over time. Therefore, space and electrical facilities should be designed accordingly.

Patient Entertainment systems

Patients may be provided with the following entertainment/ communications systems according to the Operational Policy of the facility:

- Television
- Telephone
- Internet (through Wi-Fi)

Building Service Requirements

Mechanical Services (HVAC)

The unit shall have appropriate air conditioning that allows control of temperature, humidity and air change.

Refer to Part E of these Guidelines for the specific requirements for Mechanical and Electrical provision.

Electrical Services

Provide the required electrical services and outlets by quantity and type as shown in the Standard Components for the required rooms within the HDU. These constitute the briefing requirements for the electrical services required for HDU.

The number and type of electrical sockets may at first appear excessive. However, operational practice has shown that they are required and cannot be compromised.

Refer to Part E of these Guidelines for the specific requirements of Electrical Services including backup generators, distribution etc.

Medical Gases

Provide the Medical Gas outlets required by quantity and type as shown in the Standard Components for the patient rooms and optional procedure rooms. These constitute the briefing requirements for the Medical Gas services required for HDU.

Hydraulics/ Water Treatment

Provide the necessary public health services within HDU, which include hot, cold and warm water and drainage to various sanitary fixtures and equipment within the unit.

Refer to Part E of these Guidelines for the specific requirements of Public Health Services.

Information Technology (IT) and Communications

It is vital to provide reliable and effective IT/ Communications service for efficient operation of the Unit. The following items relating to IT/ Communication shall be addressed in the design of the Unit:

- Electronic patient records – Patient information systems
- Electronic forms and requests (e.g. scripts and investigative requests)
- Picture archiving communications systems (PACS)
- Telephones including cordless and mobile phone/ DECT
- Computers and hand-held computers
- Paging for staff and emergencies
- Duress systems
- Bar coding for supplies, x-rays and records
- Wireless network requirements
- Videoconferencing requirements
- Communications rooms and server requirements.

Nurse Call / Emergency Call/ Staff Call

Nurse and Emergency Call facilities shall be provided in all patient and treatment areas in order for patients and staff to request for urgent assistance.

The individual call buttons shall alert to an annunciator system. Annunciator panels should be located in strategic points within the circulation area, particularly Staff Stations, Staff Rooms, and Meeting Rooms and should be of the “non-scrolling” type, allowing all calls to be displayed at the same time. The audible signal of these call systems should be controllable to ensure minimal disturbance to patients at night. The alert to staff members shall be done in a discreet manner at all times.

Pneumatic Tube Systems

It is highly desirable, although not mandatory to provide a Pneumatic Tube System (PTS) within the HDU.

Typically, the PTS will be located close to the Staff Station, within an alcove. PTS can be used for the transfer of samples to the Laboratory, various forms of paper or drugs from the Inpatient Pharmacy, to name a few.

Infection Control

Hand Basins

Handwashing facilities shall be provided in the corridors, critical care bed rooms and other rooms as specified by the Standard Components.

Hand-washing facilities shall not impact on minimum clear corridor widths. The following handwashing ratios should be provided:

- There must be one handwashing bay type A within each enclosed HDU room, isolation room and ante-room
- There must be one handwashing bay type A for each open HDU area for each 4 beds
- At least one handwashing bay is to be conveniently accessible to the Staff Station and one to be provided at the unit entry/exit

Hand basins are to comply with Standard Components Bay - Hand-washing and Part D - Infection Control.

Hand Basins in patient bedrooms should be used solely for infection control purposes and utilised only by staff. Patients should use hand basins provided in bathrooms for personal purposes. Staff may not use the patient ensuite hand wash basin.

Antiseptic Hand Rubs

Antiseptic hand rubs should be located so they are readily available for use at points of care, at the end of patient beds and in high traffic areas.

The placement of antiseptic hand rubs should be consistent and reliable throughout facilities. Antiseptic hand rubs are to comply with Part D - Infection Control, in these guidelines. Antiseptic Hand Rubs, although very useful and welcome, cannot fully replace Hand Wash Bays. Both are required.

Isolation Rooms

Refer to the section under Functional Planning Considerations above for the minimum number of negative pressure isolation rooms.

Entry to each Isolation room shall be through an airlock (or anteroom). Clinical hand-washing, gown and mask storage, and waste disposal shall be provided within the airlock.

The pressurisation of the isolation HDU room and the airlock must be monitored and displayed on a device on the corridor side. The monitor must have audible and visible alarm.

The pressure regime for the negative pressure isolation HDU room and airlock should be based on the following:

Corridor	(N) Neutral
Airlock	(-) Negative
HDU room	(--) Negative
Ensuite	(---) Negative

An Ensuite - Special, directly accessible from the Isolation Room, shall be provided for every isolation room, negative or positive.

Positive Pressure isolation HDU rooms will depend on the operational policy of the facility and the clinical assessment of the patient types expected.

The pressure regime for the positive pressure isolation HDU room and airlock should be based on the following:

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Corridor (N) Neutral

Airlock (+) Positive

HDU room (++) Positive

Ensuite (N) Neutral (Negative against the HDU room)

The provisions for isolation rooms and the design requirements for isolation rooms will be identical to ICU isolation rooms and the same Standard Components provided within these Guidelines will apply.

Also refer to Parts E and D of these Guidelines

5 Components of the Unit

Standard Components

Standard Components are typical rooms within a health facility, each represented by a Room Data Sheet (RDS) and a Room Layout Sheet (RLS).

The Room Data Sheets are written descriptions representing the minimum briefing requirements of each room type, described under various categories:

- Room Primary Information; includes Briefed Area, Occupancy, Room Description and relationships, and special room requirements).
- Building Fabric and Finishes; identifies the fabric and finish required for the room ceiling, floor, walls, doors, and glazing requirements.
- Furniture and Fittings; lists all the fittings and furniture typically located in the room; Furniture and Fittings are identified with a group number indicating who is responsible for providing the item according to a widely accepted description as follows:

Group	Description
1	Provided and installed by the Builder/ Contractor
2	Provided by the Client and installed by the Builder/Contractor
3	Provided and installed by the Client

- Fixtures and Equipment; includes all the serviced equipment typically located in the room along with the services required such as power, data, and hydraulics; Fixtures and Equipment are also identified with a group number as above indicating who is responsible for provision.
- Building Services; indicates the requirement for communications, power, Heating, Ventilation and Air conditioning (HVAC), medical gases, nurse/ emergency call and lighting along with quantities and types where appropriate. Provision of all services items listed is mandatory.

The Room Layout Sheets (RLS's) are indicative plan layouts and elevations illustrating an example of good design. The RLS indicated are deemed to satisfy these Guidelines. Alternative layouts and innovative planning shall be deemed to comply with these Guidelines provided that the following criteria are met:

- Compliance with the text of these Guidelines.
- Minimum floor areas as shown in the schedule of accommodation.
- Clearances and accessibility around various objects shown or implied.
- Inclusion of all mandatory items identified in the RDS.

The HDU consists of Standard Components to comply with details described in these Guidelines. Refer also to Standard Components Room Data Sheets (RDS) and Room Layout Sheets (RLS) separately provided.

Non-Standard Components

Non-standard rooms are rooms are those which have not yet been standardised within these Guidelines. As such there are very few Non-standard Rooms. These are identified in the Schedules of Accommodation as NS and are separately covered below.

Bay - Pneumatic Tube

The Bay - Pneumatic Tube should be located at the Staff Station/s under the direct supervision of staff for urgent arrivals. The location should not be accessible by external staff or visitors.

Requirements include:

- The bay should not impede access within staff station areas
- Racks should be provided for pneumatic tube canisters
- Wall protection should be installed to prevent wall damage from canisters

6 Schedule of Equipment (SOE)

The Schedule of Equipment (SOE) below lists the major equipment required for the key rooms in this FPU.

Room Name		
Patient Bay - High Dependency, Room Code (pb-hdu-24-i)		
Air flowmeter	Infusion pump: single channel	Sequential compression unit (may be shared)
Bed: ICU, electric	Infusion pump: syringe	Suction adapter
Chair: recliner, electric	Light: procedure (may be part of supply unit/ pendant)	Supply unit: ceiling
Haemodialysis unit: CRRT (optional or haemodialysis unit)	Monitor: physiologic, critical care	Ventilator: adult/ paediatric
Infusion pump: enteral feeding	Oxygen flowmeter	
Patient Bay - Intensive Care, Room Code (pbc-24-i), Patient Bay - Critical (Enclosed); Class N Isolation, Room Code (1br-icu-25-i similar)		
Air flowmeter	Infusion pump: single channel	Sequential compression unit (may be shared)
Bed: ICU, electric	Infusion pump: syringe	Suction adapter
Chair: recliner, electric	Light: procedure (may be part of supply unit/ pendant)	Supply unit: ceiling
Haemodialysis unit: CRRT (optional or haemodialysis unit)	Monitor: physiologic, critical care	Ventilator: adult/ paediatric
Infusion pump: enteral feeding	Oxygen flowmeter	

7 Schedule of Accommodation

The Schedule of Accommodation (SOA) identifies the rooms required in the Unit along with the quantity and the recommended room area. The sum of these room areas is the Sub Total and Total Departmental areas with a recommended circulation percentage. The circulation percentage represents the area required for internal corridors and is a target for efficient planning. SOAs and room sizes are developed for typical units and are organised into the functional zones applicable to the Unit. Not all rooms identified are mandatory requirements and optional rooms are indicated. Quantities of rooms may need to be proportionally adjusted to suit the desired unit size and service needs.

The Schedules of Accommodation are developed for levels of service known as Role Delineation Level (RDL) and numbered from 1 to 6 (including in-between numbers such as 4-5). Level 1 represents uncomplicated health facilities, ascending to level 6 representing complex specialist services and hospitals. Refer to the full Role Delineation Framework in these guidelines for a full description of the RDL's identified. RDL Levels not listed are not applicable for this service.

The Schedule of Accommodation for typical HDUs at RDL Levels 4 to 6 with 4, 8 and 12 beds are as follows. The Schedule of Accommodation lists generic spaces that form an HDU. Quantities and sizes of some spaces need to be determined in response to the service needs of each unit on a case-by-case basis.

High Dependency Unit (HDU)

Room/ Space	Standard Component Room Codes	RDL 3 Qty x m ² 4 Beds			RDL 4 Qty x m ² 8 Beds			RDL 5/6 Qty x m ² 12 Beds			Remarks
Entry / Reception											
Reception/ Clerical	recl-10-i recl-15-i similar				1	x	10	1	x	12	Optional
Waiting (Male/Female)	wait-15-i wait-20-i wait-30-i similar	2	x	15	2	x	20	2	x	25	Separate M & F; 1.2 m ² per person; 1.5 m ² per wheelchair
Meeting Room	meet-1-15-i similar				1	x	12	1	x	15	
Toilet - Public	wcpu-3-i	2	x	3	2	x	3	2	x	3	May share public amenities if located close
Toilet – Accessible	wcac-i	1	x	6	1	x	6	1	x	6	
Gown- up	gw-up-i similar	1	x	8	1	x	10	1	x	10	
Gown-down	gw-dn-i similar	1	x	8	1	x	10	1	x	10	
Patient Areas											
1 Bed Room - ICU/HDU	1br-icu-25-i				3	x	25	5	x	25	Enclosed bedrooms (optional)
Patient Bay – HDU	pb-hdu-24-i	3	x	24	4	x	24	6	x	24	Bed bays
1 Bed Room - ICU/HDU, Class N Isolation	1br-icu-25-i similar	1	x	25	1	x	25	1	x	25	Negative Pressure Isolation room
Anteroom	anrm-i similar	1	x	6	1	x	6	1	x	6	For Class N Isolation Rooms
Ensuite - Super	ens-sp-i	1	x	6	1	x	6	1	x	6	For isolation room
Patient-Toilet/Shower	ens-sp-i similar	1	x	6	4	x	6	7	x	6	For enclosed rooms and bed bays at the ratio of one per enclosed room and 1 per 4 bed bays shared
Support Areas											
Bathroom - Assisted	bath-i	1	x	16	1	x	16	1	x	16	Optional, inclusion depends on operational policy
Bay - Beverage	bbev-op-i bbev-enc-i	1	x	5	1	x	5	1	x	5	
Bay - Blanket Warmer	bbw-1-i	1	x	1	1	x	1	1	x	1	Optional
Bay - Handwashing, Type A	bhws-a-i	1	x	1	2	x	1	3	x	1	At Unit entry and in Corridors; refer to Part D
Bay - Linen	blin-i	1	x	2	1	x	2	2	x	2	
Bay - Mobile Equipment	bmeq-4-i	1	x	4	1	x	4	2	x	4	
Bay - Pathology (Satellite Laboratory)	bpath-1-i similar	1	x	1	1	x	2	1	x	4	
Bay - Pneumatic Tube	bpts-i	1	x	1	1	x	1	1	x	1	Optional, may be located with Pathology Bay or Staff Station
Bay - PPE	bppe-i	1	x	1.5	1	x	1.5	1	x	1.5	As required, may be combined with Bay-Handwashing
Bay - Resuscitation Trolley	bres-i	1	x	1.5	1	x	1.5	1	x	1.5	
Cleaners Room	clrm-6-i	1	x	6	1	x	6	1	x	6	Smaller units may share with a collocated unit
Clean Utility	clur-12-i				1	x	12	1	x	12	May be interconnected with Medication room. These areas apply if HDU is in the typical ICU configuration. If HDU is integrated with IPU, then the support area sizes of IPU will apply
Medication Room	medr-10-i				1	x	10	1	x	10	May be interconnected with Clean Utility room
Clean Utility / Medication	clum-14-i	1	x	14	1	x	14	1	x	14	*Optional if Clean Utility and Medication Room are provided separately.

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Room/ Space	Standard Component Room Codes	RDL 3 Qty x m ² 4 Beds			RDL 4 Qty x m ² 8 Beds			RDL 5/6 Qty x m ² 12 Beds			Remarks
Dirty Utility	dtur-10-i dtur-12-i dtur-14-i	1	x	10	1	x	12	1	x	14	These areas apply if HDU is in the typical ICU configuration. If HDU is integrated with IPU, then the support area sizes of IPU will apply
Disposal Room	disp-8-i disp-10-i	1	x	8	1	x	8	1	x	10	Optional
Equipment Clean-up	ecl-10-i similar	1	x	8	1	x	8	1	x	8	Optional; provide only if the unit is back to back with ICU or if there is an intention to upgrade or use as ICU. Room size according to service requirements.
Respiratory Workroom	rewm-i	1	x	20	1	x	20	1	x	20	This room may also be shared with ICU.
Respiratory Store	steq-20-i	1	x	20	1	x	20	1	x	20	
Office - Clinical Handover	off-cln-i similar	1	x	10	1	x	15	1	x	15	Locate near staff station
Reporting Station	rpst-2-i	2	x	2	3	x	2	6	x	2	De-centralised reporting stations between bedrooms or bays.
Staff Station	sstn-14-i similar sstn-20-i similar	1	x	12	1	x	18	1	x	20	Provide one per two bedrooms or bed bays if there is no direct observation from the Staff Station to the bed.
Staff Station	sstn-14-i similar sstn-20-i similar	1	x	12	1	x	18	1	x	20	
Store - Equipment	steq-10-i steq-14-i	1	x	10	1	x	14	1	x	14	May be subdivided
Store - General	stgn-12-i stgn-16-i	1	x	12	1	x	16	1	x	16	
Store - Sterile Stock	stss-12-i similar stss-20-i similar	1	x	6	1	x	12	1	x	24	Room size according to service requirements
On-call Room	ovbr-10-i	1	x	10	1	x	10	1	x	10	One per Pod. But may also be grouped together between several units.
On-call Room -Ensuite	oves-4-i	1	x	4	1	x	4	1	x	4	
Office - Single Person	off-s9-i	1	x	9	1	x	9	1	x	9	Unit Manager
Office - 2 Person Shared	off-2p-i				1	x	12	1	x	12	Nurse Educators, Staff Specialists, Clinicians
Office - Workstation	off-ws-i	1	x	5.5	2	x	5.5	4	x	5.5	Registrars, Nursing, Secretarial
Meeting Room	meet-l-15-i meet-l-30-i similar				1	x	15	1	x	25	Quantity and size dependent on Service Plan
Bay - Beverage	bbev-op-i bbev-enc-i				1	x	5	1	x	5	Optional, near Meeting Room/s
Store - Photocopy/ Stationery	stps-8-i stps-10-i	1	x	8	1	x	8	1	x	10	
Staff Lounge (Male / Female)	srm-15-i	2	x	15	2	x	15	2	x	15	Male/ Female, Include Beverage Bay
Sub Total				385.5			622			817	
Circulation %				35			35			35	
Area Total				520			840			1103	

Please note the following:

- Areas noted in Schedules of Accommodation take precedence over all other areas noted in the Standard Components.
- Rooms indicated in the schedule reflect the typical arrangement according to the sample bed numbers.
- All the areas shown in the SOA follow the No-Gap system described elsewhere in these Guidelines.
- Exact requirements for room quantities and sizes shall reflect Key Planning Units (KPU) identified in the Clinical Service Plan and the Operational Policies of

the Unit.

- Room sizes indicated should be viewed as a minimum requirement; variations are acceptable to reflect the needs of individual Unit.
- Offices are to be provided according to the number of approved full-time positions within the Unit.

8 Further Reading

In addition to Sections referenced in this FPU, i.e. Part C- Access, Mobility, OH&S, Part D - Infection Control, and Part E - Engineering Services, readers may find the following helpful:

- International Health Facility Guideline (iHFG) www.healthfacilitydesign.com.au
- DH (Department of Health) (UK), Health Building Note 57: Facilities for critical care, 2003, refer to website www.estatesknowledge.dh.gov.uk
- Guidelines for Design and Construction of Hospitals; The Facility Guidelines Institute, 2018 Edition; refer to website: www.fgiguideines.org
- AHIA, Australasian Health Facility Guidelines, Part B Health Facility Briefing and Planning, HPU 0360 - Intensive Care - General, Rev 6, 2016; refer to website: <https://healthfacilityguidelines.com.au/health-planning-units>