Part B – Health Facility Briefing & Design

278 Sleep Lab Unit

iHFG

International Health Facility Guidelines

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Table of Contents

20 SLEEP LAB UNIT 3

1 INTRODUCTION 3
2 FUNCTIONAL AND PLANNING CONSIDERATIONS 4
3 FUNCTIONAL RELATIONSHIPS 6
4 DESIGN CONSIDERATIONS 10
5 COMPONENTS OF THE UNIT 13
6 SCHEDULE OF ACCOMMODATION 14
7 FURTHER READING 17

20 Sleep Lab Unit

1 Introduction

Description

Sleep Lab Unit is a facility provided for the diagnosis of a variety of sleep disorders. This is accomplished within a monitored, overnight accommodation where a patient's mental and body activities during sleep can be measured and recorded.

The types of disorders may include:

- Sleep apnoea
- Insomnia
- Restless leg syndrome (RLS)
- Others

A Sleep Lab Unit may be provided:

- As part of a Hospital Inpatient Unit
- As an attachment to a Day Care Surgery Centre

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

Users who wish to propose minor deviations from these guidelines should use the Non-Compliance Report (Appendix 4 in Part A) to briefly describe and record their reasoning based on models of care and unique circumstances.

The prime function of the Sleep Lab Unit is to provide overnight accommodation in a controlled and monitored environment where a patient's mental and body activities during sleep can be measured and recorded. Recording brain waves, heart rate, breathing pattern, oxygen levels in the blood and limb movement, assist to identify and diagnose sleep disorders such as sleep apnoea, insomnia, restless leg syndrome (RLS) etc.

The Unit must provide a home-like environment with quiet & relaxing facilities and conditions to meet the needs of patients as well as the workplace requirements of staff.

A Sleep Lab Unit is commonly provided within a hospital or day care surgery setting taking advantage of a range of shared facilities. Its functions require provision of overnight accommodation with clinical staff on duty. Patients suffering from sleeping disorders will be admitted for an overnight stay (or in some cases during the day) at the Unit to measure and record the physiological and brain activities.

Patients attending a Sleep Lab Unit are not regarded as high risk patients.

The following studies may be conducted at the Sleep Unit:

- Polysomnography (PSG) – this test is conducted overnight where brain activity, breathing activity and muscle activity will be monitored and tracked.
- Multiple Sleep Latency Test (MSLT) – this test will be conducted through a 24 hours cycle where a PSG test will be conducted over night then follow by scheduled naps throughout the day.
- CPAP Titration – this type of test is mainly prescribed to patients who is suffering from sleeping disorders.
- Split Night Study – Both the PSG and CPAP Titration are performed over night with one after the other.
- Maintenance of Wakefulness Test (MWT) – this is a full-day test used to measure how awake

Considering the function of a Sleep Lab and its operational hours, it is most efficient to have the Unit collocated with an Inpatient Unit in a hospital.

2 Functional and Planning Considerations

Operational Models

Hours of Operation

The Sleep Lab Unit will generally operate on a 7 days per week basis but with hours that typically span across from early evening till the following morning.

Planning Models

The Sleep Lab Unit is a separate specialty (Service Line) with an independent management structure. However, it could be collocated with the Inpatient Unit or Day Care Surgery Centre for clinical and staffing support but zonally separated. Some inpatient facilities such as bedrooms may have a dual use function, where they can be used either as a general Inpatient bedroom, or a sleep lab bedroom, incorporating the features of both.

Option 1- Located at a Hospital

A Sleep Lab Unit, when located in a hospital, is often strategically placed within an Inpatient Unit (IPU) as they both provide overnight accommodation and are staffed 24/7. A typical patient bedroom in the IPU will have sufficient space and can be converted for sleep studies by simply adding the required equipment. In this model, the sleep testing room (patient room) should be located in a quiet part of the IPU away from regular traffic and potential noise.

Option 2- Located as part of a Day Care Surgery Centre

If the Sleep Lab Unit is located as part of a Day Care Surgery Centre, it should be located close to the entry of the facility but zonally separated as it will typically operate outside the regular operational hours of the facility. Any required and shared support services should also be made available during these hours when the Sleep Lab is functioning, but the rest of the facility may be closed. One or more testing bedrooms, with sufficient space for the equipment and a comfortable patient bed with attached ensuite should be provided for the patient. The Control/ Technical Room will be located sufficiently close to the patient testing bedroom(s).

If the facility provides fully enclosed rooms for Pre/Post surgery with attached ensuite bathrooms, the same can be adapted for dual use as part of the Sleep Lab function.

Functional Areas

The Sleep Lab Unit may be provided at different sizes as required. The minimum provision comprises of three rooms – a patient bedroom for testing, an ensuite attached to the patient bedroom and a Control/ Technical room with monitoring equipment. Other required support services can be shared with adjoining units as long as they remain accessible to the Sleep Lab Unit during its operational hours.

The number of testing bedrooms may be increased according to the facility's service plan. The most typical minimum number is 3 and the maximum typical number is 10. However, there is no overall limit on the numbers. Up to 8 testing bedrooms can be efficiently monitored from one Control/ Technical room with monitoring equipment and are regarded as a "Pod". Facilities offering more than 8 testing bedrooms should be designed as two Pods or adjoining departments.

The above rooms are described below:

- Sleep Testing Room (patient bedroom) - The room should allow for a regular patient bed, handbasin, wardrobe, and storage area for consumables. Clearances around the bed should follow the same standards as described under the Inpatient Unit FPU within these guidelines. If the Unit conducts sleep studies for children, the room should have sufficient space to accommodate an extra bed for the accompanying adult. If sleep studies are scheduled for more than one patient per cycle, additional rooms, each with single occupancy should be provided. Shared bedrooms are not permitted. It is recommended that the internal finishes, colours and decoration be more domestic in style and less "hospital like".
- An Ensuite – The patient ensuite is to be directly accessible from the bedroom. In general, an Ensuite including a toilet, shower and hand basin must be available within each standard

patient room. Ensuites shall provide sufficient space for the manoeuvring of a wheelchair and various types of mobility devices. Grab rails to be fitted to the WC pan and shower area. The same standards as an Ensuite Bathroom within an Inpatient Unit FPU will apply. However, it is recommended that the internal finishes, colours and decoration be more domestic in style and less “hospital like”.

- Control/ Technical Room – This can be located either next to the sleep testing room or in proximity. This room will include control console, monitors and other required equipment connected to the testing system in the patient room. A write-up bench as well as a cabling trench connecting equipment in the patient room should be provided. If located adjacent to the patient room, a window looking into the patient room can be considered but is not mandatory. The Control/ Technical rooms also have the same function as a Staff Station in an Inpatient Unit. However, these are in an enclosed room rather than within an open counter. Each Control/ Technical Room can monitor up to 8 Sleep Testing Room, regarded as a Pod.
- Staff and Support Facilities – A Sleep Lab requires the following support facilities, which may be provided as dedicated facilities, shared with an Inpatient Unit or an adjacent Outpatient Unit:
  - Reception
  - Waiting
  - Public WC (Male and Female, Accessible)
  - Office
  - Store (Records)
  - Store (Housekeeping)
  - Disposal Room
  - Cleaners Room
  - Linen Bay (or Room)
  - Staff Toilets
  - Staff Room
  - Server Room (Optional)
  - Consultation Room (Optional)
  - Lung Examination Room (Optional)

Sleep Lab Unit Pods

Up to 8 patient testing bedrooms are described as one “Pod” . The requirements related to each Pod can are described below:

- Each pod can be managed efficiently with one Control/ Technical Room. For more than 8 beds, the unit should be regarded as two pods, with separate Control/ Technical rooms. However other staff & support facilities and public amenities may be shared between the pods.
- For each pod, provide at least one testing bedroom and its attached ensuite bathroom sized and designed for bariatric use.
- For pods with 6 or more bedrooms consider providing a breakfast room with seating and tea/coffee making and serving bench with a sink and microwave. This rooms is not mandatory. Such a room can be shared between the pods but sized 15 m2 or 1.5m2 per patient bedroom number, whichever is larger.

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

3 Functional Relationships

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.

External Relationships

The Sleep Lab Unit is a discrete specialty (Service Line) and its operations are independent and self-sufficient. External Relationships are similar to an Outpatient Unit including access to:

- Carparking
- Any existing building entrance, lobby and waiting area
- Any existing building reception
- Any existing building public amenities

Internal Relationships

When the Sleep Lab Unit is located within a Hospital or Day Care Surgery Centre, the pathway from the main entrance to the unit should always be accessible after-hours.

If the Sleep Lab Unit is attached to, or part of a Day Care Surgery Centre, it should ideally be located close to the entrance to allow for after-hours access, when the rest of the facility is expected to be closed. If the Sleep Lab Unit relies on certain shared facilities with the rest of the facility, then access to these shared facilities must be available through the operational hours of the Sleep Lab Unit, even if the balance of the Outpatient facility may be closed.

If a Sleep Lab Unit is located as part of a Day Care Surgery Unit, its corridors and facilities leading to the Testing Bedrooms and Control/ Technical room must be kept separate from the clean corridors of the Day Surgery Unit leading to the operating rooms. Only the areas of the Day Care Surgery Unit which are open to the public and the staff without changing into theatre gowns may be linked to the Sleep Lab Unit. These include Reception, Waiting, Public Amenities, Staff Amenities and Consultation rooms. The Pre/Post operative areas of the Day Care Surgery may be designed for dual purpose and serve as part of the Sleep Lab Testing bedrooms. However, the operations must be separated by time. For example, the Sleep Lab operation can start after the Day Care Surgery operations finish for the day.

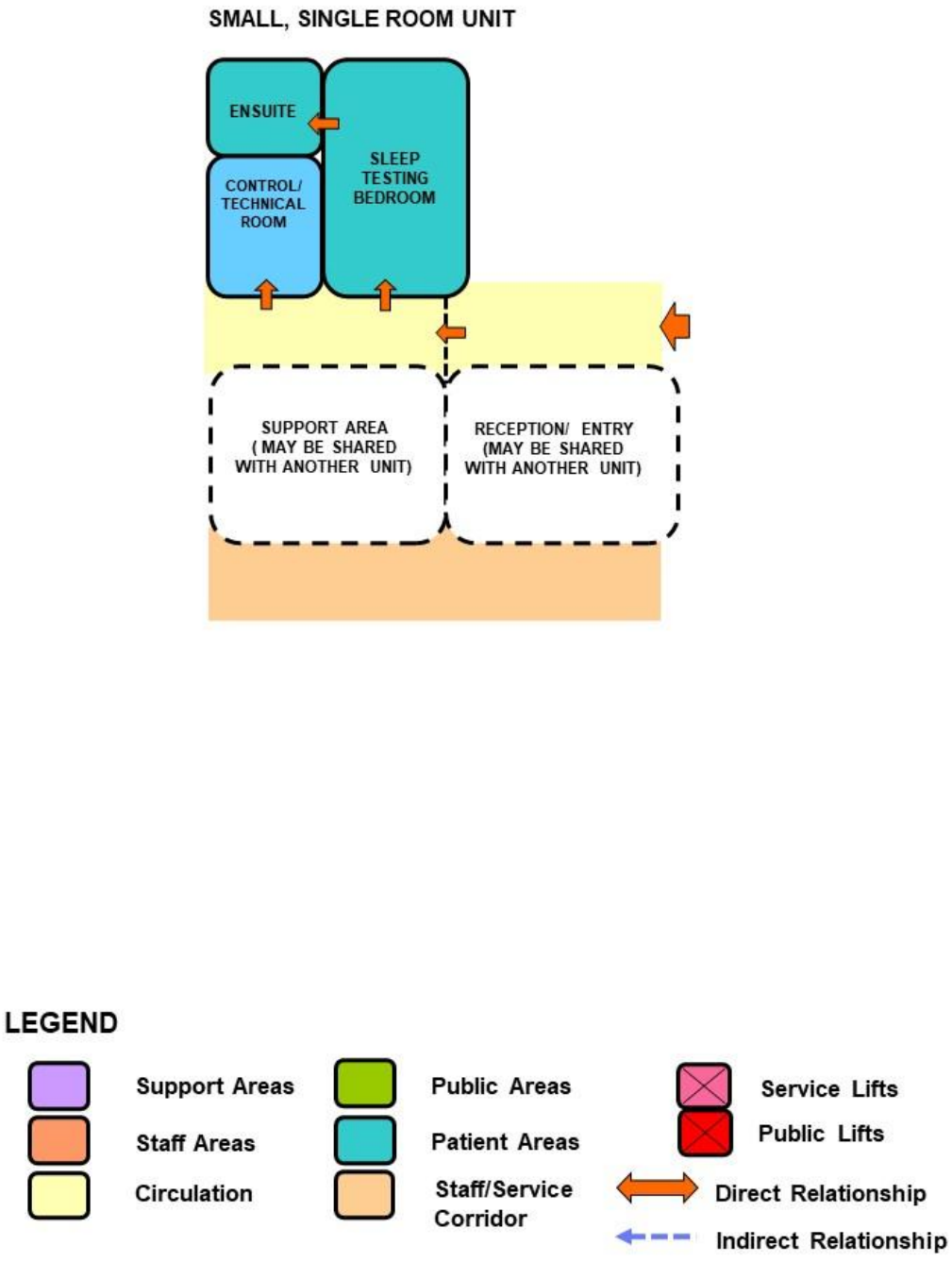
If the sleep lab is located within an Inpatient Unit at a hospital, considering that the facility is already a 24-hour operation, the exact location is flexible. However, it is highly recommended that it should be located in a quiet zone away from main traffic and potential noise.

For a small Sleep Lab Unit, it would be ideal for the three minimum required rooms to be collocated in a compact arrangement as much as possible, rather than disbursed through a larger facility such as an Inpatient Unit or Day Care Surgery Unit.

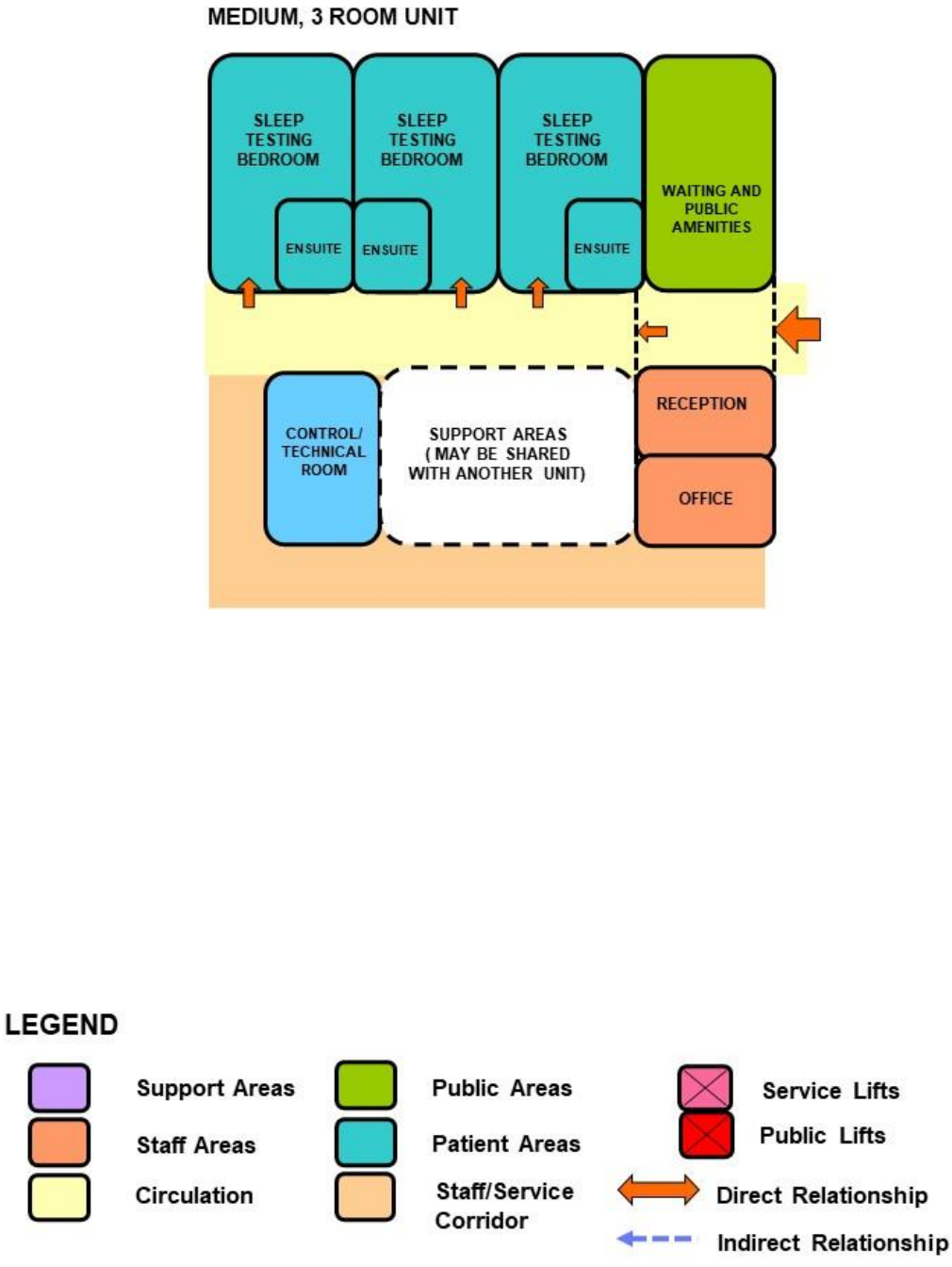
Functional Relationships Diagram

The functional relationships of a typical Sleep Lab Unit are best demonstrated in the diagram below. More than one testing rooms can be provided in a Unit where a Control/ Technical room can be shared between two or more testing rooms.

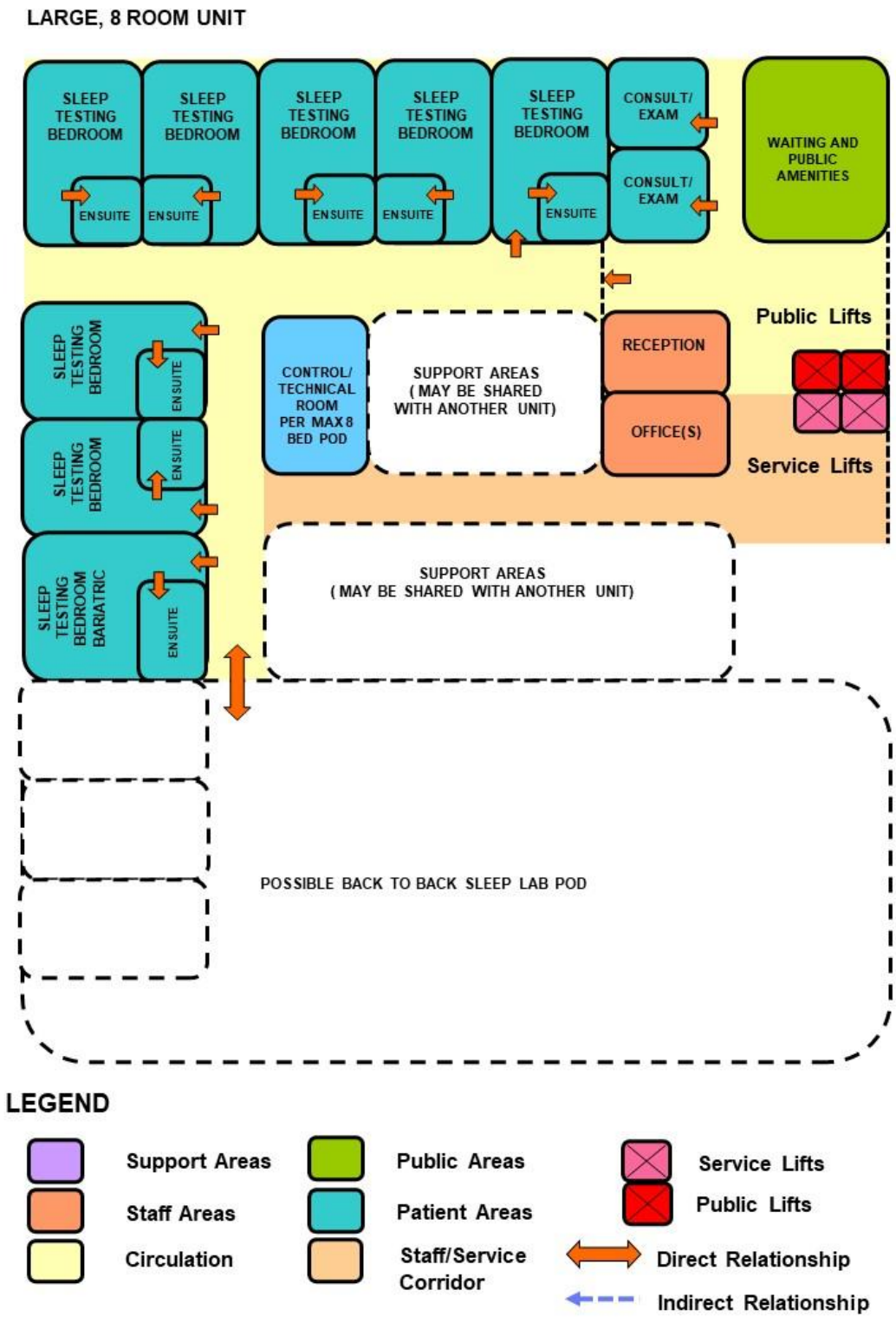
Sleep Lab Unit Functional Relationship Diagram



Sleep Lab Unit Functional Relationship Diagram



Sleep Lab Unit Functional Relationship Diagram



4 Design Considerations

Environmental Considerations

Acoustics

The Sleep Lab Unit should be designed to minimise 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.

Acoustic treatment will be required to the patient bedroom.

Refer to Part G – Acoustics of these Guidelines for more information.

Natural Light/ Lighting

Access to an external window is not required given the sleep testing area should be without daylight as a 'timeless' space.

Privacy

Depending on the design of the Unit, observation from the common corridor outside the patient room may be required if the control room is not adjacent the testing room. In this scenario, the sleep testing room should be located away from the main traffic to avoid visibility for other patients and visitors in the area.

Interior Décor

Interior décor includes colour, textures, surface finishes, fixtures, fittings, furnishings, artworks and atmosphere. It is desirable that these elements are combined to create a calming, non-threatening environment that meets the expectations of patient, staff and visitors.

Delivery Rooms, lounges, treatment, and reception areas should be open and inviting, of domestic scale and décor rather than institutional. Access to outdoor areas is desirable.

Colours should be used in combination with lighting to ensure that they do not mask skin colours particularly in rooms where clinical observation takes place.

Space Standards and Components

Accessibility

Bedrooms and ensuites should comply with accessibility requirements in line with regional and international standards; including NFPA. Accessible bedrooms and ensuites should enable normal activity for wheelchair dependant patients,.

Doors

Door openings to inpatient bedrooms shall have a minimum of 1350mm clear opening (ideally 1400mm) to allow for easy movement of beds and equipment.

Also refer to Part C - Access, Mobility and OH&S of these Guidelines.

Safety and Security

The facility, furniture, fittings and equipment must be designed and constructed in such a way that children and all other users of the facility are not exposed to avoidable risks of injury. Fittings, surfaces and furniture should have rounded edges and no small, removable elements. All cupboards should be provided with locks. Units should be assessed and must meet security provision checklists as seen in Part C - Access, Mobility, OH&S of these Guidelines.

Finishes

Finishes including building fabric, floor, wall and ceiling finishes, should be relaxing and non-institutional as far as possible. The following additional factors should be considered in the selection of finishes:

- acoustic properties

- durability
- ease of cleaning
- infection control
- fire safety
- movement of equipment

In areas where clinical observation is critical such as bedrooms and treatment areas, colour selected must not impede the accurate assessment of skin tones. Walls shall be painted with lead free paint.

Refer to Part C - Access, Mobility and OH&S of these Guidelines for more information on wall protection, floor finishes and ceiling finishes.

Fixtures, Fittings and Equipment

Curtains / Blinds

Each patient room shall have blackout facilities (blinds or lined curtains) when an external window is provided to the patient testing room.

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

If blinds are to be used instead of curtains, the following will apply:

- 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.

Building Service Requirements

This section identifies unit specific services briefing requirements only and must be read in conjunction with Part E - Engineering Services for the detailed parameters and standards applicable.

Information and Communication Technology

Unit design should address the following Information Technology/ Communications issues:

- Electronic patient records and patient information systems
- Telephones including cordless and mobile phones
- Computers, laptops, hand-held tablets and other smart devices
- Patient call, nurse assist call, emergency call systems
- Paging for staff and emergencies
- Supply and records management systems including bar coding for supplies
- Data and communication outlets, servers and communication room requirements
- Wireless network requirements for staff, patients and visitors.

Nurse Call

Patient call, staff assist, and emergency call facilities shall be provided in the Patient Room and Ensuite for patients and staff to request urgent assistance.

Heating Ventilation and Air Conditioning (HVAC)

The air temperature in inpatient areas should be capable of being maintained along with relative humidity, both should be adjustable.

All HVAC units and systems are to comply with services identified in Standard Components and Part E – Engineering Services.

Medical Gases

Oxygen and suction must be provided to all inpatient beds, while medical air is optional dependent of the service being provided. Medical gases will be provided for each bed according to the quantities noted in the Standard Components Room Data Sheets.

Refer to Part E - Engineering Services for relevant standards related to medical gas installations.

Infection Control

Hand Basins

Provide hand washing facilities in the patient bedroom.

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

Hand Basin in the patient bedroom 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 or at the end of patient beds.

Antiseptic based 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

5 Components of the Unit

Standard Components

Standard Components are typical rooms in a health facility, each represented by a Room Data Sheet (RDS) and Room Layout Sheet (RLS). Sometimes, there are more than one configuration possible and therefore, more than one room layout sheet can be found in the Standard Components for a room with same function. They may differ in room size and/or the requirement of FF&FE items.

The Room Data Sheets are presented in a written format, describing the minimum briefing requirements of each room type divided into the following categories:

- Room Primary Information; includes briefed areas, occupancy, room description, relationships and special room requirements
- Building Fabric and Finishes; describes fabric and finishes for the room's 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 commonly located in the room along with the services required such as power, data, water supply and drainage; 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, HVAC (Heating, Ventilation and Air Conditioning), 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 a 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 by 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.

Standard Components have considered the required design parameters described in these Guidelines. Each FPU should be designed with compliance to Standard Components - Room Data Sheets and Room Layout Sheets, nominated in the Schedules of Accommodation in Appendices of this FPU.

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.

6 Schedule of Accommodation

The Schedule of Accommodation (SOA) provided in the Appendices of this FPU represents generic requirements for this Unit. It identifies the rooms required along with the room quantities and the recommended room areas. The sum of the room areas is shown as the Sub Total as the Net Area. The total area comprises of the sub-total areas of these rooms plus an additional percentage of the sub-total applied as the circulation (corridors within the Unit). Circulation is represented as a percentage is the minimum recommended target area. Any external areas and optional rooms/ spaces are not included in the total areas in the SOA.

Within the SOA, room sizes indicated for typical units and are organised into functional zones. Not all rooms identified are mandatory, therefore, some rooms are found as optional in the corresponding Remarks. These Guidelines do not dictate the size of the facilities and the SOA provided represents a limited sample based on assumed unit sizes. The actual size of the facilities is determined by the Service Planning or Feasibility Studies. Quantities of rooms need to be proportionally adjusted to suit the desired unit size and service needs.

Any proposed deviations from the mandatory requirements, justified by innovative and alternative operational models may be proposed within the departure forms included in Part A of these guidelines for consideration by the health authority for approval.

Sleep Lab Unit

ROOM/ SPACE	Standard Component Room Codes	All RDLs Qty x m2			All RDLs Qty x m2			All RDLs Qty x m2			Remarks
Unit Size		**1 bedroom**			**3 bedrooms**			**8 bedrooms**			
Entrance/ Reception											
Reception	recl-10-i similar	1	x	5	1	x	10	1	x	10	Optional; may be shared with other units
Waiting	wait-sub-i similar	1	x	5	1	x	10	1	x	15	Optional; may be shared with other units
Toilet - Public	wcac-6-i	2	x	6	2	x	6	2	x	6	Optional; may be shared with other units
Patient Areas											
Sleep Testing Room	1br-st-18-i similar	1	x	18	3	x	18	8	x	18	Similar to a regular Patient Bedroom with additional storage and work benches for equipment
Ensuite - Standard	ens-st-i	1	x	5	3	x	5	7	x	5	Directly accessible from Patient Room
Sleep Testing Room, Bariatric	1br-ba-20-i							1	x	20	Provide one per pod with 6 beds or more
Ensuite - Bariatric	Ens-ba-7-i							1	x	7	Provide one per pod with 6 beds or more
Control/ Technical Room	NS	1	x	8	1	x	10	1	x	12	May be used for observation if adjacent to Patient Room; provide work benches for monitoring equipment with cabling from the Patient Room
Consult/ Exam Room	cons-i				1	x	13	2	x	13	Optional. May also be provided in an Outpatient Unit. Size one for bariatric patients.
Lung Function Test Room	cons-i similar							1	x	13	Optional.
Breakfast Room	Srm-15-i similar				1	x	10	1	x	16	Optional- may be shared as Staff Room/ Staff Meeting room. Min 10m2 or 2m2 per bedroom.
Staff and Support Areas											
Office, Unit Manager	off-s12-i similar	1	x	12	1	x	9	1	x	12	Optional, may be shared with other Units
Office, 2 person shared	off-2p-i				1	x	12	2	x	12	May be shared with other Units
Bay - Handwashing, Type B	bhws-b-i	1	x	1	1	x	1	1	x	1	Staff access to at least one HWB within the Unit
Dirty Utility	dtur-8-i	1	x	8	1	x	8	1	x	8	May be shared with other Units
Disposal Room	disp-8-i similar	1	x	4	1	x	4	1	x	4	May be shared with other Units
Store – General/ Equipment	steq-10-i	1	x	10	1	x	10	1	x	15	Size as per service demand and operational policies; may be shared with other Units
Cleaner's Room	clrm-6-i	1	x	6	1	x	6	1	x	6	May be shared with other Units
Bay – Linen	blin-i	1	x	2	1	x	2	1	x	2	May be shared with other Units
Bay – Beverage, Open Plan	bbev-op-i	1	x	5	1	x	5	1	x	5	May be shared with other Units. Not required if breakfast room is provided.
Toilet – Staff	wcst-i	2	x	3	2	x	3	2	x	3	May be shared with other Units

ROOM/ SPACE	Standard Component Room Codes	All RDLs Qty x m2	All RDLs Qty x m2	All RDLs Qty x m2	Remarks
Unit Size		1 bedroom	3 bedrooms	8 bedrooms	
Sub Total		108	197	393	
Circulation %		35	35	35	
Total Areas		146	266	530.5	

Please note the following:

- Consultation room(s) may be provided in the separate Outpatient Unit. If required, consult rooms with required support services can be located within the Sleep Lab Unit. Also refer to separate FPU - Outpatient Unit.
- Areas noted in Schedules of Accommodation take precedence over all other areas noted in the FPU
- Rooms indicated in the schedule reflect the typical arrangement according to the bed numbers
- Exact requirements for room quantities and sizes will reflect Key Planning Units (KPU) identified in the Clinical Service Plan and the Operational Policies of the Unit
- All the areas shown in the SOA follow the No-Gap system described elsewhere in these Guidelines

7 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:

- Guidelines for Design and Construction of Health Care Facilities; The Facility Guidelines Institute, 2014 Edition; refer to website www.fgiguidelines.org
- International Health Facility Guideline (iHFG), refer to website: www.healthdesign.com.au/ihfg
- NFPA, National Fire Protected Association, refer to website: https://www.nfpa.org/