

**Part B – Health Facility Briefing & Design**  
**235 Operating Unit**



iHFG

**International Health Facility Guidelines**  
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## 235 Operating Unit

### 1 Executive Summary

The Operating Unit refers to a Functional Planning Unit (FPU) which covers the requirements of surgical operations (also referred to as surgical procedures). The functions of this FPU include receiving the patient, preparation and performance of the operation, followed by recovery within the unit. After initial recovery within the Unit, inpatients are transferred to an Inpatient Unit or ICU for final recovery. Day Surgery patients will recover within the unit until they are discharged home.

The Operating Unit Guidelines describe the operational, functional and design requirements for a range of surgical services to be accommodated in hospitals or stand-alone surgical facilities. The Unit may be optimised for

several operational models such as Inpatient Surgery, Day Surgery, Day of Surgery Admissions (DOSAs) and 23 Hour Surgery.

The Operating Unit will have one or more Operating Rooms (sometimes referred to as Procedure Rooms), with provision to deliver anaesthesia and accommodation for the immediate post-operative recovery of patients. The Operating Unit will have the required supporting facilities for staff changing, scrubbing and gowning before the operations. It will have the necessary supporting facilities such as sterile stock store, equipment stores and clean-up rooms.

Some of the provisions for the supporting areas are fixed and others may be parametric and depend on the number of operating rooms. For example, the number of recovery bays will depend on the number of operating rooms.

The Operating Unit may be combined with Day Surgery and Endoscopy Unit to form a fully integrated unit, saving on size, resources and costs. The components of this Unit which may be shared with the Day Surgery Unit and Endoscopy Unit are noted in the respective FPUs within these Guidelines.

The Functional Relationship Diagrams for the Operating Unit indicate the ideal internal relationships between the key rooms, based on the flow of patients, staff and goods. They also indicate external relationships with other key FPUs (hospital departments) and services. There are 8 permutations of the planning model indicating the relationships between the key rooms within in this FPU, such as the Operating Room, Scrub Room, Sterile Stock room and Clean-up room. There is a particular air pressurisation regime applied to each of these permutations and indicated in this FPU.

For an Operating Unit located within a hospital building, the external relationship with Emergency Unit, Inpatient Units, Intensive Care Units and Sterile Supply Unit (SSU) should be carefully considered as noted in this FPU.

Design Considerations address a range of important issues including Finishes, Accessibility, Acoustics, Safety and Security, Building Services, and Infection Control.

This FPU describes the minimum requirements for support spaces of a typical Operating Unit at Role Delineation Levels 2 to 6. At RDL 2, only Day Surgery is permitted as there are no Inpatients.

The typical Schedule of Accommodation (SOA) is provided using Standard Components (typical room templates) and quantities for the rooms. Optional specialised operating room types are also noted and can be selected separately. The SOA is presented for several different facility sizes and guide the designers to create their project-specific SOA's.

For each of the nominated room types within the SOA the code link to the corresponding Room Data Sheets (RDS) and Room Layout Sheets (RLS) has been provided. Readers may use those codes to access this information on the rooms in the section titled Standard Components on the website.

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

Users who wish to propose minor deviations from these guidelines should use the Non-Compliance Report (in Part A appendices) to briefly describe and record their reasoning based on models of care and unique circumstances. The responsible Health Authority may then consider the circumstances and accept such deviations.

## 2 Introduction

The Operating Unit provides a safe and controlled environment for the care of patients undergoing surgical procedures under anaesthesia and peri-operative care including initial pre-operative care and post procedure recovery.

## 3 Functional and Planning Considerations

### *Operational Models*

There are 4 basic models of surgery:

- Inpatient Surgery
- Day Surgery (or Outpatient Surgery or Ambulatory Care Surgery or Day Care Surgery) which may also include:
  - Catheter Lab procedures
  - Endoscopy procedures
  - Minor or Cosmetic procedures
- Day of Surgery Admissions or DOSA (or Same-day Surgery)
- 23 Hour surgery.

All these models should ideally be operated from the same integrated facility in the interest of efficiency, safety and economy, but they can also be separated if preferred. These models require the following basic facilities and services: Reception, Pre-operative (or holding) facilities, Operating Room (or Procedure Room), Recovery Stage 1, Recovery Stage 2, Inpatient Unit (IPU) and Intensive Care Unit (ICU). IPU and ICU are covered by separate FPU's within these Guidelines and are required only for Inpatient Surgery and DOSA.

The difference between the models is the flow of patients before and after surgery. The different models may utilise some facilities and by-pass other facilities. These are further described below:

### **Inpatient Surgery**

Patients undergoing Elective or Emergency surgery are first admitted to an IPU, ICU or are transferred from the Emergency Unit. After surgery, patients return to the IPU or ICU, but not the Emergency Unit.

Inpatient Surgery may start early (e.g. 7 am) and continue into the late hours of the evening. Longer hours of operation are highly efficient as they increase the throughput for the same physical facility investment. A 30% increase in the hours of operation is almost the same as having 30% more operating rooms with every other support facility. In some countries, operating 24 hours is common.

After the operation, patients need to recover in the controlled and monitored environment of the Recovery Stage 1 until they wake up and are assessed by the clinicians as ready for transfer to ICU or IPU.

Within the Recovery Stage 1, the patient may request access to toilets which should be provided. For certain types of operation such as cardiac surgery, after surgery the patients may be transferred directly to an adjacent ICU, by-passing Recovery Stage 1. However, for most patient types, the provision of ICU is not a replacement for Recovery facilities.

All parts of the interior of the FPU are equally subject to the theatre dress code, therefore clinicians and staff must change before entering the Surgical zone including Recovery Stage 1.

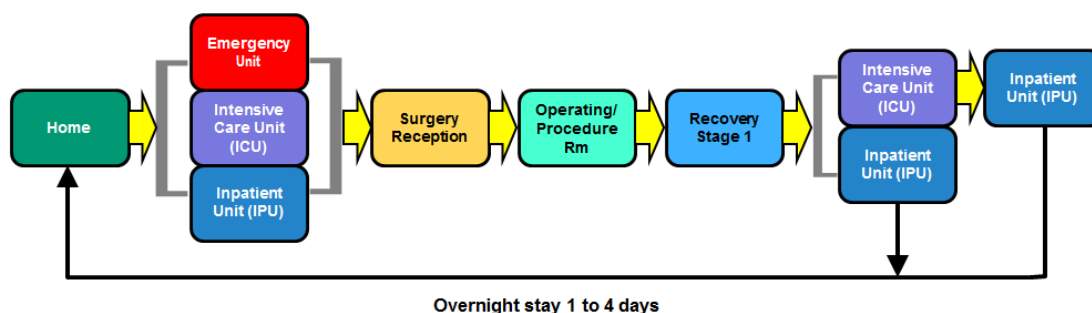


Figure 1 Inpatient Surgery Model patient flow chart

### Day Surgery (Outpatient Surgery)

An integrated surgical facility will use the same facilities for both Inpatient Surgery and Day Surgery as described below. For dedicated Day Surgery facilities please refer to the separate Day Surgery Unit FPU within these Guidelines.

Up to 70% of all surgery may be performed as Day Surgery. Every surgical case performed as Day Surgery will save between 1 and 3 bed-days<sup>1</sup> as no IPU bed will be occupied by the patient. This will save costs whilst preserving valuable IPU beds for major inpatient surgery.

Day Surgery patients are usually organised to arrive very early (e.g. 6 am) with the aim of starting surgery at 7 am. Day Surgery patients will recover in the unit and go home before the evening. This means sufficient time should be set aside for the last patient's recovery. The last surgery may be around 4 pm or earlier.

Patients change in private bed cubicles or change rooms in the pre-operative area of the attached Day Surgery facility.

Patients who undergo Day Surgery under general anaesthesia will initially recover in Recovery Stage 1 just as Inpatient Surgery. After they wake up, they are transferred to Recovery Stage 2 which is in the style of a lounge for further recovery before they are discharged to go home.

For some minor procedures, the patient may not undergo general anaesthesia or may wake up immediately after surgery. These patients do not need to go through Stage 1 Recovery, they can go directly to Stage 2 Recovery.

Stage 1 Recovery is seen as an integral part of the interior of the Surgical zone, subject to the clinicians, staff and patients being changed.

However, Stage 2 Recovery is seen as being outside of the Surgical zone, replicating the functionality of an IPU. Therefore, as an option patient may change to their street clothes in Recovery Stage 2. Similarly, the staff working exclusively in Recovery Stage 2 may be subject to a different dress code, similar to an IPU.

### Catheter Lab

The patient flow will be similar to Day Surgery or DOSA. There is no need to separate Catheter Labs as a unit, however, the Catheter Lab should be located close to Stage 1 Recovery bays in order to share facilities. The pre-operative facilities for Cath Lab will be similar to Day Surgery can be shared.

### Endoscopy

Endoscopy procedures may follow the same patient flows as Day Surgery. It is anticipated that over time many types of surgery will require a form of endoscopy. Therefore, surgical facilities need to gradually prepare themselves for every operating room to be regarded as an endoscopy theatre. With careful design it is not necessary to perform endoscopy in a separate unit. As long as the endoscopy rooms in a discrete area at one end of the surgical unit, there should be no need to duplicate other facilities. Ideally the section of corridor which serves the Endoscopy procedure rooms should be separated by doors. However, these doors do not need to be lockable.

1. Bed-days; the length of stay of admitted patients is measured in bed-days - beds available per day multiplied by the number of days of care.

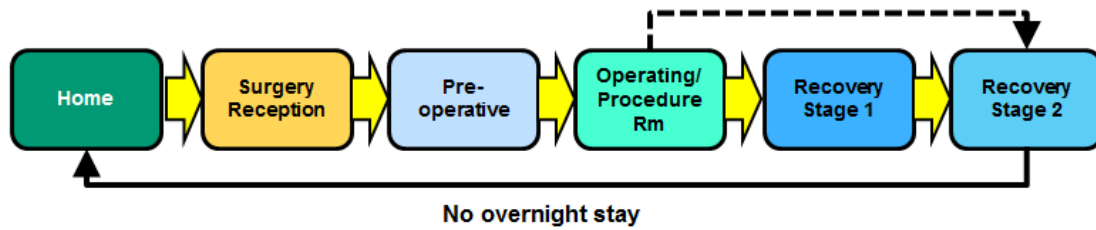


Figure 2: Day Surgery patient flow chart

### Day of Surgery Admissions- (DOSA) or Same-day Surgery

This model is a hybrid between Day Surgery and Inpatient Surgery. In this model the start of the process is similar to Day Surgery, with the patient arriving from home directly to the unit.

However, in this model there is no expectation for the patient to recover and go home the same day. The patient goes through the same process as Day Surgery. However, the patient may undergo more complex surgery than the typical Day Surgery. Then after Recovery Stage 1, the patient will be formally admitted to an inpatient bed for final recovery between 1 and 4 days.

Unlike Day Surgery, DOSA Surgery can continue into the late hours of the night (e.g. 10 pm). This process will save one bedday for each DOSA patient, which will save costs for the healthcare system. It also preserves one bedday for inpatient surgery cases or medical patients. DOSA is only an operational model with no additional facilities required beyond those already provided for Inpatient Surgery and Day Surgery.

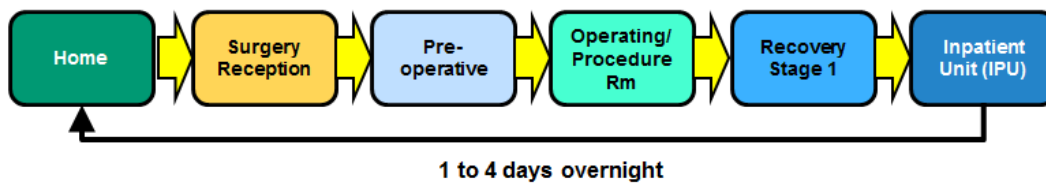


Figure 3: Day of Surgery Admissions / DOSA patient flow chart

### 23 Hour Surgery

Under all of the above models, the Stage 2 Recovery facilities will be unused overnight. This is seen as a waste of resources and valuable investment, resulting in the introduction of 23 Hour Surgery in some countries. This model is similar to Day Surgery, but there is no limit on how late the surgery can take place. A patient may be admitted in late afternoon and undergo surgery as late as 10 pm. Then the patient will recover overnight in the Recovery Stage 2 facilities and be discharged the next morning before the new patients require this facility. Discharge can occur by around 7 am the following morning. This model requires the provision of toilets, showers and overnight nursing within the Recovery Stage 2 area. Also, the Recovery Stage 2 area should be provided with full beds or reclines which can be adjusted to full flat for overnight recovery.

The ideal arrangement for 23 hour surgery is to arrange Recovery Stage 2 as a small version of an Inpatient Unit with small but private cubicles with sliding glass front and individual ensuites. This, however is not mandatory and the traditional curtain cubicle bed bays with shared toilets and showers are also permissible.

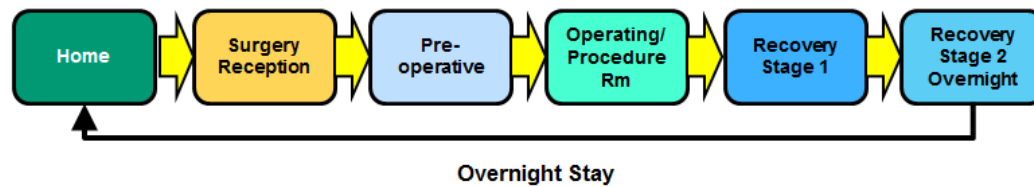


Figure 4: 23 Hour Surgery patient flow chart

### Planning Models

The Operating Unit must be located and arranged to prevent non-related traffic through the Unit.

The number of Operating Rooms and Recovery beds and the sizes of the service areas should be based on the service plan and expected surgical workload. The size, location, and configuration of the surgical suite and support services should reflect the projected case load, the operational model and planning model of the Unit.

A number of planning models and components which should be considered are explained below:

#### Single Corridor model

The single corridor model involves travel of all supplies (clean and used) as well as patients (pre and post-operative) in one main corridor. This option suits relatively compact facilities. It is considered suitable provided:

- The main corridor is sufficiently wide in order to permit separation of passage of goods and patients
- Handling of clean supplies and waste in sealed carts is carefully managed to avoid cross contamination

#### Racetrack (or Sterile Core) model

The Racetrack model allows for all the Operating rooms to be accessed from a corridor system which wraps around a group of operating rooms, usually in two rows, for patient transfers into and out of the operating rooms. The central area between the operating rooms is dedicated to the sterile stock store with direct access to each of the operating rooms. This model is also referred to as the Sterile Core model.

This model can be more compact than the Single Corridor model and suits larger facilities. A Single Corridor Model can be later duplicated (mirrored) to become the Racetrack model so it is a good option for staging major expansions.

#### Clusters of Operating Rooms

In this model Operating Rooms may be clustered according to specialty, with a shared Sterile Stock and Set-up Room for each group or cluster.

Disadvantages of this model include:

- Additional corridor and circulation space required around the clusters of rooms, which reduces the available space for sterile stock;
- Potential duplication of stock and additional staff requirements may result in increased operating costs

#### Dedicated Theatres with Fixed or Mobile Equipment

Generally, it is recommended that around 50% of the operating rooms be designated as General (non-specialised). These General theatres will provide flexibility for a wide range of operations. When necessary, specialised equipment can be brought in and used for specific surgeries. The balance of the operating rooms may be specialised for specific operations with fixed equipment to suit.

This category includes urology, vascular, neurology, ophthalmology, transplant, hybrid or robotic theatres etc. This may be beneficial in larger Operating Units where the case volume justifies specialisation; however, smaller suites may favour flexibility of Operating Room use. Fixed equipment used in specialised operating rooms can restrict the multifunctional use of the room.

## TSSU / SSU

The Operating Unit is a major user of sterile stock and therefore location of the sterilisation facilities and sterile stock store are of high importance.

There are two main options available for the supply of sterile stock to the Operating Unit:

- A dedicated TSSU (Theatre Sterile Supply Unit or sometimes referred to as CSSD) serving only the Operating Unit
- An SSU (Sterile Supply Unit) that serves the Operating Unit and other areas of the hospital

TSSU is usually smaller than SSU. It should be directly attached to the Operating Unit or embedded within the Operating Unit. The TSSU sterile stock store can be merged with the operating unit sterile stock store without the need for duplication.

The SSU may be attached to the Operating Suite for maximum operational efficiency. However, sometimes this arrangement will prevent a future expansion of the Operating Unit or may not fit into the building footprint. As an alternative an SSU may be located on a separate floor and linked to it via dedicated clean and dirty lifts. Reference to dedicated lifts means that the same lifts cannot connect to other floors or be used for any other purpose. Such dedicated lifts will be regarded as vertical corridors or airlocks connecting two related FPU's and compatible functions.

Often, locating the SSU on other floors will free up the floor plan of the Operating Unit for the best planning solutions.

In existing buildings with multiple restrictions where the Operating Unit and SSU cannot be directly linked via lifts, then transportation of instruments (sterilised or used) via service corridors of the hospital in hermetically sealed carts may be acceptable to the Health Authorities. However, this arrangement is not generally recommended and should not be used in new facilities.

The changing facilities for the staff working on the clean side of the TSSU or SSU (e.g. Sorting and Packing or Sterilising areas) can be shared with the Operating Unit. However, the staff working in the decontamination area of TSSU or SSU should have dedicated changing and toilet facilities or use the Operating Theatre facilities from the corridor outside the Unit and only after removing their PPE's and washing their hands in a room before entering the TSSU or SSU.

## **Functional Areas**

The Operating Unit consists of the following functional areas:

- Admissions/ Reception and Holding area for receiving and admission of patients to the Unit, with general overseeing of day-to-day operations. This area controls the entry and exit from the Unit and completion of general administrative tasks including:
  - Reception and Waiting areas
  - Interview room
  - Staff Station and write up bay
  - Bays for handwashing, linen
  - Access to Clean and dirty utilities
  - Holding bays for holding and management of patients prior to their operation or procedure
- Operating Rooms area where procedures are carried out including:
  - Operating Rooms, general, specialty, hybrid, robotic, transplant etc.
  - Anaesthetic Induction Rooms (optional)
  - Scrub up rooms
  - Exit Bays
- Support Areas including:
  - Bays for linen, mobile equipment
  - Blood store
  - Cleaners room/s
  - Clean-up rooms
  - Flash sterilizer (if locally permitted)
  - Pathology area for frozen sections
- Storerooms and storage areas for:



## Part B: Health Facility Briefing & Design

### Operating Unit

- Anaesthetic supplies store
  - Drugs store
  - Equipment store/s, including mobile items, table accessories, loan equipment
  - Minor store for items such as small supplies, pre-sterile packs and minor electronics
  - Perfusion equipment and supplies store (if cardiac surgery is undertaken)
  - Sterile stock store
  - None-sterile store
- Recovery Stage 1 (and Stage 2 for Day Surgery) areas where patients are assisted through the process of recovering from the effects of anaesthetic including:
    - Patient bed bays, open and enclosed for Isolation
    - Bays for blanket warmer, linen, handwashing
    - Clean and Dirty Utilities
    - Patient toilets
    - Store for consumable items and equipment
  - Administrative and Staff Amenities including:
    - Change Rooms with showers, toilets and lockers and additional separate toilets for large units
    - Staff Room
    - Meeting rooms
    - Offices and administrative space for clinical staff

### Operating Unit Reception

The Reception area for Inpatient Surgery is the receiving hub for the patients and visitors entering the Operating Unit. Patients arrive from the IPU, ICU or Emergency Unit on beds/ trolleys. At the reception, depending on the operational policy of the facility the patient may be transferred to a trolley which remains within the Operating Unit whilst the transfer bed or trolley will exit the Unit.

This is known as the bed exchange zone. A line on the floor or sliding glass doors may designate this zone. The staff bringing the patients into the unit may not go beyond the transfer zone and must hand the patient over to the staff already changed and inside the Operating Unit.

The reception design should ideally be located in such a way as to enable observation the entry and exit of patients and to perform quality control. The same reception can also act as a staff station for the Pre-op Holding area (see below).

### Pre-operative (Pre-op) Holding - Inpatients

Patients received at the Operating Unit inpatient Reception are placed in a curtained holding bay or a private cubicle with solid side walls and curtained front. The recommended number of bays/ cubicles is a ratio of 1 per two operating rooms (or procedure rooms). This number may be reduced to as few as 1 per four operating rooms according to the operational policy of the facility if a just-in-time patient transfer system can be organised with minimal or no waiting before the patient transfer to the operating room. Any patient preparation including changing should be done at the Inpatient Unit before the patient is transferred.

It should be noted that this Pre-op Holding facility is different to the Day Surgery Pre-operative area, which is used for patient changing and preparation.

### Day Surgery Reception/ Waiting (if Day Surgery is provided)

Day Surgery, 23 Hour Surgery or DOSA will have a separate Reception and Waiting area. This area is not considered as part of the Surgical zone of the Operating Unit and is not subject to the same dress code as the Operating Unit. Therefore, those arriving at this Reception/Waiting area are in street clothes. They may arrive on foot or in a wheelchair.

The Reception area receives the pre-booked patients and guides them through the Day Surgery processes such as checking the booking and payment system (if any), pre-operative consultation and control of access to the pre-operative area.

The Day Surgery waiting areas with access to amenities should be provided for family groups waiting for patients in surgery. The Reception/ Waiting area should be located to avoid conflict with inpatient traffic entering the Operating Unit via the separate entrance.

Once administrative and consultation processes are completed, the patient will be guided to the Day Surgery Pre-operative area.

Also refer to the separate Day Surgery Unit FPU provided within these Guidelines.

### **Pre-operative (Pre-op) Holding – Day Surgery, 23 Hour Surgery or DOSA**

After attendance at the Reception/Waiting, Day Surgery and DOSA patients are directed to the Pre-op Holding area. The purpose of this area is for patients to change into theatre gowns and wait a short time until they are transferred to the Surgical zone of the Operating Unit. If necessary, a patient relative or carer may accompany the patient and give assistance with changing.

The Pre-op Holding area is a series of bed bays separated by privacy curtains with access to toilets and monitored by a staff station. Alternatively, instead of bed bays, bedrooms with solid walls and glazed front and ensuite bathrooms can be considered.

In the Pre-op Holding area there is no need for separate change rooms as the Pre-op bed bay or bedroom is regarded as the equivalent of a temporary inpatient bedroom and changing is undertaken within the bed bay or bedroom. In the case of paediatrics, it is common and desirable for parents to accompany the patient. In the same area, if appropriate sedation (not anaesthesia) can also be administered to the patient.

Patients are generally transferred from this point on beds/trolleys to the Surgical zone of the Operating Unit through a connecting door or corridor. This process will not require a bed/trolley exchange in the same manner as the Inpatients. Once the bed/trolley is passed on to the Surgical zone of the Operating Unit, the patient will be in the care of the Operating Unit rather than the Day Surgery Unit.

In short, the Pre-op Holding area can be seen as a temporary and more compact version of an Inpatient Unit. In this area, the patient is completely prepared, then transferred to the Operating Unit for surgery. After the Stage 2 recovery (separately explained in this FPU), the patients can also return to the Reception/Waiting area via the Pre-op/Holding area, if the planning geometry requires it. Alternatively, they can bypass the Pre-op/ Holding area and change back to their street clothes within a separate change room or within Recovery Stage 2, then exit via a corridor to the Reception/Waiting area.

### **Anaesthetic Induction Rooms**

The Anaesthetic rooms may be used for administration of local and spinal anaesthetics, patient monitoring or patient preparation prior to the procedure. The same can also be performed in the operating room. General anaesthetics and sedations are typically administered in the operating room. Therefore, Anaesthetic Induction rooms are optional and may be provided based on the facility operator's preference. The use of a separate Anaesthetic Induction room appears to be regionally specific. It seems to be the norm in some countries and not used in others. In countries where there is usually a mix of surgeons and anaesthetists from different regions of the world, the best recommendation would be to provide Anaesthetic Induction rooms for 50% of the operating rooms. In countries where the use of Anaesthetic Induction rooms is common, the provision of one per operating room is recommended.

The functional relations diagrams in this FPU show the preferred location of the Anaesthetic Induction room directly attached to the operating room. This potentially allows the Anaesthetist to attend to a new patient immediately even as the previous patient operation is being completed for transfer.

### **Operating/ Procedure Room/s**

The Operating (or Procedure) rooms are designed and set up to perform any type of surgical procedure on the patient. The procedures may be highly invasive, minimally invasive, sterile or non-sterile. The design may vary slightly according to the intended procedure. It is recommended that designers minimise the degree of specialisation as far as practical. A very high level of specialisation can lead to inefficiency in surgical throughput due to the number of useable operating rooms and functional restrictions imposed by highly specialised operating rooms, such as fixed equipment.

Under this definition, a Procedure room includes a Catheter Lab, Endoscopy procedure room etc.

The Standard Components provided in these Guidelines include general and specialised operating rooms of a variety of sizes. The designers and operators should decide on the allocation of general vs specialised theatres.

In recent times there has been a trend for operators requesting increasingly large operating rooms. It should be noted that beyond the sizes recommended in these Guidelines, the technical functionality of the rooms may not increase but in fact it may become a serious challenge. Operating rooms

## Part B: Health Facility Briefing & Design

### Operating Unit

require laminar flow (turbulent-free) air supply via terminal HEPA filters (absolute filters) directly over the operating table to envelope the patient. The minimum ceiling height of the operating room is 3000 mm and there is a need for 20 air changes per hour. Air must be extracted at the low and high level at the 4 corners of the room, with part of the air exhausted and part recirculated back through the HEPA filters.

This means a very large volume of air with a specific flow to maintain the laminar flow. In extremely large operating rooms this may become very difficult to achieve or control. So, designers should not automatically assume that operating rooms larger than those provided in the Standard Components are necessarily better.

On the other hand, operating rooms which are too small create a crowded and chaotic environment which can result in errors. Small operating rooms are common in older facilities which remain operational. In future refurbishments of such facilities compliance with the minimum sizes recommended in these Guidelines would be appropriate.

Most, if not all service connections accessed by surgeons and anaesthetists are suspended from the ceiling on double articulated arms and booms. The intention is to keep the operating room free of cables, tubes etc. Furthermore, with the current operating room sizes, there is a trend to install monitors on pendants rather than on walls, which may be close to 4 metres away from the surgeon. In short, in most modern operating rooms the walls are largely blank with few, if any service outlets or monitors installed.

### Modular OR

Recent decades have seen the rise in the promotion and use of a type of operating theatre construction commonly referred to as “Modular OR”, or “Modular Theatre”. This is a different concept to modular buildings or modular prefabricated pods. It mostly refers to factory-made wall panels which may be constructed from pre-finished metal sheets, HPL panels or other robust material. The same is also offered for operating room ceilings. These are typically fixed to a steel framework and joined by gaskets. Other than these panels, the design of the operating room is similar to conventional practice and standards.

Under these Guidelines, there is no requirement or preference for this definition of Modular OR or Modular Theatre. If such construction complies with the requirements of these Guidelines (Parts B, C and D), they are most welcome and can be used. However, for maximum clarity, they are not considered mandatory or preferred to conventional operating theatre construction such as those indicated in the Standard Components of these Guidelines. The greatest concern is the use of gaskets for joining numerous individual panels. The conventional construction will utilise impact resistant gypsum sheets or equal, finished with scrubbable paint (such as epoxy paint) or fully welded sheet vinyl or similar, to achieve a monolithic finish without any joints. The same applies to ceilings where a monolithic gypsum or similar flush-set sheeting with scrubbable paint finish would be most preferred. If service access to the ceiling is required, it should be provided via hermetically sealed proprietary access hatches.

### Barn Theatres

Operating Rooms, as described within the functional relationship diagrams shown in this FPU and the Standard Component Room Data Sheets and Room Layout Sheets provided, must be separate. Some operating rooms used for transplant and those used as Hybrid Theatres for the shared use of CT may be interconnected for functional reasons. However, two or more operating rooms may not be fully merged to create a large hall for surgery, referred to as a Barn Theatre.

The principles explained in these Guidelines are highly compromised within such arrangements and therefore unacceptable. These are main unacceptable features of Barn Theatres:

- Lack of acoustic privacy between the operating teams, potentially leading to errors
- Potential cross infection between an infected patient and other patients in the same hall
- Compromise in the laminar flow achieved for each patient
- Compromise in the return air flow from the corners of the room
- Compromise in the level of light required for certain operations, including laser in use
- Compromise in x-ray shielding per patient and staff team

In short Barn Theatres are not deemed compatible with these Guidelines.

### **Dental Surgery**

A conventional outpatient dental practice is also commonly referred to as Dental Surgery. However, this is not the subject of this FPU.

For outpatient dental treatment, please refer to the separate Dental Surgery FPU within these Guidelines. This section refers to complex dental surgery which is performed in an operating room rather than in a dental treatment room.

In an operating room intended for Dental Surgery, in addition to the standard operating room equipment and services, items considered essential for dental procedures are as follows:

- One compressed dental air outlet situated close to the service panels for medical gases, suction and electrical outlets, with the provision of a regulated bottle of appropriate compressed air as emergency backup or secondary use
- Facilities for dental X-ray.

### **Scrub Bay**

Scrub facilities shall be located adjacent to the Operating Rooms. Scrub Bays require sufficient enclosure to ensure the mechanical ventilation system can extract the air and create a relative negative pressure. This is to contain the floating micro-droplets of water and minimise the spread of contaminants potentially floating in the air.

Scrub bays do not require a door to the corridor and can be arranged in a semi-enclosed bay. However, there must be a door access to the operating room. Scrub bays created directly inside the operating rooms are strictly prohibited. Open scrub troughs along the main operating theatre corridors are not considered desirable. In the case of dedicated Endoscopy Rooms, an additional hand wash facility may be provided inside the room.

The door from the scrub bay to the operating room may be dedicated and direct. It should incorporate features so that opening the door in either direction does not require touching the door or door handle. Alternatively, surgeons and nurses can use the main doors to the operating room as long as electric doors are provided with knee, elbow, gesture or similar activation pads.

Direct doors from scrub rooms to the operating rooms should ideally be light doors, opening both ways by light pressure either with the elbow or the hip. This allows the surgeons and nurses to enter the operating rooms backwards without touching the door or door handle.

Optionally, a window may be provided between the scrub bay and the operating room. This allows the surgeons to observe the way the room is being set up for the next case.

### **Recovery Stage 1**

Following general surgery patients are recovered in the Stage 1 Recovery, also known as Post Anaesthesia Care Unit (PACU). Patients with complicated surgery may bypass Stage 1 Recovery and be recovered directly in an ICU. Patients in Stage 1 recovery are under general anaesthesia. They can be moved out once they awake and are assessed by the clinical staff to be in a fit state to be transferred to the next stage of recovery. It should be noted that eventually almost all patients will awake in the Stage 1 Recovery and some may ask to use a toilet. Therefore, it is essential to provide toilets in Stage 1 Recovery (as well as Stage 2) for patients who are able to use them.

The required ratio of beds in Stage 1 Recovery is 2:1 per General Operating/Procedure room and 1.5:1 per Day Surgery Operating/Procedure room. If the same operating rooms are used for both Inpatient Surgery and Day Surgery, then the higher ratio of 2:1 should be used. This ratio can be reduced only if it can be demonstrated that some patients move directly from the Operating room to a dedicated ICU. For example, after Cardiac Surgery.

Recovery Stage 1 is regarded as an internal part of the Operating Unit. Only staff who have changed in the Operating Unit change rooms can enter the Recovery Stage 1.

Recovery Stage 1 applies to Inpatients, Day Surgery and DOSA patients who undergo general anaesthesia. Day Surgery patients who may have an operation under local anaesthesia or may come out of the operating room already awake, may be transferred directly to the Recovery Stage 2, bypassing Recovery Stage 1.

The staff working in Recovery Stage 1 will be under the same dress code as the operating theatres as this area is regarded as part of the surgical zone.

### **Recovery Stage 2**

Day Surgery patients, after they awake from general anaesthesia will progress from Recovery Stage 1 to Recovery Stage 2. Alternatively, they, may be taken directly to Recovery Stage 2 following some procedures requiring minimal sedation or local anaesthetics. In Recovery Stage 2 patients will have regained consciousness following a procedure but still require observation and management. They will be conscious but may prefer to sleep, eat, drink or read.

Recovery Stage 2 may be provided as bed bays or recliner bays or a combination of both. The beds or recliners may be in curtain cubicles or in private rooms with glass or curtain front. The recommended minimum ratio of beds/recliners in Recovery Stage 2 is 2 per Operating/Procedure room. However, a higher ratio of 3 per Operating/ Procedure room is recommended as it allows for a rapid turnover for procedures that take 15 minutes or less.

Based on the operational policy of each facility, Recovery Stage 2 may be regarded as an internal part of the Operating Unit (and part of the surgical zone). Under this policy, nurses and doctors will be under the Operating Unit dress code and those who have changed in the Operating Unit change rooms may enter and work in this area. Under this policy, patients may not change back to street clothes within this area.

Alternatively, Recovery Stage 2 may be regarded in the same manner as a temporary Inpatient Unit (or Day Ward) and regarded as outside the Operating Unit (and not part of the surgical zone). Staff working in this area may have the same dress code as an Inpatient Unit and may not enter the Operating Unit surgical zone. Under this policy, patients may be allowed to change back to street clothes as they wait for discharge.

If Recovery Stage 2 is regarded as the equivalent of a temporary Inpatient Unit (or Day Ward), it may be located adjacent Stage 1 Recovery for convenient patient movement. Alternatively, it may be placed remotely from Stage 1 Recovery in a suitable location within the facility linked by a restricted travel corridor.

In the 23 hour surgery model, Recovery Stage 2 can be repurposed for overnight stay of patients. The enhancements required include additional privacy, access to toilets, showers and overnight nursing care.

### **Recovery Stage 3 (or Discharge Lounge)**

Recovery Stage 3 is an optional lounge area, where patients have already recovered and dressed in street clothes, awaiting collection by relatives, friends or the facility's transportation service.

Patients in Recovery Stage 3 (or Discharge Lounge) will be in comfortable recliners or lounge chairs. The recommended ratio of chairs in Recovery Stage 3 is 3 per Operating/ Procedure room.

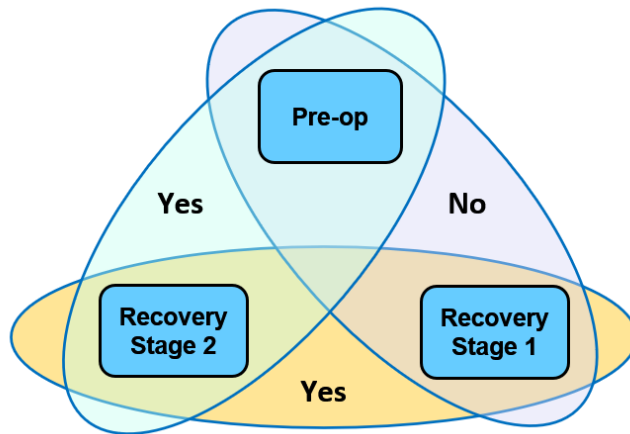
Recovery Stage 3 is not considered as part of the Operating Unit (or surgical zone) and therefore the staff and patients are not subject to the dress code of the Operating Unit. Recovery Stage 3 can be located remote from the Operating Unit. For example, it may be a lounge off the main entrance and closer to the vehicle pickup area. If a remote location is chosen, then the necessary provisions for the patients such as toilets and a staff station should be provided separately.

### **Back-to-Back Recovery Areas**

Recovery Areas which are used for Day Surgery patients including Endoscopy and Catheter Lab (but not Inpatient Surgery or DOSA or 23 hour surgery) may be co-located back-to-back for greater operational efficiency. The diagram below indicates the type of back-to-back recovery areas which are allowed (or not). When the recovery areas are co-located, a reasonable zonal separation is required between those who are unconscious and those who are conscious but without physical separation. This can be managed operationally.



**Permitted Back to Back  
In Day Surgery and Endoscopy only**  
(subject to zonal separation and work practices)



### Pathology Area

Depending on the service plan and unit policy, an area for preparation and examination of frozen sections may be provided.

Based on the facility operational policy a Stat Lab can also be provided for certain immediate tests.

This may be part of the general Pathology Laboratory if immediate results are obtainable without unnecessary delay in the completion of surgery.

### Flash Sterilising Facilities

A limited number of Flash Sterilisers may be located in the unit. However, the use of this method of sterilising should be restricted to situations where a single instrument has been dropped in mid-operation and there is no sterile duplicate available. Flash sterilising is not suitable for processing of cannulated, complex instruments, suction and other tubing, textiles, paper or liquids. The utilisation of a Flash Steriliser should be carefully considered and applied according to the Operational Policies of the facilities. Permission to use Flash Sterilisers should be checked with the Health Authority before installation and use. Some Health Authorities permit only a limited number of Flash Sterilisers as their regular use may be regarded as an operational risk.

### Storage

Adequate Store room/s for equipment and supplies used in the Operating Unit shall be provided including sterile stock, consumables, anaesthetic supplies, drugs and equipment such as operating table accessories, mobile microscopes and other mobile equipment. Sterile stock storage should be provided at the minimum rate of 10 to 12 m<sup>2</sup> per Operating Room. Equipment storage should be provided at a rate of 10 to 11 m<sup>2</sup> per Operating Room.

Note:

- Equipment Store Rooms do not necessarily require doors.
- Store Rooms are best designed in an elongated rectangular shape to allow easy front access to all items.
- The design of the Operating Unit should allow for ease of access to the storage areas for delivery of Operating Unit consumables. Controlled access from an external corridor is highly desirable.

Mobile Equipment Bays shall be provided for equipment such as portable X-ray equipment, stretchers, patient transportation trolleys, warming devices, and other mobile equipment. Mobile Equipment Bays shall comply with Standard Components and distributed for easy access. Equipment Bays are best designed as elongated rectangular shapes and may be combined for space efficiency.

Non-sterile store is a special use storage facility intended for receiving manufactured, pre-sterile items and consumables such as catheters, sutures, single use linen, masks, gloves etc.

## Part B: Health Facility Briefing & Design

### Operating Unit

These items arrive in boxes which are not regarded as clean (and therefore the name Non-sterile store). The contents are removed and transferred to the appropriate store room within the Operating Unit. The boxes are discarded outside the unit without entering the unit. Therefore the Non-sterile store will have a door to the outside and a door to the inside of the unit. Those delivering the boxes of goods may not enter the Operating Unit except just inside the entrance to the Non-sterile store.

#### Administration

Offices and workstations will be required for senior staff managing the various zones of the unit to undertake administrative functions, or to facilitate educational and research activities. Offices and workstations may be located within a discreet zone remote from the surgery areas.

Adequate access to meeting rooms should be provided to facilitate education and research activities within the Unit. Activities and procedures within the operating rooms may be streamed to meeting rooms for education and training purposes.

If the offices are located within the Operating Unit, all staff using these facilities will be subject to the Operating Unit dress code and must already be changed into theatre gowns in the main pass-through change rooms.

If the offices are located outside the Operating Unit, the staff may not freely enter the Operating Unit unless they change in the main pass-through change rooms.

#### Staff Change Rooms

Separate Male and Female Change Rooms shall be provided for nurses, doctors and technicians working within the Operating Unit. The Operating Unit change rooms should be in the pass-through style with a separate entrance from outside the Unit and exit directly into the Unit.

The Operating Unit interior zone after these pass-through change rooms is referred to as the surgical zone (or clean zone) and staff will be free to move to their designated workplace including the Operating Rooms, Sterile Stock store and Recovery Stage 1.

The Change Rooms should contain adequate lockers, showers, toilets (but not urinals), handbasins and space for donning surgical attire and booting.

In highly restricted buildings and refurbishment of old buildings where a pass-through design may not be possible, a single entry/exit point for each change room may be provided. However, access to the Change room should be via an air lock or corridor with one door to the outside and one door to the inside of the Operating Unit. Therefore, the pass-through is achieved via the air lock or corridor rather than the change room.

Another alternative is to place the entrance to the Change Rooms just inside the main entrance to the Operating Unit, before the Reception area, within the **bed exchange zone**. This will put the staff entrance under the observation of the Reception area, which may be regarded as a security feature preventing unauthorised persons from following doctors and nurses into the Change Rooms.

Notes:

- It is desirable but not mandatory to increase the number of change room facilities for female change rooms by approximately 30%.
- The use of urinals in existing facilities are permitted, however for new facilities they are discouraged.
- Warm air hand dryers shall be avoided.
- Lockers may be full height, half lockers or quarter lockers.
- Space should be set aside for used gown bins, shelves for new gowns and racks for boots.

## 4 Functional Relationships

### External Relationships

The Operating Unit requires close relationships with the following areas, particularly for urgent cases:

- Emergency Unit (and its attached Ambulance Bay)
- Inpatient Units (all types)
- Critical Care Units (ICU, HDU, CCU, NICU)

## Part B: Health Facility Briefing & Design

### Operating Unit

- Obstetric/Birthing Unit for Caesarean Section procedures
- Helipad

Links between these Units and the Operating Unit should be rapid, direct and discreet; transit of severely ill patients to and from the Unit through public corridors or lifts should be avoided.

The Operating Unit may have a direct operational link with the following Units:

- Day Surgery
- Endoscopy
- Catheter Laboratory
- TSSU or SSU

Other Units that have a close relationship include:

- Laboratory Unit

### ***Internal Relationships***

Internally, the Operating Unit will be arranged in functional zones. The entrance to the unit will provide access control at the Reception and all other access points such as Change Rooms, Non-sterile store, disposal room etc.

For internal relationships refer to the Functional Relationship Diagrams below.

### ***Functional Relationship Diagrams***

The relationships between the various components within an Operating Unit are best described by functional relationship diagrams. The requirements for infection control and patient management result in several planning 'models' which have proved successful through numerous built examples and many years of practice. Most Operating Unit plans are a variation of one of these 'models'. The most common models are also described above under the section titled "Planning Models".

A plan substantially based on one of the diagrams and permutations provided within this FPU is 'deemed to satisfy' the requirements of these Guidelines. A plan that is significantly different to these diagrams and permutations should be carefully examined against all the individual requirements of these Guidelines, to determine if it is acceptable. It should be noted that some older practices from decades past are no longer regarded as appropriate and should not be automatically followed.

In reviewing and using the enclosed Operating Unit flow diagrams, designers should carefully consider a number of issues:

- Each flow diagram represents a method of managing patient and staff access, clean/dirty activities, air pressurisation etc.
- The diagrams are different but each one addresses the issues involved in a satisfactory manner. All options shown are regarded as acceptable.
- Each option may suit a different management mode or building configuration or structural grid. Some options are more suitable for a regular structural grid than others.
- Designers are strongly cautioned against creating hybrid options by combining features of various permutations of the diagrams provided. This may result in wrong clean/dirty flows or other unacceptable features. If in doubt, designers should seek advice from specialist Operating Room consultants and Infection Control nurses to interpret the requirements of this FPU.

The functional relationship diagrams below show a base linear configuration. This model can be stretched to create the number of Operating Rooms desired. The support facilities required also grow with the number of Operating Rooms.

Each module includes the configuration of:

- Operating Rooms
- Optional Anaesthetic Induction Rooms
- Scrub Rooms
- Sterile Stock Store / Set-up Room



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- Clean-up Room
- Optional Flash Sterilising Bay

The optimal internal relationships are demonstrated in the diagrams below:

- Arrows indicate the direction of flow
- Adjacencies of rooms indicate the desired relationships
- Separate entrances to the Unit for staff, services and patients
- Control of access for all persons and patients entering
- Staff Station located for best observation

Operating Unit Single Corridor Model

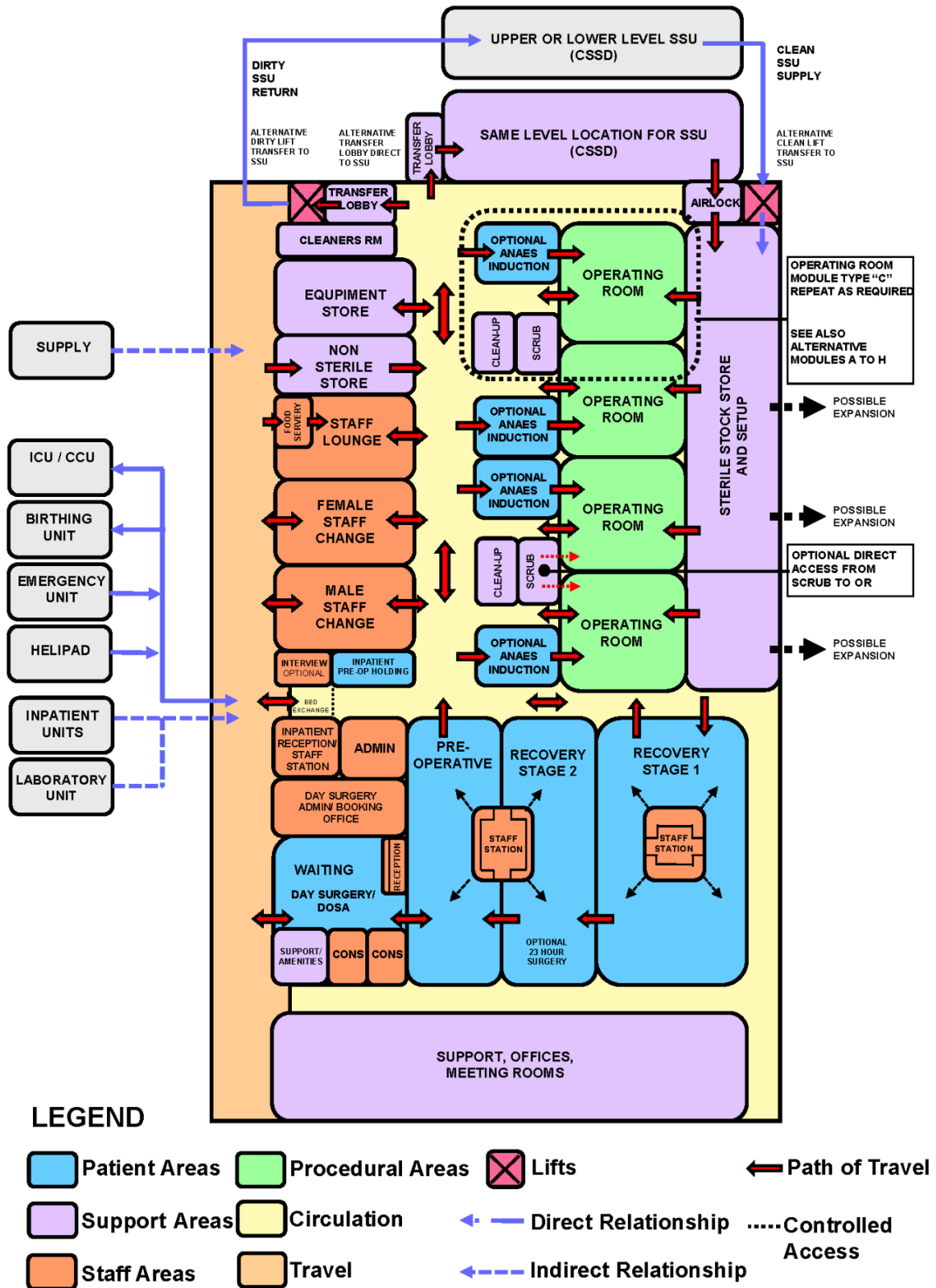
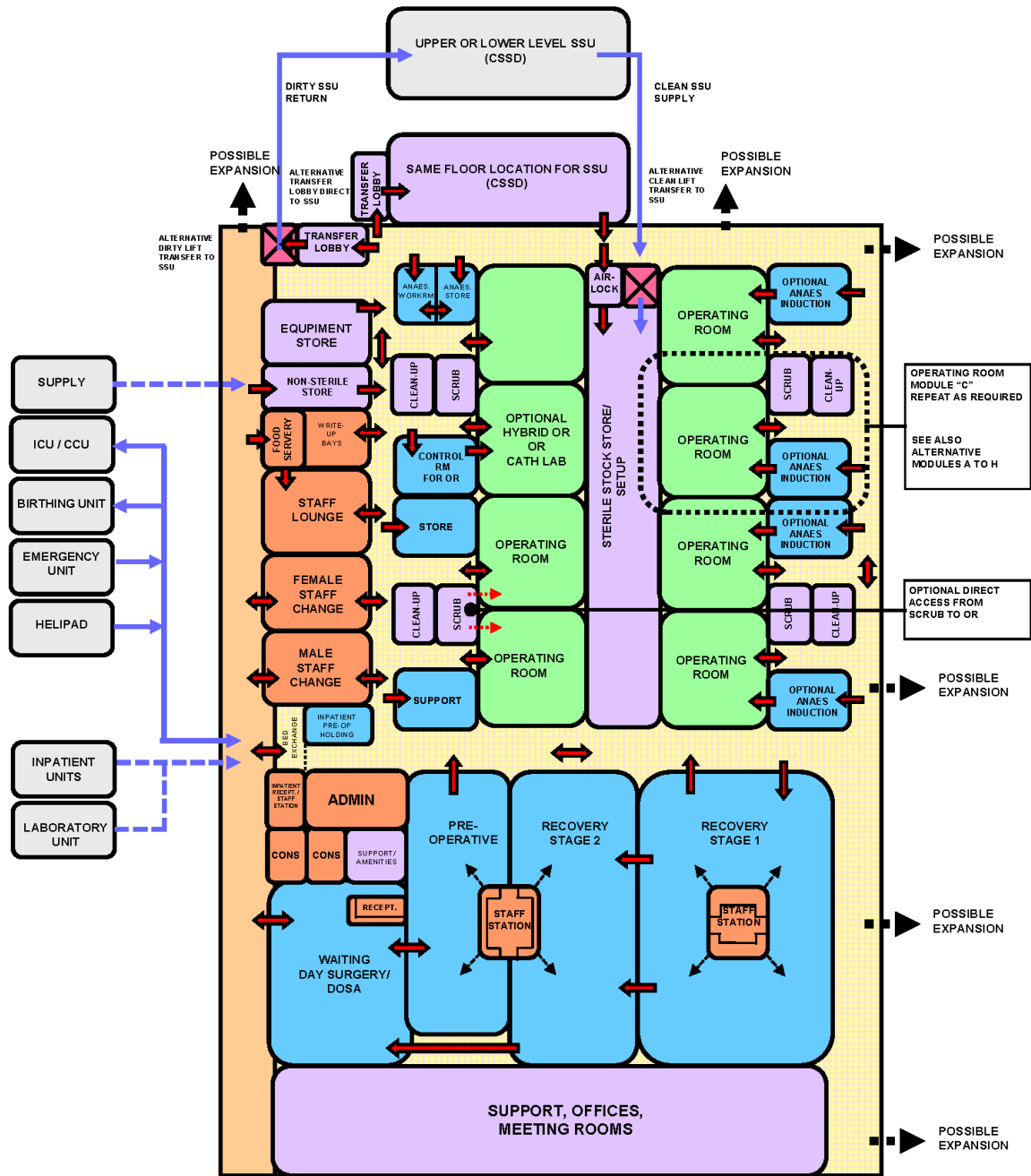


Figure 5 Functional Relationship Diagram: Operating Unit – Single Corridor Model

Operating Unit Racetrack (or Dual Corridor) Model



LEGEND

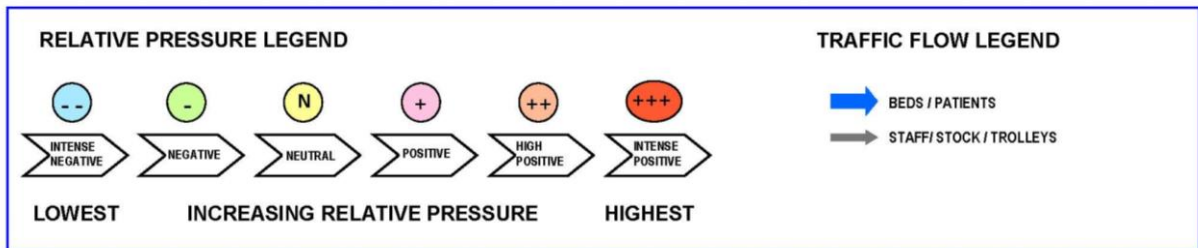
- Patient Areas
- Procedural Areas
- Lifts
- Support Areas
- Circulation
- Staff Areas
- Travel
- Path of Travel
- Direct Relationship
- Indirect Relationship
- Controlled Access

Figure 6 Functional Relationship Diagram: Operating Unit – Dual Corridor Model

### Operating Room Modules and Air Pressurisation Diagrams

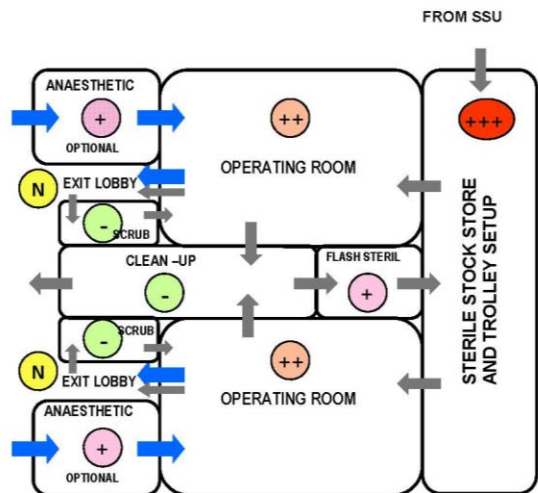
The zone marked as Operating Room Modules in the above diagrams can have multiple permutations shown in this section. These permutations defined the relationship between the most important rooms serving the Operating Room. The Module Options A to E show the required relationships between the rooms and the relative air pressurisation required. Each module represents ideal relationships and maintains the correct and acceptable flows.

Air pressurisation and traffic flows have been graded from the lowest pressure to the highest pressure according to the legend below. The common corridors linking the various rooms inside the surgery zone are regarded as having Neutral Pressure designated as (N). Pressurisation less than N are designated as (-) and (- -). Pressurisation more than (N) are designated as (+) or (++).

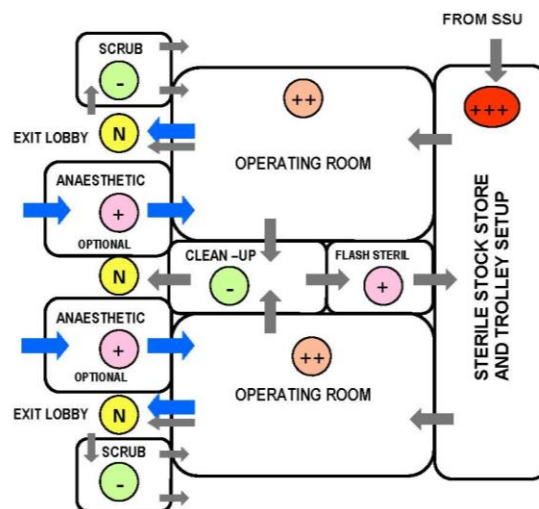


Modules A to H

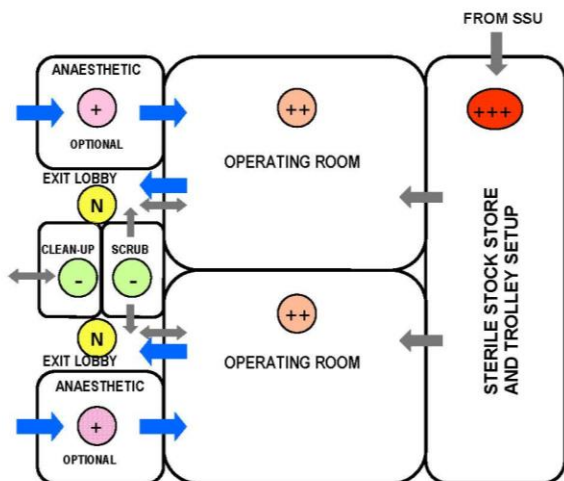
Modules Types A to H are shown below/overleaf. It should be noted that Module C is shown by default in the main Functional Relationship Diagrams for Single Corridor and Racetrack (Dual Corridor) options above. This is due to the relative popularity of Module C.



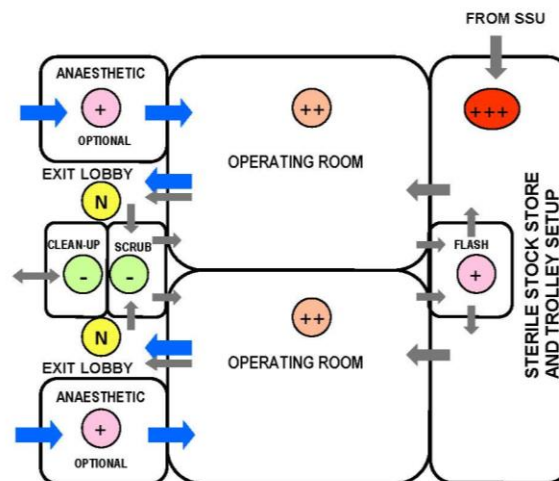
**Operating Room  
Module Type A**



**Operating Room  
Module Type B**



**Operating Room  
Module Type C**



**Operating Room  
Module Type D**

Figure 7 Air Pressurisation Diagrams: Operating Unit – Modules A to D

Module Types E to H

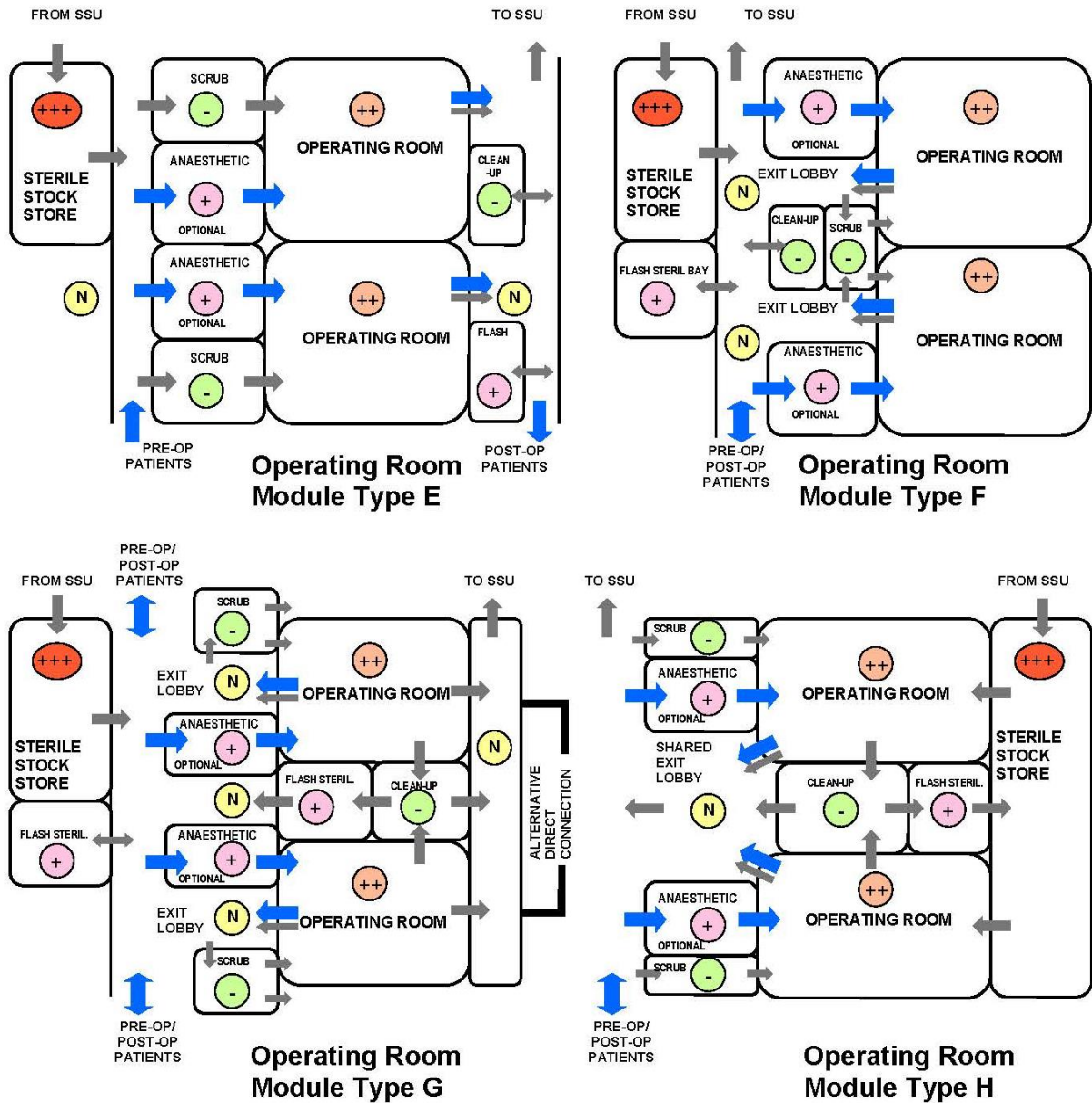


Figure 8 Air Pressurisation Diagrams: Operating Unit – Modules E to H

## 5 Design

### *Environmental Considerations*

#### Acoustics

Acoustic privacy is required in Operating Rooms, Procedure rooms, Interview, Treatment rooms and any rooms where confidential information will be discussed. However, in the Operating Unit smooth, cleanable finishes are required and are seen as critical. Therefore, in these areas the use of porous acoustic panels often used for sound attenuation will not be required.

The transfer of sound between clinical spaces should be minimised to reduce the potential of staff error from disruptions and miscommunication and to increase patient safety and privacy. Noisy areas such as Staff rooms should be located away from procedural areas.

Options such as combining several operating rooms to create a larger operating hall for multiple patients (referred to as Barn Theatres) is not permitted, partly due to the noise interference, distraction and potential mistakes.

#### Natural Light

The need for an external view from the Operating Room is an important consideration. Provision of windows need to consider the following:

- Fixed windows to operating rooms are welcome and desirable when possible, however windows are not mandatory.
- Vision from the Operating Room could be through a corridor, set up area or directly to the external environment.
- All windows will require a screening device for light control, including full blackout. However, such devices may not be inside the operating room. They can only be within double glazing or outside the operating room.
- There are heating, cooling, and shading implications for windows in the Unit located on the outside of the building that may have an impact on the design of the mechanical systems inside the operating room.
- Viewing windows from a corridor to the Operating Room can be useful for supervision and training purposes. However, increasingly these are replaced with multiple cameras which provide a better view, unobstructed by the surgeons and nurses.
- Windows to Recovery areas, Staff Lounge and TSSU are not mandatory but highly desirable.

#### Privacy

Careful consideration of privacy and patient comfort is required to reduce discomfort and stress for patients and privacy screening will be required to all patient bed bays.

#### Interior Decor

Interior décor refers to 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.

Colours should be used in combination with lighting to ensure that they do not mask skin colours as this can be a problem in areas where clinical observation takes place.

In Operating Suites very light colours or simply off-white are often used. In Operating Rooms any colour which may mask the colour of blood during the cleaning process is regarded as undesirable. So, red, pink, light brown, orange or yellow colours for floors and walls are not desirable. In Operating rooms colours such as off-white, light blue, light green, teal or light grey are most desirable.

In order to create an attractive space within the otherwise bland operating rooms images and large graphics such as flowers or abstract art may be applied to the walls but protected by transparent material such as glass for easy cleaning.



## **Space Standards and Components**

### **Accessibility**

The Reception desks, Waiting areas and Interview rooms should provide access for patient relatives and visitors in wheelchairs.

### **Doors**

All entry points, doors or openings requiring bed/trolley access including Operating Rooms are recommended to be a minimum of 1400 mm wide, unobstructed. Larger openings may be required for special equipment, as determined by the Operational Policy, to allow the manoeuvring of equipment without manual handling risks and risk of damage.

For individual door clearances please also refer to the relevant Room Layout Sheets.

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

### **Ergonomics/OH&S**

Design of clinical spaces including Operating and Procedure rooms must consider Ergonomics and OH&S issues for patient and staff safety and welfare.

Refer to Part C – Access, Mobility, OH&S of these Guidelines for more information.

### **Size of the Unit**

The size of the Operating Unit (number of operating rooms) will be determined by the Clinical Services Plan establishing the intended services scope and complexity. Nothing in this FPU or within the iHFG dictates the minimum or maximum number of operating rooms required.

Typical Schedules of Accommodation have been provided for typical units at role delineation levels 2 (less complex services) to 6 (teaching/research facilities).

### **Curtains and Blinds**

Windows that require screening within the entire Unit shall be double glazed with internal blinds. Surface mounted blinds or window curtains are not permitted in the Operating Unit due to difficulty in cleaning and maintaining a dust free environment.

Privacy bed screens must be provided to each bed bay in Holding and Recovery areas. Privacy bed screens must be washable, fireproof and cleanly maintained at all times. Disposable bed screens may also be considered.

## **Safety and Security**

Access control is required to the patient and staff entry areas of the Operating Unit. Limiting the number of entries and locating the Reception area with direct overview of entry areas is highly desirable. The perimeter of the Unit must be secured, and consideration given to electronic access for all staff areas.

Patient entry into the unit from the outside corridor may be combined with the patient exit out of the Operating unit after recovery. This may be desirable for quality control (who has come in and who has gone out). It is also possible to create a separate and more direct exit for patients from the Recovery areas back to the outside corridor.

### **Finishes**

Operating Units shall have the following finishes:

- Floors should be smooth, monolithic, slip resistant, impervious and washable. In wet areas, the floor material should be graded to fall to the floor waste. Ideally the floor finish should be coved against the wall up to a height not less than 125 mm for easy cleaning.
- In areas such as scrub and operating rooms, where staining chemicals such as iodine may be used, the floor material should resist staining and be easy to clean.
- Wall finishes should be smooth, monolithic, impervious and washable.
- For wall finishes, seamless material will be preferred such as scrubbable paint (epoxy paint) welded sheet vinyl, PCV, welded resinates and similar.



## Part B: Health Facility Briefing & Design

### Operating Unit

- Panelised wall systems (referred to as Modular Theatres) may be used subject to highly reliable gasket systems which require no maintenance and are impervious to air and liquids. Modular Theatres or metal panels in general are not mandatory.
- Ceiling finishes should be smooth, monolithic, impervious and washable. Tiled ceilings or any panelised ceiling system with joints are not desirable.

### **Fixtures, Fittings and Equipment**

Equipment, furniture, fittings and the facility itself shall be designed and constructed to be safe, robust and meet the needs of a range of users. All furniture, fittings and equipment selections for the Operating Unit should be made with consideration to ergonomic and Occupational Health and Safety (OH&S) aspects. Particular consideration should be given to compact units for sterile items, storage and movement of loan equipment and shelving for storage of heavy items.

Refer to Part C of these Guidelines, the Room Layout Sheets (RLS) and Room Data Sheets (RDS) for more information.

### **Building Service Requirements**

#### Information Technology (IT) and Communications

The Operating Unit will require special consideration of the following IT/Communications items in the design of the Unit:

- Picture archiving communications systems (PACS) and location of monitors
- Paging for staff and emergencies
- Voice and data cabling for telephones and computers
- Bar coding systems for supplies and records
- Wireless network requirements
- Videoconferencing requirements for meeting rooms
- Digital operating room requirements particularly camera linkages to seminar and education facilities for teaching purposes
- Communications rooms and server requirements.

Patient and Emergency Call facilities shall be provided in all patient bed areas (e.g. Holding bays, Recovery bays, Lounges, Change Rooms and Toilets) 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 visible from Staff Stations and audible in Staff Rooms and Meeting Rooms, and should be of the "non-scrolling" type, allowing all calls to be displayed at the same time.

#### Heating, Ventilation and Air conditioning (HVAC)

The Operating Rooms will require special air-conditioning with positive pressure and HEPA filtration to comply with relevant standards and guidelines shown in Part E of these Guidelines. Individual Operating Room temperatures should be controllable by staff from within the room. Please refer to Part E of these Guidelines for details.

#### Medical Gases

The main storage of medical gases must be outside the Operating Unit and reticulated internally to gas outlets. Provision shall be made for additional separate storage of reserve gas cylinders necessary to complete at least one day's procedures.

#### Radiation Shielding and Radiation Safety

All Operating Rooms require radiation shielding. A certified physicist or qualified expert will need to assess the plans and specifications for radiation protection as required by the relevant local radiation/nuclear safety authorities. A radiation protection assessment will specify the type, location and amount of radiation protection required for an area according to the equipment types, the layout of the space and the relationship between the space and other occupied areas. It should be noted that the x-ray equipment may change over time. So, the shielding provision should take this into consideration and make a general provision for the present and the future.

## Part B: Health Facility Briefing & Design Operating Unit

Incorporate all radiation protection requirements into the final specifications and building plans and re-evaluate radiation protection if the intended use of a room changes, equipment is substantially upgraded, or surrounding room occupancy is altered. Consideration should be given to the provision of floor and ceiling shielding when rooms immediately above and below are occupied.

### Staff Call

Patient, Staff Assist and Emergency Call facilities must be provided in all patient areas (e.g., Anaesthetic Induction Room, Holding bays, Recovery bay, Lounges, Change Rooms and toilets) in order for patients and staff to request urgent assistance.

The individual call buttons will alert to a central module situated at or adjacent to the Staff Station. Calls must be audible in Utilities, Staff Room and Meeting Rooms within the Unit. The alert to staff members should be done in a discreet manner at all times. Calls left unanswered should be escalated by the system automatically. In modern facilities, individual hand-held devices may be used and carried by clinical staff.

### Infection Control

Infection control issues are paramount in the Operating Unit and require careful attention to planning models and separation of clean and dirty workflows.

The need for Isolation rooms (Positive and Negative Pressure) in Holding and Recovery areas is to be evaluated by an infection control risk assessment and will reflect the requirements of the Service Plan. As a minimum, the provision of Negative Pressure isolation room including ante-room within the Recovery areas is required.

By default, Operating Rooms will require Positive Pressure. The need for Negative Pressure Operating Rooms shall be determined by the Service Plan and Operational Policy of the Unit. Such a provision must be restricted to certain patient types.

### Hand Wash Basins

Clinical hand-washing facilities shall be provided within all patient holding and recovery areas and convenient to the Staff Stations. The ratio of provision shall be a minimum of one clinical hand-washing facility for every four patient bays in open-plan areas.

Refer also to Part D - Infection Control in these Guidelines for additional information.

### 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.

Refer to Part D – Infection Control of these Guidelines for further information.

## 6 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, more than one configuration is 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.

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**Operating Unit**

- 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) 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 when 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 (SOA) of this FPU.

**Non-Standard Components**

Non-Standard rooms are identified in the Schedules of Accommodation as NS and are described below.

**Biomedical Store/ Workshop**

An area for testing operating equipment may be included in the Operating Unit. This room may be collocated with a General Store, or a dedicated room for this purpose may be necessary. A direct corridor access to this room is recommended, with led access to the remainder of the Operating Unit.

**Perfusion Room**

The Perfusion Room is for the preparation of perfusion equipment, and where set-up of perfusion equipment for cardiac procedures may be undertaken. The room will be located in close proximity to the Cardiac Operating Room/s and adjacent to a Perfusion Store.

Room requirements may include:

- Heavy duty shelving for storage of perfusion fluids and equipment
- Computer workstation for a perfusion technician including power and data outlets.
- Handwashing basin Type B with paper towel and soap fittings
- Bench, sink and cupboard unit for servicing of the perfusion machine.

**7 Schedule of Equipment (SOE)**

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

Room Name		
Operating Room - General, room code (or-gn-i), Operating Room - Large, Room Code (or-la-i)		
Air flowmeter	Infusion pump: single channel	Pump: suction/ aspirator, surgical

**Part B: Health Facility Briefing & Design**  
**Operating Unit**

Room Name		
Anaesthesia unit: standard	Infusion pump: syringe	Stool: adjustable, OR
Cabinet: storage, instrument, OR	Integration system: OR	Suction adapter
Control panel: surgical	Light: surgical, ceiling, with monitor arms & camera	Supply unit: ceiling, anaesthesia
Defibrillator: with monitor	Medication dispensing system: automated, anaesthesia	Supply unit: ceiling
Endoscopy tower: laparoscopy	Monitor: physiologic, operating theatre/ cardiac	Tracking system: instrument tray
Headlight: surgical	Operating table: electric, general	Warming cabinet
Hypo-hyperthermia unit: general	Oxygen flowmeter	
Infusion pump: rapid, blood/solution warming	Pump: suction/ aspirator, portable	
Operating Room - Cardiac, Room Code (or-ca-i)		
Air flowmeter	Infusion pump: rapid, blood/ solution warming	Pump: suction/ aspirator, surgical
Anaesthesia unit: standard	Infusion pump: single channel	Smoke evacuation system, surgical
Atherectomy System: rotational	Infusion pump: syringe	Stool: adjustable, OR
Cabinet: storage, instrument, OR	Integration system: OR	Suction adapter
Coagulation unit: ACT	Light: surgical, ceiling, with monitor arms & camera	Supply dispensing system: automated, catheter
Control panel: surgical	Medication dispensing system: automated, anaesthesia	Supply unit: ceiling, anaesthesia
Defibrillator: with monitor	Monitor: physiologic, operating theatre/ cardiac	Supply unit: ceiling
Electrosurgical unit: monopolar/ bipolar	Operating table: electric, general	Thrombectomy system: catheter
Headlight: surgical	Oxygen flowmeter	Tracking system: instrument tray
Heart/ lung bypass machine	Pump: intra-aortic balloon (IABP)	Ultrasound scanning unit: cardiac/ echo
Hypo-hyperthermia unit: general	Pump: suction/ aspirator, portable	Warming cabinet
Operating Room - ENT/ Ophthalmology, Room Code (or-ent-oph-i)		
Air flowmeter	Integration system: OR	Oxygen flowmeter
Anaesthesia unit: standard	Laser unit: surgical, holmium	Phaco system: ophthalmic
Cabinet: storage, instrument, OR	Laser: ophthalmic, YAG	Pump: suction/ aspirator, portable
Control panel: surgical	Laser: ophthalmic, retinal photocoagulation	Pump: suction/ aspirator, surgical
Defibrillator: with monitor	Light: surgical, ceiling, with monitor arms & camera	Stool: adjustable, OR
Diagnostic set: ophthalmic	Medication dispensing system: automated, anaesthesia	Suction adapter
Endoscopy tower: laparoscopy	Microdebridement unit: ENT	Supply unit: ceiling, anaesthesia
Headlight: surgical	Monitor: physiologic, operating theatre/ cardiac	Supply unit: ceiling
Hypo-hyperthermia unit: general	Operating microscope: ENT	Tonometer: IOP
Infusion pump: rapid, blood/ solution warming	Operating microscope: ophthalmic	Tracking system: instrument tray
Infusion pump: single channel	Operating table: electric, ENT/ ophth	Vitreoretinal system: anterior/ posterior segments
Infusion pump: syringe	Ophthalmoscope: indirect, binocular	Warming cabinet
Operating Room - Hybrid - CT Scanning, Room Code (or-hy-ct-i)		
Air flowmeter	Infusion pump: single channel	Pump: suction/ aspirator, portable
Anaesthesia unit: standard	Infusion pump: syringe	Pump: suction/ aspirator, surgical
Cabinet: storage, instrument, OR	Injector: contrast media, CT	Scanning unit: CT
Control panel: surgical	Integration system: OR	Stool: adjustable, OR
Defibrillator: with monitor	Light: surgical, ceiling, with monitor arms & camera	Suction adapter
Endoscopy tower: laparoscopy	Medication dispensing system: automated, anaesthesia	Supply unit: ceiling, anaesthesia
Headlight: surgical	Monitor: physiologic, operating theatre/ cardiac	Supply unit: ceiling
Hypo-hyperthermia unit: general	Operating table: electric, general	Tracking system: instrument tray
Infusion pump: rapid, blood/ solution warming	Oxygen flowmeter	Warming cabinet

**Part B: Health Facility Briefing & Design**  
**Operating Unit**

Room Name		
<b>Operating Room - Hybrid - MRI Scanning, Room Code (or-hy-mri-i)</b>		
Air flowmeter	Infusion pump: single channel	Pump: suction/ aspirator, portable
Anaesthesia unit: standard	Infusion pump: syringe	Pump: suction/ aspirator, surgical
Cabinet: storage, instrument, OR	Integration system: OR	Scanning unit: MRI
Control panel: surgical	Injector: contrast media, MRI	Stool: adjustable, OR
Defibrillator: with monitor	Light: surgical, ceiling, with monitor arms & camera	Suction adapter
Endoscopy tower: laparoscopy	Medication dispensing system: automated, anaesthesia	Supply unit: ceiling, anaesthesia
Headlight: surgical	Monitor: physiologic, operating theatre/ cardiac	Supply unit: ceiling
Hypo-hyperthermia unit: general	Operating table: electric, general	Tracking system: instrument tray
Infusion pump: rapid, blood/ solution warming	Oxygen flowmeter	Warming cabinet
<b>Operating Room - Hybrid - Vascular/ Cardiac, Room Code (or-hy-vs-i)</b>		
Air flowmeter	Infusion pump: single channel	Smoke evacuation system, surgical
Anaesthesia unit: standard	Infusion pump: syringe	Stool: adjustable, OR
Angiography: interventional radiology	Injector: contrast media, angiography	Suction adapter
Atherectomy System: rotational	Integration system: OR	Supply dispensing system: automated, catheter
Cabinet: storage, instrument, OR	Light: surgical, ceiling, with monitor arms & camera	Supply unit: ceiling, anaesthesia
Coagulation unit: ACT	Medication dispensing system: automated, anaesthesia	Supply unit: ceiling
Control panel: surgical	Monitor: physiologic, operating theatre/ cardiac	Thrombectomy system: catheter
Defibrillator: with monitor	Operating table: electric, general	Tracking system: instrument tray
Electrosurgical unit: monopolar/ bipolar	Oxygen flowmeter	Ultrasound scanning unit: Intravascular (IVUS)
Headlight: surgical	Pump: intra-aortic balloon (IABP)	Ultrasound scanning unit: cardiac/ echo
Heart/ lung bypass machine	Pump: suction/ aspirator, portable	Warming cabinet
Hypo-hyperthermia unit: general	Pump: suction/ aspirator, surgical	
Infusion pump: rapid, blood/ solution warming	Rack: lead apron	
<b>Operating Room - Neurosurgery, Room Code (or-neuro-i)</b>		
Air flowmeter	Infusion pump: single channel	Pump: suction/ aspirator, portable
Anaesthesia unit: standard	Infusion pump: syringe	Pump: suction/ aspirator, surgical
Cabinet: storage, instrument, OR	Integration system: OR	Stool: adjustable, OR
Control panel: surgical	Light: surgical, ceiling, with monitor arms & camera	Suction adapter
Defibrillator: with monitor	Medication dispensing system: automated, anaesthesia	Supply unit: ceiling, anaesthesia
Endoscopy tower: laparoscopy	Monitor: physiologic, intracranial pressure (ICP)	Supply unit: ceiling
Headlight: surgical	Monitor: physiologic, operating theatre/ cardiac	Tissue ablation unit: ultrasonic
Hypo-hyperthermia unit: general	Operating microscope: neuro	Tracking system: instrument tray
Image guided system: surgical navigation, neuro	Operating table: electric, neuro	Warming cabinet
Infusion pump: rapid, blood/ solution warming	Oxygen flowmeter	
<b>Operating Room - Orthopaedic, Room Code (or-orth-i)</b>		
Air flowmeter	Infusion pump: rapid, blood/ solution warming	Pump: suction/ aspirator, portable
Anaesthesia unit: standard	Infusion pump: single channel	Pump: suction/ aspirator, surgical
Cabinet: storage, instrument, OR	Infusion pump: syringe	Stool: adjustable, OR
Control panel: surgical	Integration system: OR	Suction adapter
Defibrillator: with monitor	Light: surgical, ceiling, with monitor arms & camera	Supply unit: ceiling, anaesthesia
Endoscopy tower: arthroscopy	Medication dispensing system: automated, anaesthesia	Supply unit: ceiling
Headlight: surgical	Monitor: physiologic, operating theatre/ cardiac	Tourniquet: surgical, automated

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**Operating Unit**

Room Name		
Hypo-hyperthermia unit: general	Operating table: electric, ortho/ trauma	Tracking system: instrument tray
Image guided system: surgical navigation, ortho	Oxygen flowmeter	Warming cabinet
Operating Room - Robotic, Room Code (or-rob-i)		
Air flowmeter	Infusion pump: single channel	Pump: suction/ aspirator, surgical
Anaesthesia unit: standard	Infusion pump: syringe	Stool: adjustable, OR
Cabinet: storage, instrument, OR	Integration system: OR	Suction adapter
Control panel: surgical	Light: surgical, ceiling, with monitor arms & camera	Supply unit: ceiling, anaesthesia
Defibrillator: with monitor	Medication dispensing system: automated, anaesthesia	Supply unit: ceiling
Endoscopy tower: laparoscopy	Monitor: physiologic, operating theatre/ cardiac	Surgical system: robotic
Headlight: surgical	Operating table: electric, general	Tracking system: instrument tray
Hypo-hyperthermia unit: general	Oxygen flowmeter	Warming cabinet
Infusion pump: rapid, blood/ solution warming	Pump: suction/ aspirator, portable	

## 8 Schedule of Accommodation (SOA)

The Schedule of Accommodation (SOA) provided in 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.

The Schedule of Accommodation is developed for particular levels of services known as Role Delineation Level (RDL) and numbered from 1 to 6. Applicable RDLs are noted in each SOA provided in this FPU and not necessarily all six RDLs are applicable. Refer to Part A for a full description of the RDLs.

The following should be considered in conjunction with the SOAs provided in this FPU:

- Areas noted in Schedules of Accommodation take precedence over all other areas noted in this FPU.
- Rooms indicated in the schedule reflect the typical arrangement according to the Role Delineation and/or capacity required for the clinical service.
- Exact requirements for room quantities and sizes reflect Key Planning Units (KPU) identified in the Service Plan and the Operational Policies of the Unit
- All areas shown in the SOA follow the No-Gap system described elsewhere in these Guidelines. Refer to Part B Preliminaries
- Room sizes indicated should be viewed as a minimum requirement; variations are acceptable to reflect the needs of individual Unit.
- Staff and support rooms may be shared between Functional Planning Units dependent on location and accessibility to each unit and may provide scope to reduce duplication of facilities.
- Offices to be provided according to the number of approved full-time positions within the Unit.

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Operating Unit

Operating Unit at RDL 2 to 6

Room / Space	Standard Component Room Codes	RDL 2 Qty x m2			RDL 3 Qty x m2			RDL 4 Qty x m2			RDL 5/6 Qty x m2			Remarks
<b>Admission/ Reception/ Pre-op Holding</b>		<b>1 OR</b>			<b>2 ORs</b>			<b>4 ORs</b>			<b>12 ORs</b>			
Reception/ Clerical	recl-10-i recl-12-i recl-15-i	1	x	10	1	x	12	1	x	12	1	x	15	
Waiting	wait-10-i wait-25-i	1	x	10	1	x	10	1	x	10	1	x	25	May be divided into female/ family areas as applicable
Waiting - Family	wait-10-i wait-25-i	1	x	10	1	x	10	1	x	10	1	x	25	
Meeting Room - Small	meet-9-i meet-12-i				1	x	9	1	x	9	1	x	12	
Patient Bay - Holding (M/F)	pbtr-h-10-i	2	x	10	2	x	10	4	x	10	6	x	10	1 per Operating Room; optional; Separate Male/Female areas
Staff Station	sstn-5-i										1	x	5	Reception area can be used for levels 2-4
Bay - Blanket Warmer	bbw-i							1	x	2	1	x	2	As required
Bay - Handwashing, Type B	bhws-b-i	1	x	1	1	x	1	1	x	1	2	x	1	
Bay - Linen	blin-i							1	x	2	1	x	2	Linen Bay may be shared for Levels 2-3; 1 per 16 bed spaces
Clean Utility - Sub	clur-8-i	1	x	8	1	x	8	1	x	8	1	x	8	
Dirty Utility - Sub	dtur-s-i							1	x	8	1	x	8	Levels 2-3 may share Dirty Utility
Office - Write-up Bay	off-wi-6-i				1	x	6	1	x	6	1	x	6	Staff work area based on 3m2 per person, as required
<b>Operating Rooms (OR) Areas</b>		<b>1 OR</b>			<b>2 ORs</b>			<b>4 ORs</b>			<b>12 ORs</b>			
Anaesthetic Induction	anin-i	1	x	15	2	x	15	4	x	15	10	x	15	Optional
Anaesthetic Induction - Large	anin-i similar										2	x	18	Optional, larger room for specialty ORs as needed
Operating Room - General	or-gn-i	1	x	42	1	x	42	1	x	42	2	x	42	For minor procedures
Operating Room - Large	or-la-i				1	x	60	3	x	60	10	x	60	
Operating Room - ENT/ Ophthalmology	or-ent-oph-i										1	x	55	Optional; Provide according to service demand
Operating Room - Hybrid - CT Scanning	or-hy-ct-i										1	x	60	Optional; Provide according to service demand



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Room / Space	Standard Component Room Codes	RDL 2 Qty x m2			RDL 3 Qty x m2			RDL 4 Qty x m2			RDL 5/6 Qty x m2			Remarks
Hybrid - CT Scanning - Control Room	or-ctcr-i										1	x	10	Optional; if Operating Room - Hybrid - CT Scanning room provided
Operating Room - Hybrid/ MRI Scanning	or-hy-mri-i										1	x	55	Optional; Provide according to service demand
Hybrid/ MRI Scanning - Control Room	mricr-i similar										1	x	12	Optional; if Operating Room - Hybrid/ MRI Scanning room provided
Operating Room - Hybrid - Vascular/ Cardiac	or-hy-vs-i										1	x	76	Optional; Provide according to service demand
Hybrid - Vascular/ Cardiac - Control Room	clcr-i similar										1	x	12	Optional; if Operating Room - Hybrid - Vascular/ Cardiac room provided
Operating Room - Minor	or-ms-i										1	x	36	Optional; Provide according to service demand
Operating Room - Neurology	or-neuro-i										1	x	55	Optional; Provide according to service demand
Operating Room - Orthopaedic	or-orth-i										1	x	55	Optional; Provide according to service demand
Operating Room - Robotics	or-rob-i										1	x	65	Optional; Provide according to service demand
Operating Room - Transplant	or-tr-i										1	x	55	Optional; Provide according to service demand
Scrub-Up/ Gowning	scrb-8-i	1	x	8	2	x	8	4	x	8	12	x	8	1 per Operating Room
Exit Bay	NS	1	x	8	2	x	8	4	x	8	12	x	8	1 per Operating Room
<b>OR Support Areas</b>														
Audio-visual Room	audv-i										1	x	10	As required for digital recording
Anaesthetic Store	anst-i similar				1	x	15	1	x	20	2	x	20	
Anaesthetic Workroom	anwm-i similar				1	x	10	1	x	15	1	x	20	Also used for Biomedical equipment
Bay - Blanket Warmer	bbw-i	1	x	1	1	x	1	1	x	1	1	x	1	Optional
Bay - Linen	blin-i	1	x	2	1	x	2	2	x	2	2	x	2	
Bay - Mobile Equipment	bmeq-2.5-i	1	x	2.5	1	x	2.5	2	x	2.5	2	x	2.5	1 per OR, may be collocated

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Room / Space	Standard Component Room Codes	RDL 2 Qty x m2			RDL 3 Qty x m2			RDL 4 Qty x m2			RDL 5/6 Qty x m2			Remarks
Bay - Pathology	bpath-i similar	1	x	1	1	x	1	1	x	4	1	x	6	Optional for RDL 3 & 4
Blood Store	blst-i similar	1	x	2	1	x	2	1	x	2	1	x	4	
Cleaners Room	clrm-6-i	1	x	6	1	x	6	1	x	6	2	x	6	Minimum of 1 per approximately 1000m <sup>2</sup>
Clean-Up Room	clup-7-i	1	x	7	1	x	7	1	x	7	1	x	7	1 per OR, may be collocated and shared between ORs
Disposal Room	disp-10-i	1	x	10	1	x	10	1	x	10	2	x	10	
Flash Steriliser	fst-2-i	1	x	2	1	x	2	1	x	2	1	x	2	Optional (subject to local authority approval)
Office - Write-up Bay	off-wi-6-i	1	x	6	1	x	6	1	x	6	1	x	6	
Set-up Room	setup-8-i setup-16-i	1	x	8	1	x	8	1	x	16	1	x	16	Optional. depends on Operational Policy of the unit
Store - Drugs	str-5-i str-10-i							1	x	5	1	x	10	
Store - Equipment, Major	steq-10-i steq-15-i steq-30-i similar	1	x	10	1	x	15	1	x	30	2	x	36	6m <sup>2</sup> per OR recommended for RDL 5/6
Store - Equipment, Minor	steq-10-i steq-15-i steq-30-i	1	x	10	1	x	15	1	x	15	2	x	30	5m <sup>2</sup> per OR recommended for RDL 5/6
Store - Loan Equipment	steq-10-i steq-15-i				1	x	10	1	x	10	1	x	15	Optional, for equipment on consignment
Store - Non-Sterile/ De-boxing	steq-20-i steq-30-i	1	x	20	1	x	20	1	x	30	1	x	30	
Store - Sterile Stock	stss-12-i stss-44-i similar	1	x	12	1	x	24	1	x	44	1	x	120	Based on 10-12 m2 per OR
Perfusion Room	NS										1	x	20	Optional, for cardiac specialties
Store - Perfusion	stgn-20-i										1	x	20	Optional, for cardiac specialties
Toilet - Staff	wcst-i							1	x	3	1	x	3	In addition to toilets in Change Rooms
<b>Recovery Areas – Stage 1</b>		<b>1 OR</b>			<b>2 ORs</b>			<b>4 ORs</b>			<b>12 ORs</b>			
Patient Bay – Recovery Stage 1	pbtr-rs1-9-i pbtr-rs1-12-i	2	x	9	4	x	9	8	x	12	22	x	12	2 bays per OR; separate Male/ Female areas
Patient Bay Enclosed – Recovery Stage 1, Isolation	pbhe-is-n-i										2	x	14	Provide according to service demand
Anteroom	anrm-i										2	x	6	for isolation rooms
Staff Station	sstn-10-i sstn-12-i sstn-20-i	1	x	10	2	x	10	2	x	12	2	x	20	1 each for Male/ Female areas

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Room / Space	Standard Component Room Codes	RDL 2 Qty x m2			RDL 3 Qty x m2			RDL 4 Qty x m2			RDL 5/6 Qty x m2			Remarks
Bay – Blanket Warmer	bbw-i	1	x	1	1	x	1	1	x	1	1	x	1	As required
Bay - Handwashing, Type A	bhws-a-i	1	x	1	1	x	1	2	x	1	6	x	1	1 per 4 bays; Refer to Infection Control Part D
Bay - Linen	blin-i	1	x	2	1	x	2	2	x	2	2	x	2	
Bay - Resuscitation	bres-i	1	x	1.5	1	x	1.5	1	x	1.5	1	x	1.5	
Clean Utility	clur-12-i clur-14-i	1	x	12	1	x	12	2	x	12	2	x	14	May be combined with Staff Station for RDL 2; Direct access
Dirty Utility	dtur-12-i	1	x	12	1	x	12	2	x	12	2	x	12	
Store - General	stgn-6-i stgn-10-i				1	x	6	2	x	6	2	x	10	
<b>OR Staff Areas</b>		<b>1 OR</b>			<b>2 ORs</b>			<b>4 ORs</b>			<b>12 ORs</b>			
Change - Staff (Male/Female)	chst-12-i chst-20-i chst-35-i similar	2	x	12	2	x	20	2	x	35	2	x	120	Toilets, Shower and Lockers; size dependent on staffing numbers
Meeting Room - Small	meet-9-i meet-12-i	shared			1	x	9	1	x	9	1	x	12	Optional, according to service demand
Meeting Room – Medium/ Large	meet-l-15-i meet-l-30-i	shared			shared			1	x	15	1	x	30	Optional, according to service demand
Office - Single Person, 12 m <sup>2</sup>	off-s12-i							1	x	12	1	x	12	Note 1; Service Manager
Office - Single Person, 9 m <sup>2</sup>	off-s9-i				1	x	9	1	x	9	2	x	9	Note 1; Unit Manager OR, Unit Manager Recovery
Office - Single Person, 9 m <sup>2</sup>	off-s9-i	1	x	9	1	x	9	2	x	9	4	x	9	Note 1; Surgeons, Anaesthetists, Clinical Nurse Consultants
Office - 2 Person, Shared	off-2p-i							1	x	12	1	x	12	Note 1; Nurse Educators, Medical Specialists, Clinicians
Office - 3 Person, Shared	off-3p-i							1	x	15	2	x	15	Note 1; Registrars, Medical Officers
Staff Room	srm-15-i srm-30-i similar	1	x	15	1	x	15	1	x	30	1	x	60	May divide into Male & Female areas
Toilet - Staff	wcst-i										1	x	3	In addition to toilets in Change Rooms, separate M/ F
Toilet - Accessible, Staff	wcac-i										1	x	6	Unless available nearby
<b>Sub Total</b>		<b>319</b>			<b>528</b>			<b>975.5</b>			<b>2377.5</b>			
<b>Circulation %</b>				<b>40</b>			<b>40</b>			<b>40</b>			<b>45</b>	
<b>Area Total</b>		<b>447</b>			<b>739</b>			<b>1366</b>			<b>3329</b>			

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Operating Unit**

**Peri-operative Unit (Optional – May be Collocated with Operating Unit)**

Room / Space	Standard Component Room Codes	RDL 2 Qty x m2			RDL 3 Qty x m2			RDL 4 Qty x m2			RDL 5/6 Qty x m2			Remarks
<b>Admissions/ Reception</b>														
Reception/ Clerical	recl-10-i recl-12-i	1	x	10	1	x	10	1	x	10	1	x	12	May be shared with OR/ Day Surgery Reception
Office	off-s9-i off-2p-i	1	x	9	1	x	9	1	x	9	1	x	12	Clerical Support/ records; May be shared with OR/ Day Surgery
Toilet – Public (Male/ Female)	wcpu-3-i	2	x	3	2	x	3	2	x	3	2	x	3	Unless access available nearby
Toilet - Accessible	wcac-i	1	x	6	1	x	6	1	x	6	2	x	6	Unless access available nearby
Waiting	wait-10-i wait-20-i wait-25-i	1	x	10	1	x	20	1	x	20	1	x	25	
Waiting – Female/ Family	wait-15-i wait-20-i wait-30-i wait-50-i	1	x	15	1	x	20	1	x	30	1	x	50	Separate Female/ Family Waiting areas may be provided
Waiting	wait-sub-i						5			5			5	Wards persons/ Orderlies
<b>Pre-operative Area</b>		<b>2 ORs</b>			<b>4 ORs</b>			<b>6 ORs</b>			<b>12 ORs</b>			
Change –Patient (Male/ Female)	chpt-12-i similar	2	x	6	2	x	12	2	x	12	2	x	24	Includes Toilet, Shower, Lockers; provide toilets and showers not less than 1:6 bed bays, each
Waiting – Changed Patient (Male/ Female)	wait-10-i wait-20-i wait-25-i	2	x	10	2	x	10	2	x	25	2	x	25	Alternatively, use patient holding bays
Patient Bay - Holding	pbtr-h-10-i	2	x	10	3	x	10	4	x	10	10	x	10	1 per OR recommended
Patient Bay Enclosed, Isolation	pbhe-is-n-i				1	x	14	2	x	14	2	x	14	Class S Isolation
Anteroom	anrm-i				1	x	6	2	x	6	2	x	6	for Isolation Room, Negative Pressure
Bay - Handwashing, Type B	bhws-b-i	1	x	1	1	x	1	1	x	1	3	x	1	1 per 4 bays; Refer to Part D Infection Control
Bay - Linen	blin-i							1	x	2	1	x	2	May be shared with Recovery
Bay - Resuscitation Trolley	bres-i	1	x	1.5	1	x	1.5	1	x	1.5	1	x	1.5	May be shared with Recovery if close

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Room / Space	Standard Component Room Codes	RDL 2 Qty x m2			RDL 3 Qty x m2			RDL 4 Qty x m2			RDL 5/6 Qty x m2			Remarks
Clean Utility	clur-8-i clur-12-i	1	x	8	1	x	8	1	x	12	1	x	12	Includes medications; May be collocated with Staff Station
Consult/ Exam Room	cons-i	2	x	14	2	x	14	3	x	14	4	x	14	Provide according to service demand
Dirty Utility	dtur-s-i	1	x	8	1	x	8	1	x	8	1	x	8	May be shared with Recovery
Ensuite	ens-st-i	1	x	5	1	x	5	2	x	5	2	x	5	For Enclosed Bed Bay & Isolation Room Negative Pressure
Toilet – Accessible, Patient	wcac	1	x	6	1	x	6	2	x	6	2	x	6	May share with Recovery areas if close
<b>Post-operative Area (Recovery Stage 2/3)</b>		<b>1 OR</b>			<b>2 ORs</b>			<b>4 ORs</b>			<b>6 ORs</b>			
Patient Bay - Holding, Recovery Stage 2	pbt-rs2-12-i	2	x	12	4	x	12	8	x	12	10	x	12	Separate Male/Female areas, may be combination of bed and chair spaces; allow 2 beds/ chairs per Day Surgery OR
Staff Station	sstn-10-i sstn-14-i similar	1	x	10	1	x	10	2	x	12	2	x	14	
Bay - Beverage, Open Plan	bbev-op-i	1	x	5	1	x	5	1	x	5	1	x	5	
Bay -Blanket/ Fluid Warmer	bbw-i	1	x	1	1	x	1	1	x	1	1	x	1	As required
Bay - Handwashing, Type B	bhws-b-i	2	x	1	4	x	1	6	x	1	9	x	1	1 per 4 beds/ chairs; refer to Part D Infection Control
Bay - Linen	blin-i	1	x	2	1	x	2	1	x	2	2	x	2	
Bay - Pathology	bpath-i	1	x	1	1	x	1	1	x	1	1	x	1	
Bay - Resuscitation Trolley	bres-i	1	x	1.5	1	x	1.5	1	x	1.5	1	x	1.5	
Cleaner's Room	clrm-6-i	1	x	6	1	x	6	1	x	6	1	x	6	
Clean Utility	clur-8-i clur-12-i similar	1	x	8	1	x	8	1	x	12	1	x	14	
Dirty Utility	dtur-s-i dtur-12-i dtur-14-i	1	x	8	1	x	8	1	x	12	1	x	14	May be shared
Disposal Room	disp-8-i disp-10-i	1	x	8	1	x	8	1	x	10	1	x	10	May be shared
Store - Equipment/ General	steq-10-i similar steq-15-i steq-20-i	1	x	12	1	x	15	1	x	15	1	x	20	Equipment, consumable stock
Toilet – Patient	wcpt-i	1	x	3	1	x	3	2	x	3	4	x	3	

**Part B: Health Facility Briefing & Design  
Operating Unit**

Room / Space	Standard Component Room Codes	RDL 2 Qty x m2			RDL 3 Qty x m2			RDL 4 Qty x m2			RDL 5/6 Qty x m2			Remarks
Toilet - Accessible	wcac-i	1	x	6	1	x	6	2	x	3	2	x	6	
<b>Staff Areas</b>														
Meeting Room - Small	meet-9-i				1	x	9	1	x	9	1	x	9	May be shared
Office – Write-up (Shared)	off-wis-i				1	x	12	1	x	12	1	x	12	
Office – Single Person	off-s9-i	1	x	9	1	x	9	1	x	9	1	x	9	Unit Nurse Manager
Property Bay - Staff	prop-3-i prop-6-i	1	x	3	1	x	3	2	x	6	2	x	6	
Staff Room	srm-15-i srm-20-i	1	x	15	1	x	15	1	x	20	1	x	20	May share with an adjacent Unit
Toilet - Staff	wcst-i	1	x	3	1	x	3	2	x	3	2	x	3	
<b>Sub Total</b>		<b>293</b>			<b>400</b>			<b>595</b>			<b>785</b>			
<b>Circulation %</b>				<b>40</b>			<b>40</b>			<b>40</b>			<b>40</b>	
<b>Total Area</b>		<b>410</b>			<b>560</b>			<b>833</b>			<b>1099</b>			

Note 1: Offices to be provided according to the number of approved full-time positions within the Unit

Also note the following:

- 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 Role Delineation and number of Operating Rooms.
- Exact requirements for room quantities and sizes will reflect Key Planning Units (KPU's) identified in the 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.
- Room sizes indicated are based on the area measurement system described in the Part B Preliminaries.
- Staff and support rooms may be shared between the Operating Unit, Day Surgery Unit and Endoscopy Unit based on the facility operational policies.

## 9 Future Trends

When planning for future developments the following trends should be considered:

- Increasing demand for digital operating rooms
- Increasing availability and use of robotic surgery
- Increasing use of imaging within the operating room particularly CT scanning, MRI and angiography
- Technological development of support, monitoring, diagnostic, treatment and procedural equipment
- Increasing sophistication of information systems
- Demand for transparency about quality, safety and cost.

## 10 Further Reading

- ASHRAE American Society of Heating Refrigeration and Air-conditioning Engineers, HVAC design manual for hospitals and clinics, 2003 refer to website: <https://www.ashrae.org/standards-research--technology/standards--guidelines>
- Australasian Health Facility Guidelines, Part B Health Facility Briefing and Planning, HPU B.0520 Operating Unit, 2016; refer to website <https://healthfacilityguidelines.com.au/health-planning-units>
- CDC Centres for Disease Control and Prevention, Guideline for Disinfection and Sterilisation in Healthcare Facilities, 2008, refer to website [http://www.cdc.gov/hicpac/pdf/guidelines/Disinfection\\_Nov\\_2008.pdf](http://www.cdc.gov/hicpac/pdf/guidelines/Disinfection_Nov_2008.pdf)
- DH (Department of Health) (UK) Health Building Note HBN 26 Facilities for surgical procedures: Volume 1, 2009, refer to website: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/148490/HBN\\_26.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/148490/HBN_26.pdf)
- DH (Department of Health) (UK) Health Building Note HBN 00-03 Clinical and clinical support spaces, 2013, refer to website: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/147845/HBN\\_00-03\\_Final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/147845/HBN_00-03_Final.pdf)
- Guidelines for Design and Construction of Health Care Facilities; The Facility Guidelines Institute, 2014 Edition refer to website [www.fgiguidelines.org](http://www.fgiguidelines.org)
- Bureau of Health Statistics (Aus) Occupancy rates in Health Facilities, available from website [http://www.statistics.health.pa.gov/StatisticalResources/UnderstandingHealthStats/ToolsOfTheTrade/Documents/Occupancy\\_Rates\\_in\\_Health\\_Facilities.pdf](http://www.statistics.health.pa.gov/StatisticalResources/UnderstandingHealthStats/ToolsOfTheTrade/Documents/Occupancy_Rates_in_Health_Facilities.pdf)