

Part B – Health Facility Briefing & Design
230 Oncology Unit - Radiation



*i*HFG

International Health Facility Guidelines

Version 5 June 2017

Table of Contents

230 **Oncology Unit - Radiation** 3

 1 **Introduction** 3

Description 3

 2 **Functional and Planning Considerations** 3

Operational Models 3

Planning Models 3

Functional Areas 3

Functional Relationships 7

 3 **Design** 9

Construction Standards 9

Patient Treatment Areas 9

Environmental Considerations 9

Space Standards and Components 9

Safety & Security 10

Finishes 10

Fixtures, Fittings & Equipment 10

Building Service Requirements 10

Infection Control 11

 4 **Components of the Unit** 12

Standard Components 12

 5 **Schedule of Accommodation** 13

Oncology Unit – Radiation (with 2 & 4 bunkers) 13

Brachytherapy Suite (Optional) 16

Imaging Suite (Optional) 17

 6 **Future Trends** 19

 7 **Further Reading** 19

230 Oncology Unit - Radiation

1 Introduction

Description

The purpose of the Radiation Oncology Unit is to provide facilities and equipment for radiotherapy treatment. Mainly used for the treatment of cancer, radiotherapy is often used in conjunction with other treatments, including chemotherapy and surgery. The Radiation Oncology Unit contains spaces to support patient consultation, treatment simulation and planning, and the administration of treatment. The Radiation Oncology Unit may contain both external and internal radiotherapy (brachytherapy) treatment areas. Although not recommended, a Simulation Room may be omitted in small linear accelerator facilities where other positioning geometry is provided.

Room sizes and specifications for a Radiation Oncology Unit should accommodate the equipment manufacturer's recommendations, as space requirements may vary from one machine to another and one manufacturer to another.

2 Functional and Planning Considerations

Operational Models

Hours of Operation

The Radiation Oncology Unit will typically operate from 8am to 6pm daily, week days; however, extended hours of operation may occur according to the unit operational policy.

Model of Care

The preferred model of care for Radiation Oncology is where cancer services are collocated and provided in a purpose-built facility. The benefits of this model are improved communications between all members of the team, resulting in optimal clinical management, efficiency and best outcomes for patients. Separation of planning and therapy is not recommended.

Planning Models

Location

Generally, the Radiation Oncology Unit should be located on ground level due to the weight of the equipment and shielding, for ease of installation/ replacement of specialised equipment. The Unit should be located with ready access for outpatients, including people with disabilities, people arriving by patient transfer services and ambulances, and for inpatients in wheelchairs and on beds or trolleys. If the Unit is located in a free-standing building on a hospital campus, careful consideration must be given to covered links between the Unit and the main hospital particularly for inpatients on beds/ trolleys, the delivery of goods and supplies, and access to other departments such as Medical Imaging or Pathology.

Functional Areas

The Radiation Oncology Unit may include the following Functional Areas:

- Entry/ Reception including:
 - Interview Room
 - Waiting areas with access to refreshments
 - Public amenities
 - Reception with storage for files and stationery
- Patient Consult Area:
 - Consult rooms
 - Interview room
 - Specimen collection and access to patient toilets
- Treatment Planning and Appliance areas:
 - Simulator rooms with Control and Equipment rooms
 - Mould fitting room

- Mould workshop
- Patient holding bay for patients on a bed or trolley
- Support rooms including Change cubicles, stores for consumables and equipment, patient toilets and sub-waiting areas
- Medical Physics:
 - Offices and workstations for Physicists
 - Physics laboratory and storage for technical equipment
- Radiation Therapy Treatment Areas:
 - Radiation bunkers with Control rooms
 - Change cubicles
 - Patient sub-waiting, locker area and access to toilets
 - Ready access to Interview rooms
- Support Areas including:
 - Bays for Handwashing/PPE, Linen, Resuscitation trolley, holding of mobile equipment and wheelchairs
 - Clean and Dirty Utilities with waste holding areas
 - Cleaners Room
 - Staff Station
 - Store rooms for equipment and consumables
- Administration / Office Areas:
 - Offices and workstations for key personnel according to the approved service plan
 - Meeting room
- Staff Areas:
 - Staff Room
 - Locker area
 - Toilets and Showers, gender separated

The Unit may incorporate the following Optional areas depending on the Service Plan:

- Brachytherapy Suite:
 - Brachytherapy bunker with Control room
 - Anaesthetic room
 - Operating/ Procedure room (optional)
 - Scrub up room
 - Patient Bays for holding and recovery with access to patient toilets
 - Patient Waiting area
 - Support areas including Bays for handwashing basins/PPE, Linen and resuscitation trolley
 - Radioactive seed and loading room
 - Store room for sterile stock and equipment
 - Shared utility rooms
- Medical Imaging (optional satellite unit) including:
 - CT Scanning room with Control and Equipment rooms
 - General X-ray room
 - MRI imaging room with Preparation, Control, Equipment rooms
 - Patient facilities such as holding bays, property bays, waiting areas and toilets
 - Staff and support rooms including

Entry / Reception

Sufficient parking should be made available for ambulances, staff and patients. Ideally, patients should be allocated parking closest to the department, and it is important to take into account the fact that, although there would be a limited number of patients being actively attended to in the Unit at any given point in time, patients nevertheless spend many hours inside the department when undergoing imaging or planning, consulting with doctors or receiving brachytherapy.

The Reception area will provide for administrative tasks, such as booking appointments and record keeping, as well as receiving and directing patients to the appropriate zone for consulting, treatment planning or radiotherapy treatment. The waiting area should accommodate a range of patients and visitors with varied levels of ability and provide clear access to conveniently located public and patient amenities.

Waiting areas, where appropriate, may be designed with separation to meet cultural requirements. A child play area can be incorporated into the main waiting area. Facilities for volunteers and transport staff may also be provided in this area.

Patient Consult Areas

The Consult area should include individual consultation rooms as well as accommodating multidisciplinary teams for patient consultation, follow-up and case review. Patients are generally assessed weekly by a Radiation Oncologist throughout the course of their treatment and will be referred to other specialists and allied health personnel as required including Dietitians, Physiotherapists, Occupational Therapists and Social Workers. Interview and conference rooms are required for patient and family education which may include computers for review of treatment programs.

The Consult area should be located with easy access for outpatients without entering radiation treatment zones. The Consult area should have access to blood collection rooms and patient toilets for specimen collection and the area may include Procedure rooms for minor procedures including endoscopic examinations, pleural taps and peritoneal drains.

Treatment Planning and Appliance Areas

Treatment planning requirements include:

- Treatment planning rooms with computer workstations which may include including planning room for Brachytherapy where required by the service plan
- Simulator / CT suite
- Patient and visitor amenities (change cubicles, toilets, sub-waiting, patient holding, etc.)
- Offices and workstations for radiation therapists, trainees and students;
- Offices for data checking and transfer in a quiet and discreet area

The Appliance area allows mask and mould manufacturing for use in radiotherapy treatment and includes:

- Mould Fitting Room; accommodates patient trolley and positioning accessories
- Mould Workshop/s; workshops require special exhaust systems for the molten metal used to fabricate photon and electron shielding, foam cutters and vacuum formers used to manufacture custom masks.
- A separate dirty/ noisy workshop to accommodate machinery and drills may be required if acoustic separation is insufficient
- Materials storage for immobilization devices and heavy moulds used in mask manufacture
- Mould storage for items held in the unit for the patient's treatment duration.

Medical Physics/ Biomedical Engineering

Medical Physicists supervise the physical aspects of radiation treatment and radiation safety of staff, patients and visitors. They provide scientific support for all treatment machines, simulators, CT, MRI and PET imaging, computer planning systems, brachytherapy sources and equipment as well as dosimetry, quality assurance and radiation safety.

Biomedical Engineering services may be provided in-house or by external contractors. The service provides maintenance and service support to an extensive range of treatment and non-treatment equipment in Radiation Oncology. Biomedical engineers work closely with Medical Physicists to provide regular calibration and compliance checks of all treatment delivery and diagnostic machines.

Facility requirements include:

- Offices and workstations for physicists, physics assistants and biomedical engineers
- Physics laboratory to manufacture equipment not available commercially for patient treatment such as installation of rigid attachments for patient hoists, calibration jigs for physics, mask creation appliances
- Storage for Medical Physics equipment including bulky water tanks and phantoms
- Technical support (IT office and work area / equipment storage)

- Electronic / biomedical engineering workshop
- Dark room x-ray processor as required for machine commissioning and imaging of special procedures.

Radiation Therapy Treatment Area

The radiation treatment zone includes:

- Bunkers with entry/ exit maze and Control rooms
- Change cubicles and patient toilets immediately adjacent to radiation treatment areas.
- Sub-Waiting areas located conveniently to each bunker and access to Interview rooms
- Support areas including patient bays, utilities, staff station, preparation and storage areas.

Support Areas

Support areas include clean and dirty utilities, storage, disposal rooms, linen bays and handwashing facilities.

The following optional support areas may be required:

- Quality control area with illuminated X-ray viewing boxes
- Dosimetry equipment area
- Hypothermia Room (may be combined with an Examination Room)

Administration / Offices

Offices should be provided for the clinical director of the unit, radiation oncologists, and radiation therapy managers, nursing managers, allied health professionals, cancer care co-ordinators and specialist nurses. In a stand-alone facility additional offices/ workstations may be required for human resources, finance, legal services, public relations and information technology professionals. Quantities and configuration of offices is according to needs analysis.

Adequate access to meeting rooms should be provided to facilitate education, training and research activities within the Unit.

Staff Areas

Staff Areas will consist of:

- Staff Room
- Toilets, Showers and Lockers.

Staff areas may be shared with adjacent Units as far as possible.

Optional Areas

Brachytherapy Treatment Areas

The Brachytherapy treatment room is used for delivery of a radiation source through a tube or applicator, implanted during surgery. The Brachytherapy room is similar to a radiation bunker and is equipped as an operating room with services to provide for anaesthesia. Support facilities include an anaesthetic induction room, scrub-up area, patient recovery bays, and sterile stock areas.

Medical Imaging

Computed tomography (CT), magnetic resonance imaging (MRI), ultrasound (US), positron emission tomography (PET) and general x-ray imaging may be used for the visualization of bone or soft-tissues during planning and review of radiotherapy treatment.

If a facility is a distinct entity or does not have an efficient functional relationship with a medical imaging department it may need to accommodate medical imaging facilities.

CT and MRI are the most commonly used imaging facilities for treatment planning. However there are certain conditions under which ultrasound and PET may be used. The types of imaging facilities required will be determined by the service plan.

Functional Relationships

The Radiation Oncology Unit should be located with ready access for ambulant outpatients as well as inpatients arriving by wheelchairs and beds. The Unit may be co-located with Medical Imaging Units, Chemotherapy Units and related Inpatient Units to increase efficiency. If intra-operative therapy is proposed, the Radiation Oncology Unit should be located close to the Operating Unit or with a direct link.

A ground level location is preferred due to the weight of the equipment and shielding requirements, and for ease of installation and replacement. There will also be a restriction on the type of departments located above the Radiation Oncology bunkers.

External

Principal relationships with other Units include ready access to:

- Diagnostic facilities such as Medical Imaging and Pathology
- Emergency and Critical Care Units
- Clinical Laboratories
- Pharmacy
- Outpatient Rehabilitation and Complementary Medicine facilities
- Material Management and Housekeeping
- Operating/ Day Procedures Units
- Public amenities and cafeteria
- Parking

Internal

Optimum internal relationships include:

- The Staff Station and associated areas need direct access and observation to patient holding areas
- Utility and storage areas need ready access to both patient and staff work areas
- Planning and treatment areas should be collocated.

Functional Relationship Diagram - Oncology Unit - Radiation

External relationships outlined in the diagram include:

- Clear staff, goods and service entrance:
 - Access to/from Housekeeping, Supply and Catering Units via service corridor.
 - Access to Offices and staff areas via service corridor
 - Access to/ from key clinical units associated with patient arrivals and transfers via a service corridor
 - Entry for staff via the public or service corridor
- Separate public entrance
 - Access to/ from key public areas, such as the main entrance, Outpatients Units and parking from the public corridor
 - Entry for ambulant patients and visitors directly from public corridor
 - Access to/ from related treatment facilities via a public corridor

Optimum internal relationships outlined in the diagram include:

- Reception located with control of access for public and patients
- Waiting area at the Unit entry and sub-waiting within the Unit for patients
- Patient flow from Reception, to Consult, to Simulation and Planning then Radiotherapy Treatment areas.
- Convenient access to Mould Fitting and Workshop from Planning areas
- Access to Medical Imaging from Consult, Planning and Radiotherapy Treatment stages
- Shared patient holding for both Simulation and Treatment stages
- Staff Station located with direct observation of patient bed holding
- Support areas decentralised, located close to treatment areas for staff convenience
- Staff Offices and Support areas located on a perimeter in a staff accessible zone.

Functional Relationship Diagram

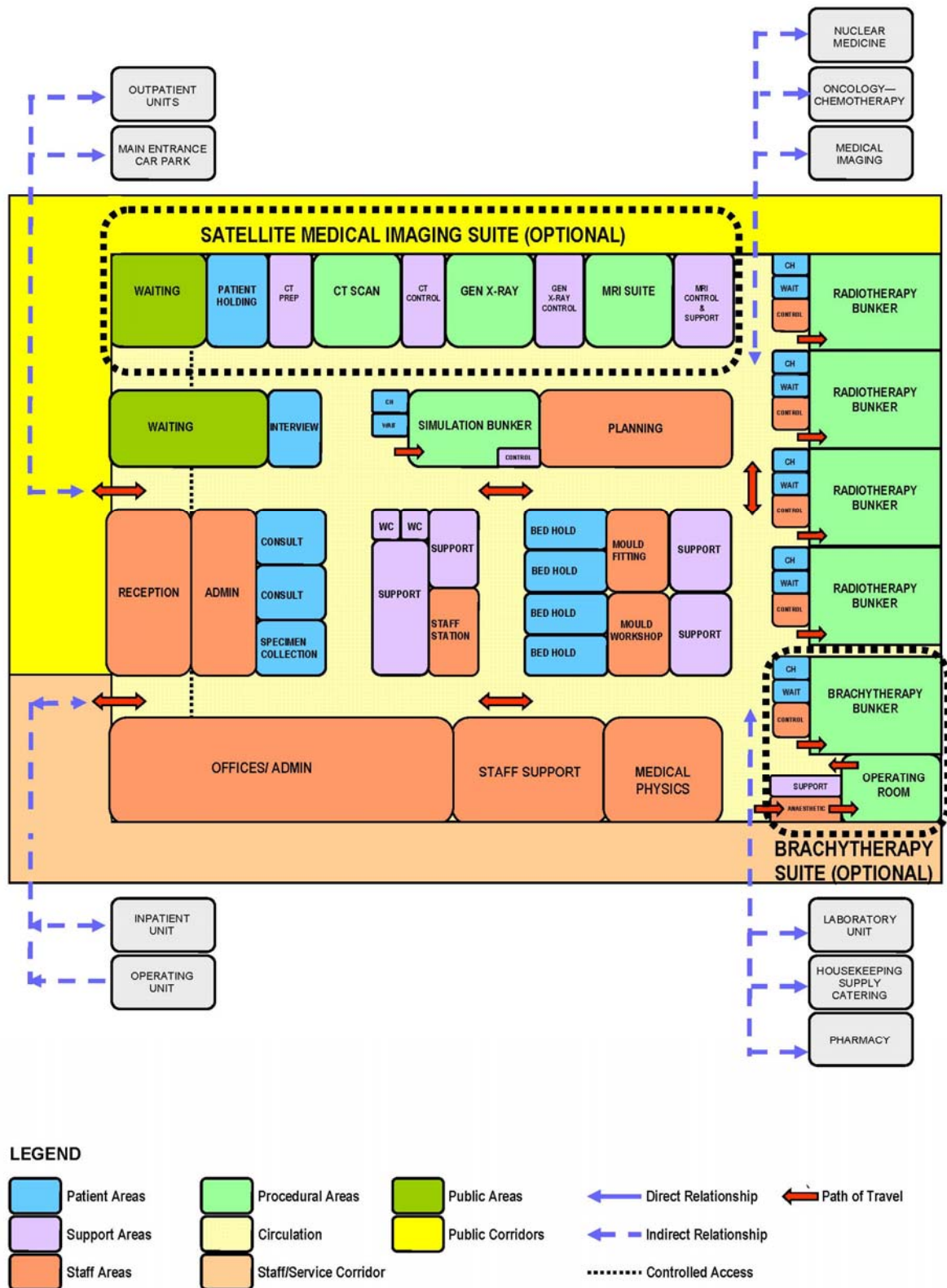


Figure 1 Functional Relationship Diagram:

3 Design

Construction Standards

The flooring for a Radiation Oncology Unit shall be adequate to meet the load requirements for equipment, patients and personnel. Provision for cable ducts or conduits should be made in the floors and ceilings as required. Ceiling mounted equipment should have properly designed rigid support structures located above the finished ceiling. The minimum recommended ceiling height is 3 metres. A lay-in type of ceiling should be considered for ease of installation and service.

The linear accelerator installation may require an opening in a wall and co-ordination of the entry door size to also allow for future servicing of the equipment

Patient Treatment Areas

Radiation Oncology Units should be designed to avoid exposing patients, staff and visitors to risks such as injury or radiation hazard.

Environmental Considerations

Acoustics

Acoustic treatment will be required to all examination, consult rooms and offices to ensure privacy for discussions with patients, families and staff.

Provide acoustic treatment for the control of noise associated with machinery in the appliance fabrication workshop areas.

Natural Lighting/ Lighting

Radiation bunkers and simulators will require dimmable lighting with adjustable lighting levels for patient comfort. All patient areas in the Unit will require lighting with clinical colour rendering.

General lighting in staff work areas should be even, sufficient for illumination of the work area and non-reflective. Refer also to Part C of these Guidelines.

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 Décor

Interior decor includes furnishings, style, colour, textures and ambience, influenced by perception and culture. The décor of the Unit should be of a standard that meets the expectations of people using the services and make every effort to reduce an institutional atmosphere

The design of the unit should create a pleasant, reassuring atmosphere for patients whilst retaining the necessary functional requirements associated with clinical spaces and radiation treatment areas.

Space Standards and Components

Accessibility

Design should provide ease of access for wheelchair bound patients in all patient areas including Reception desk, Consult, Interview, Mould fittings rooms and Radiation Treatment bunkers. Waiting areas should include spaces for wheelchairs and suitable seating for patients with disabilities or mobility aids.

Doors

All entry points, doors or openings requiring bed/trolley access including Radiation Therapy and Procedure 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.

Within workshop and appliance room areas, the number of doors should be kept to a minimum to facilitate the movement of equipment; double doors should be provided to all workshop areas. Also refer to Part C – Access, Mobility, OH&S of these Guidelines.

Ergonomics/ OH&S

Heights and depths of benches and workstations in the radiation treatment area need to allow staff to efficiently work from standing and seated positions. The emergency stop button should be placed within easy reach of attending staff.

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

Size of the Unit

The size of the Radiation Oncology Unit will be determined by the Clinical Services Plan establishing the intended services scope and complexity. In a satellite facility, where cancer services are collocated, two Radiotherapy Treatment rooms (bunkers) is the minimum viable number.

Schedules of Accommodation have been provided for typical units with 2 and 4 Radiotherapy Bunkers.

Safety & Security

Access control is required to the patient areas, Radiation Therapy areas and staff areas of the Unit. Security measures may include:

- CCTV camera surveillance of bunkers, access and exit points
- Emergency “stop” buttons in treatment bunkers and control rooms
- Controlled staff access after hours
- Controlled access to equipment storage areas to protect sensitive equipment
- Fixed and personal duress alarms for staff.

Finishes

All surface finishes are to be washable including walls and ceilings. Floor surfaces should be impervious, easy to clean, sealed and coved at the edges. Refer also to Part C of these Guidelines and Standard Components for more information on wall protection, floor finishes and ceiling finishes.

Fixtures, Fittings & Equipment

Equipment such as the linear accelerator and control equipment must be installed to the manufacturer’s specifications and recommendations, in particular:

- Space requirements may vary according to equipment selection
- Doors will need to be sized to allow passage of equipment
- Structural assessment will be required for equipment weight loads
- Adequate space will be required for maintenance of major equipment ensuring adequate access to cabinets and control units.

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 Unit should be made with consideration to ergonomic and Occupational Health and Safety (OH&S) aspects.

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

Building Service Requirements

Communications

Communications and information systems installed in the unit may include:

- Voice / data outlets and wireless networks
- Telephone and video conferencing capacity for meeting rooms
- PACS imaging system, electronic records and radiotherapy information management systems

- CCTV for patient viewing, treatment delivery computers and intercoms to allow the radiation therapist to monitor and communicate with the patient from the control area during treatment.

Nurse Call/ Emergency Call

Patient and Emergency Call facilities shall be provided in all patient areas (e.g. Consult Room/s, Holding/ Recovery bays, Change Cubicles 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 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

General air conditioning needs to cool equipment but outlets should not be placed directly over partially undressed patients on beds or trolleys. The temperature of the unit should be maintained within a comfortable range not exceeding 25 degrees Celsius for optimal operating efficiency and patient comfort.

Air conditioning systems should be designed with consideration to the following:

- Appropriate air exchanges and exhaust for chemicals and dust in the appliance workshop
- Sufficient cooling for heat generating equipment in radiotherapy treatment and computer equipment rooms.

Smoke detectors in radiation treatment and simulator rooms must be of the type not sensitive to radiation (i.e. photoelectric) and require special consideration.

Medical Gases

The Unit will require:

- oxygen and suction in all patient bays and procedure rooms
- provision of medical air to patient recovery bays is optional

Full anaesthetic capability is required within the Brachytherapy Room or adjacent Operating Room, including systems for the delivery of nitrous oxide and the ‘scavenging’ of gases that have been exhaled by the patient that should not be breathed in by any medical personnel.

Refer to Part E of these guidelines and to the Standard Components, RDS and RLS.

Radiation Shielding and Radiation Safety

Linear accelerator bunkers require radiation protection that may include lead shielding and concrete walls, floors and ceilings to specified thicknesses. Design of the bunker rooms may incorporate a maze entry to assist with radiation protection; a neutron door may also be required depending on the type of linear accelerator used.

The radiation protection needs of the unit shall be assessed by a certified physicist or appropriate agency. This assessment is to specify the type, location, and amount of protection to be installed in accordance with final approved department layout and equipment selection. The radiation protection requirements shall be incorporated into the final plans and specifications. Early consultation with the manufacturers of radiotherapy equipment is recommended.

The lifespan of the facility and the need to upgrade technology should be considered when specifying the radiation shielding required. It is likely that the machines will be upgraded and newer machines may or may not emit stronger radiation. Therefore it is sensible to allow for the highest energy machine and widest beam that is likely to be used in the future.

Infection Control

Infectious and immune-suppressed patients may be sharing the same treatment space at the different times of the same day. The design of all aspects for the Unit should take into consideration the need to ensure a high level of infection control in all aspects of clinical and non-clinical practice.

Hand Basins

Hand washing facilities for staff within the Unit will be required in all patient treatment areas including bed bays for holding and recovery, Consult Rooms, Procedure Rooms and Radiation Therapy Bunkers, Imaging rooms, and located conveniently to Simulator Rooms and Staff Stations. Where a hand wash basin is provided, there shall also be liquid soap and disposable paper towels provided and PPE equipment.

Hand hygiene is important and it is recommended that in addition to hand basins, medicated hand gel dispensers be located strategically in staff circulation corridors.

For further information refer to Part D – Infection Control in these Guidelines.

4 Components of the Unit

Standard Components

The Radiation Oncology Unit will contain Standard Components to comply with details in the Standard Components described in these Guidelines. Refer to Standard Components Room Data Sheets and Room Layout Sheets.

5 Schedule of Accommodation

Oncology Unit – Radiation (with 2 & 4 bunkers)

| ROOM/ SPACE | Standard Component Room Codes | | | | | | | | RDL 4 Qty x m ² | RDL 5/6 Qty x m ² | Remarks |
|--------------------------------------------|-------------------------------|--|--|--|--|--|--|--|----------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------|
| Entry/ Reception | | | | | | | | | | | |
| Airlock | airle-6-i airle-10-i | | | | | | | | 1 x 6 | 1 x 10 | For standalone facilities or units with direct access from outside |
| Bay - Beverage, Open Plan | bbev-op-i | | | | | | | | 1 x 4 | 1 x 4 | Optional. May be shared with a collocated unit |
| Bay - Mobile Equipment | bmeq-4-i bmeq-10-i | | | | | | | | 1 x 4 | 1 x 10 | Optional. May be shared with a collocated unit |
| Bay - Vending Machines | bvm-3-i bvm-5-i | | | | | | | | 1 x 3 | 1 x 5 | Optional. May be shared with a collocated unit |
| Reception/ Clerical | recl-10-i recl-20-i | | | | | | | | 1 x 10 | 1 x 20 | |
| Store - Files | stfs-8-i stfs-10-i | | | | | | | | 1 x 8 | 1 x 10 | |
| Store - Photocopy/ Stationery | stps-8-i | | | | | | | | 1 x 8 | 1 x 8 | |
| Toilet - Public | wcpu-4-i | | | | | | | | 2 x 4 | 2 x 4 | Separate Male/ Female. May be shared |
| Toilet - Accessible | wcac-i | | | | | | | | 1 x 6 | 1 x 6 | May be shared |
| Waiting | wait-20-i wait-30-i | | | | | | | | 1 x 20 | 1 x 30 | Allow 1.2m ² per person and 1.5m ² for people in wheelchairs. May be gender segregated. |
| Consult Area | | | | | | | | | | | |
| Consult/ Exam Room | cons-i | | | | | | | | 2 x 14 | 4 x 14 | Quantity according to service plan |
| Interview Room - Family/ Large | intf-i | | | | | | | | 1 x 12 | 1 x 12 | For up to 8 persons |
| Procedure Room | proc-i | | | | | | | | 1 x 20 | 1 x 20 | |
| Specimen Collection Bay | specc-i | | | | | | | | 1 x 9 | 1 x 9 | As required |
| Toilet - Accessible | wcac-i | | | | | | | | shared | shared | Access to patient toilets |
| Waiting | wait-20-i | | | | | | | | Shared | shared | Shared with Entry/Reception |
| Treatment Planning, Appliance Areas | | | | | | | | | | | |
| Bay - Resuscitation Trolley | bres-i | | | | | | | | 1 x 1.5 | 1 x 1.5 | |
| Change Cubicle - Accessible | chpt-d-i | | | | | | | | 1 x 4 | 2 x 4 | 1 per simulation room |
| Clean-up Room | clup-7-i | | | | | | | | 1 x 7 | 1 x 7 | Mould fitting/workshop clean up |
| Computer Equipment Room | coeq-i | | | | | | | | 1 x 8 | 1 x 8 | To simulator room. Size and requirements as per manufacturers specifications |
| Mould Room – Fitting | mld-ft-i | | | | | | | | 1 x 10 | 1 x 10 | |
| Mould Room – Workshop | mld-ws-i | | | | | | | | 1 x 20 | 1 x 20 | Noise reduction required |
| Radiotherapy Simulator Room | rad-sim-i | | | | | | | | 1 x 40 | 2 x 40 | Sized to suit equipment |
| Radiotherapy Simulator Control Room | rad-bctr-i similar | | | | | | | | 1 x 17 | 1 x 30 | 1 control room can be shared between 2 simulation rooms |

| ROOM/ SPACE | Standard Component Room Codes | | | | | | | | | RDL 4 Qty x m ² | RDL 5/6 Qty x m ² | Remarks |
|------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|----------------------------|------------------------------|-----------------------------------------------------------------------|
| Radiotherapy Treatment Planning | rad-trp-i | | | | | | | | | 1 x 35 | 1 x 55 | Workstations for 6 & 10 staff respectively |
| Patient Bay – Holding | pbtr-h-10-i | | | | | | | | | 1 x 10 | 2 x 10 | 1 per simulation room |
| Store – Equipment | steg-20-i steg-30-i | | | | | | | | | 1 x 20 | 1 x 30 | |
| Store – General | stgn-9-i stgn-12-i | | | | | | | | | 1 x 9 | 1 x 12 | Patient mould storage during treatment program |
| Toilet - Accessible | wcac-i | | | | | | | | | 1 x 6 | 1 x 6 | |
| Waiting – Sub | wait-sub-i | | | | | | | | | 1 x 5 | 1 x 5 | May be shared between 2 simulation rooms |
| X-Ray Viewing and Reporting | xrrr-i | | | | | | | | | 1 x 12 | 1 x 12 | PACS room; may be combined with control room |
| Medical Physics | | | | | | | | | | | | |
| Office - Single Person | off-s12-i | | | | | | | | | 1 x 12 | 1 x 12 | Chief Physicist. |
| Office - Workstation | off-ws-i | | | | | | | | | 1 x 5.5 | 2 x 5.5 | Physicists. Quantity as per service plan |
| Office - Workstation | off-ws-i | | | | | | | | | 1 x 5.5 | 1 x 5.5 | Biomedical Engineer |
| Physics Laboratory | phlab-i | | | | | | | | | 1 x 24 | 1 x 40 | |
| Store - Equipment | steg-10-i steg-20-i | | | | | | | | | 1 x 10 | 1 x 20 | Physics equipment |
| Workshop - Biomedical | ws-bm-i | | | | | | | | | 1 x 40 | 1 x 50 | |
| Radiation Therapy Treatment Areas | | | | | | | | | | | | |
| Change Cubicle - Accessible | chpt-d-i | | | | | | | | | 2 x 4 | 4 x 4 | 1 per bunker |
| Clean up Room | clup-15-i | | | | | | | | | 1 x 15 | 2 x 15 | 1 per 2 bunkers |
| Interview Room – Family / Large | intf-i | | | | | | | | | 2 x 12 | 2 x 12 | Optional. May be shared with adjacent zones |
| Patient Bay – Holding / Recovery | pbtr-h-10-i similar | | | | | | | | | 2 x 10 | 4 x 10 | 1 per bunker. |
| Property Bay | prop-2-i | | | | | | | | | 1 x 2 | 2 x 2 | Optional; Patient property. 1 per 2 bunkers |
| Radiotherapy Bunker Room | rad-bunk-i | | | | | | | | | 2 x 128 | 4 x 128 | See Note 1. Size and requirements as per manufacturers specifications |
| Radiotherapy Bunker Control Room | rad-bctr-i | | | | | | | | | 2 x 17 | 4 x 17 | Size and requirements as per manufacturers specifications |
| Toilet - Patient | wcpt-i | | | | | | | | | 2 x 4 | 2 x 4 | Separate male / female |
| Waiting - Sub | wait-sub-i | | | | | | | | | 2 x 5 | 4 x 5 | 1 per bunker |
| Support Areas | | | | | | | | | | | | |
| Bay - Handwashing, PPE, Type B | bhws-pp-e-i | | | | | | | | | 1 x 1 | 2 x 1 | To patient holding bays |
| Bay - Linen | blin-i | | | | | | | | | 1 x 2 | 2 x 2 | 1 per 2 bunkers |
| Bay - Mobile Equipment | bmeq-4-i | | | | | | | | | 1 x 4 | 2 x 4 | 1 per 2 bunkers, mobile equipment & wheelchairs |
| Bay - Resuscitation Trolley | bres-i | | | | | | | | | 1 x 1.5 | 2 x 1.5 | 1 per 2 bunkers |
| Clean Utility/ Medication | clur-12-i clum-14-i similar | | | | | | | | | 1 x 12 | 1 x 14 | |
| Cleaner's Room | clrm-5-i | | | | | | | | | 1 x 5 | 1 x 5 | |

| ROOM/ SPACE | Standard Component Room Codes | | | | | | | | RDL 4 Qty x m ² | RDL 5/6 Qty x m ² | Remarks |
|---------------------------------|-------------------------------|--|--|--|--|--|--|--|----------------------------|------------------------------|--------------------------------------------------------------------------------|
| Dirty Utility | dtur-12-i dtur-14-i | | | | | | | | 1 x 12 | 1 x 14 | |
| Disposal Room | disp-8-i | | | | | | | | 1 x 8 | 1 x 8 | |
| Staff Station | sstn-5-i sstn-10-i | | | | | | | | 1 x 5 | 1 x 10 | |
| Store - Equipment | steq-10-i steq-14-i | | | | | | | | 1 x 10 | 1 x 14 | |
| Administration / Offices | | | | | | | | | | | Note 2 |
| Office - Single Person | off-s12-i | | | | | | | | 1 x 12 | 1 x 12 | Clinical Director |
| Office - Single Person | off-s9-i off-s12-i | | | | | | | | 1 x 9 | 1 x 12 | Radiation Oncologist. |
| Office - Single Person | off-s9-i off-s12-i | | | | | | | | 1 x 9 | 1 x 12 | Manager - Radiation Therapy. |
| Office - Single Person | off-s9-i | | | | | | | | 1 x 9 | 2 x 9 | Radiation Therapist - Head of Planning |
| Office - Single Person | off-s9-i | | | | | | | | 1 x 9 | 1 x 9 | Radiation Therapist - Head of |
| Office - Single Person | off-s9-i | | | | | | | | 2 x 9 | 4 x 9 | Educator, Teaching Fellow, Quality Assurance manager, IT manager, etc. |
| Office - Single Person | off-s9-i | | | | | | | | 1 x 9 | 1 x 9 | Nurse Manager. Located close to patient areas |
| Office - 2 Person Shared | off-2p-i | | | | | | | | 1 x 12 | 1 x 12 | Clinical trials monitor, nurse coordinator. |
| Office - 2 Person Shared | off-2p-i | | | | | | | | 1 x 12 | 1 x 12 | Biostatistician, data manager |
| Office - 3 Person Shared | off-3p-i | | | | | | | | 1 x 16 | 1 x 16 | Allied health |
| Office - Workstation | off-ws-i | | | | | | | | 1 x 5.5 | 1 x 5.5 | Nurse coordinator |
| Office - Workstation | off-ws-i | | | | | | | | 2 x 5.5 | 4 x 5.5 | Cancer care coordinators, specialist cancer nurses and palliative care nurses. |
| Office - Workstation | off-ws-i | | | | | | | | 2 x 5.5 | 4 x 5.5 | Administration staff |
| Office - Write up (Shared) | off-ws-i | | | | | | | | 1 x 12 | 2 x 12 | Clinical reviews. Located close to patient areas. |
| Meeting Room - Medium / Large | meet-l-15-i meet-l-20-i | | | | | | | | 1 x 15 | 1 x 20 | |
| Staff Areas | | | | | | | | | | | |
| Property Bay - Staff | prop-3-l prop-6pil | | | | | | | | 1 x 3 | 1 x 6 | |
| Staff Room | srm-20-i srm-30-il | | | | | | | | 1 x 20 | 1 x 30 | |
| Shower - Staff | shst-i | | | | | | | | 2 x 3 | 4 x 3 | Separate Male / Female |
| Toilet - Staff | wcst-i | | | | | | | | 2 x 3 | 4 x 3 | Separate Male / Female |
| Sub Total | | | | | | | | | 1089.5 | 1756.5 | |
| Circulation % | | | | | | | | | 40 | 40 | |
| Area Total | | | | | | | | | 1525.3 | 2459.1 | |

Note 1: Spatial allocation for one Linear Accelerator Bunker includes maze and radiation shielding wall. Bunker size depends on equipment selected and radiation shielding recommendation from radiation safety specialist

Note 2: Offices to be provided according to the number of approved full time positions within the Unit

Brachytherapy Suite (Optional)

| ROOM/ SPACE | Standard Component Room Codes | | | | | | | | | | RDL 5/6 Qty x m ² | Remarks |
|-----------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|------------------------------|-----------------------------------------------------------------------------------|
| Brachytherapy Suite | | | | | | | | | | | | |
| Anaesthetic Induction Room | anin-i | | | | | | | | | | 1 x 15 | |
| Brachytherapy Bunker | rad-bunk-i similar | | | | | | | | | | 1 x 128 | Size and requirements as per manufacturers specifications |
| Brachytherapy Bunker Control Room | rad-bctr-i similar | | | | | | | | | | 1 x 17 | Size and requirements as per manufacturers specifications |
| Change Cubicle – Accessible | chpt-d-i | | | | | | | | | | 1 x 4 | |
| Clean up Room | clup-10-i | | | | | | | | | | 1 x 10 | |
| Operating Room | orgn-i similar | | | | | | | | | | 1 x 42 | Optional. Provide if Brachytherapy Bunker is not equipped for surgical procedures |
| Patient Bay – Holding/ Recovery | pbtr-h-10-i | | | | | | | | | | 2 x 10 | |
| Scrub up / Gowning | scrb-6-il | | | | | | | | | | 1 x 6 | |
| Store / Prep - Seed and Loading | htlb-i similar | | | | | | | | | | 1 x 9 | Radiation shielding as per specialist advice |
| Toilet – Accessible, Patient | wcac-i | | | | | | | | | | 1 x 6 | |
| Waiting - Sub | wait-sub-i | | | | | | | | | | 2 x 5 | Separate Male/ Female |
| Brachytherapy Support | | | | | | | | | | | | |
| Bay - Handwashing, PPE, Type B | bhws-ppe-i | | | | | | | | | | 1 x 1 | Patient holding bay, combined with PPE storage |
| Bay - Linen | blin-i | | | | | | | | | | 1 x 2 | |
| Bay - Resuscitation Trolley | bres-i | | | | | | | | | | 1 x 1.5 | |
| Clean Utility | clur-8-i | | | | | | | | | | shared | Shared with main treatment/planning support |
| Cleaner's Room | clrm-5-i | | | | | | | | | | shared | Shared with main treatment/planning support |
| Dirty Utility | dtur-s-i | | | | | | | | | | shared | Shared with main treatment/planning support |
| Disposal Room | disp-8-i | | | | | | | | | | shared | Shared with main treatment/planning support |
| Property Bay | prop-2-i | | | | | | | | | | 1 x 2 | Optional, Patient property |
| Store - Equipment | steg-15-i | | | | | | | | | | 1 x 15 | Sterile stock and consumables |
| Sub Total | | | | | | | | | | | 288.5 | |
| Circulation % | | | | | | | | | | | 40 | |
| Area Total | | | | | | | | | | | 403.9 | |

Imaging Suite (Optional)

For Stand-alone Facility. May be shared with collocated Chemotherapy Oncology Unit

| ROOM/ SPACE | Standard Component Room Codes | | | | | | | | | | RDL 5/6 Qty x m ² | Remarks |
|------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|------------------------------|-----------------------------------------------------------------------------------|
| Computer Tomography - CT Scanning | | | | | | | | | | | | |
| Change Cubicle - Accessible | chpt-d-il | | | | | | | | | | 1 x 4 | |
| Computer Equipment Room | coeq-i | | | | | | | | | | 1 x 8 | Size and requirements as per manufacturers specifications |
| C.T Scanning - Procedure Room | ctpr-i | | | | | | | | | | 1 x 45 | Size and requirements as per manufacturers specifications |
| C.T Scanning - Control Room | ancrt-i similar | | | | | | | | | | 1 x 14 | |
| Preparation/ Set-Up Room (Imaging) | prep-s-i | | | | | | | | | | 1 x 9 | |
| Patient Bay - Holding | pbtr-h-10-i | | | | | | | | | | 1 x 10 | |
| Viewing and Reporting Room | xrrr-i similar | | | | | | | | | | 1 x 12 | Optional. May be combined with control room |
| Waiting - Sub | wait-sub-i | | | | | | | | | | 1 x 5.5 | Optional. Waiting may be shared |
| General X-Ray | | | | | | | | | | | | |
| Change Cubicle - Accessible | chpt-d-i | | | | | | | | | | 1 x 4 | |
| General X-Ray | genxr-i | | | | | | | | | | 1 x 30 | Size and requirements as per manufacturers specifications |
| Day Light Processing | dpro-i similar | | | | | | | | | | 1 x 16 | Optional; Digital processing/ printing. |
| Patient Bay – Holding | pbtr-h-10-i | | | | | | | | | | 1 x 10 | |
| Viewing and Reporting Room | xrrr-i similar | | | | | | | | | | 1 x 12 | Optional. May be combined with processing room |
| Waiting - Sub | wait-sub-i | | | | | | | | | | 1 x 5.5 | Optional. Waiting may be shared |
| Magnetic Resonance Imaging - MRI | | | | | | | | | | | | |
| Change Cubicle - Accessible | chpt-d-i | | | | | | | | | | 1 x 4 | |
| Computer Equipment Room | coeq-i | | | | | | | | | | 1 x 8 | Size and requirements as per manufacturers specifications |
| MRI Scanning Room | mri-sc-42-i | | | | | | | | | | 1 x 42 | Size and requirements as per manufacturers specifications |
| MRI - Control Room | ancrt-i similar | | | | | | | | | | 1 x 14 | |
| Preparation/ Set-Up Room (Imaging) | prep-s-i | | | | | | | | | | 1 x 9 | |
| Patient Bay - Holding | pbtr-h-10-i | | | | | | | | | | 1 x 10 | |
| Viewing and Reporting Room | xrrr-i similar | | | | | | | | | | 1 x 12 | Optional. May be combined with control room |
| Waiting - Sub | wait-sub-i | | | | | | | | | | 1 x 5.5 | Optional. Waiting may be shared between imaging rooms or with main facility entry |
| Imaging Support | | | | | | | | | | | | |

| ROOM/ SPACE | Standard Component Room Codes | | | | | | | | | | RDL 5/6 Qty x m ² | Remarks |
|--------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|------------------------------|-----------------------------------------|
| Bay - Handwashing, PPE, Type B | bhws-ppe-i | | | | | | | | | | 1 x 1 | To patient holding bays |
| Bay - Linen | blin-i | | | | | | | | | | 2 x 2 | 1 per 2 imaging rooms |
| Bay - Resuscitation Trolley | bres-i | | | | | | | | | | 2 x 1.5 | 1 per 2 imaging rooms |
| Bay - Wheelchair Park | bwc-i | | | | | | | | | | 2 x 4 | 1 per 2 imaging rooms |
| Clean Utility | clur-8-i | | | | | | | | | | 1 x 8 | |
| Cleaner's Room | clrm-5-il | | | | | | | | | | 1 x 5 | |
| Dirty Utility | dtur-s-i | | | | | | | | | | 1 x 8 | |
| Disposal Room | disp-8-i | | | | | | | | | | 1 x 8 | |
| Property Bay | prop-2-i | | | | | | | | | | 2 x 2 | Patient property. 1 per 2 imaging rooms |
| Shower - Patient | shpt-i | | | | | | | | | | 2 x 3 | Separate Male / Female |
| Staff Station | sstn-5-i | | | | | | | | | | 1 x 5 | To waiting / patient holding bays |
| Toilet - Patient | wcpt-i | | | | | | | | | | 2 x 4 | Separate male / female |
| Office - Single Person | off-s9-i | | | | | | | | | | 1 x 9 | Radiologist |
| Office - Single Person | off-s9-i | | | | | | | | | | 1 x 9 | Radiographer |
| Office - Workstation | off-ws-i | | | | | | | | | | 1 x 5.5 | Quantity dependent on service plan |
| Property Bay - Staff | prop-3-i | | | | | | | | | | 1 x 3 | |
| Staff Room | srm-15-i | | | | | | | | | | 1 x 15 | |
| Shower - Staff | shst-i | | | | | | | | | | 2 x 3 | Separate Male / Female |
| Toilet - Staff | wcst-i | | | | | | | | | | 2 x 3 | Separate Male / Female |
| Sub Total | | | | | | | | | | | 411 | |
| Circulation % | | | | | | | | | | | 40 | |
| Area Total | | | | | | | | | | | 575.4 | |

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.
- Exact requirements for room quantities and sizes will reflect Key Planning Units 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.
- Office areas are to be provided according to the Unit role delineation and number of endorsed full time positions in the unit.
- Staff and support rooms may be shared between Units dependent on location and accessibility to each unit and may provide scope to reduce duplication of facilities.
- 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.

6 Future Trends

- Developing international trends for cancer services to be concentrated in centres that treat high volumes of patients and offer a full range of cancer services including surgery, oncology, radiotherapy, and specialised nursing and allied health services.
- Improved survivals (both long-term & short-term palliative) leading to increased care demands.
- Ongoing technological developments e.g. the robotic 'cyberknife' which combines a linear accelerator with a computerized tomography (CT) scanner, delivering radiotherapy from six different angles.
- Biologically targeted radiation e.g. boron neutron capture which delivers radiation from within a tumour.
- Ground-breaking new evidence that adrenaline, produced by muscles during exercise activates Interleukin 6 which seeks out tumour cells directly, inhibiting further development while informing the body's natural killer cells what to target. In future, this may lead to gymnasiums being an integral part of oncology units.

7 Further Reading

- American Institute of Architects, The Facility Guidelines Institute, Guidelines for Design and Construction of Hospitals and Outpatient Facilities; Available from: <http://www.fgiguilines.org/>
- Australasian Health Facility Guidelines Part B-Health Facility Briefing and Planning 600 – Radiation Oncology (2016) https://aushfg-prod-com-au.s3.amazonaws.com/HPU_B.0600_6_0.pdf
- Gov.UK Health Building Note 02-01: Cancer Treatment Facilities (2013) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/147860/HBN_02-01_Final.pdf
- International Atomic Energy Agency (IAEA) Radiotherapy Facilities: Master planning & Concept Design Consideration (2014) <http://www-pub.iaea.org/MTCD/Publications/PDF/Pub1645web-46536742.pdf>
- The Kings Fund; 'Future Trends and Challenges for Cancer Services in England, a Review of Literature & Policy'. <https://www.kingsfund.org.uk/publications/future-trends-and-challenges-cancer-services-england>
- The Royal Australian and New Zealand College of Radiologists. <http://www.ranzcr.edu.au/>
- Exercise Medicine Research Institute. Edith Cowan University, WA, Australia <https://www.exercisemedicine.org.au/>



The International Health Facility Guidelines recommends the use of HFBS “Health Facility Briefing System” to edit all room data sheet information for your project.

HFBS provides edit access to all iHFG standard rooms, and departments, and more than 100 custom report templates.

HFBS Health Facility Briefing System



Briefing Module

The Health Facility Briefing System (HFBS) has numerous modules available via annual subscription. It suits healthcare Architects, Medical Planners, Equipment Planners Project Managers and Health Authorities.

Use the HFBS Briefing Module to quickly drag in health facility departments or pre-configured room templates from the iHFG standard, edit the room features such as finishes, furniture, fittings, fixtures, medical equipment, engineering services. The system can print or download as PDF more than 100 custom reports including room data sheets, schedules, and more...

To learn more about the HFBS web-based Healthcare Briefing and Design Software and to obtain editable versions of the “Standard Components” including Room Data Sheets (RDS) and Room Layout Sheets (RLS) offered on the iHFG website, signup for HFBS using the link below.

Get Started Now:
hfbs.healthdesign.com.au

- ✓ iHFG Room Data Sheets and Departments are instantly editable in the HFBS software available online.
- ✓ You can access hundreds of report templates to print your iHFG room data in HFBS.
- ✓ HFBS has a onetime free 3 day trial available to all new users.

Get Started Now:
hfbs.healthdesign.com.au



HFBS

Health Facility Briefing System

hfbsinfo.com | techsupport@healthdesign.com.au