

30.0 Medical Imaging Unit – General

30.1 Introduction

30.1.1 Description

The Medical Imaging Unit is a discrete unit of the hospital which provides for General X-Ray diagnostic investigations. Depending on the level of service the unit may also provide for diagnostic screening (fluoroscopy), ultrasound, mammography, computed tomography (CT) or interventional radiographic procedures.

The Medical Imaging Unit may be co-located with or incorporate other specialties including Nuclear Medicine, Angiography, MRI, and PET Units.

30.2 Planning

30.2.1 Planning Models

The layout of a Medical Imaging Unit should be developed in compliance with manufacturer's recommendations, because area requirements may vary from machine to machine. Since technology changes frequently and from manufacturer to manufacturer, rooms should be sized larger to allow upgrading of equipment in the future.

Privatization of Services

Increasingly Medical Imaging services are being delivered as a privately owned and operated service. This option needs to be identified early in the planning process as there may be considerable spatial, design and cost implications.

Offsite Services

In smaller hospitals that cannot justify a full Medical Imaging Unit, access to offsite services is an important consideration in the planning phase, in particular, the selection of the site.

30.2.2 Functional Areas

The Medical Imaging Unit may consist of the following Functional Areas depending on the Operational Policy and service demand:

- Reception and Waiting Areas
- Imaging and screening rooms with access to patient change areas and toilets
- Support areas including preparation areas, storage, disposal and utility rooms
- Film processing areas – both daylight and darkroom areas as required; alternatively, medical imaging may be based on a filmless digital imaging system with its own equipment and storage requirements
- Film storage areas
- Viewing and Reporting areas
- Administrative and Office areas
- Staff Amenities areas including Staff Room, Staff Change Rooms and Toilets and access to Meeting Rooms.

Clean Utility/Preparation Areas

The Clean Utility/Preparation Room shall provide for preparation and mixing of contrast media, storage of medications and sterile supplies. The Clean Utility/Preparation Room, if conveniently located, may serve any number of rooms. The Clean Utility/Preparation Room shall comply with requirements identified in Standard Components – Clean Utility. When pre-prepared media is used, additional storage shall be provided for the media.

Film Processing Areas

Digital Imaging will not require film processing areas. If film processing is required, it shall be located convenient to the Imaging Rooms and to the quality control area and will normally involve daylight processing equipment. A Darkroom may be provided for specialized processing if required. The Darkroom, if provided will require special attention to lighting and ventilation. If film processing is required, provide a silver recovery unit.

If the Medical Imaging Unit operates with a filmless, digital imaging system, the appropriate areas for image processing and printing will be required according to the type of system installed.

Film Storage

For digital imaging applications, there will need to be an area for the PACS (Picture Archiving and Communications System) archive storage units.

A room with cabinets or shelves to file hard copies of patient film shall be provided, located close to the Reception/administration area. Archived film may be stored outside the Imaging Unit, but must be properly secured to protect films against loss or damage.

General Radiography/Tomography

Each General will include an upright Bucky stand for chest films. Where volumes are low, OPG, Mammography and Tomography may be added to the General room equipment. This will necessitate a slightly larger room. Tomography is becoming less used with the advent of CT but may be required/preferred by a Urology service. The necessary attachments may be incorporated into a General Room.

At least one General X-Ray room must be sized and located to facilitate transfer of patients from Emergency Unit, if a dedicated room in the EU is not provided.

Orthopantomography (OPG)

OPG is a method of obtaining films of the upper and lower teeth-bearing jaws that supports Trauma, Dental and Fabio-maxillary services. This equipment may be incorporated into a General Room, a separate bay or within the Dental Unit.

Mammography

Mammography imaging may be included for diagnostic purposes. It should be sized to allow prone positioning for some interventional biopsy procedures. Mammography should be located adjacent to an Ultrasound Room for fine needle biopsies. Change Rooms should be discreet and access to an Interview Room will be required.

Ultrasound

Ultrasound imaging is used in a variety of specialties including Obstetrics, Medicine, Surgery, Cardiology and Vascular Surgery. Ultrasound rooms may be provided within the specialty departments or within the Medical Imaging Unit. One ultrasound room should be sized to allow for interventional procedures. There must be access to a toilet and drinking water for ultrasound procedures that require the patient to have a full bladder.

Fluoroscopy

Fluoroscopic/radiographic imaging procedures involve administration of contrast media to the patient, serial repositioning of the patient and the timed use of a fluoroscopic imaging system. The Fluoroscopy room will require a preparation room for barium preparation and an adjacent toilet/shower, accessed from inside the room and from the external corridor.

With the general decline in use of barium contrast studies and advances in equipment technology, fluoroscopy and angiography may be combined in one room. The room must be equipped for anesthesia.

Digital Subtraction Angiography (DSA)

Simple angiography involves injection of a radiographic contrast agent into blood vessels so that vascular structures are enhanced and revealed together with surrounding bony and soft tissue structures. This procedure is used for simple peripheral studies and can be done on a fluoroscopy table.

With DSA, a contrast agent is administered directly, via a catheter, into an artery close to the area to be examined. The subtraction of a pre-contrast mask suppresses interfering structures from the image so that the arteries become clearly defined. This process enables a full spectrum of vascular and non-vascular procedures including angiography, angioplasty, arterial and venous stents, biopsy and drainage procedures and biliary and urologic procedures.

Computerized Tomography (CT)

Refer to the Standard Component for CT Scanning. A Control Room may service two rooms. The room may need to be serviced for general anesthesia. A bed/trolley bay adjacent to each room is required for staff to observe waiting patients.

Magnetic Resonance Imaging (MRI)

MRI will require a dedicated area or suite for access control and protection of/from the magnet (fringe field), and preparation/nursing support areas.

Requirements include:

- Interview room for patient consents and explanations in close proximity
- Storage for MRI-compatible (non-ferrous) equipment
- Lockers for patient property that may interfere with or be damaged by the magnet such as credit cards and keys.

Careful consideration must be given to the location of the MRI in order to minimize the provision and cost of shielding required including the following:

- MRI should not be located under a helipad or next to a sub-station
- Floor/slab must be structurally capable of carrying the weight of the MRI
- Good external access is required for the installation of the MRI; a removable side panel may be more cost effective than dismantling a RF shielded door
- Room size and shape must be able to contain the 5 Gauss magnetic field with the room and consideration should be given to the needs for future 3T MRIs
- Access control needs to be included to ensure only authorized staff enter the MRI room
- Locate away from moving ferrous objects which can interfere such as lifts, cars moving through car parks, construction sites
- Ensure that emergency equipment such as fire extinguishers and medical gas bottles in the vicinity are not made of magnetic iron.

Endoscopic Retrograde Choleopancreatography (ERCP)

ERCP is a diagnostic procedure for examination of the biliary and pancreatic ducts system and may be a therapeutic intervention for removal of gall stones etc. It is a procedure used by gastroenterologists, and may be performed in the Medical Imaging Unit or in an Endoscopy Unit.

30.2.3 *Functional Relationships*

The location of the Medical Imaging Unit, if provided, is variable. Consideration must be given to its proximity to Accident and Emergency, and to the Operating Unit where dedicated in-theatre X-Ray is not provided. The requirement for an Outpatient X-Ray Service may also dictate where in the facility it is located. In most instances, a compromise between travelling distance for inpatients (minor role) and convenience for outpatients (major role) will be made.

30.3 Design

30.3.1 Construction Standards

Special attention is to be given to the following in the design of a Medical Imaging Unit:

- Structural support for equipment including equipment mounted to ceilings
- Level floor for equipment positioning and safe patient movement
- The impact on room space of large diameter electrical cable support tray (in floor and surface - mounted)
- Equipment ventilation
- Procedure timing (clocks)
- Task lighting/dimming and room blackout, as required.
- Construction Standards for a Medical Imaging Unit include the following:
- Provision for cable trays, ducts or conduits should be made in floors, walls, and ceilings as required.
- Ceiling heights may be higher than normal.
- A lay-in type ceiling should be considered for ease of installation, service, and remodeling.

Standards and Codes

Radiological facilities are to comply with relevant State legislation, regulations and statutory requirements.

30.3.2 Environmental Considerations

Acoustics

Acoustic privacy should be provided in all imaging rooms, interview rooms and particularly in reporting areas

Lighting

Provide indirect and dimmable lighting required in all examination rooms for patient comfort. Ceiling -mounted shadowless lighting is required in CT and Angiography imaging rooms.

Privacy

Visual patient privacy is an important consideration to be addressed in the design of imaging rooms and waiting spaces. Privacy screens will be required to imaging and screening rooms.

30.3.3 Infection Control

Hand-washing facilities shall be provided for each Imaging Room, located within or outside the entry to the room. Refer to Part D – Infection Control: Handwashing Facilities for a discussion on the types of basins suitable for this area.

30.3.4 Space Standards and Components

Rooms shall be sized to suit the design requirements of the equipment to be used, to provide a safe working environment and to allow the effective movement of staff and patients.

Ceiling heights shall suit the equipment, but shall not be less than 3000mm for ceiling tube mount installations.

Special consideration should also be given to the width and height of doorways to ensure delivery and removal of equipment is not impeded or prevented, and that patient trolley and bed movement is not hampered.

30.3.5 *Building Service Requirements*

Radiation Protection

Most Medical Imaging requires radiation protection. Plans and specifications will require assessment for radiation protection by a certified physicist or other qualified expert. The radiation protection assessment will specify the type, location and amount of radiation protection required according to the final equipment selections and layout. Radiation protection requirements shall be incorporated into the final specifications and the building plans.

Communications

Nurse Call System

Nurse call buttons shall be located in or near change cubicles, patient-use toilets, showers and at every holding/recovery bay. Staff Assist and Emergency Call buttons are required in all Imaging rooms, Holding and Recovery areas. Annunciator panels in corridors must be located for optimum viewing.

Voice/Data Communications

Voice/data installation may include:

- Voice/data cabling for phones and computers
- Dictation system for reporting and/or voice recognition system
- High speed network for digital and CR equipment
- PACS
- Patient or clinical Information Systems
- Radiology Information System ideally linked to the Patient Information System
- Conferencing facilities.

Fire Sprinklers

Caution is required against the use of pre-activation sprinklers in Medical Imaging areas. It should be ensured that a broken sprinkler does not result in the flow of water from all heads, damaging expensive equipment.

30.4 Components of the Unit

The Medical Imaging – General Unit will consist of a combination of Standard Components and Non-Standard Components. Provide Standard Components to comply with details in Standard Components described in these Guidelines. Refer also to Standard Components Room Data Sheets and Room Layout Sheets.

30.4.1 *Non-Standard Components*

Digital (PACS) Reporting Area

Description and Function

PACS reporting areas will include Radiologist workstations for viewing and reporting on procedures using high resolution (LCD) monitors on which images can be manipulated. A minimum of two linked monitors are required, occasionally four screens are provided.

In addition to the reporting monitors, a dedicated computer will be required for access to the Patient Information System and a system for dictating reports. .

Location and Relationships

Locate in a quiet area with ready access to the imaging rooms. Several workstations may be located in one room but will need to be visually and acoustically separated.

Considerations

The reporting area will require:

- Ergonomic design of the workstation to accommodate the monitors.
- Adequate ventilation and temperature control to individual spaces to minimize risk of monitor failure
- Individual cubicle lighting (dimmable)
- Acoustic measures to ensure quality of voice recordings.

Magnetic Resonance Imaging (MRI) Room

Description and Function

The MRI Room is for MRI scanning procedures. A staff handwashing basin will be located outside the room in close proximity.

Location and Relationships

The MRI room will have an adjacent control room and computer equipment room. Refer to Functional Areas – MRI above for discussion on location and specific requirements.

Considerations

Refer to Functional Areas above for specific requirements. The following are additional considerations:

- Fixtures and fittings are to be non-magnetic
- Electromagnetic shielding (radio frequency enclosure) will be required as advised by a Radiation Consultant
- Installation will be according to manufacturer's specifications; floor to ceiling cable duct with removable covers may be required
- Provide 'X-Ray in Use' lights outside each entry door
- Power to be on emergency supply – all power to MRI to pass through MRI isolation transformer.

30.5 Schedule of Accommodation

Typical Medical Imaging Unit - General at levels 1 to 6

ROOM/ SPACE	Standard Component	Level 1/2 Qty x m ²			Level 3/4 Qty x m ²			Level 5/6 Qty x m ²			Remarks
Entrance/ Reception Areas											
Reception/ Clerical	RECL-10-SJ Similar	1	x	9	1	x	12	1	x	15	
Waiting	WAIT-10-SJ Similar	2	x	10	2	x	15	2	x	50	Separate Female areas
Play Area - Paediatric	PLAP-10-SJ Similar	1	x	10	1	x	15	1	x	20	Adjacent to waiting area
Bay - Mobile Equipment	BMEQ-4-SJ	1	x	4	1	x	6	2	x	6	Depends on facility requirement
Bay - Water Fountain		1	x	1	1	x	1	2	x	1	
Bay - Wheelchair Park	BWC-SJ	1	x	4	2	x	4	1	x	8	
Bay - Vending Machines		1	x	1	1	x	1	1	x	3	Optional
Office - 4 Person Shared	OFF-4P-SJ	1	x	12	1	x	15	2	x	20	Clerical
Office - Workstation	OFF-WS-SJ				1	x	5.5	1	x	5.5	For transport staff. May be adjacent to trolley parking area
Store - Current Film	STFS-SJ Similar	1	x	20	1	x	50	1	x	100	Optional; Size depends on facility requirement and digital records
Toilet - Public	WCPU-3-SJ	2	x	3	4	x	3	6	x	3	May share general public amenities
Toilet - Accessible	WCAC-SJ	1	x	6	1	x	6	2	x	6	May share general public amenities
Support Areas											
Cleaner's Room	CLRM-5-SJ	1	x	5	1	x	5	2	x	5	
Communications Room	COMM-SJ COMM-20-SJ	1	x	10	1	x	20	1	x	30	PACS server room. Size determined by operational policy
Office - 3 Person Shared	OFF-3P-SJ	1	x	12	1	x	12	1	x	15	PACS operation/ management
Store - Files	STFS-10-SJ	1	x	8	1	x	10	1	x	20	Film/ CDs/ Discs. Size determined by operational policy
Store - General	STGH-12-SJ Similar	1	x	9	1	x	12	1	x	16	
Store - Photocopy/ Stationery	STPS-8-SJ	1	x	8	1	x	8	1	x	8	Printing/ Digitiser
General X-Ray/ OPG/ Fluoroscopy											
General X-Ray	GENXR-SJ	1	x	30	4	x	30	12	x	30	
Orthopantomogram (OPG)								2	x	6	
Screening Room (Fluoroscopy)	SCRN-SJ				1	x	36	3	x	36	
Patient Bay Holding (Male/Female)	PBTR-H-10-SJ	2	x	10	4	x	10	4	x	10	Separate Male/ Female areas
Bay - Handwashing, Type B	BHWS-B-SJ	1		1	1		1	1		1	1 per 4 bed bays; refer to Part D
Bay - Linen	BLIN-SJ	1	x	2	1	x	2	1	x	2	
Bay - Resuscitation Trolley	BRES-SJ	1	x	1.5	1	x	1.5	1	x	2	
Change Cubicle - Patient	CHPT-SJ	2	x	2	6	x	2	20	x	2	2 Change rms per General Imaging room in total
Change Cubicle - Accessible	CHPT-D-SJ	2	x	4	2	x	4	4	x	4	2 Change rms per Imaging room in total
Daylight Processing	DPRO-SJ				1	x	16	1	x	40	Digital processing/ printing; as required by service plan
Dark Room		1	x	6	1	x	6	1	x	6	Optional
Preparation/ Set-up Room (Imaging)	PREP-S-SJ	1	x	9	1	x	9	1	x	9	
Property Bay - Patients	PROP-3-SJ Similar	2	x	2	2	x	4	2	x	8	Patient lockers, Separate Male/ Female areas
Toilet – Patient	WCPT-SJ	2	x	4	2	x	4	2	x	4	Separate Male/ Female areas
Toilet - Accessible	WCAC-SJ	1	x	6	1	x	6	2	x	6	
Waiting – Changed Patients	WAIT-10-SJ	2	x	5	2	x	10	2	x	10	Separate Male/ Female areas

ROOM/ SPACE	Standard Component	Level 1/2 Qty x m ²			Level 3/4 Qty x m ²			Level 5/6 Qty x m ²			Remarks
(Male/Female)											
Ultrasound/ Mammography											
Ultrasound	ULTR-SJ	1	x	14	2	x	14	8	x	14	
Change Cubicle - Patient	CHPT-SJ	1	x	2	1	x	2	6	x	2	For ultrasound, Separate Male /Female areas
Change Cubicle - Accessible	CHPT-D-SJ	1	x	4	1	x	4	2	x	4	For Ultrasound
Mammography	MAMMO-SJ	1	x	16	1	x	16	2	x	16	
Change Cubicle - Patient	CHPT-SJ							1	x	2	For Mammography
Change Cubicle - Accessible	CHPT-D-SJ	1	x	4	1	x	4	1	x	4	For Mammography
Daylight Processing (Mammography)	CPR-SJ				1	x	6	1	x	10	
Preparation/ Set-up Room	PREP-S-SJ				1	x	9	2	x	9	
Waiting - Sub	WAIT-10-SJ Similar	2	x	5	4	x	5	4	x	10	Separate Female areas
CT Scanning Area											
CT Scanning - Procedure Room	CTPR-SJ	1	x	45	2	x	45	4	x	45	
CT Scanning - Control Room	CTCR-SJ	1	x	14	1	x	14	4	x	14	Larger space required if shared
Computer Equipment Room	COEQ-SJ	1	x	8	2	x	8	4	x	8	For Imaging modules
Patient Bay Holding (Male/Female)	PBTR-H-10-SJ	2	x	10	2	x	10	4	x	10	Separate Male/ Female areas
Waiting – Changed Patients (Male/Female)	WAIT-10-SJ	2	x	5	2	x	10	2	x	10	Separate Male/ Female areas
Change Cubicle - Patient	CHPT-SJ	1	x	2	2	x	2	4	x	2	
Change Cubicle - Accessible	CHPT-D-SJ	1	x	2	1	x	2	2	x	4	
Bay - Handwashing, Type B	BHWS-B-SJ	1	x	1	1	x	1	1	x	1	1 per 4 bed bays; refer to Part D
Bay - Linen	BLIN-SJ	1	x	2	1	x	2	1	x	2	
Bay - Resuscitation Trolley	BRES-SJ	1	x	1.5	1	x	1.5	1	x	2	
Angiography Area (Optional - depends on service plan)											
Angiography Procedure Room	ANPR-SJ				2	x	42	4	x	42	
Angiography Control/ Reporting Room	ANCR-SJ				2	x	14	4	x	14	May be shared between two procedure rooms
Computer Equipment Room	COEQ-SJ				2	x	8	4	x	8	For Imaging modules
Anaesthetic Induction Room	ANIN-SJ				1	x	15	2	x	15	Optional
Preparation/ Set-up Room	PREP-S-SJ				1	x	9	2	x	9	
Patient Bay Holding (Male/Female)	PBTR-H-10-SJ				2	x	10	4	x	10	Separate Male/ Female areas
Reporting Room	XRRR-SJ				1	x	12	1	x	12	May be combined with control room
Scrub Up/ Gowning	SCRB-6-SJ				2	x	6	4	x	6	Larger space required if shared
Store - Sterile Stock	STSS-12-SJ				2	x	12	4	x	12	
Bay - Handwashing, Type B	BHWS-B-SJ				1	x	1	1	x	1	1 per 4 bed bays; refer to Part D
Bay - Linen	BLIN-SJ				1	x	2	1	x	2	
Bay - Resuscitation Trolley	BRES-SJ				1	x	1.5	1	x	2	
Store - Files	STFS-10-SJ				1	x	8	1	x	10	According to operational policies
MRI Area											
MRI Scanning Room					1	x	42	2	x	42	
MRI Control/ Reporting Room	ANCRT-SJ				1	x	14	2	x	14	May be shared between 2 MRI procedure rooms
Computer Equipment Room	COEQ-SJ				1	x	8	2	x	8	Size & configuration as per manufacturer's specifications
MRI Viewing and Reporting	XRRR-SJ				1	x	12	1	x	12	Optional. Maybe combined with Control Room
Change Cubicle - Patient	CHPT-SJ				2	x	2	2	x	2	For MRI

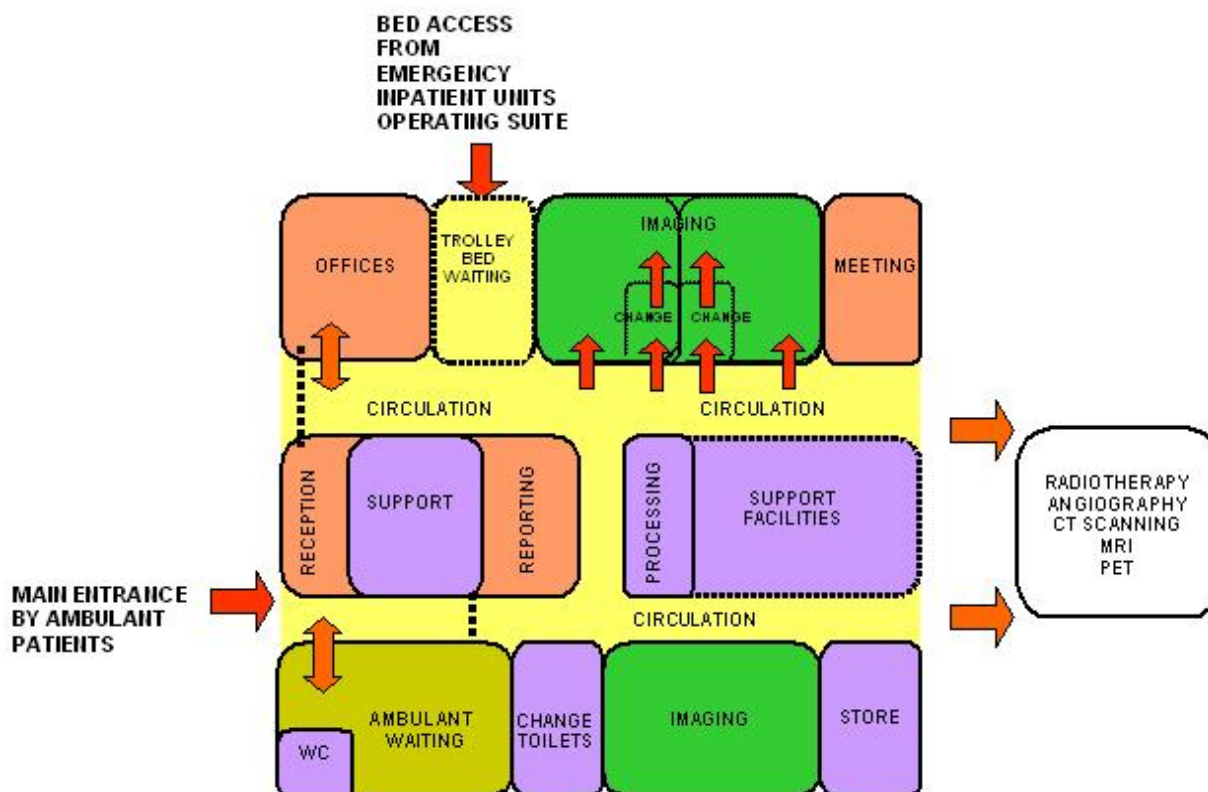
ROOM/ SPACE	Standard Component	Level 1/2 Qty x m ²			Level 3/4 Qty x m ²			Level 5/6 Qty x m ²			Remarks
Patient Bay Holding (Male/Female)	PBTR-H-10-SJ				1	x	10	2	x	10	Separate Male/ Female areas
Property Bay - Patients	PROP-3-SJ				2	x	4	2	x	8	Patient lockers, Separate Male/female areas
Waiting – Changed Patients (Male/Female)	WAIT-10-SJ				2	x	10	2	x	10	Separate Male/ Female areas
Toilet – Patient	WCPT-SJ				2	x	4	2	x	4	Separate Male/ Female areas
Bay - Handwashing, Type B	BHWS-B-SJ				1	x	1	1	x	1	1 per 4 bed bays; refer to Part D
Bay - Resuscitation Trolley	BRES-SJ				1	x	1.5	1	x	1.5	
Consult & Holding/ Recovery Area - Shared between Imaging Specialties											
Consult Room	CONS-SJ				1	x	12	2	x	12	
Patient Bay - Holding/ Recovery	PBTR-H-10-SJ				4	x	10	8	x	10	
Procedure Room	PROC-20-SJ Similar				1	x	14	1	x	20	
Bay - Handwashing, Type B	BHWS-B-SJ				1	x	1	2	x	1	1 per 4 bed bays; refer to Part D
Bay - Linen	BLIN-SJ				1	x	2	1	x	2	
Bay - Resuscitation Trolley	BRES-SJ				1	x	1.5	1	x	1.5	
Clean Utility	CLUR-12-SJ Similar				1	x	8	1	x	12	
Dirty Utility - Sub	DTUR-8-SJ				1	x	8	1	x	8	
Disposal Room	DISP-8-SJ				1	x	8	1	x	8	
Property Bay - Patients	PROP-3-SJ Similar				2	x	4	2	x	8	Patient lockers
Shower - Patient	SHPT-SJ				1	x	4	1	x	4	
Staff Station	SSTN-14-SJ Similar				1	x	10	1	x	14	
Store - Equipment	STEQ-10-SJ				1	x	10	1	x	12	
Toilet - Patient	WCPT-SJ				2	x	4	2	x	4	Separate Male/ Female areas
Toilet - Accessible	WCPT-D-SJ				1	x	5	1	x	5	
Staff Offices											
Office - Single - 12m2	OFF-12-SJ				1	x	12	1	x	12	Director
Office - Single - 9m2	OFF-S9-SJ				2	x	9	4	x	9	Radiologists and Radiographers
Office - Single - 9m2	OFF-S9-SJ				1	x	9	1	x	9	Nurse Manager
Office - Workstations	OFF-WS-SJ				4	x	5.5	6	x	5.5	Medical / Clerical; according to staffing numbers
Store - Photocopy/ Stationery	STPS-8-SJ				1	x	8	1	x	8	
Meeting Room - Medium	MEET-L-20-SJ				1	x	20	1	x	20	
Meeting Room - Large	MEET-L-30-SJ				shared			1	x	30	
Staff Room	SRM-25-SJ Similar				1	x	20	1	x	25	
Store - Files	STFS-10-SJ							1	x	10	Optional; May include film library
Property Bay - Staff	PROP-3-SJ				2	x	3	2	x	3	Lockers
Toilet - Staff	WCST-SJ				2	x	3	2	x	3	Easily accessible if general staff amenities are remote
Staff Change Room	CHST-12-SJ				2	x	12	2	x	14	Required for facilities with high interventional workload
Total Net Department					410.0			1427.0			2806.5
Circulation %					35			35			35
Grand Total					553.5			1926.5			3788.8

Notes:

- 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 staffing establishment; Executives and Managers may be responsible for more than one area but should have only one office assigned within the campus
- 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.

30.6 Functional Relationship Diagram



30.7 Further Reading

- Australasian Health Infrastructure Alliance (Aus.). 'Australasian Health Facility Guidelines'. Retrieved from website: www.healthfacilityguidelines.com.au 2014
- Australasian Health Facility Guidelines (Aus.). 'Part B – Health Facility Briefing and Planning 440 Medical Imaging Unit Revision 5' 2013. Retrieved from website: [http://www.healthfacilityguidelines.com.au/AusHFG_Documents/Guidelines/\[B-0440\]%20Medical%20Imaging%20Unit.pdf](http://www.healthfacilityguidelines.com.au/AusHFG_Documents/Guidelines/[B-0440]%20Medical%20Imaging%20Unit.pdf) 2014
- Department of Health (UK). 'Facilities for Diagnostic Imaging and Interventional Radiology HBN 6' 2001. Retrieved from website: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/149183/HBN_6_V1_DSSA.pdf 2014
- Department of Veteran Affairs (US). 'VA Design Guide; Magnetic Resource Imaging' 2008. Retrieved from website: <http://www.wbdg.org/ccb/VA/VADEGUID/mri.pdf> 2014
- The Facility Guidelines Institute (US). 'Guidelines for Design and Construction of Health Care Facilities' 2010 Edition. Retrieved from website: www.fgiguidelines.org 2014.