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INTRODUCTION

Preamble

503061 440 .1.00

Medical Imaging (Diagnostic Radiology) is a Clinical Support Service in the Guide to the Role Delineation of Health Services (Third Edition 2002). Six levels of service are delineated and a description of type of service, facilities and staffing for each level is provided.

Planners may refer to this document to determine/understand the service profile and roles of the institution/s in which the Medical Imaging Unit occurs to determine the extent of facility needs.

Medical Imaging Units will vary in size. Components and allocated spaces will depend on the outcome of a needs analysis and a service plan. The service plan is based on the location, size, needs and population of the area in which the Medical Imaging Unit is to be sited and must be well in place prior to the commencement of the capital planning process.

In addition, facility design, must, where appropriate, meet all necessary criteria to reach accreditation standards with regard to design and equipment. Refer to the Australian Council on Healthcare Standards (ACHS) EQUIP Guide.

503062 440 .2.00

NEW TECHNOLOGIES

Medical Imaging is possibly one of the most rapidly developing and evolving specialties within the health care system. Whilst general radiology still forms the bulk of the workload in terms of volume, modalities such as ultrasound and MRI are increasing exponentially in terms of their applications and safety factors. At the more complex end of the spectrum, the interventional / therapeutic work is growing at major hospitals and is expected to grow further. This may require additional requirements in areas such as infection control, monitoring, outpatients review and resuscitation.

Planners need to be very aware of future possibilities, build in flexibility for expansion and/or change but also be aware not only of the capital cost of major equipment, but
- be confident that the health outcomes of installing a particular imaging modality can be justified
- consider the overall impact on other hospital services in terms of referral patterns and
- be aware of what is available in the private sector particularly in rural areas to avoid unnecessary and costly duplication and under-utilisation. Some small towns rely on private practice for more sophisticated modalities and private practitioners may be contracted to provide facilities on the hospital campus.

Introduction

503063 440 .3.00

This Health Planning Unit (HPU) is a resource to assist project teams with the planning, design and construction of a Medical Imaging Unit. It should be read in conjunction with generic requirements and Standard Components (Room Data & Room Layout Sheets (RDS/RLS) in Parts A, B, C and D of these Guidelines.

This Guideline will address the following imaging modalities:
- General imaging including Tomography
- Orthopantomography (OPG)
- Fluoroscopy (Screening)
- Ultrasonography
- Mammography
- Digital chest screening
- Computerised Tomography (CT)

- Angiography
- Digital Subtraction Angiography
- Magnetic Resonance Imaging (MRI)
- Picture Archiving & Communication Systems (PACS)

It will also address the type and provision of mobile imaging units.

503064 440 .4.00 Cardiac angiography is excluded from this guideline although it may be incorporated into an Interventional Suite of a Medical Imaging Unit to share recovery facilities etc.

Nuclear Medicine, Positron Emission Tomography (PET) and Bone Mineral Densitometry will be included at a later date.
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Policy Statement

503065 440 .5.00 LEGISLATION

Radiation Control Act 1990 (amended 2002) and Radiation Control Regulations 2003 administered by the Environment Protection Authority (EPA). Areas of EPA responsibility include:
- Licensing
- Registration and
- Accreditation

PD2005_339. Manual – "Protecting People and Property: NSW Health Policy and Guidelines for Security Risk Management in Health Facilities".

PD2005_576: Office Accommodation Policy – Public Health Organisations and Ambulance Service.

Description of the Unit

503066 440 .6.00 DEFINITION OF HPU

The Medical Imaging Unit is a discrete unit of the hospital which provides for radiological investigations, both diagnostic and increasingly therapeutic. The most common modalities at Level 4 and above are general radiology, screening (fluoroscopy), ultrasound and computed tomography (CT) Depending on the level of service and the clinical profile of the facility, the unit may also provide:
- tomography
- OPG (orthopantomography)
- Mammography (in support of a breast service, not screening)
- Chest screening
- Peripheral angiography
- DSA and
- Magnetic resonance imaging (MRI).

It is expected that there will be a need for some level of anaesthesia to be given, particularly if the Health Facility offers paediatric services and substantial interventional imaging that will require associated nursing care and patient holding, preparation and recovery facilities.

503067 440 .7.00 PATIENT CHARACTERISTICS

Unit design and layout must accommodate the needs of a wide range of patients, from mobile outpatients to acutely ill patients on life support and a significant proportion of patients will/may require high levels of nursing and medical support

during transfer to and from, and throughout their time in the Imaging Unit. Examples include:
- frail aged (walking aids & wheelchairs)
- ventilated patients
- patients suffering acute trauma
- confused, breathless, sedated or unconscious patients
- patients being monitored for vital signs
- patients on intravenous therapy
- patients undergoing sedation or general anaesthesia during the procedure and requiring recovery post-procedure
- neonatal and paediatric patients
- antenatal patients.

Paediatric patients merit special consideration as a proportion of these may be acutely or seriously ill, may require specialist nursing care and are more likely to need some degree of anaesthesia / sedation and consequent recovery.

PLANNING

Operational Models

503068 440 .8.00 HOURS OF OPERATION

Hours of operation will depend on the Level of Service. Small units may only operate during business hours with an on-call after-hours service. Large units will provide a 24 hour, 7 days a week service. Both operating regimes will have some impact on Unit access and security.

503069 440 .9.00 INTERVENTIONAL UNITS

A single consolidated Medical Imaging Unit at ground level with direct adjacency to Emergency and ready access to Ambulatory Care facilities is the ideal with or without a satellite Unit in the Emergency Unit.

However, the increasing incidence of complex interventional and surgical procedures under radiological control are starting to raise concerns over the optimum location of the Interventional Suites with regard to recovery and access to anaesthetists and trained recovery nursing staff.

The line between surgery in an Operating Unit and Interventional Imaging is blurring and intraoperative imaging is emerging to the point where the Interventional Imaging could be considered as part of an operating unit sharing recovery etc. This will generally result in a “split” department and planners need to carefully consider all the implications, particularly for patient safety and staffing –anaesthetic, nursing and radiological.

There is however, a considerable cost differentiation between the utilisation of Operating Unit and Imaging Unit for interventional work as the Operating Unit has an inbuilt high structural cost that should be taken into consideration.

503070 440 .10.00 EMERGENCY SATELLITE

If collocation of Medical Imaging and the Emergency Unit cannot be achieved, or if travel distances are too great (depending on the size of the respective units), and if emergency workload and acuity justify, it will be appropriate to locate a satellite unit within Emergency, usually comprising a general room, CT room and ultrasound. (The latter may be via a mobile unit). Major trauma centres may also have overhead gantries in their resuscitation rooms.

503071 440 .11.00 ORTHOPAEDIC CLINIC SATELLITE

If a high volume of work is generated by the Hospital's Orthopaedic Service, every attempt should be made to locate the Orthopaedic Clinic as close as possible to Medical Imaging. If this cannot be achieved, consideration may need to be given to a Satellite Imaging Unit. If this occurs, it should be integrated with the Clinic itself.

503072 440 .12.00 OBSTETRIC ULTRASOUND SATELLITE

The need for dedicated perinatal ultrasound room/s remote from the main Imaging Unit will depend on the complexity, utilisation and throughput of the Obstetric Service. If provided, it will usually be incorporated into the Maternity Ambulatory Care Unit. Most likely restricted to facilities with a major Women's Health service.

503073 440 .13.00 PICTURE ARCHIVING & COMMUNICATION SYSTEMS (PACS)

PACS are computers or networks dedicated to the storage, retrieval, distribution and presentation of images, and a full system can handle images from any modality from plain x-rays to PET.

It provides the capability of off-site viewing and reporting (telediagnosis) and allows practitioners in disparate locations to view and discuss the same data simultaneously (teleradiology).

It allows for instantaneous reporting, obviates the need for film transport between units thus minimising the risk of lost films and possible re-examination and ultimately obviates the need for hard copy film storage as existing hard copy film can be progressively digitised and stored into the system.

If there is integration with HIS, then order entry may be automatic.

It is important to recognise the difference a fully implemented PACS system makes to work flows and to unit layout as clerical duties change and radiographers can verify images at time of exposure, hence most of their work is done in the x-ray room.

It is envisaged that all new and/or refurbished facilities will utilise this system making traditional daylight processing obsolete. However, a back-up dark room may be needed in case of failure of the digital systems.

Satellite units, off-campus units, private practices and staff homes may all be linked into the system. All wards and departments will be able to retrieve and view images but manipulation of images will be restricted.

Modalities

503074 440 .14.00 GENERAL RADIOLOGY / TOMOGRAPHY

Each room will probably contain 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 increasingly rare with the advent of CT but may be required/preferred by a Urology service. The necessary attachments may be

incorporated into a General Room.

Assuming no satellite in the Emergency Unit, one room must be sized and located to facilitate transfer of patients from ED.

503075 440 .15.00 ORTHOPANTOMOGRAPHY (OPG)

OPG is a method of obtaining films of the upper and lower teeth-bearing jaws that supports Trauma, Dental and Faciomaxillary services.

Utilisation patterns and the clinical services provided will determine whether it can be incorporated into a General Room or whether it needs its own dedicated space.

503076 440 .16.00 MAMMOGRAPHY

Mammography will usually only be provided if the Hospital provides a breast service (clinics, surgery etc) as it will used for diagnostic not screening purposes.
It should be sized to allow prone positioning for some biopsy procedures.
It is unlikely that a general hospital will house a screening service as part of BreastScreen Australia but there may be exceptions in Women's Centres. This needs to be ascertained as it will affect facility requirements and functional relationships.
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.

503077 440 .17.00 DIGITAL CHEST UNIT

Usually only provided if a chest screening service is part of the Hospitals' service profile.

503078 440 .18.00 ULTRASOUND

One of the most rapidly growing modalities in terms of use, ultrasonography is particularly appropriate to the imaging of internal organs and blood vessels in Obstetrics, Medicine, Surgery, Cardiology and Vascular Surgery. In the latter two specialties, the work will either be done in their own specialty units or in an integrated unit for clinical measurement. They are rarely part of a Medical Imaging Unit.

One ultrasound room should be sized to allow for interventional procedures.

There must be access to a toilet and drinking water as procedures often require the patient to have a full bladder.

Adjacent Preparation Area for set-up and review of biopsy slides etc.

503079 440 .19.00 FLUOROSCOPY

Room equipped for fluoroscopic/radiographic examination involving contrast media, serial repositioning of the patient and the timed use of a fluoroscopic imaging system.

The functions of the Screening (Fluoroscopy) Room involve the administration to the patient of a contrast media which will suitably outline an organ or system, and subsequent radiological examination utilising fluoroscopic equipment.

Facilities for barium preparation and a toilet / shower will be required. For

maximum flexibility, the latter should be accessed from inside the room and from the external corridor.

Procedures may be general or specialised. With the general decline in use of barium contrast studies and advances in equipment technology, general screening and angiography may sometimes be appropriately combined in one room.

The room must be equipped for anaesthesia – ERCPs etc.

503080 440 .20.00 DIGITAL SUBTRACTION ANGIOGRAPHY (DSA).

Angiography is the imaging of the vascular system.

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. 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.

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.

503081 440 .21.00 COMPUTERISED TOMOGRAPHY (CT SCANNING)

Standard Component. A Control Room may service 2 rooms. May need to be serviced for general anaesthesia. Also needs a bed/trolley bay adjacent to each room in order for staff to observe whilst carrying out other duties.

503082 440 .22.00 MAGNETIC RESONANCE IMAGING (MRI)

Requires its own suite for access control and protection of/from the magnet (fringe field), and preparation/nursing support areas. Needs ready access to a small interview for patient consents and explanations. Include storage for MRI-compatible (non-ferrous) equipment. Locker for patients' property that may interfere with or be damaged by the magnet such as credit cards, keys.

Careful consideration must be given to the siting of the MRI in order to minimise the shielding required (and the cost of same). I.e. do not locate a helipad above it or locate the MRI next to a sub-station.

Siting considerations must also include:
- floor / slab structurally capable of carrying the weight of the MRI
- good external access for the installation of the MRI. This may be less expensive if done through a removable side panel rather than dismantling the RF shielded door
- room size / 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 designed in, so that the four zones of control are accommodated, with only authorised staff entering the MRI room
- Other moving ferrous objects which can interfere are lifts, cars moving through car parks, construction sites,

Need to ensure that emergency equipment such as fire extinguishers and medical gas bottles in the vicinity are not made of magnetic iron.

503083 440 .23.00 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 project staff will need to ascertain whether the procedures are to be performed in the Medical Imaging Unit or in an Endoscopy Unit if the latter is provided.

Unlikely to occur in Level 4 facilities and below.

503084 440 .24.00 DENTAL X-RAY

Wall-mounted x-ray units in Dental Surgeries with benchtop processing. Usually managed by the Dental Unit and outside the scope of this Guideline.

503085 440 .25.00 COMPUTED AND DIGITAL RADIOGRAPHY (CR & DR)

Computed radiology is replacing traditional film processing as a means of capturing an image. Cassettes are still used but viewing is done on a CR viewing monitor and the image can be enhanced by the operator to capture the best image before being stored onto the PACS network for reporting.

Digital radiography does away with the use of cassettes altogether and images appear directly onto the workstation monitor and allow manipulation of the images.

Hard copy film brought in by a patient may be digitised and stored onto the network and as images can be viewed from any computer with the necessary authorised access there is no need for traditional x-ray viewing boxes. However, it may be appropriate to locate a viewing box in the Outpatient Department for use until such time as the films can be digitised.

Operational Policies

503086 440 .26.00 PATIENT TRANSPORT

Determine whether the Unit will have its own dedicated portering service or use a central portering service. If the former, space will be required for trolley/wheelchair parking, a small orderly base, storage for linen and portable oxygen cylinders and a small area with sink for wiping down trolleys.

503087 440 .28.00 ANAESTHETICS & RECOVERY

It is vital to ascertain the likely extent of anaesthetic requirements (general and sedation) in order to assess holding and recovery needs, equipment needs and medical servicing of rooms.

Access to a small Interview Room will be required for consents etc in privacy.

Planning Models

503088 440 .29.00 PRIVATISATION OF SERVICES

Increasingly, and especially in smaller facilities, consideration is being given to partial or full privatisation of Medical Imaging services. These options need to be addressed early in the planning process as they may have considerable spatial, design and cost implications.

503089 440 .30.00 OFF-SITE SERVICES

In smaller or remote rural hospitals that cannot justify a full Medical Imaging Unit, access to off-site services such as CT scanning and MRI is an important consideration in the planning phase as is the possibility of establishing teleradiology links with a larger centre. (Implications for an appropriately equipped room).

Functional Areas

503090 440 .31.00 FUNCTIONAL ZONES

The Medical Imaging Unit will consist of the following Functional Zones depending on Operational Policy and service demand:
- Reception, Waiting for ambulatory patients and visitors and Public Amenities
- Clerical / administrative areas (typing, sorting, bookings)
- Imaging rooms with access to patient change areas and toilets
- Patient Holding/Recovery
- Support areas including interview rooms, preparation areas, storage, disposal and utility rooms
- Film processing areas – whether dark room, daylight or computed radiology (CR) workroom
- Film storage
- PACS storage and work areas
- Viewing and reporting areas
- Staff offices & Amenities including Staff Room, Change Rooms, Toilets and Meeting Room/s

503091 440 .32.00 RECEPTION / WAITING

Standard Components. May require a Child Play area. Access to public and disabled toilets.

Must be well-designed, well-defined and user-friendly. The Reception must oversight the entry and waiting areas. Approximately a third of available seating must have arms and seat height of 500mm to allow patients with some disability e.g. hip replacement to get out of the seat easily.

Ambulatory outpatients only. No patients on beds/trolleys.

In large departments, it may be preferable to limit the numbers of patients at the “front” and direct to sub-waiting areas once patients have registered.

503092 440 .33.00 CHANGE AREAS

There should be separation of “changed” and “unchanged” patients, and ambulatory patients and those in wheelchairs or on beds/trolleys requiring some supervision.

Optional arrangements for Change Cubicles include:
- Two dedicated cubicles per imaging room, each opening directly into that room or
- A bank of cubicles located adjacent to the imaging rooms but not opening

directly into the rooms. This option may be supported by a bank of lockers and separate male and female “changed” waiting areas so that patients are not confined to a cubicle. This latter option allows for more flexibility re wheelchair access and more efficient management of clean and soiled linen and call systems. There will still need to be a toilet attached to the screening room.

503093 440 .34.00 INTERVIEW / ASSESSMENT / PRE-PROCEDURE ROOMS

For patient assessment by medical and technical staff, explanations and consents.

Ready access from reporting area & imaging suites.

503094 440 .35.00 IMAGING ROOMS

Usually clustered into suites of like rooms that can share appropriate radiological and patient support. For example

- General & screening rooms
- Ultrasound & Mammography (and often CT)
- CT
- Interventional (DSA & Angiography)
- MRI

503095 440 .36.00 MOBILE IMAGING EQUIPMENT

Mobile units may be general x-ray units, image intensifiers or ultrasound units. Their use and provision should be defined in the Service Plan / Functional Brief as they will impact on space and staffing.

General units will be parked in the Medical Imaging Unit for deployment around the facility, with dedicated units in:
- Operating Unit – general and image intensifier
- NICU – general and ultrasound
- ICU – general and ultrasound
- Emergency – general (if no satellite) and ultrasound.

Locations will need to be determined so that the appropriate parking bays, fittings, protective aprons, power etc can be provided in outlying units.

It is expected that images will be digital or CR system and on the PACS system, so no processing facilities should be required - in the Operating Unit for example. However these units may require viewing stations for better clarity of images.

The responsibility for maintenance etc rests with Medical Imaging.

503096 440 .37.00 VIEWING & REPORTING

These days reporting rarely uses traditional x-ray viewers but “soft copy” reading using high resolution viewing monitors. Design of reporting areas must be conducive to productivity, comfort and efficiency.

Each reporting station will need a minimum of two viewing monitors, a computer for patient and radiological information systems (PIS and RIS) and dictating equipment.

In some instances, reporting may be carried out in the Control Rooms but this requires additional space in these areas for audio privacy.

If staff with permanent offices wish to do reporting in their offices, they must also have two viewing monitors to give better clarity for more accurate diagnosis, dimmable lighting etc.

Staff in shared offices and visiting medical staff will need access to reporting stations.

Reporting stations need to be central with easy access from imaging suites (particularly US, CT, MRI)

Control of environmental conditions i.e. lighting, noise levels etc – ideally individually at each reporting station. Voice recognition software in future will need to be isolated from noise pollution

503097 440 .38.00 PACS ROOM

A climate-controlled area to house the optical disc storage unit/s ("juke boxes") and computers for use by the PACS controller and the suppliers of the equipment.

All digital machines will have – in the imaging room - an ISDN connection linked back to the PACS Room to either an individual monitor or to a single router (a device in a network that handles message transfer between computers) to so that software maintenance of equipment by suppliers requires only one line in/out. Similarly the workstations in the CR Workroom will be linked back.

503098 440 .39.00 SUPPORT AREAS

CLEAN UTILITY / PREPARATION ROOM required for preparation and mixing of contrast media and storage of medications and sterile supplies. If conveniently located, may serve a number of rooms and the Patient Holding/Recovery Area. When pre-prepared media is used, additional storage shall be provided for the media.

DIRTY UTILITY ROOM required and size and number will depend on the number of patient holding/recovery bays and type of patient accommodated. In many instances, a Sub Dirty Utility will suffice but more than one room will/may be required in large Units to minimise staff travel distances.

RESUSCITATION TROLLEY BAYS: In large units, more than one trolley will be needed and planners will need to define locations which may include the Interventional Unit, MRI, and Recovery.

503099 440 .40.00 FILM PROCESSING & VIEWING AREAS

It is likely that in the future, even in small units – and certainly in private units, that all storage will be via PACS making dark rooms and daylight processing obsolete.

- Dark room: May be required as a back-up in the event of a disaster or failure of the PACS system.

- Daylight processing if provided shall be located convenient to the General Imaging Rooms and to the quality control area. Still used for mammography.

If a computed radiography system is used, allow 1 CR unit per 2 general rooms located central to the rooms.

Laser printers are required for CT, Ultrasound, MRI etc

Film scanning (digitiser) for conversion of conventional films to PACS and the laser printer will be used to convert back to hard copy.

503100 440 .41.00 FILM STORAGE

Hard copy storage requires a room with static shelving and should ideally be located near the main Reception/Clerical Area for ease of retrieval. Size will depend on Operational Policy re culling, retention or destruction and archiving and may be progressively reduced as films become digitised or culled. Films must be retained for 7 years and paediatric records until children are 7 years past their age of majority – i.e. 25 years.

Storage for archived film may need to be provided. It may be outside the Imaging Unit, but must be properly secured to protect films against loss or damage.

Film to be retained for teaching and research purposes may be housed in a Film Library.

Storage facilities for unexposed film shall ensure protection of film against exposure and shall not be warmer than the air of adjacent occupied spaces.

If the facility has converted to digital imaging, there will need to be an area for the PACS archive storage units.

At the time of the redevelopment a decision must be made to determine the system the unit will adopt – total digital and PACS systems or a combination of PACS and old films system. However, the maintenance of dual system is inefficient and ineffective and a decision regarding the conversion of films to digital format should be made based on a cost benefit analysis.

503101 440 .42.00 PATIENT HOLDING / RECOVERY AREAS

Patients may be in the Unit for periods of up to four hours and longer during the course of an examination or series of examinations.

Because of increasing patient acuity and the increasingly interventional nature of examinations, often requiring anaesthesia/sedation, there is a corresponding need for an area designated as a patient holding/recovery area with nursing supervision and support areas.

The number of bed/trolley spaces will depend on the Level of Service and the number and mix of imaging modalities but there should be a minimum of two bed spaces for routine purposes. Where Computerised Tomography procedures are to be carried out, an additional bed-space will be required.

The required dimensions of the Patient Holding/Recovery area should be determined with reference to:
- operational policy on the transport of patients within the facility (own bed, trolley)
- additional mobile/fixed equipment to be accommodated (IV stands, monitors etc)
- staff access to patient/equipment.

This area needs to be supported by a Staff Station, Utilities etc.

Functional Relationships

503102 440 .43.00 EXTERNAL

It is highly desirable that the Medical Imaging Unit has ready access to:
- Emergency Department
- Ambulatory Care areas – particularly orthopaedic and surgical clinics

When determining location, transfer of patients through public areas must be avoided, particularly those who are critically ill or severely traumatised.

There must also be effective horizontal or vertical links between Medical Imaging and
- Intensive Care / Coronary Care
- Surgical/Orthopaedic Inpatient Units
- Radiotherapy/Nuclear Medicine where applicable
- Transport arrival points

503103 440 .44.00 INTERNAL

Location of diagnostic rooms around a central staff and processing area if achievable provides for optimal workflow/circulation.

The rooms used for large volume outpatients should be located near the main entry & outpatient waiting.

DESIGN

Access

503104 440 .45.00 ENTRIES

There should be one only point of access to the Unit for outpatients and visitors to the Unit overseen by the Reception. (A shop front entrance may be highly attractive to outpatients in a competitive market environment)

Wherever possible there should be separate discreet entry for patients on beds/trolleys from Emergency, ICU and Inpatient Units to provide privacy for inpatients away from public scrutiny and to optimise workflows. This entry may also efficiently serve as a dedicated staff access particularly for staff movements to and from outlying units and particularly after hours.

Consideration should be given to the most appropriate means of entry for outpatients brought in by ambulance (e.g. from a Nursing Home).

Access for large equipment must be considered and a “back-of-house” access for supplies delivery and waste removal will need to be determined.

503105 440 .46.00 WAYFINDING

In large Units that provide sub-waiting areas for each modality / cluster of modalities, very careful thought must be given to overall layout and wayfinding and the manner in which patients may be directed from Reception by sensory or other means as it is unlikely that there will be the staff to act as escorts under most circumstances.

Parking

503106 440 .47.00 Visitors will use public car parks with access to drop-off and disabled car spaces.

Staff parking is addressed in Part C of these Guidelines (Section 790.59)

Disaster Planning

503107 440 .48.00 There should be emergency power available to allow completion of processing of digital images and storing in to PACS, thus overcoming the need for repeat x-ray exposure to patients.

Digital records should not only be backed up on site, but also remotely for added security.

Seismic joints as indicated.

Infection Control

503108 440 .49.00 Handbasins in all imaging rooms and clinical support areas.

Interventional rooms will need to be designed to operating room standards.

Also refer to Section D of these guidelines for further information.

Environmental Considerations

503109 440 .50.00 ACOUSTICS

Acoustic privacy in all imaging rooms, interview rooms and especially in reporting areas.

503110 440 .51.00 NATURAL LIGHT

Although imaging rooms are usually windowless, an attempt should be made to provide natural light wherever possible as it contributes to a sense of wellbeing and minimise the stress of the unknown or potentially uncomfortable or painful procedure.

In staff areas, the Staff Rooms and offices should have access to natural light and preferably a pleasant outlook.

503111 440 .52.00 LIGHTING

Ceiling mounted shadowless lighting required in CT and Angiography.
Indirect and dimmable lighting required in all examination rooms for patient comfort.

503112 440 .53.00 TEMPERATURE & HUMIDITY

- Technological requirements of equipment (as per manufacturer's specifications).
- Control of heat and humidity critical in equipment/computer areas and as the heat load for equipment is high, there must be separate heating/cooling zones for the equipment and the Control Room.
- Patient comfort particularly if uncovered during an investigation.
- Heat generated by Ultrasound equipment.

Given the large diversity of heat outputs from imaging equipment, individual room control may be easier with multiple small air conditioner units rather than a few large capacity ones.

503113 440 .54.00

503113 440 .54.00 PRIVACY

Visual patient privacy, particularly if unclothed is an important consideration to be addressed in the design of rooms and waiting spaces. Consideration could be given to locations of privacy screens.

The Medical Imaging Unit should be designed to ensure confidentiality of patient conditions and instruction regarding examinations.

Discrete sub-waiting areas could be provided as necessary for patients wishing or needing to be separated.

503114 440 .55.00 INTERIOR DESIGN

Despite its technical nature, a sterile clinical environment must be avoided by judicious use of colour, furnishings and artwork.

Refer to Part C of these guidelines for further information.

Space Standards and Components

503115 440 .56.00 ROOM SIZES & CONFIGURATION

Imaging rooms must be sized and proportioned (usually rectangular) to suit the equipment to be installed, provide a safe working environment and allow the effective movement of staff and patients.

Since technology changes frequently and from manufacturer to manufacturer, rooms should be sized to allow upgrading of equipment in the future, particularly if existing equipment is to be transferred in the first instance.

For maximum flexibility, all rooms should enable bed/trolley access so that bed patients do not have to wait for the appropriate room.

503116 440 .57.00

ACCESS AND MOBILITY

Refer Part C of these Guidelines for information.

503117 440 .58.00 ERGONOMICS

Refer Part C, Section 730.12 of these Guidelines for information.

Addresses such issues as bench heights and depths, storage systems etc.

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503118 440 .59.00 HUMAN ENGINEERING

Refer Part C of these Guidelines for information.

503119 440 .60.00 DOORS, WINDOWS AND CORRIDORS

Special consideration should 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.

Where windows are provided in imaging rooms, they should be fitted with operator-controlled screening and be radiation shielded where necessary.

Refer Part C of these Guidelines for information.

Safety and Security

503120 440 .61.00 SAFETY

In Imaging Units, risks to staff are :
- exposure to radiation and other chemicals
- manual handling from trolley to table and back and
- after-hours isolation.
- risks associated with the MRI Magnetic Field

In-use warning lights must be located outside all imaging rooms; may be manual or automatic operation.

For OHS reasons, installation of ceiling-mounted lifters may be considered in rooms dealing with non-ambulant patients.

Refer to the Occupational Health & Safety Act 2000 and Regulation 2001.

Refer to Part C of these Guidelines for further information.

Environmental Protection Authority for radiation safety standards

503121 440 .62.00 SECURITY

Access control particularly after-hours.

Duress call at Reception.

Patients' property – own locker or use of basket that stays with the patient during examination.

Finishes

503122 440 .63.00 WALL PROTECTION

It is imperative that intra-departmental corridors have protection to the lower part of the walls to minimise what can be considerable damage from trolleys.

Refer to Part C of these Guidelines

503123 440 .64.00 FLOOR FINISHES

Refer to Part C of these Guidelines

503124 440 .65.00 CEILINGS

Refer to Part C of these Guidelines

Fixtures & Fittings

503125 440 .66.00 Refer to part C of these Guidelines and to the Room Data Sheets (RDS) and Room Layout Sheets (RLS) for further detailed information

Building Service Requirements

503126 440 .67.00 CONSTRUCTION

Construction standards for a Medical Imaging Unit include the following:
- Flooring adequate to meet load requirements for equipment, patients and personnel.
- No conduits shall be laid in the vicinity of expected core holes
- Provision for cable trays, ducts or conduits in floors, walls and ceilings as required for equipment installation
- Ceiling heights that suit the equipment, but shall not be less than 3000 mm
- for ceiling tube mount installations
- Ceiling-mounted equipment needs properly designed, rigid support structures located above the finished ceiling.
- A unistrut or equivalent ceiling should be considered for ease of installation, service and remodelling.
- Lighting to be designed so as not to obstruct ceiling-mounted tubestands
- X-ray control screens to be designed so as not to obstruct equipment positioning and ceiling-mounted tubestands
- Separate air-conditioning to control rooms to accommodate high fluctuating A/C equipment loads.

Recent post-occupancy evaluations undertaken for NSW Health state that the use of ceiling space as a return air plenum is ineffective in existing building conditions, where existing walls go up to the underside of the slab above.
The above ceiling space requirements are important considerations given the amount of equipment which has to be accommodated – air conditioning, vents, cable runs, plumbing, unistruts for x-ray gantries etc.
In the digital age, the x-ray control screens should be full ceiling height to facilitate the running of data cables to the control bench.

503127 440 .68.00 RADIATION PROTECTION

Medical imaging (ionising) equipment requires radiation protection. Plans and specifications will require assessment by a Radiation Services consultancy and reviewed by an Accredited Consultant Radiation Expert (CRE)

The radiation protection assessment will specify the type, location and amount of radiation protection required according to final equipment selection and layout. Radiation protection requirements shall be incorporated into the final specifications and the building plans.

503128 440 .69.00 CALL SYSTEMS

Systems will comprise:
- Nurse call located in or near change cubicles, patient-use toilets and showers and at every holding/recovery bay
- Staff Assist and Emergency Call – In every imaging room, in the Holding/Recovery area and corridor/s.
- Duress call – At Reception

Annunciator panels in corridors must be located for optimum viewing and be non-scrolling.

Consideration needs to be given as to exactly where calls will be annunciated particularly in times of reduced staffing (night shift).

503129 440 .70.00 INFORMATION TECHNOLOGY / COMMUNICATIONS

Systems will/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 Hospital) Information System (HIS)
- Radiology Information System (RIS) ideally linked to the PIS
- Teleradiology

503130 440 .71.00 ELECTRICAL SERVICES

Three phase power for x-ray generating rooms - equipment specific
Interventional rooms will need to be cardiac-protected.

503131 440 .72.00 MEDICAL GASES

Oxygen and suction in all rooms and holding / recovery bays.

Medical air, nitrous oxide (if used) and scavenging will be required in all rooms where general anaesthesia is delivered.

Medical gas systems must have alarms within the imaging suite which alert staff to diminished capacity or potential failure, as well as when gas bottles need changing

All portable ferrous oxygen cylinders must carry MRI Warning Label

COMPONENTS OF THE UNIT

Standard Components

503132 440 .73.00 Standard Components must comply with details in Standard Components described in these Guidelines. Refer also to Standard Components Room Data and Room Layout Sheets.

Provide the Standard Components as identified in the Schedule of Accommodation.

Non-Standard Components

503133 440 .74.00 Provide the Non-Standard Components as identified in this section and in the Schedule of Accommodation, according to the Operational Policy and Functional Brief.

503134 440 .75.00 COMPUTED RADIOGRAPHY (CR) WORKROOM

DESCRIPTION & FUNCTION
Uses phosphor plates (cassettes) instead of the traditional film plates and effectively replaces Dark Room and Daylight functions for processing general

films. It allows viewing of the image on a computer monitor and the radiographers can enhance the image before storing.The following equipment for 2 radiographer workstations will service 4 general rooms:

- CR plate readers – a multiplate unit and a smaller back-up unit
- Computers for entering patient information - 1 per workstation
- CR monitors for viewing images – 1 per workstation
- Storage for manuals
- Plate holders (carriers) ideally mobile for moving between imaging room and workroom.

Smaller Units using a small reader may require a back-up Dark Room.

LOCATION & RELATIONSHIPS
Immediately outside the General Radiology Rooms with access from each room.

CONSIDERATIONS
Temperature control and ventilation.

503135 440 .76.00 CONTRAST MEDIA PREPARATION ROOM

DESCRIPTION & FUNCTION
Space for storing and preparing contrast media (barium sulphate or iodine compounds) for fluoroscopy examinations.

LOCATION & RELATIONSHIPS
May be part of a Clean or Dirty Utility room but must be a discrete space. Ready access to the Fluoroscopy Room

CONSIDERATIONS
Additional storage for pre-prepared media. Requires a dedicated sink.

503136 440 .77.00 DIGITAL (PACS) REPORTING WORKSTATION

DESCRIPTION & FUNCTION
Radiologist workstation for reporting on procedures using high resolution (LCD) monitors on which, unlike traditional x-ray viewers, images can be manipulated. A minimum of 2 linked monitors are required but occasionally 4.

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. In the future, these 3 functions may be integrated into a single computer system with appropriate software.

LOCATION & RELATIONSHIPS
Ready access from the imaging rooms but in a quiet location. Several workstations may be located in the one room but cubicles need to be visually and acoustically separated.

CONSIDERATIONS
Ergonomic design of the workstation to accommodate the monitors.

Temperature control imperative to minimise risk of monitor failure.
Adequate ventilation

Individual cubicle lighting (dimmable) and temperature controls

Acoustic management to ensure quality of voice recordings.

APPENDICES

Schedule of Accommodation

503137 440 .78.00 A Generic Schedule of Accommodation for a Medical Imaging Unit - (General, Angiography, CT Scanning, MRI) at Level 2, 3, 4, 5, and 6 follows.

Note: (o) in Qty/ x m2 column = Optional

ENTRY / RECEPTION / CLERICAL

Note 1 : Transport Staff Workbase/Trolley Park
If provided, will need linen supply, portable oxygen cylinder storage & bench/sink for wiping down trolleys. (need larger space at facilities with heavy interventional work)

ROOM/SPACE	Standard Component	Level 2 Qty x m2	Level 3 Qty x m2	Level 4 Qty x m2	Level 5 Qty x m2	Level 6 Qty x m2	
ENTRY / RECEPTION / CLERICAL							
WAITING	yes	Share	Share	1 x 20	1 x 35	1 x 45	1.2 m2 per seat, 1.5m2 for w/chair. Respectively 15, 25 & 35 seats/wheelchairs
BAY - DRINKING FOUNTAIN				1 x 1	1 x 1	1 x 1	Optional vending may be addedd at 3m2
CHILD PLAY AREA				1 x 8 (o)	1 x 8 (o)	1 x 8 (o)	3-4 places
TOILET - DISABLED / BABY CHANGE	yes	Share	Share	1 x 5	1 x 5	1 x 5	Unless available nearby
TOILET - PUBLIC	yes	Share	1 x 3	2 x 3	2 x 3	2 x 3	Unless available nearby
RECEPTION	yes	Share	Share	1 x 10	1 x 12	1 x 12	1, 2 & 2 staff
CLERICAL WORKROOM		Share	1 x 9	1 x 10	1 x 15	1 x 20	May need larger area if they also combine booking system for the facility/AHS
CURRENT FILM STORAGE		Share	1x30(o)	1 x 50 (o)	1 x 70 (o)	1 x 100 (o)	Check need if PACS used
BAY - MOBILE EQUIPMENT	yes	Share	1 x 4	2 x 4	3 x 4	4 x 4	For mobile units depending on policy re decentralising
TROLLEY / WHEELCHAIR PARK		Share	1 x 5	1 x 6	1 x 10	1 x 12	Not required if provided from Transport Unit
TRANSPORT STAFF WORKBASE/TROLLEY PARK		Share		1 x 4	1 x 6	1 x 8	See note 1

503138 440 .79.00 SUPPORT AREAS

Note 2 : PACS Server Room

SUPPORT AREAS							
CLEANER'S ROOM	yes	Share	Share	1 x 5	1 x 5	1 x 5	
HARD COPY / DIGITISER ROOM				1 x 6	1 x 6	1 x 6	
PACS SERVER ROOM			1 x 10	1 x 12	1 x 20	1 x 30	See note 2.
STORE - GENERAL	yes		1 x 9	1 x 9	1 x 12	1 x 12	

STORE - FILM / CASSETTES / PLATES			1 x 9	1 x 9	1 x 12	1 x 12	
OPTICAL DISCS STORAGE ROOM			1 x 9	1 x 9	1 x 12	1 x 12	
PACS OPERATION/MANAGEMENT TEAM			1 x 9	1 x 9	1 x 12	1 x 12	

503139 440 .80.00 GENERAL X-RAY & FLUOROSCOPY (SCREENING)

GENERAL X-RAY & FLUOROSCOPY (SCREENING)							
PATIENT BAY - HOLDING	yes		1 x 8	2 x 8	0	0	For Level 5 & 6 refer to general nursing holding/recovery unit.
BAY - LINEN	yes		Share	1 x 2	1 x 2	1 x 2	
GENERAL X-RAY ROOM	yes	1 x 30	1 x 30	2 x 30	3 x 30	4 x 30	Includes Control. Adjust numbers as per service plan
CHANGE CUBICLE - PATIENT	yes	1 x 2	1 x 2	2 x 2	3 x 2	4 x 2	1 cubicle per imaging room. Less required if centralised
CHANGE CUBICLE - W/CHAIR ACCESS	yes	1 x 4	1 x 4	2 x 4	3 x 4	4 x 4	1 cubicle per imaging room. Less required if centralised
CHANGED WAITING / PATIENT LOCKERS (IF PROVIDED)	yes			2x5 (8 seats)	2 x 7	2 x 10	Required if Change Cubicles are centralised.Seperate male & female patients.
PATIENT LOCKER BAY (IF CENTRAL CHANGED WAITING)				1 x 1	1 x 2	1 x 2	
COMPUTED RADIOLOGY (CR) PROCESSING				1 x 20	1 x 30	1 x 40	Approximately 10m2 per Imaging Room for CR equipment & workstations (1 per imaging room)
DARK ROOM	yes		1 x6	1 x6	1 x6	1 x8	Back-up for Level 4 single CR plate reader & system failure
DAYLIGHT PROCESSING	yes		0	0	0	0	Assumed no longer required
SCREENING ROOM (FLUOROSCOPY)	yes		1 x 36 (o)	1 x 36	1 x 36 (o)	1 x 36 (o)	Includes control
CONTRAST MEDIA PREPARATION ROOM/BAY			1 x 5 (o)	1 x 5	1 x 5	1 x 5	Could be part of nearby Utility Room
CHANGE CUBICLE - PATIENT	yes		1 x 2 (o)	1 x 2	1 x 2	1 x 2	
SHOWER/TOILET - DISABLED			1 x 6 (o)	1 x 6 (o)	1 x 6 (o)	1 x 6 (o)	Dual access from room and corridor
BAY - RESUSCITATION TROLLEY	yes		0	1 x 2 (o)	1 x 2	1 x 2	

503140 440 .81.00 ULTRASOUND, MAMMOGRAPHY & CT SCANNING

Note 3 : CT Scanning Room
Size may be increased to contain computer cabinets thus eliminating need for a separate room.

ULTRASOUND, MAMMOGRAPHY & CT SCANNING							
SUB-WAITING (U/SOUND & MAMMOGRAPHY)			1 x 6	1 x 8	1 x 10	1 x 10	
ULTRASOUND ROOM	yes		1 x 12 (o)	2 x 12	2 x 12	2 x 12	Numbers adjusted to suit service plan
ULTRASOUND ROOM			0	0	1 x 24	1 x 24	For interventional procedures

CHANGE CUBICLE - U/SOUND	yes		1 x 2 (o)	1 x 2	1 x 2	1 x 2	1 per room
CHANGE CUBICLE - DISABLED			1 x 4 (o)	1 x 4	1 x 4	1 x 4	1 per room
MAMMOGRAPHY ROOM	yes(draft)			1 x 16	1 x16	1 x 16	
CHANGE CUBICLE - MAMMOGRAPHY	yes		1 x 2	2 x 2	2 x 2	2 x 2	2 per room
MAMMOGRAPHY PROCESSOR				1 x 6	1 x 6	1 x 6	
ULTRASOUND/ MAMMOGRAPHY PREP ROOM/LAB					1 x 9	1 x 9	
CT SCANNING ROOM	yes(draft)		1 x 45 (o)	1 x 45	2 x 45	2 x 45	See note 3.
CT CONTROL ROOM	yes(draft)		1 x 6	1 x 6	1 x 12	1 x 12	Shared between 2 rooms
CT COMPUTER ROOM			1 x 12 (o)	1 x 12 (o)	2 x 12 (o)	2 x 12 (o)	Optional depending on equipment selected.
CHANGE CUBICLE - DISABLED - CT	yes		1 x 4	1 x 4	2 x 4	2 x 4	1 per room
TOILET - PATIENT	yes			1 x 4	1 x 4	1 x 4	
PATIENT BAY - HOLDING	yes		1 x 8	1 x 8	2 x 8	2 x 8	1 per room outside room
CLEAN UTILITY (PREP) ROOM -	yes			1 x 8	1 x 8	1 x 8	
BAY - LINEN TROLLEY	yes		Share	1 x 2	1 x 2	1 x 2	
BAY - RESUSCITATION TROLLEY	yes		0	1 x 2 (o)	1 x 2 (o)	1 x 2 (o)	Depending on size and layout of unit

503141 440 .82.00 ANGIOGRAPHY / DSA

ANGIOGRAPHY / DSA							
ANAESTHETIC INDUCTION ROOM	yes			15 (o)	15 (o)	15 (o)	
SCRUB-UP / GOWNING	yes			1 x 6	1 x 6	1 x 6	2 scrub stations. May be shared between Angiography Rooms if design permits
STERILE STOCK / SET-UP ROOM	yes			1 x 16	1 x 18	1 x 24	
ANGIOGRAPHY ROOM	yes			1 x 42	2 x 42	3 x 42	Refer Service Plan to determine number of rooms (50m2 8m L x 6.25W)
CONTROL ROOM - SINGLE	yes			1 x 14	0	1 x 14	
CONTROL ROOM - SHARED				0	1 x 24	1 x 24	
COMPUTER EQUIPMENT				1 x6	2 x 6	3 x 6	1 per Angiography Room.
REPORTING ROOM	yes			1 x 8	1 x 12	1 x 16	Adjust as necessary
BAY - RESUSCITATION TROLLEY	yes			1 x 2	1 x 2	1 x 2	
STORE - FILMS / CDS / VIDEOS				1 x 6	1 x 8	1 x 8	

Schedule of Accommodation

503142 440 .83.00 MRI

(1 room only assumed for the purposes of this Guideline but may be a suite of 2 rooms at Level 6)

MRI							
INDUCTION / PREPARATION ROOM	yes			1 x 20	1 x 20	1 x 20	Include small staff base/clean utility and 1 patient trolley/bed bay per room
BAY - HANDWASHING (TYPE A)	yes			1 x 1	1 x 1	1 x 1	Part of Prep Area
MRI SCANNING ROOM				1 x 42	1 x 42	1 x 42	Size will depend on equipment selected
MRI CONTROL				1 x 10	1 x 10	1 x 10	Must oversight and control entry into magnet room
MRI COMPUTER ROOM				1 x 10	1 x 10	1 x 10	
OFFICE / REPORTING	yes			1 x 9	1 x 9	1 x 9	
CHANGE CUBICLE	yes			1 x 2	1 x 2	1 x 2	
PATIENT LOCKER BAY	yes			1 x 1	1 x 1	1 x 1	
SUB-WAITING	yes			1 x 6	1 x 6	1 x 6	
TOILET - PATIENT	yes			1 x 4	1 x 4	1 x 4	
BAY - RESUSCITATION TROLLEY				1 x 2	1 x 2	1 x 2	Non-ferrous construction
STORE - DEWAR TANK				Remote areas only	Remote areas only	Remote areas only	Remote areas only.Must provide easy access into MRI room for top-up using mobile Dewars.

503143 440 .84.00 PATIENT HOLDING / RECOVERY

Note 4 : Patient Bay - Holding / Recovery
At least 2 per interventional room (Holding / Recovery may be combined make it single larger area with direct observation from Nurses Station. Separate holding area adjacent to each modalities may inefficient due to additional staff resources. A lot of interventional work is being performed under the control of CT and Ultrasound)

PATIENT HOLDING / RECOVERY							
PATIENT BAY - HOLDING / RECOVERY	yes		9	9	9	9	See note 4.
STAFF STATION	yes			1 x 10	1 x 10	1 x 10	
CLEAN UTILITY	yes			1 x 10	1 x 10	1 x 10	
BAY - LINEN TROLLEY	yes			1 x 2	1 x 2	1 x 2	
BAY - RESUSCITATION TROLLEY	yes			1 x 2	1 x 2	1 x 2	
DIRTY UTILITY - SUB	yes			1 x 8	1 x 8	1 x 8	
DISPOSAL ROOM	yes			1 x 8	1 x 8	1 x 8	

STORE - EQUIPMENT	yes			1 x 9	1 x 12	1 x 12	
DISCOUNTED CIRCULATION %			35%	35%	35%	35%	

503144 440 .85.00 STAFF OFFICES & REPORTING

Offices/workstations will be based on Staff Establishment. Sizes based on NSW Health Directive - PD2005-576 - Office Accommodation

STAFF OFFICES & REPORTING							
OFFICE - SINGLE -12M2 (DIRECTOR)	yes				1 x 12	1 x 12	
OFFICE - SINGLE 9M2 (RADIOLOGIST)	yes	1 x 9	1 x 9	9	9	9	At Level 2 & 3, office used for reporting
OFFICE - SINGLE 9M2 (RADIOGRAPHER)	yes			9	9	9	Chief Radiographer, Assistant Chiefs, Senior Radiographers etc
OFFICE - SINGLE NUM				1 x 9 (o)	1 x 9	1 x 9	
OFFICE - WORKSTATION (TRANSCRIPTION)	yes			4.5	4.5	4.5	
OFFICE - WORKSTATION (IT, CLERICAL)	yes				5.5	5.5	
OFFICE - WORKSTATION (SECRETARY)	yes				5.5	5.5	
OFFICE - WORKSTATION (REGISTRARS)	yes				5.5	5.5	
PACS REPORTING WORKSTATION			5.7	5.7	5.7	5.7	Refer Non-Standard Components. May be used for individual and group teaching.

503145 440 .86.00 STAFF AMENITIES

STAFF AMENITIES							
FILM LIBRARY / STUDY					1 x 20	1 x 20	5 places
QUIET STUDY ROOM					1 x 9 (o)	1 x 9 (o)	
STORE - PHOTOCOPY / STATIONERY	yes				1 x 8	1 x 8	
MEETING ROOM - MEDIUM	yes				1 x 20	1 x 20	
MEETING ROOM - LARGE	yes				2 x 30	2 x 30	
STAFF ROOM	yes			1 x 15	1 x 20	1 x 25	Depending on Staff Establishment
PROPERTY BAY - STAFF	yes			1 x 2	0	0	Numbers will depend on Staff Establishment
SHOWER - STAFF	yes			1 x 2 (o)	0	0	Numbers will depend on Staff Establishment
TOILET - STAFF	yes			2x 3	1 x 3	1 x 3	Easily accessible if main change rooms remote
STAFF CHANGE ROOM					2 x 14	2 x 14	1 Shower, 2 WCs plus lockers. Required for facilities with high interventional workload

DISCOUNTED CIRCULATION %				30%	30%	30%	

Functional Relationships

503146 440 .87.00 A diagram of key functional relationships is attached.

References and Further Reading

503147 440 .88.00 DS-15 Health Building Guideline – Medical Imaging Unit, NSW Health Department, 1992

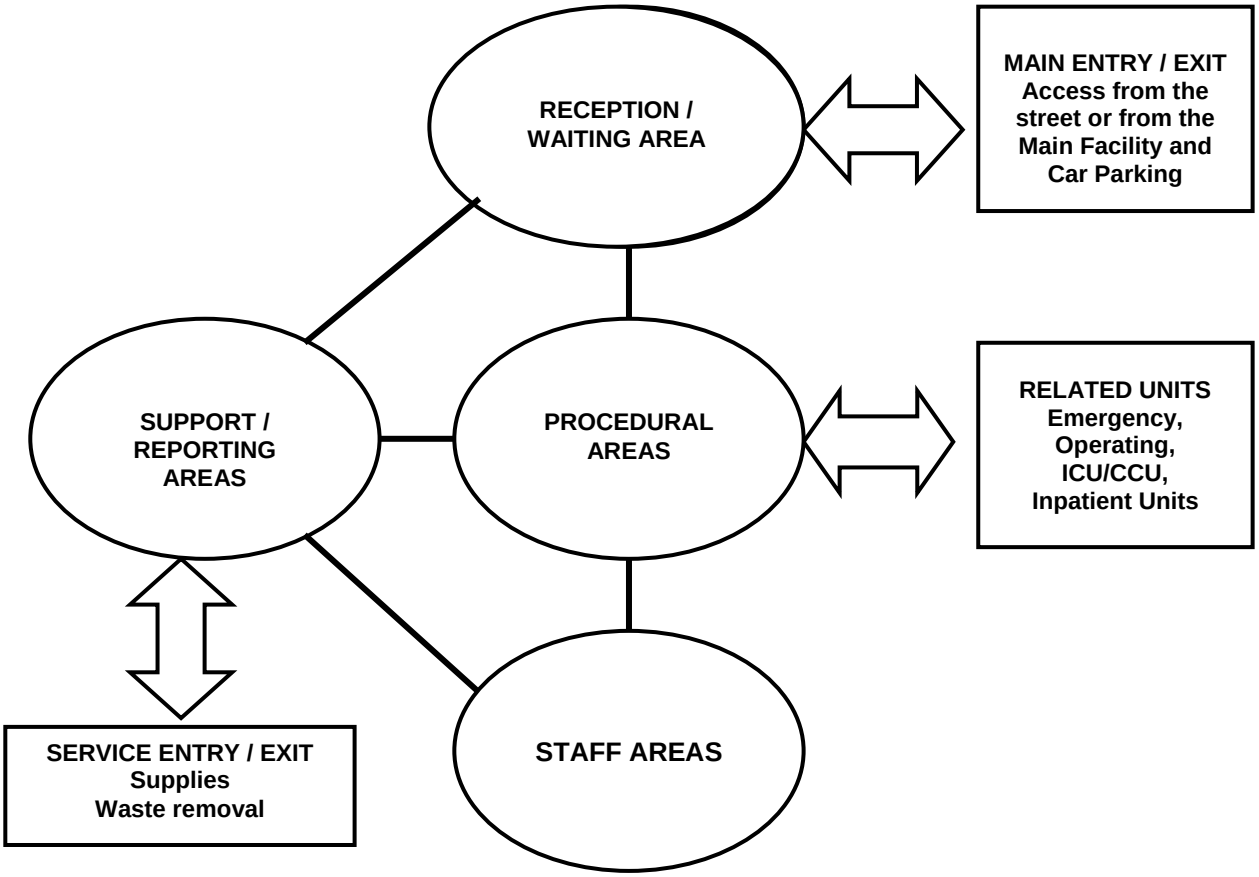
DHS Victoria HFG – Medical Imaging,

Checklists

503148 440 .89.00 A Security Checklist is appended to this document. Refer also to Part C of these Guidelines for general requirements.

FUNCTIONAL RELATIONSHIP DIAGRAM –MEDICAL IMAGING UNIT

The following diagram sets out the relationships between zones in a Medical Imaging Unit:



SECURITY ISSUES TO BE CONSIDERED IN MEDICAL IMAGING UNIT

GENERIC SAFETY AND/OR SECURITY RISKS	POTENTIAL SOLUTIONS
1. Area where outpatients and inpatients come for treatment.	1. Control access.

SPECIFIC SAFETY AND/OR SECURITY RISKS	POTENTIAL SOLUTIONS
1. Furniture fittings and equipment including Computers, Office and Medical Equipment	1. Non-removable 'Asset No.' on all equipment above a predetermined value. 2. Keep equipment in lockable area.
2. Patient files	1. Personnel working on these must return to secure area after use or return to Medical Records Department. 2. If any electronic files are produced, locate in restricted area of hard drive.
3. Drugs storage	1. Dangerous drug safe within the clean utility area.
4. Hospital personnel safety	1. Staff working in this area to have knowledge of where the fixed duress system is located and/or use a mobile duress pendant. 2. Provide appropriate after-hours access and security, including secure access from all parts of the facility.
5. Staff personal effects	1. Provision for lockers in staff areas and lockable desk drawer to keep small personal effects.

SECURITY CHECKLIST – MEDICAL IMAGING UNIT

FACILITY:	**DEPARTMENT: Medical Imaging Unit**
RISK ISSUE	**DESIGN RESPONSE**
1. How is 'after hours' access provided for patients and how is this access point monitored ?	
2. Do staff have access to both fixed and mobile duress systems ?	
3. Is access to patient records restricted to staff entitled to that access ?	
4. Is a system implemented to prevent theft of equipment, files, personal possessions, etc ?	
5. How is after hours access provided for staff?	
6. How is this area secured during and after hours?	
7. Are there lockable storage areas available for specialised equipment?	
8. Is lockable furniture provided for storage of staff personal effects?	
9. Has a secure waiting area been planned in this area that allows for the public to present at a counter, sign forms, wait and then receive photocopies of relevant records as requested?	
10. Are drug safes installed in accordance with current regulations?	

DESIGN COMMENTARY /NOTES	**DESIGN SIGN-OFF**
	Name: …… Position: …….. Signature: …….. Date: ……..
	Name: …… Position: …….. Signature: …….. Date: ……..
	Name: …… Position: …….. Signature: …….. Date: ……..