

Part B – Health Facility Briefing & Design

35 Cardiac Investigation Unit



iHFG

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35 Cardiac Investigation Unit

1 Introduction

Description

The Cardiac Investigation Unit provides diagnostic procedures, interventional treatments and consultation for patients with cardiac conditions. The Unit consists of three major components:

- Cardiac Catheter Suite
- Cardiac Diagnostic Unit
- Outpatient Clinics

This Functional Planning Unit will address the following components of a cardiac investigation service primarily for secondary and tertiary healthcare facilities:

- Cardiac Catheter Laboratories – diagnostic and interventional
- Electrophysiology (EP) laboratory
- Echocardiography – trans-thoracic (TTE), trans-oesophageal (TOE) and stress echocardiography
- Exercise stress testing
- Electrocardiography (ECG)
- Holter monitoring
- Ambulatory blood pressure monitoring
- Pacemaker and defibrillator implantation and follow-up
- Outpatient clinics.

2 Operational and Planning Considerations

Operational Models

Hours of Operation

The Cardiac Investigation outpatients area will generally operate up to 8 hours a day, five-days a week. The diagnostic and interventional areas of Cardiac Investigations Unit may operate up to 12-hours a day, seven-days a week, depending on the Operational Policy.

Models of Care

The Cardiac Investigation Unit may incorporate the following Models of Care for specific components:

Cardiac Catheter Laboratories

Catheter laboratories, depending on their role within the service plan, may be:

- Integrated into an interventional imaging suite in a Medical Imaging Unit
- A component of a Cardiac Precinct
- A component of an interventional floor that incorporates operating theatres and cardiac investigations with access to a 23 hour or short stay ward.

The number of laboratories will be determined by the service plan, but laboratories should operate at near-optimum capacity to justify the expense of operation, maintain the skills and teamwork of the operators and staff, and provide maximum patient and operator safety.

Cardiac Diagnostic Unit

Cardiac diagnostic services may be provided:

- Within a fully integrated Cardiac Investigation Unit
- As a part of a general Clinical Measurement Unit that can include diagnostic facilities for other units such as neurology and respiratory function testing
- Within an outpatient clinic (depending on the range of tests to be provided by the unit).

Cardiac Outpatient Clinics

Cardiac Outpatient Clinics can be conducted through:

- A general Outpatient Unit
- Consulting rooms provided within a Clinical Measurement Unit that can be shared with other disciplines
- Dedicated consulting rooms within a Cardiac Precinct. The provision of dedicated cardiac clinics should be based on throughput requirements and service planning.

Access to ECG testing is required as a minimum in all forms of cardiac outpatients clinics. The Cardiac Outpatients Clinics will generally work closely with the Cardiac Rehabilitation Service with patient referrals for ongoing therapy.

Planning Models

Location

The relationships required between the Cardiac Investigation Unit and other units within the health facility will determine the most appropriate location for the unit. The models of care, described above, will impact on the location of the unit in relation to other units, particularly if areas such as diagnostic units, are shared. If the Unit is not on the ground floor, consideration should be given to outpatient volumes in regard to vertical access to clinics.

Configuration

Staff, patients and the general public should not need to use the Cardiac Investigation Unit as a thoroughfare to other units of the healthcare facility as it could adversely impact on issues relating to security, privacy and stock control.

The diagnostic and clinic rooms that are less complex and more frequently used should be located closer to reception/ waiting areas, while the catheterisation suite should be located in a more private zone.

It would be preferable if staff and patient paths are separate and a discreet access for inpatients is provided.

Functional Areas

The Cardiac Investigation Unit can include the following functional zones, arranged in relation to each other depending on operational policies, service delineation and relationships to other services:

Outpatient/ Diagnostic Facilities – Non-interventional

Cardiac Outpatient/ Diagnostic facilities will generally comprise:

- Entry Reception including:
 - Waiting with beverage bay and drinking water facilities if required
 - Public amenities, if not located in close proximity
 - Interview room
 - Patient bed bays, for holding pre-procedure and recovery following procedures
 - Storage for files and stationery
- Outpatient/ Diagnostic areas that may incorporate the following rooms or diagnostic testing specialties according to the Service Plan:
 - Consult rooms
 - ECG cubicles
 - Stress testing
 - Echocardiography
 - Holter monitoring application room
 - Tilt table testing
 - Reporting areas with workstations

- Support areas including
 - Patient amenities with showers for post exercise hygiene
 - Patient change rooms, that may be located within the diagnostic rooms
 - Storage for linen, equipment, consumables, mobile equipment, resuscitation trolley
 - Clean-up room.

Procedural Areas (Cardiac Catheter Laboratories)

The service plan, capability (secondary, tertiary) and anticipated caseload will determine the number and type of laboratories required.

The Cardiac Catheterisation Suite requires the following functional areas as a minimum:

- Entry/ Reception, which may be shared with an adjacent unit along with:
 - Patient /visitor waiting area
 - Change cubicles
 - Interview room for patient/ family discussions
 - Patient bed Bays for holding and post-procedure
 - Patient amenities
- Treatment Area:
 - Catheter Laboratory/s (diagnostic, interventional)
 - Electrophysiology Laboratory (EP) rooms as required
 - Computer equipment rooms (generators, computer modules for imaging equipment)
 - Control room/s (Note: it is not recommended that control rooms are shared; refer to Design: Environmental Considerations: Acoustics in this FPU)
 - Scrub bay/s for catheter laboratories (should be located external to laboratories)
- Support Areas will include:
 - Beverage bay for patient refreshments as required
 - Clean-up and Dirty Utility rooms
 - Clean Utility area that may be collocated with the staff station for ease of staff access
 - Handwashing bays with close access to bed bays
 - Staff station with observation of holding and recovery bed bays
 - Storage for linen, blanket warmer, sterile stock, equipment, consumables, lead aprons, resuscitation trolley and files
 - Set-up area for procedure set-up as required
 - Viewing/ reporting room
- Staff Area:
 - Change rooms with showers, toilet and lockers
 - Offices/ workstations, according to the service plan
 - Staff Room and amenities

Depending on the model of care, every opportunity should be taken to share facilities such as:

- Public waiting areas and amenities
- Reception
- Support areas
- Staff offices and amenities.

Reception/ Waiting

The Reception/ Waiting area of the Cardiac Investigation Unit may be shared by all sections of the unit and should provide convenient access to both the diagnostic areas and procedural areas such as cardiac catheter laboratories, as well as allowing access to public and disabled amenities for patients and visitors. The Reception area may include patient registration, a patient queuing system and cashier facilities where appropriate.

Waiting areas may be designed with separation to meet cultural requirements where appropriate. Waiting areas should accommodate a range of occupants including children, those less mobile or in wheelchairs.

A separate Reception/ waiting area may be provided for the Catheterisation Suite in order to offer discreet access to patients.

Cardiology Outpatient Clinics

Multi-function consultation rooms can sufficiently serve cardiology outpatient clinics. They may be scheduled for use by other disciplines and the number and size of rooms provided will be determined by throughput and relationships to other units as outlined in the service plan. If a pacemaker clinic is included in the service plan, there should be access to a room for testing equipment and access to an external defibrillator.

If the consulting rooms are part of a general outpatient area that is shared with other disciplines, the location/ layout of the rooms should allow ready access to ECG facilities.

ECG Cubicles

A room or bay for undertaking resting electrocardiograms is required, with ready access from the waiting area and outpatient area as ECGs are routinely performed in a cardiac clinic. This may be provided as a single room/ cubicle or may be designed as two patient bays. If two bays are designed, curtain tracks and screens will be required for patients' privacy. Patients may change in the room/ bay or an adjacent change cubicle. A handwashing basin will be required in close proximity.

Stress Testing

Stress testing rooms should be located with ready access to change facilities and a shower for patients following the test. Stress Testing Rooms should comply with the Standard Component for Stress Testing.

Echocardiography

Echocardiography Rooms should comply with the Standard Component for Echocardiography. Room size may be adjusted according to equipment to be used.

Holter Monitoring/ Ambulatory Monitoring/ BP Application Room

A room for attaching Holter monitors or blood pressure cuffs for ambulatory monitoring of patients may be required. Note that a multi-disciplinary Consult room may be suitable for this purpose. Patients may change in the room or in an adjacent change cubicle. The room should be located with ready access to the Waiting Area.

The Room will require Body Protected power in accordance with local authority requirements.

Furniture, Fittings and Equipment within the room will include:

- Examination Couch/ table
- Holter monitoring equipment (ECG leads and monitors) and blood pressure equipment
- Small desk and technician chair or stool
- Patient chair
- Hand basin
- Clothes hook/s for patient clothing
- Storage for leads, equipment parts and consumable stock.

Cardiac Catheter Laboratory/s

The Cardiac Catheter Laboratory is to comply with Standard Components Catheter Laboratory. Rooms may be resized according to equipment to be installed. Cardiac Catheter Laboratories should be located in close proximity to holding and recovery bed bays.

Electrophysiology (EP) Laboratory

The Electrophysiology Laboratory is a room for undertaking electrophysiology studies and radiofrequency ablation if indicated and will be similar to the Cardiac Catheter Laboratory. The room needs to be located away from external electrical interference i.e. plant rooms or other equipment requiring high voltage, and properly shielded; an electro-magnetic shielding cage may be necessary. The room will require direct access to Patient Holding bays.

Note that patients may become unstable during a procedure and therefore more support equipment is required. Allow for circulation space for four (4) staff plus equipment in room.

The Control Room should be located at head or foot of bed not at the side for optimum patient visibility.

Equipment required may include:

- Anaesthetic pendant at head of table
- Anaesthetic machine
- Resuscitation trolley and defibrillators
- Set-up and stock trolleys
- 3 dimensional mapping equipment
- Echocardiography (TOE) machine.

Provide services pendants or power points co-located with the patient table to reduce trip hazards from electrical cables across the room. Increasingly equipment is becoming cordless e.g. foot pedals, echo machines.

The room should include a bench or trolley for preparation of emergency drugs. The room will require storage space, drawers and shelves for consumable equipment required during procedures.

Staff Offices and Amenities

Offices and workstations may be required for senior staff managing the various zones of the unit to undertake administrative functions, or to facilitate educational and research activities. Offices / workstations may be located within the functional zone or may be provided as a combined general office complex in a cardiac precinct.

Staff will need access to the following:

- Toilets, showers, change rooms and lockers
- Staff room with beverage and food storage facilities
- Meeting room/s

Teaching and Research

An assessment to gain an understanding of the extent of the teaching and research to be undertaken within the Cardiac Investigation Unit will need to be conducted in order to allow for sufficient office space and teaching facilities. The assessment should consider applicable guidelines for staff training and competence, particularly as new procedures and technologies are developed. The assessment will determine the type, size, and number of facilities provided in the service plan as well as whether they are located within the unit or easily are accessible from the unit. At a minimum, adequate access to facilities for meetings and staff education should be provided.

Clinical research needs should be assessed for provision of offices for senior coordinators, research fellows, research staff and assistants. Facilities may include consulting and diagnostic rooms if required for patient consultation, drug storage and monitoring, records storage and research laboratories.

Functional Relationships

External

The rapid transfer of emergency patients requires direct access from the Emergency Unit to the Catheter Laboratory.

The Cardiac Investigation Unit should also be well-situated for easy access to:

- The Chest Pain Assessment Unit
- Medical Imaging (chest x-rays and CT scanning)
- Nuclear Medicine (stress testing)
- Positron Emission Tomography Unit (in tertiary facilities)
- Operating Unit for cardiac surgery
- Short stay unit/ 23 hour unit for patient observation and investigations
- Pathology Services
- Biomedical Engineering for equipment support and maintenance
- Community Health Services.

The Cardiac Investigation Unit will have a strong relationship with cardiac surgical specialties including Operating Unit and cardiac Inpatient Units and should be located to enable effective communication and collaboration between staff of these areas. Links with cardiac surgery occur at several levels including clinical decision making concerning patients who require cardiac surgery, cardiac management of patients in the post-operative phase including rehabilitation and cardiac research projects.

Internal

Radiofrequency interference should be considered when planning the Cardiac Investigation Unit. The Electrophysiology (EP) laboratories, as well as Pacemaker and ICD (Implantable Cardiac Defibrillator) clinics should not be located close to any high voltage electronic equipment (such as a sub-station or lift plant room) as interruption by auxiliary radiofrequency will distort the assessment of the patient and affect new devices that use wireless technology. Expert advice should be obtained.

If Stress Echocardiography is undertaken within the unit, the Echo room may include a dedicated treadmill. Alternatively the Echo room may be located adjacent to the Stress Testing room to allow for efficient staff and patient access.

Functional Relationship Diagram

Cardiac Investigation Unit located within a health facility incorporating an interventional unit

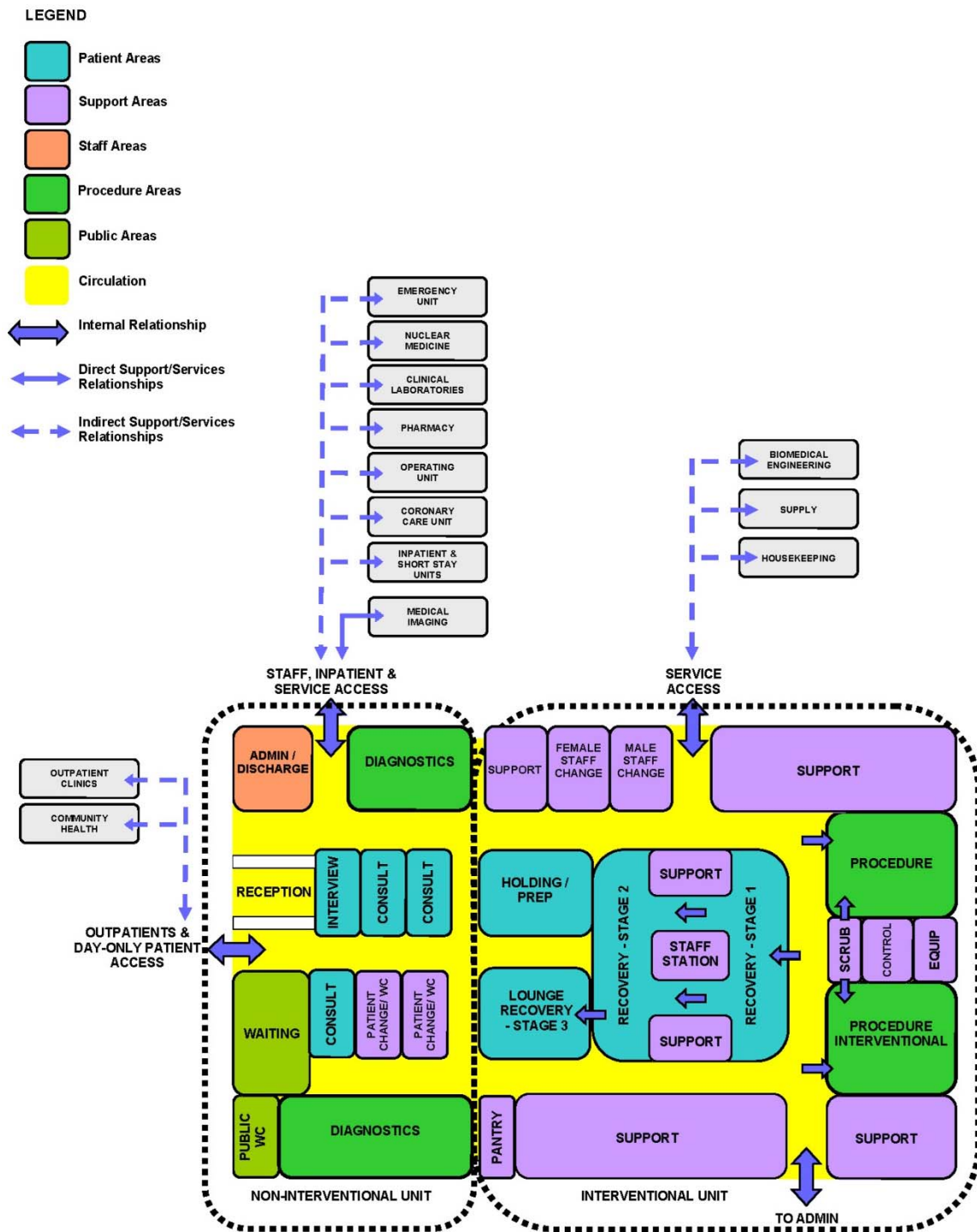


Figure 1 Functional Relationship Diagram: Cardiac Investigations Unit

The optimum external relationships include:

- Visitors access from a main circulation corridor with a relationship to the Main Entrance
- Separate entry and access for staff from hospital units to Administration
- Access for service units such as Supply and Housekeeping via a service corridor.

Internal relationships should include the following:

- Reception at the entrance with access to an interview area
- Access to administrative sub units such as Public Relations, Human Resources, Finance, and Clinical Administration etc. via staff corridors with link to Reception
- Areas of administration that are more frequently visited, such as Public Relations and Human Resources, located closer to Reception and entry
- Support areas located centrally for ease of staff access.

3 Design

Patient Treatment Areas

Direct visualisation, or indirect by video monitoring, of patients is essential at all times. This approach permits the monitoring of patient status under both routine and emergency circumstances. The preferred design is to allow a direct line of vision between the patient and the Staff Station.

Weight-bearing surfaces that support the monitoring and imaging equipment should be sturdy enough to withstand high levels of strain over time. Design should allow for a future increase in monitoring equipment requirements, particularly mobile monitoring.

Environmental Considerations

Acoustics

Acoustic privacy is required in consulting/ testing rooms and any rooms where confidential information will be discussed.

The transfer of sound between clinical spaces should be minimised to reduce the potential of staff error from disruptions and miscommunication and to increase patient safety and privacy.

Shared Control Rooms to cardiac laboratories are not recommended. The staff working in the control room are responsible for scheduling and coordinating all investigations and treatments. Acoustic difficulties may occur when several staff occupy the same space creating the potential for instructions to be misinterpreted and mistakes to be made.

Natural Light/ Lighting

Natural light and views should be available from the Unit for the benefit of staff and patients. Windows are an important aspect of sensory orientation, and as many rooms as possible should have windows to reinforce day/ night orientation. If windows cannot be provided in each room, an alternate option is to allow a remote view of an outside window or skylight. Windows are particularly desirable in waiting areas, holding and recovery areas and staff lounges. Diagnostic rooms are an exception where it is not needed or recommended to have windows.

Variable lighting levels should be provided in Control/ Reporting rooms, Procedure rooms, Cardiac Catheterisation Laboratories, Ultrasound / Echo rooms and Holter reading rooms, where screen visibility is required.

Privacy

Change rooms should be located adjacent to testing rooms so that a patient is not required to cross public areas to access them.

Patients should not be in view when a door to a change room is open; therefore entry should be discrete and controlled.

Additional privacy considerations will include:

- Privacy screening to all Patient Bed Bays
- Discreet and non-public access to medical records
- Location of doors to avoid patient exposure in Consult, Diagnostic and treatment rooms.

Interior Decor

Interior décor refers to colour, textures, surface finishes, fixtures, fittings, furnishings, artworks and atmosphere. It is desirable that these elements are combined to create a calming, non-threatening environment.

Colours should be used in combination with lighting to ensure that they do not mask skin colours as this can be a problem in areas where clinical observation takes place. Bold primary colours and greens are colours to be aware of e.g. yellow could mask a main symptom of jaundice.

Space Standards and Components

Patient Bays

Where an open plan arrangement is provided in patient holding and treatment bay areas, bed spaces shall be arranged so that there is a clearance of at least 1200 mm from the side of the bed to the nearest fixed obstruction or wall. At the head of the bed, at least 900 mm clearance shall be allowed between the bed and any fixed obstruction or wall.

Catheter Laboratories

Catheter laboratories should have ceilings that are at least 3 metres high and are capable of supporting the weight of the various pieces of ceiling-mounted imaging equipment required. This may include the gantry for catheter equipment, theatre light, room lighting, air conditioning, medical gas booms etc. The co-ordination of all ceiling fixed services is vital to the functioning of the laboratories.

Accessibility

Design should provide ease of access for wheelchair bound patients in all patient areas including Consult, Diagnostic rooms and Catheter Laboratories. Waiting areas should include spaces for wheelchairs (with power outlets for charging electric mobility equipment) and suitable seating for patients with disabilities or mobility aids. The Unit will require provision for bariatric patients.

Doors

All entry points, doors or openings, shall be a minimum of 1200 mm wide, unobstructed. Larger openings may be required for special equipment, as determined by the Operational Policy, to allow the manoeuvring of beds, trolleys, equipment and wheelchairs without manual handling risks and risk of damage. Doors used for emergency bed transfer to the Operating Units must be appropriately positioned and sized. A minimum of 1400mm clear opening is recommended for doors requiring bed/trolley access.

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

Ergonomics/ OH&S

Design of clinical spaces including Diagnostic rooms, Catheter Laboratories, EP laboratories must consider Ergonomics and OH&S issues for patient and staff safety and welfare.

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

Size of the Unit

The size of the Clinical Information Unit will be determined by a Clinical Services Plan and will take into consideration:

- The size of the population served by the Unit and demographic trends
- The average length of consultation, diagnostic procedure or stay
- The number of referrals and transfers from other local regions or hospitals.

Safety & Security

The Cardiac Investigation Unit should include the following security considerations:

- The Reception may act as a control point for the unit
- Entry to the Cardiac Catheter Suite may require restricted access such as electronic card reader
- All Offices require lockable doors
- All Store rooms for files, records and equipment should be lockable
- After-hours access which may be required to some diagnostic and procedural areas for emergency procedures

Finishes

In all areas where patient observation is critical, colours shall be chosen that do not alter the observer's perception of skin colour.

The following aspects should always be considered when specifying internal finishes:

- Cleaning and infection control
- Fire safety of the materials
- Patient care and comfort
- Staff safety, particularly for floor finishes
- Cultural/ social perceptions of a professional healthcare environment.

Refer to Part C of these Guidelines and Standard Components for more information on wall protection, floor finishes and ceiling finishes.

Fixtures, Fittings & Equipment

All furniture, fittings and equipment selections for the Cardiac Investigations Unit should be made with consideration to ergonomic and Occupational Health and Safety (OH&S) aspects.

Refer to Part C of these Guidelines - Access, Mobility, OH&S, the Room Layout Sheets (RLS) and Room Data Sheets (RDS) for more information.

Clocks

An analogue clock/s with a second sweep hand shall be provided and conveniently located for easy reference from all diagnostic areas, bed positions and the Staff Station.

Window Treatments

Window treatments should be durable and easy to clean. Consideration may be given to use double glazing with integral blinds, tinted glass, reflective glass, exterior overhangs or louvers to control the level of lighting.

Building Service Requirements

Communications

The Cardiac Investigation Unit requires a wide range of systems to ensure the storage of patient information and image management is efficient and effective. These systems include but are not limited to:

- Picture archiving communications systems (PACS) and storage for digital archives
- Voice/ data cabling and outlets for phones, fax and computers
- Network data requirements and wireless network requirements to support remote reporting
- Video and teleconferencing capability
- CCTV surveillance if indicated
- Patient, staff, emergency call, duress alarms and paging systems

- Communications rooms and server rooms.

Patient, staff assist and emergency call facilities shall be provided in all Diagnostic, Procedure, Treatment rooms and patient areas (e.g. Catheter Laboratories, Echo rooms, ECG rooms and toilets) in order for patients and staff to request for urgent assistance.

Close collaboration with the IT Unit and obtaining advice from consultants early in the design phase is recommended.

Heating, Ventilation and Air conditioning

The unit shall have appropriate air conditioning that allows control of temperature, humidity and air change. Cardiac Catheterisation Suites will require specialised air-conditioning and filtration requirements, refer to Standard Components Catheter Laboratory Room Data Sheets and Room Layout Sheets.

Medical Gases

The Unit will require:

- oxygen and suction in all patient investigation rooms, treatment rooms and procedure rooms
- provision of medical air to patient recovery bays and interventional rooms is optional
- Full anaesthetic capability is required within the catheter laboratories, 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

The Catheter Laboratories require radiation shielding. A certified physicist or qualified expert will need to assess the plans and specifications for radiation protection as required by the relevant local radiation/nuclear safety authorities. A radiation protection assessment will specify the type, location and amount of radiation protection required for an area according to the final equipment selections, the layout of the space and the relationship between the space and other occupied areas.

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

Infection Control

Standard precautions apply to the Cardiac Investigation Unit areas to prevent cross infection between patients, staff and visitors. 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.

Hand Basins

Basins suitable for surgical scrubbing procedures shall be provided for each Procedure and Treatment room (refer to Standard Components Room Layout and Room Data Sheets). Clinical hand-washing facilities shall be provided within the diagnostic testing rooms, convenient to the Staff Stations and patient areas. The ratio of provision shall be one clinical hand-washing facility for every four patient bays in open-plan areas.

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

4 Components of the Unit

Standard Components

The Cardiac Investigation 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.

Non-Standard Components

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

ECG Cubicle/s

The ECG Cubicle is similar to a Patient Bay – Holding with the following inclusions:

- Cubicle partitions, optional
- Body protected power to protect patients from electric shock in accordance with local authority requirements.
- Examination couch/ table
- ECG machine, mobile, with storage for leads and consumable stock
- Small desk and technician chair or stool,
- Patient chair
- Hand basin located in close proximity
- Clothes hook/s for patient use.

Multiple cubicles will require screening for patient privacy.

5 Schedule of Accommodation – Cardiac Investigation Unit

Cardiac Investigation Unit located within a health facility – Non-Interventional

ROOM/ SPACE	Standard Component Room Codes											RDL ALL Qty x m ²	Remarks
Entry/ Reception													
Reception/ Clerical	RECL-10-I											1 x 10	
Waiting Room	WAIT-20-I											1 x 20	For patients and visitors. May be divided into gender segregated areas.
Toilet - Public	WCPU-3-I											1 x 3	May share amenities if located conveniently
Toilet - Accessible	WCAC-I											1 x 5	May share amenities if located conveniently
Bay - Beverage	BBEV-OP-I											1 x 4	Optional
Bay - Drinking Fountain	BWF 1-I											1 x 1	
Bay - Patient Holding	PBTR-H-10-I											1 x 10	Bed or trolley for waiting inpatient
Meeting Room - Small	MEET-9-I											1 x 9	Adjust number to suit service requirement.
Play Area - Paediatric, 10m ²	PLAP-10-I											1 x 10	For families/children.
Store - Files	STFS-8-I											1 x 8	Clinical records; optional for digital records
Store – Photocopy/Stationery	STPS- 8-I											1 x 8	
Outpatient/ Diagnostic Area													
Consult/ Interview	CONS-I											1 x 14	Adjust number of rooms to suit service demand
ECG Cubicle - 1 Patient	NS											1 x 8	Screened cubicle close to hand wash basin
ECG Cubicle - 2 Patients	NS											1 x 16	Screened cubicles close to hand wash basin
Stress Testing	STRT-I											1 x 12	Inclusion of resuscitation trolley essential
Echocardiography - General	ECHO-I similar											1 x 15	
Echocardiography - Transthoracic (TTE)	ECHO-I similar											1 x 15	
Echocardiography - Trans-Oesophageal (TOE)	ECHO-I (similar)											1 x 15	
Holter/ Ambulatory BP Application	CONS-I (similar)											1 x 8	Locate close to consult rooms.
Office – Reporting	OFF-WIS-I											2 x 12	Holter Analysis, Echo reporting
Tilt Table Testing	TRMT-I (similar)											1 x 16	Optional
Support Areas													
Bay Hand wash - Type B	BHWS-B-I											1 x 1	
Bay - Linen	BLIN-I											1 x 2	
Bay - Mobile Equipment	BMEQ-4-I											1 x 4	Mobile ECG Units

ROOM/ SPACE	Standard Component Room Codes										RDL ALL Qty x m ²	Remarks
Bay - Resuscitation Trolley	BRES-I										1 x 1.5	May be stored in ECG Stress Testing Room
Change - Patient (Male/Female)	CHPT-12-I										2 x 12	Shower, Toilet, Lockers
Clean – Up Room	CLUP-7-I										1 x 7	For clean-up of echo probes.
Store - Equipment	STEQ-20-I										1 x 20	
Toilet - Accessible	WCAC-I										1 x 6	As required
Staff Areas												
Staff Room	SRM-15-I										1 x 15	Includes beverage making facilities
Office – Single Person	OFF-S9-1										1 x 9	Unit Manager, Note 1
Office – 2 Person Shared	OFF-2P-I										1 x 12	General Administration; , Note 1
Office- Write – Up (Shared)	OFF-WIS-U										1 x 12	Note 1
Office – Workstation (Technicians)	OFF-WS-I										1 x 5.5	Work-stations numbers will depend on staffing.
Toilet - Staff	WCST-I										2 x 3	
Sub Total											356.0	
Circulation %											35	
Area Total											480.6	

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

Also note the following:

- Areas noted in Schedules of Accommodation take precedence over all other areas noted in the FPU.
- Rooms indicated in the schedule reflect the typical arrangement according to the Role Delineation.
- 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 Functional Planning Units dependent on location and accessibility to each unit and may provide scope to reduce duplication of facilities.

Cardiac Catheter Suite – Interventional

Note: If the Cardiac Catheter Suite is collocated with a non-interventional Cardiac Investigations Unit, Entry / Reception, Support Areas and Staff Areas may be shared between the two Units.

ROOM/ SPACE	Standard Component Room Codes										RDL 6 Qty x m ²	Remarks
Entry / Reception											2 Cath Labs	
Reception/ Clerical	RECL-I0-I										1 x 10	
Waiting	WAIT-15-I										1 x 15	May be divided into gender segregated areas.
Change Cubicle - Accessible	CHPT-D-I										2 x 4	May be divided into gender segregated areas.
Meeting Room - Small	MEET-9-I										1 x 9	For pre-admission interviews, post angiography reviews, etc.
Patient Bay- Holding /Recovery	PBTR-H-10-II										14 x 10	6 bays per laboratory, plus 1-2 for TOE
Toilet - Accessible	WCAC-I										1 x 4	
Procedural Area												
Consult Rom	CONS-I										1 x 14	
Catheter Laboratory Procedure Room	CLAB-I										2 x 55	For Single Plane or Bi-plane procedures
Catheter Laboratory Control/Reporting Room	CLCRT-I										2 x 14	
Computer Equipment Room	COEQ-I										2 x 10	Computer & technical equipment modules
Electrophysiology Laboratory	CLAB-I (similar)										1 x 55	
Electrophysiology Lab -Control Room	CLCRT-I										1 x 14	
Scrub up/ Gowning	SCRB-6-I										2 x 6	
Support Areas												
Bay - Beverage, Open Plan	BBEV-OP-I										1 x 4	
Bay - Blanket Warmer	BBW-I										1 x 1	
Bay - Handwashing Type B	BHWS-B-I										2 x 1	
Bay - Linen	BLIN-I										1 x 2	
Bay - Pathology	BPATH-I										1 x 1	Point of care testing units
Bay - PPE	BPPE-I										1 x 1.5	Lead aprons
Bay - Resuscitation Trolley	BRES-I										1 x 1.5	
Clean-Up Room	CLUP-7-I										1 x 7	For processing echo transfers
Dirty Utility Room	DTUR-10-I										1 x 10	
Disposal Room	DISP-10-I										1 x 10	
Set-Up Room	SETUP-8-I										1 x 8	

ROOM/ SPACE	Standard Component Room Codes										RDL 6 Qty x m ²	Remarks
Staff Station/ Clean Utility	SSCU-I										1 x 9	
Store - Sterile Stock	STSS-12-I										2 x 12	Provide 12m2 per Procedure room
Store - Equipment	STEQ-16-I										1 x 16	
Store - Files	STFS-8-I										1 x 8	Files, stationery
Store - General	STGN-12-I										1 x 12	
X-Ray Viewing & Reporting	XRRR-I										1 x 12	
Staff Areas												
Change Room - Staff	CHST-12-I										2 x 12	Shower, Toilet & lockers, may be shared
Office – Single Person	OFF-S9-I										1 x 9	Unit Manager; Note 1
Office – 2 Person Shared	OFF-2P-I										1 x 12	Cardiac technicians; Note 1
Staff Room	SRM-15-I										1 x 15	May share with an adjacent unit
Staff Toilet	WCST-I										1 x 3	May share with an adjacent unit
Sub Total											631.0	
Circulation %											35	
Area Total											851.9	

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

Also note the following:

- Areas noted in Schedules of Accommodation take precedence over all other areas noted in the FPU.
- Rooms indicated in the schedule reflect the typical arrangement according to the Role Delineation.
- 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 Functional Planning Units dependent on location and accessibility to each unit and may provide scope to reduce duplication of facilities.

6 Future Trends

Technological advances are continuing to make investigative and diagnostic cardiac procedures safer and more effective in a wider range of patients. The development of new technology, such as multiplanar systems will impact the design, spatial requirements and functioning of Cardiac Investigation Units.

There is a general movement towards the use and development of technology for remote monitoring of cardiovascular implantable electronic devices. Remote monitoring is proving to be a safe alternative to in-office evaluation of cardiac function, improves discovery of clinically important events, and reduces clinical response time and follow up contact visits. Facilities for the provision of this service will be increasingly required in the near future.

The disciplines of cardiology and cardiac surgery are increasingly converging with the development of interventional electrophysiology. Interventional electrophysiology therapies include endovascular mitral valve repair, permanent pacing for Brady arrhythmias, surgery for arrhythmias, percutaneous catheter ablation for atrial fibrillation, cardiac brachytherapy for restenosis, and implantable devices for tachyarrhythmias. The need for interventional electrophysiology is increasing with complex conditions now able to be treated with three-dimensional mapping and endovascular surgery. Mapping technology is constantly improving and able to accurately replicate the cardiac anatomy underlying an arrhythmia, to provide a plausible representation of the activation of the chambers, allowing for planning and implementation of appropriate interventions. The distinction between the two disciplines of cardiology and cardiac surgery is becoming blurred and the spatial relationships and facilities provided should reflect this interconnection.

Other emerging technologies associated with interventional electrophysiology include remote magnetic navigation techniques where catheters with magnetic tips are steered within the patient, without the need for an electrophysiologist to manoeuvre the catheter manually. Catheter ablations for complex arrhythmias can be long procedures with additional risks such as X-ray exposure. Magnetic navigation is well suited to the treatment of complex arrhythmias, because of its efficacy and reliability, the significant reduction in X-ray exposure for both patient and operator, and the very low risk of perforation. Ongoing developments will likely improve results and procedure times. The proliferation of magnetic navigation technologies will result in a drastic change in the size and amount of equipment required for various procedures.

Infarct angioplasty is likely to become more widely practiced, predominantly in those patients with large infarcts who have a high mortality rate. This procedure is becoming more widely accepted as evidence has established it to be highly effective. It has been shown that the rapid transfer of patients from general hospitals to acute revascularisation units is safe and effective. Compared to current thrombolytic treatment, angioplasty achieves a much higher rate of normal flow, a lower re-infarction rate, a lower mortality rate, improved ventricular function and a lower rate of stroke. Few centres worldwide are equipped or staffed for the routine application of primary angioplasty but this is set to change as the procedure becomes more widely accepted and practiced. The introduction of facilities for infarct angioplasty will result in an increase the amount of catheter laboratories required and will again require an interconnected cardiac investigation and cardiac surgery unit.

7 Further Reading

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- US Department of Veteran Affairs: Office of Construction & Facilities Management, Design Guides, refer to website: <http://www.cfm.va.gov/til/dGuide.asp>



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