

Australasian Health Facility Guidelines

Part B - Health Facility Briefing and Planning HPU 260 Cardiac Care (Inpatient) Unit - CCU

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Australasian Health Facility Guidelines

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CULTURAL ACKNOWLEDGEMENT AND TERMINOLOGY

The Australasian Health Facility Guidelines (AusHFG) are developed in collaboration with stakeholders across Australia and Aotearoa, New Zealand.

Acknowledgement of Country

We acknowledge the Aboriginal people as traditional owners and continuing custodians of the land throughout Australia and the Torres Strait Islander people as the traditional owners and continuing custodians of the land throughout the Torres Strait Islands. We acknowledge their connection to land, sea and community and pay respects to Elders past, present and emerging.

Acknowledgement of Te Tiriti o Waitangi

We acknowledge Māori as tangata whenua in Aotearoa New Zealand; Te Tiriti o Waitangi obligations have been considered in developing these resources.

Terminology and Language in the AusHFG

Throughout the AusHFG resources, the term 'Indigenous Peoples' is used to refer to both the Aboriginal and Torres Strait Islander Peoples of Australia and Māori of Aotearoa, New Zealand. Where references to specific cultural requirements or examples are described, the terms 'Aboriginal and Torres Strait Islander Peoples' and 'Māori' are used specifically. The AusHFG respect the right of Indigenous Peoples to describe their own cultural identities which may include these or other terms, including particular sovereign peoples or traditional place names.

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1. INTRODUCTION

1.1 Preamble

This Health Planning Unit (HPU) has been developed by the Australasian Health Infrastructure Alliance (AHIA). This revision has been informed by an extensive consultation process that was completed in 2023.

The document is intended to be used by design teams, project managers and end users to facilitate the process of planning and design.

1.2 Introduction

This HPU outlines the requirements for a **Cardiac Care Unit (CCU)** including the additional facility requirements for managing patients with cardiovascular conditions (medical, surgical, and interventional) in an adult **inpatient unit**. This document was previously called a Coronary Care Unit, but the name has been changed to reflect the evolving role of specialist cardiac care.

This HPU should be read in conjunction with the Australasian Health Facility Guidelines (AusHFG) generic requirements and Standard Components described in:

- Part A: Introduction and Instructions for Use
- Part B: Section 80 - General Requirements
- Part B: Section 90 - Standard Components
- Part C: Design for Access, Mobility, Safety and Security
- Part D: Infection Prevention and Control.

For information regarding general inpatient unit planning and design, it is recommended that this HPU be read in conjunction with HPU 340 Adult Acute Inpatient Unit.

Where the CCU is a component of an Intensive Care Unit, refer to HPU 360 Intensive Care Unit. Depending on jurisdictional and model of care requirements, where the CCU is a component of a High / Close Observation Unit, design requirements may be consistent with an inpatient unit with a higher level of observation and monitoring. Refer to HPU340 Adult Acute Inpatient Unit for further information.

Facility requirements for cardiac surgery, including intensive care and operating units, are described in HPU 360 Intensive Care Unit and HPU 520 Operating Unit.

This HPU should be read in conjunction with HPU 170 Cardiac Investigation Unit which details requirements for cardiac catheter laboratories, cardiac diagnostics, and specialist cardiac outpatient services.

1.3 Policy Framework

Prior to undertaking a project, planners and project staff should familiarise themselves with individual state and territory specific policies.

Key cardiac services references include:

- National Strategic Action Plan for Heart Disease and Stroke, Department of Health 2020
- National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand: Australian Clinical Guidelines for the Management of Acute Coronary Syndrome 2016.

In relation to the provision of acute cardiac care services, reference should be made to jurisdictional clinical services plans, role delineation, and service level information.

Refer to References and Further Reading for additional information relating to individual jurisdictions.

1.4 Description

1.4.1 Description of a Cardiac Care Unit

A CCU is a specialised area of a healthcare facility providing critical care for emergency and acute cardiac illness at a high level of expertise. Dependant on clinical capability, role delineation, or service level, the CCU may be colocated with an intensive care service or provided as a stand-alone unit.

These units have advanced monitoring and diagnostic equipment and access to a specialist cardiac team with critical care training. Staffing levels are typically more intensive than other inpatient settings.

The CCU provides a person-centred approach to care, involving family and carers in the patient journey with models of care that provide stabilisation, diagnostic assessment and treatment for patients with a primary cardiac diagnosis including:

- coronary artery disease
- acute myocardial infarction - ST elevation myocardial infarction (STEMI) and non-ST elevation myocardial infarction (NSTEMI)
- structural heart disease (e.g., congenital abnormalities)
- cardiac rhythm disturbances
- chronic and acute cardiac failure
- cardiac assessments
- other conditions such as pulmonary embolism and infective endocarditis.

The CCU will often provide, dependant on clinical capability and role delineation:

- post recovery care for procedures undertaken in the cardiac catheter lab (CCL) such as percutaneous coronary intervention (PCI), trans-catheter valve replacement and advanced care treatments such as complex electrophysiology (EP) ablations and structural heart interventions
- cardiac monitoring of patients with acute coronary syndrome, heart failure, or life-threatening arrhythmias and cardiac anomalies
- models that are rapidly evolving to manage the full range of cardiac services (medical, interventional, and surgical) as some surgical techniques are evolving to less invasive procedures
- rapid access streaming model of care that will have patients admitted directly to CCU via ambulance following thrombolysis – Emergency Department (ED) bypass model.

Patient management, treatment and procedures may vary across units with some work undertaken in an Intensive Care Unit (ICU) or CCU. Examples of this include invasive ventilation, extracorporeal membrane oxygenation (ECMO), and continuous veno-venous haemodialysis (CVVHD) which will routinely occur in ICU.

1.4.2 Services Provided

Depending on the clinical capability, role delineation, or service level, treatments and procedures provided within the CCU may include:

- cardiac monitoring, which may be invasive, non-invasive, or hard wired, with or without telemetry

- invasive haemodynamic monitoring
- co-ordination and administration of appropriate drug therapies, including thrombolysis
- non-invasive ventilation
- haemodialysis
- monitoring of devices used to manage heart failure, (e.g., left ventricular assist device)
- cardioversion, both elective and emergency procedures
- intra-aortic balloon counter-pulsation
- transthoracic echocardiography (TTE)
- transoesophageal echocardiography (TOE)
- exercise stress testing
- management of patients with temporary or external pacing wires
- patient education and multidisciplinary rehabilitation for whole-of-patient care.

1.4.3 Future Trends

The services provided by a CCU, particularly in the tertiary setting, are evolving as therapies improve. Increasingly less invasive interventional procedures, such as endovascular procedures and device implantation, are expected to substitute open surgical interventions and an integrated unit will provide flexibility to manage changes in the mix of medical and surgical patients.

There have been significant changes to models of care in Interventional Cardiology which are seeing an increase in procedures being performed by interventional cardiologists and cardiac surgeons together in a hybrid laboratory setting.

Such advances are reducing the number of patients with significant cardiac damage resulting from a cardiac event such as myocardial infarction, either STEMI or non-STEMI, and as a result, the length of stay for these patients is decreasing.

The CCU is now the setting for the administration of more complex drugs and therapies. Patients are being transferred to step-down facilities earlier.

Heart failure programmes have resulted in increased survival rates. Heart failure treatments are becoming more complex, resulting in greater levels of ambulatory and inpatient care for heart failure. Reliance on cardiology specialist staff, interventional, and diagnostic services is also increasing.

The proportion of older adults and complex patients being admitted to the CCU is increasing.

2 PLANNING

2.1 Operational Models

2.1.1 Arrangement of Cardiac Services

Consideration should be given to the location of inpatient beds, cardiac diagnostic and interventional services, and associated office space as it may be possible to make better use of specialist staff and share space between services.

2.1.2 Bed Numbers

Acute cardiac care bed numbers will be dependent on service planning which will project bed numbers based on projected activity, population growth, and clinical trends.

In smaller units there may be a need to provide 'swing beds', for example with an adjacent ICU, to provide a critical mass of beds and allow for expansion or contraction as demand for services change.

2.1.3 Bed Mix

CCU beds will be arranged to facilitate critical care in a mix of one and two bed rooms. The bed mix needs to be determined by individual jurisdictions on a project-by-project basis, taking into consideration local feedback and requirements.

All one bed rooms can accommodate patients requiring standard contact isolation, but in standalone CCUs at least one negative pressure one bed room with an anteroom should be provided for isolation purposes. The number of negative pressure rooms, when the CCU is combined with an IPU or ICU, will be dependent on the total bed numbers within the unit and local requirements.

The care of bariatric patients will also need to be considered.

Refer to HPU 340 Adult Acute Inpatient Unit, Australasian Health Facility Guidelines (AHIA, 2020) for further information when planning cardiology and cardiothoracic inpatient units.

2.2 Operational Policies

2.2.1 General

Operational policies have a major impact on design requirements and capital and recurrent costs of health facilities. These policies must be established at the earliest possible stage. Users will also be guided by local and jurisdictional policies.

Unit specific operational policies are detailed below. For a list of general operational policies that may apply, refer to AusHFG Part B: Section 80 General Requirements.

2.2.2 Hours of Operation

The CCU will provide service 24 hours a day, seven days a week.

2.2.3 Cardiac Rehabilitation

Cardiac rehabilitation includes education in risk factor modifications such as diet, counselling, and physical activity.

Cardiac rehabilitation in the CCU context will involve one-on-one education and some group education. Patients will be referred for an ongoing program on discharge.

2.2.4 Medical Imaging

Ready access to medical and cardiac imaging services will be required for a range of imaging needs, including chest x-rays, Computed Tomography (CT) including computed tomography coronary angiography (CTCA), Magnetic Resonance Imaging (MRI), nuclear medicine and Positron Emission Tomography (PET).

A mobile x-ray machine may be available to use for monitored patients who are too unwell to transfer. The mobile x-ray machine will be located in the medical imaging unit, unless a dedicated machine servicing a range of critical care units can be justified. Alternatively, larger services may consider a satellite imaging unit (e.g., chest x-ray) as this reduces travel times and staffing needed to transport monitored patients.

2.2.5 Cardiac Diagnostics and Procedures

Many cardiac diagnostic tests and procedures may be undertaken at the bed side and may include:

- Electrocardiogram (ECG) and echocardiography
- arterial sheath removal
- transoesophageal echo (TOE) and transthoracic echocardiography (TTE)
- insertion of temporary pacing wires
- pericardiocentesis
- intra-aortic balloon pump
- pulmonary artery catheters
- cardioversion.

Equipment will generally be stored in the cardiac investigation unit.

Other cardiac tests and diagnostic procedures may require the patient to be transferred to a cardiac investigation unit for procedures such as stress testing, TOE, or coronary angiography. Selected procedures, such as a combined TOE and cardioversion, may be performed in an operating theatre or procedure room.

2.2.6 Pathology

Pathology is extensively used by cardiac services and may be facilitated by point-of-care equipment, including a blood gas analyser, either fixed or hand-held, and pneumatic tube system, to send samples to the pathology unit, in or near the CCU. Infrastructure may be shared with an adjoining unit.

2.2.7 Bedside Monitoring

Cardiac monitoring equipment should allow visual display at both the bed location and the staff station. Each cardiac care bed should be individually monitored.

Bedside monitors should be mounted so they are visible from the bedroom door, and staff should be able to assess the status of the patient at a glance. Their location should not interfere with physical access to the patient.

The addition of 'slave' monitors in corridors of larger units should be considered.

The extent of monitoring equipment is likely to continue increasing in the future. Space requirements for equipment such as central monitors, printing devices at staff stations, and storage of accessories must be considered by project teams. If the unit has a large number of beds, ceiling mounted monitors may be considered to maximise space at the staff station.

2.2.8 Telemetry

Telemetry is the transmission of cardiac ECG signals to a receiving location via Wi-Fi, where they are displayed for monitoring purposes.

Telemetry (remote monitoring) may be used for patients within the CCU and other inpatient units throughout the facility. A central monitor will be located in the CCU staff station to ensure appropriate skilled observation of the monitored patients. New technologies are allowing skilled staff and response teams to be alerted to arrhythmias from telemetry and cardiac monitoring systems via wearable devices.

If the CCU has direct access to an external courtyard, adequate Wi-Fi coverage is required within this space to support telemetry.

2.2.9 Telemedicine

Telemedicine is the transmission of images, voice, and data between two or more health units via telecommunication channels to provide clinical advice and consultation, education, and training services. It has particular relevance for rural and remote areas. Telemedicine links may allow patients to be treated closer to home, supported by advice from a tertiary or regional referral hospital. The telemedicine space should be in a quiet location with access to the appropriate technology such as computers, webcams, and telephones. This may be provided within staff office / workstation areas subject to projected activity.

2.2.10 Renal Dialysis

The provision of a dialysis station, which includes a water supply and drainage to an agreed number of CCU beds, will be determined on a project-by-project basis.

Dialysis within the CCU can be provided by a system with a central Reverse Osmosis (RO) unit, where the water treatment plant room is close to the CCU, or portable RO devices which attach to each dialysis machine. The use of portable RO devices in ICU and CCU is recommended, given the high cost to install and maintain a separate RO plant, however this will depend on the projected utilisation of dialysis services, as well as proximity to, and size of, the central RO plant.

The NSW Agency for Clinical Innovation (2018) recommends that a central RO water plant is utilised for dialysis units with six chairs or more to reduce costs associated with maintenance and repair of individual RO devices. For further information refer to:

- HPU 620 Renal Dialysis Unit
- NSW Agency for Clinical Innovation (2018) Water for Dialysis – A Guide for In-Centre, Satellite and Home Haemodialysis in NSW.

2.2.11 Storage – Equipment

Routinely used equipment (e.g., cardiac monitors) will be stored in bed rooms. Equipment storage may be in bays near point of use, or in a central store for items used less frequently. Items may include:

- resuscitation trolley
- non-invasive ventilation machines
- ECG machines
- intra-aortic balloon pump
- IV stands and infusion pumps
- procedure trolleys
- transport defibrillators, transport packs, and transport oxygen cylinders
- battery chargers

- walking aids
- sitting and standing scales
- workstations on wheels (WOW)
- advanced heart equipment, such as left ventricular assist devices (LVAD).

2.2.12 Visitors

CCU will have specific policies regarding visiting hours and accommodation for carers guided by the facility's overall operational policies. Visitor amenities may include:

- patient and visitor lounge
- ability to room-in with the patient
- private spaces for interviews and bereavement, etc.
- accessible areas for visitors with mobility and neuro-diversity requirements.

2.2.13 Staffing

The multidisciplinary staff establishment, permanent and visiting, may include:

- medical staff, including cardiologists, registrars, and junior medical staff
- nursing staff, including unit manager, nursing specialists, and educators
- allied health staff, including social worker, dieticians, and physiotherapists
- other staff, including clerical and environmental services staff
- students from all disciplines
- volunteers.

Staffing levels will vary for each unit and is dependent on the size of the unit and the operational policies.

2.3 Planning Models

2.3.1 Location

In all instances, by good design and location, the potential for appropriate sharing of facilities with an adjoining unit should be maximised.

Ensure that the CCU and adjoining units do not act as a thoroughfare to other parts of the healthcare facility.

The location may enable expansion if additional beds are required in the future.

2.3.2 Layout

All cardiac care beds should ideally be visible from the staff station. In larger units, where this cannot be achieved, consideration may be given to providing decentralised staff workstations with computer support. All units will, however, require a central staff station with central cardiac monitors to facilitate the early detection of arrhythmias so that staff can respond and plan for ongoing management.

2.3.3 Cardiac and Cardiac Surgery Inpatient Unit

In most respects, acute cardiac and cardiac surgery inpatient units will be the same as a general medical or surgical inpatient unit with the following additions:

- telemetry equipment with monitoring at a staff station that may be in the CCU or in the main inpatient unit staff station
- access to patient education facilities for cardiac rehabilitation.

2.4 Functional Areas

2.4.1 Functional Zones

Functional zones may be classified as follows:

- patient areas
- clinical support areas
- staff areas, including workspace and amenities
- shared areas.

2.4.2 Patient Areas

Patient areas include bedrooms, ensuites, and a patient and family lounge.

Bedrooms may be a mix of one and two bed rooms.

Patient lounges provide an opportunity for socialisation, and a destination and space to meet with family and friends. With an increasing number of one bed rooms, a need for constant monitoring, and decreased lengths of stay, the utilisation of this space may be low. Where provided, this space should be provided within the envelope of the CCU so staff can supervise easily.

2.4.3 Clinical Support and Shared Areas

The extent of rooms or spaces that may be shared between CCU and an adjoining inpatient unit or ICU, should be determined by the size of the overall CCU itself. Large units may have entirely self-contained clinical spaces but may still share some staff amenities and teaching spaces.

Areas accessed by staff in the management of the patient include:

- staff station - central and decentralised and including a clinical workroom
- interview room
- clean store
- medication room
- dirty utility room
- bays for linen, equipment, and resuscitation trolleys and WOWs
- storage for equipment and consumables
- disposal room, ideally located at the periphery of the unit with direct external access by environmental services staff.

2.4.4 Staff Areas

Staff areas include workspace and staff amenities.

Workspace for the unit manager is usually located within the envelope of the unit, and where indicated, workspace for senior nursing staff, such as nursing specialists and educators, and medical staff, is usually provided within ready access to the unit.

Local jurisdictional policies relating to the provision of staff work areas will guide the allocation and arrangement of staff workspaces.

Access to adequate facilities for staff education and meetings will be needed. In larger units, staff require easy access to areas that support simulation training and competency assessment.

Research associated with the provision of all cardiac services will be a feature of tertiary services. While clinical trials staff may visit the unit, office and related space will not be provided within the CCU. Specific requirements will be dependent on the scope and scale of research activities.

Staff amenities will include a staff room that is readily accessible and may be shared between units for use by all staff and students to facilitate interaction. Staff toilets and lockers should be immediately accessible within the envelope of the unit.

2.5 Functional Relationships

2.5.1 External

The CCU will have ready access to:

- cardiac investigation unit, which includes cardiac catheterisation laboratories etc., noting a collocation of the two services is often preferred
- emergency department
- intensive care unit
- operating theatres
- medical imaging, nuclear medicine, and PET.

Easy access required to:

- inpatient units for cardiology (step down beds) and cardiothoracic surgery
- cardiac rehabilitation services
- pharmacy
- pathology.

2.5.2 Internal

Optimal internal relationships to be achieved include those between:

- patient occupied areas forming the core of the unit
- staff stations and associated areas that need direct access and observation of patient areas
- utility and storage areas that need to be readily accessible to both patient and staff work areas
- public areas located on the perimeter of the unit
- shared areas that should be easily accessible from the units served.

3 DESIGN

3.1 Accessibility

There should be a single public entry point to the unit that can be observed by staff. Ideally, a separate access will be provided for staff, patient transfers, and for the movement of supplies and waste that is operated by a swipe card, or similar, by authorised personnel only.

3.2 Parking

Selected staff will provide on-call services and provision of parking that is both nearby and safe needs to be considered.

For further information regarding staff parking, refer to AusHFG Part C: Section 6.0 Security.

3.3 Disaster Planning

Each site and unit will have operational plans and policies detailing the response to a range of emergency situations both internal and external.

For further information, refer to:

- local jurisdictional disaster management plans
- AusHFG Part B: Section 80 General Requirements
- AusHFG Part C: Section 06 Security.

3.4 Infection Control

The number of negative pressure isolation rooms will be determined on a project-by-project basis. Relevant factors for inclusion and quantity are the size of the unit, its location, and role delineation.

For further information refer to:

- NHMRC, 2019, Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)
- Jurisdictional engineering services guidelines
- AusHFG Part D: Infection Prevention and Control
- AusHFG Isolation Rooms – Engineering and Design Requirements (2017).

3.5 Environmental Considerations

3.5.1 Acoustics

Alarms and monitors add to the sensory overload in CCUs. Without reducing their importance or sense of urgency, such signals should be modulated to a level that will alert staff yet be rendered less intrusive. For these reasons, surfaces that absorb sound should be used while keeping infection control, maintenance and equipment movement needs under consideration.

3.5.2 Natural Light

Natural light contributes to a sense of wellbeing for all building occupants including patients, staff, and other users. Higher levels of natural light may help people better orient themselves in the building thus enhancing wayfinding. Glare and heat should be minimised.

Daylight to all bedrooms is essential. Daylight to patient lounge areas and staff rooms is desirable.

3.5.3 Privacy

Visual privacy is required for patients, but the higher priority is the requirement for staff to be able to see patients and observe their condition.

3.5.4 Interior Decor

Interior design strategies should be calming and offer positive distractions to reduce stress and support recovery.

Furnishings, style, colour, textures, ambience and perception should be considered in context of cleaning, infection control, fire safety, patient care and patient perceptions of a professional environment.

Features that distract patients (e.g., artwork) may also be helpful and have a positive impact on health care staff, including staff safety, staff morale and job retention. The arts can support health care logistics such as wayfinding and waiting areas.

Some colours, particularly bold primary colours and green, should be avoided in areas where clinical observation occurs, such as bedrooms and treatment areas. Such colours may prevent the accurate assessment of skin tones e.g., yellow (jaundice), blue (cyanosis) and red (flushing).

3.6 Space Standards and Components

3.6.1 Human Engineering

Human engineering covers those aspects of design that permit effective, appropriate, safe, and dignified use by all people, including those with disabilities. Refer to AusHFG Part C: Section 04.

3.6.2 Ergonomics

Design and build of the unit must ensure that patients, staff, visitors, and maintenance personnel are not exposed to avoidable risks of injury.

Refer to AusHFG Part C Section 7.5.1 for further details.

3.6.3 Access and Mobility

The facility must comply with the Commonwealth Disability and Discrimination Act (DDA) and the following standards where applicable:

- Disability (Access to Premises – Buildings) Standards 2010
- National Construction Code
- AS1428 – Design for Access and Mobility (set)
- NZS 4121: Design for access and mobility: Buildings and Associated Facilities.

Refer to:

- AusHFG Part C: Design for Access, Mobility, Safety and Security.

3.6.4 Building Elements

Building elements include walls, floors, ceilings, doors, windows, and corridors and are addressed in detail in the section on Building Elements in AusHFG Part C.

Window sill heights should be low enough to permit a view to the outside by a patient lying in bed. This is usually 600 millimetres above the finished floor level.

Ensure that **doorways** are sufficiently wide and high enough to permit the manoeuvring of beds, wheelchairs, trolleys, and equipment without risk of damage or manual handling risks, particularly in rooms designed for bariatric patients.

Corridor widths should accommodate a bed with associated equipment and escorts.

3.7 Safety and Security

3.7.1 General

Consideration of safety and security risks should begin during the planning and design phase of a healthcare facility and consider the health and safety of patients, visitors, staff, and maintenance personnel.

3.7.2 Safety

Considerations within the CCU may include:

- allowing for ceiling-mounted hoists to a nominated number of beds. This will support the care of bariatric patients and those with high care needs
- inclusion of mobile equipment bays to store other equipment such as mobile hoists close to the point of care
- allocation of a bed room and ensuite that is sized and equipped to manage bariatric patients.

3.7.3 Security

Security of the various components or zones should be addressed at each stage of the planning and design process and not imposed on a completed building. Aspects of security may include:

- the need for fixed and/or personal duress alarms
- access control particularly at night
- observation of access points into the unit
- monitoring of patient movements into and out of the unit.

For further information refer to:

- individual jurisdiction security policies where available
- AusHFG Part C: Section 06 Security.

3.8 Finishes

3.8.1 General

Finishes in this context refers to walls, floors, windows, and ceilings. For further details refer to AusHFG Parts C and D.

3.8.2 Wall Finishes

Adequate wall protection should be provided to areas that will be regularly subjected to damage. Particular attention should be given to areas where bed or trolley movement occurs such as corridors, bed head walls, treatment areas, and equipment bays.

3.8.3 Floor Finishes

Floor finishes should be appropriate to the function of the space (e.g., non-slip in wet areas) and be hard wearing, easy to clean, and maintain. Clinical areas where patient care and treatments are undertaken should not be carpeted.

Selection of floor finishes should consider manual handling issues, including the impact of the flooring on push or pull forces for wheeled equipment, and be adequate to avoid the potential for slips and trips caused by joints between flooring.

Refer to:

- AusHFG Part C: Section 3.14 Amenity, Safety and Design Tolerances; Floor Finishes
- AusHFG Part D: Infection Prevention and Control
- TS7 - Floor Coverings in Healthcare Buildings, Issue V1.1 (NSW Health, 2009).

3.8.4 Ceiling Finishes

Ceiling finishes should be selected with regard to appearance, cleaning, infection control, acoustics, and access to services.

Refer to Part C: Section 3.13 Amenity, Safety and Design Tolerances; Ceilings and Ceiling Finishes.

3.9 Fixtures, Fittings & Equipment

3.9.1 Definitions

The Room Data and Room Layout Sheets in the AusHFG define fixtures and fittings as follows:

- fixtures: Items that require service connection (e.g., electrical, hydraulic, mechanical) that include, but are not limited to, hand basins, light fittings, medical service panels, etc. but excludes fixed items of serviced equipment
- fittings: Items attached to walls, floors, or ceilings that do not require service connections, such as curtain and IV tracks, hooks, mirrors, blinds, joinery, pin boards, etc.

For further information refer to:

- Standard Components - Room Data Sheets (RDS) and Room Layout Sheets (RLS)
- AusHFG Part F: Section 680 Furniture Fittings and Equipment.

3.10 Building Service Requirements

3.10.1 General

In addition to topics addressed below, refer to jurisdictional guidelines and policies.

3.10.2 Mechanical Services

The temperature within the unit should be maintained within a comfortable range not exceeding 24°C.

3.10.3 Electrical Services

Considerations within the CCU include:

- emergency power supply for critical equipment
- cardiac protection to CCU beds
- possible need for UPS to the staff station central monitor, if not supplied with the monitor.

For further information refer to AS/NZS 3003:2018 Electrical Installations - Patient Areas (Standards Australia, 2018).

3.10.4 Hydraulic

Where infrastructure to support haemodialysis at the bedside is required, refer to the Standard Component for a Patient Bay – Renal Dialysis, Bed (room code PBTR-RD-B). Town water will be supplied rather than a reverse osmosis (RO) outlet. Staff will use a portable RO unit instead. This reduces the need for ongoing maintenance of the RO system where use is intermittent.

3.10.5 Information Technology and Communications

A range of information technology and communications infrastructure and systems will need to be considered including:

- infrastructure to support electronic medical records. Solutions may vary and include tablet technology, fixed PCs, or mobile workstations
- cardiac monitor at the bedside and staff station
- wireless technology to support equipment such as telemetry and WOWs
- videoconferencing / telemedicine capacity
- electronic health records and other point of care systems
- barcodes and scanners to support the management of clinical supplies
- e-medication management and e-storage systems such as automated dispensing systems.

Consultation with facility information technology and communication services during the planning of the CCU is required to ensure provision of adequate power and data to support technology and equipment.

Consideration on the required space for equipment such as central cardiac monitors, downtime computers, and printing devices at staff stations is needed.

The design team should work with clinical representatives to identify optimal locations for slave screens based on the departmental layout.

3.10.6 Lighting

Consider the use of examination lights at each bed space. Other lighting to support a range of functions is described in the Standard Component for a 1 Bed Room – CCU (code 1BR-SP-B).

3.10.7 Medical Gases

Medical gases may be located on wall-mounted service panels or ceiling-mounted pendants.

Where inpatient ensuites are provided, provision should be made for an oxygen outlet.

Refer to the Standard Component for a 1 Bed Room – CCU for additional information (code 1BR-SP-B).

3.10.8 Telemetry

The CCU, cardiac, and cardiac surgery inpatient units will require a telemetry monitoring system consisting of, but not limited to:

- sensors appropriate to the particular signals to be monitored
- battery powered, patient-worn transmitters
- Real Time Location Services (RTLS) grade Wi-Fi
- a display monitor capable of concurrently presenting information from multiple patients (e.g., a central monitor).

4 COMPONENTS OF THE UNIT

4.1 Standard Components

Rooms and spaces are defined as:

- *standard components* (SC) which refer to rooms and spaces for which room data sheets, room layout sheets (drawings) and textual description have been developed
- *standard components – derived rooms* (SC-D) which are rooms, based on a SC but they vary in size. In these instances, the standard component will form the broad room 'brief' and room size and contents will be scaled to meet the service requirement
- *non-standard components* which are unique rooms that are usually service-specific and not common.

The standard component types are listed in the attached Schedule of Accommodation.

The current Standard Components can be found at:

www.healthfacilityguidelines.com.au/standardcomponents

4.2 Non-Standard Components

Non-standard components are unit-specific and provided in accordance with specific operational policies and service demand.

All the rooms and spaces in the schedule of accommodation appear as standard components but may need some slight modification such as a central cardiac monitor and printer at the staff station.

5 APPENDICES

5.1 Schedule of Accommodation

A Schedule of Accommodation (SOA) is shown below and lists generic spaces for this HPU. Quantities and sizes of spaces will need to be determined in response to the service needs of each unit on a case-by-case basis. Note that:

The following two indicatively sized CCU scenarios are provided:

- **Scenario 1:** 12 bed CCU
- **Scenario 2:** 6 bed CCU which is part of a 28-bed inpatient unit. This option allows for sharing of staff and clinical infrastructure in a logical way. In this scenario, it is assumed that 6 of the 28 beds are sized at 20m² with the remaining 22 beds sized in line with a standard inpatient bed room size (15 to 16.5m²).

Where CCU beds are being planned as part of an intensive care unit, refer to HPU 360 Intensive Care Unit. If a CCU is a component of a Close Observation Unit, design requirements may be consistent with an inpatient unit with a higher level of observation and monitoring. Refer to HPU 340 Adult Acute Inpatient Unit.

In some cases, rooms and spaces are described as 'optional' or 'o'. Inclusion of this room or space will be dependent on a range of factors such as operational policies or clinical services planning.

Where an asterisk (*) is shown in remarks, this denotes possible opportunities to share space with an adjacent unit or service.

PATIENT AREAS

The mix of bed types provided should be informed by local requirements. Local services may choose to use a mix of one and two bed rooms so numbers have not been indicated in scenario 1. Scenario 2 has an example mix of bed types specified. The mix of ensuite types is to be determined by the project depending on local requirements.

AusHFG Room Code	Room / Space	SC / SC-D	Scenario 1 Dedicated 12 Bed CCU		Scenario 2 6 Bed CCU embedded as part of a 28 Bed IPU		Remarks
			Qty	m2	Qty	m2	
1BR-SP-B	1 Bed Room – CCU	Yes	11	20	5	20	Assume one room is fitted out to support a bariatric patient.
1BR-ST-A1 1BR-ST-A2 1BR-ST-A3 1BR-ST-B1 1BR-ST-B2 1BR-ST-B3 1BR-ST-D	1 Bed Room – Inboard Ensuite	Yes			6	16.5	If using an 8,400mm structural grid refer to 1BR-ST-A2, 1BR-ST-A3 (both with inboard ensuite), 1BR-ST-B2 or 1BR-ST-B3 (both with outboard ensuite) or 1BR-ST-D (back to back ensuite). For 1 Bed Rooms on a 7,800mm structural grid, refer to 1BR-ST-A1 or 1BR-ST-B1.
2BR-ST-A1 2BR-ST-A2 2BR-ST-B	2 Bed Room – Inboard Ensuite	Yes		29	8	29	Scenario 1: Local operational services may choose to use a mix of one and two-bed rooms so numbers have not been indicated. Scenario 2: an indicative mix of bed types has been specified. Assumed that in 28 bed option, all 6 CCU dedicated beds would be single. If using an 8,400mm structural grid refer to 2BR-ST-A2 (inboard ensuite) or 2BR-ST-B (outboard ensuite). For 2 Bed Rooms on a 7,800mm structural grid, refer to 2BR-ST-A1.
1BR-IS-N1 1BR-IS-N2	1 Bed Room - Isolation - Negative Pressure	Yes	1	20	1	20	Project to determine quantity of class N beds. All single bed rooms can accommodate patients requiring standard contact isolation, but in standalone CCUs at least one negative pressure single bedroom with anteroom should be provided for isolation purposes. If using an 8,400mm structural grid refer to 1BR-IS-N2. For a 7,800m structural grid, refer to 1BR-IS-N1.
ANRM	Anteroom	Yes	1	6	1	6	Provided as part of class N rooms.
ENS-ST-A1 ENS-ST-A2 ENS-ST-A3 ENS-ST-B ENS-ST-C	Ensuite – Inboard (A), Outboard (B), Back to Back (C)	Yes	10	5	18	5	Mix of ensuites will be dependent on operational policy and local requirements.
ENS-BA	Ensuite – Bariatric	Yes	1	7	1	7	One ensuite sized for bariatric use. Mix of ensuites will be dependent on operational policy and local requirements.
ENS-ACC	Ensuite - Accessible	Yes	1	7	1	7	Designed to AS1428. Caters for independent wheelchair patients and replaces standard ensuite.
	Discounted Circulation		38%		38%		

CLINICAL SUPPORT AREAS

A Procedure Room is optional and can be considered where two bed rooms are used to provide accommodation for CCU patients, otherwise treatment and procedures are assumed to occur in bed room, sized at 20m².

In units where renal dialysis is provided, a room for the cleaning of equipment and servicing of dialysis machines may be required. All machines require connection to power and plumbing.

AusHFG Room Code	Room / Space	SC / SC-D	Scenario 1 Dedicated 12 Bed CCU		Scenario 2 6 Bed CCU embedded as part of a 28 Bed IPU		Remarks
			Qty	m ²	Qty	m ²	
SSTN-14	Staff Station	Yes	1	16	1	20	Adequate space required to accommodate eMR downtime computers, central station monitoring and USB printing devices.
	Staff Station - Decentralised		1	5	2	5	In 12 bed scenario, no. is dependent on layout so beds are easily observable. In 28 bed scenario two decentralised staff bases are recommended.
OFF-CLN	Office – Clinical Workroom	Yes	1	12	1	15	
BMFD-3	Bay - Multifunction Device	Yes	1	3	1	3	
PROC	Procedure Room	Yes	1	20 (o)	1	20 (o)	Optional. Procedure Room can be considered where two-bed rooms are used to provide accommodation for CCU patients. Otherwise, treatment and procedures are assumed to occur in bed room, sized at 20m ² .
CLN-10	Clean Store	Yes	1	10	1	10	For storage of unpacked sterile consumables. May be provided as a combined Clean Store / Medication Room depending on local jurisdictional policies.
MED-14	Medication Room	Yes	1	12	1	14	May be provided as a combined Clean Store / Medication Room depending on local jurisdictional policies.
DTUR-12	Dirty Utility	Yes	1	12	1	14	SC for 28 bed unit is DTUR-14
BBEV-OP	Bay – Beverage, Open Plan	Yes	1	4	1	4	
BMT-4	Bay - Meal Trolley	Yes	1	4 (o)	1	4 (o)	Optional. Provision will depend on food services model. Space dependent on size and capacity of meal trolleys.
BHWS-B	Bay – Handwashing, Type B	Yes	2	1	4	1	Located in corridor. Quantity of handbasins will be dependent on design. Ensure ready access to hand hygiene facilities throughout the unit.
BPATH	Bay - Pathology Point of Care Testing	Yes	1	3	1	3	
BLIN	Bay – Linen	Yes	1	2	2	2	
BMEQ	Bay - Mobile Equipment	Yes	2	4	3	4	A range of equipment such as ECG machine etc. May also be used to store WOW where used.
BPTS	Bay – Pneumatic Tube Station	Yes	1	1	1	1	Selected services may be able to justify some point of care testing. In case of 12 bed unit, this facility may be able to be shared with an adjacent unit.
BRES	Bay - Resuscitation Trolley	Yes	1	1.5	1	1.5	
CLRM-5	Cleaners Room	Yes	1	5	1	5	In case of 12 bed unit, this facility may be able to be shared with an adjacent unit.
DISP-10	Disposal Room	Yes	1	10	1	10	In scenario 1 Disposal Room may be shared with adjacent unit. Size will be dependent on local waste management policies.
INTV	Interview Room	Yes	1	12	1	12	Clinical consultation with patients and family, e.g. discharge planning, allied health, social work consultation.
STEQ-14	Store – Equipment	Yes	1	14	1	20	A range of clinical equipment, some will need recharging. SC for 28 bed unit is STEQ-20.
STGN	Store – General	Yes	1	9	1	9	
WCAC	Toilet – Accessible, 6m ²	Yes		6		6	To be provided in one location per floor in line with DDA requirements. Note staff also require access to an accessible toilet. Seek opportunities to share with adjacent unit or as part of visitor amenities each floor.
LNPT-10	Lounge – Patient/Family	Yes	1	12	1	20	Also used to provide waiting space for visitors.
	Discounted Circulation		38%		38%		

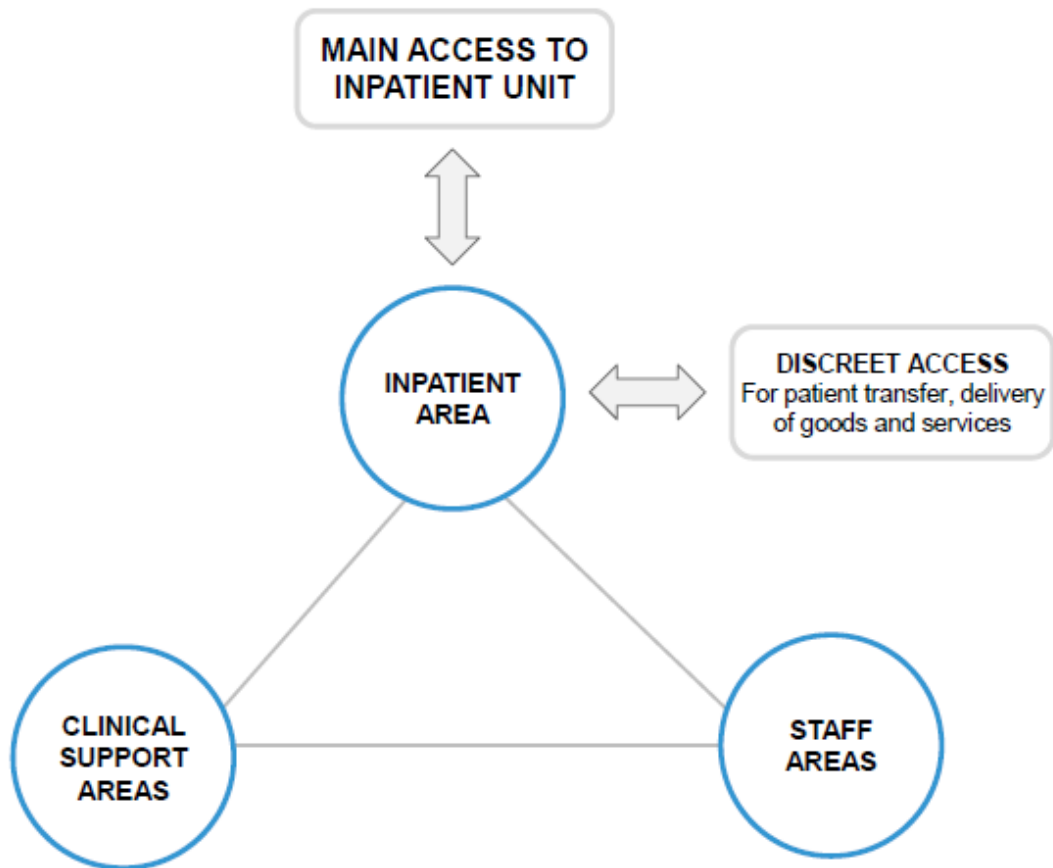
STAFF AREAS AND AMENITIES

Workspace listed below is indicative only and will be influenced by jurisdictional policies. A fully developed workforce profile will be needed to inform the development of workspace. It is likely that the majority of cardiology medical and research staff will be accommodated in a clinical department rather than the CCU. Local arrangements may also vary (e.g., provision of cardiac rehabilitation).

It is assumed that staff may access showers in a central amenity or that they may be shared between several departments.

AushFG Room Code	Room / Space	SC / SC-D	Scenario 1 Dedicated 12 Bed CCU		Scenario 2 6 Bed CCU embedded as part of a 28 Bed IPU		Remarks
			Qty	m2	Qty	m2	
OFF-1P-9	Office - 1 Person	Yes		9		9	Quantity and area allocation will be dependent on staff profile and local jurisdictional policies relating to staff work areas.
OFF-2P	Office – 2 Person	Yes		12		12	Quantity and area allocation will be dependent on staff profile and local jurisdictional policies relating to staff work areas.
OFF-WS	Office, Workstation	Yes		4.5		4.5	Quantity and area allocation will be dependent on staff profile and local jurisdictional policies relating to staff work areas.
MEET-15	Meeting Room	Yes	1	15	1	20	This should be located to serve both patient and staff functions e.g. patient education, family conferences or staff training.
BPROP	Bay - Property, Staff	Yes	1	2	1	3	Quantity and area allocation will depend on staff profile and local jurisdictional policies.
SRM-15	Staff Room	Yes	1	15	1	18	Quantity and area allocation will depend on staff profile and local jurisdictional policies.
WCST	Toilet – Staff	Yes	1	3	2	3	Quantity and area allocation will depend on staff profile and local jurisdictional policies.
	Discounted Circulation		25%		25%		

5.2 Functional Relationships - Diagram



5.4 References

- AHIA, 2017, AusHFG Isolation Rooms - Engineering and Design Requirements, Australasian Health Facility Guidelines, Australasian Health Infrastructure Alliance (AHIA), Sydney, NSW
- AHIA, 2016, AusHFG Part A: Introduction and Instructions for Use, Australasian Health Facility Guidelines, Australasian Health Infrastructure Alliance (AHIA), Sydney, NSW
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- AHIA, 2018, AusHFG Part C: Design for Access, Mobility, Safety and Security, Australasian Health Facility Guidelines, Australasian Health Infrastructure Alliance (AHIA), Sydney, NSW
- AHIA, 2016, AusHFG Part D: Infection Prevention and Control, Australasian Health Facility Guidelines, Australasian Health Infrastructure Alliance (AHIA), Sydney, NSW
- AHIA, 2020, HPU 170: Cardiac Investigation Unit, Australasian Health Facility Guidelines, Australasian Health Infrastructure Alliance (AHIA), Sydney, NSW
- AHIA, 2018, HPU 520: Operating Unit, Australasian Health Facility Guidelines, Australasian Health Infrastructure Alliance (AHIA), Sydney, NSW
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- AHIA, 2019, HPU 360: Intensive Care Unit, Australasian Health Facility Guidelines, Australasian Health Infrastructure Alliance (AHIA), Sydney, NSW
- AHIA, 2021, HPU 620 Renal Dialysis Unit, Australasian Health Facility Guidelines, Australasian Health Infrastructure Alliance (AHIA), Sydney, NSW
- NHMRC, 2019, Australian Guidelines for the Prevention and Control of Infection in Healthcare
- NSW Health, 2009, TS7 - Floor Coverings in Healthcare Buildings, Issue V1.1
- National Construction Code Australia
- New Zealand Standards, 2001, NZS 4121: 2001 Design for access and mobility: Buildings and Associated Facilities
- Standards Australia, 2021, AS/NZS 1428 Design for Access and Mobility (Set) Sydney, Australia
- Standards Australia, 2018, AS/NZS 3003:2018 Electrical Installations - Patient Areas
- NSW Agency for Clinical Innovation (2018) Water for Dialysis – A Guide for In-Centre, Satellite and Home Haemodialysis in NSW.

5.5 Further Reading

- American Heart Association Inc. Scientific Statement, 2012;1408-1248 – Evolution of Critical Care Cardiology: Transformation of the Cardiovascular Intensive Care Unit and the Emerging Need for New Medical Staffing and Training Models
- British Cardiovascular Society, 2011 – From Coronary Care Unit to Acute Cardiac Care Unit – The Evolving Role of Specialist Cardiac Care
- Canadian Journal of Cardiology 32, 2016 1197-1199 – Coronary Care Unit to Cardiac Intensive Care Unit: Acute Medical Cardiac Care – Adapting With the Times, Michael E. Bourke MD, FRCPC

- NSW Agency for Clinical Innovation Cardia Network, April 2022, Clinical Practice Guide - Cardiac monitoring of adult cardiac patients in NSW public hospitals