8.2.   Specific design requirements

The SS unit should be capable of continued operation during and after a natural disaster, except in instances where the facility sustains primary impact. Special design consideration is needed to protect essential services such as emergency power generation, heating and/or cooling systems, water supply etc.

A telephone or intercom system is required in the dirty, clean and sterile workrooms to allow communications without breaching of the 'Clean Barrier' Regime.

Floor finishes should be easy to clean and safety flooring in wet areas such as the trolley wash area and soiled instrument decontamination area.

Wall finishes shall be easy to clean with wall bumpers in all work areas to reduce damage from trolleys.

Ceiling lighting, fittings and electrical wall fittings are to be flush mounted and sealed to prevent dust settling and insects from entering.

All workstations to have a computer monitor and keyboard attached back to back for barcode labelling and printing functioning

Accommodation is required for the parking of transport trolleys used for the delivery of ward imprest supplies

Room temperature to be maintained in the range 18 degrees to 22 degrees

Allow for AGV's.

8.2.1   Entrance areas – general

Access for staff and visitors, the delivery of supplies, the return of contaminated goods and collection of waste. All entrances must be secure and controlled to prevent unauthorised access. A means of communication for the entrance points to staff occupied areas should be considered. Staff and goods entrances should be segregated.

8.2.2   Entry/Reception/Administration

The design must facilitate direct access to the manager's office without having to cross internal areas of the CSSD and with access to external area for clients.

8.2.3   Contaminated Returns Holding Area

The contaminated returns lobby provides secure, controlled access from outside the unit to the contaminated (including loan sets) returns area only. A buzzer/light system is required to alert staff within the unit to the arrival of goods. This area is the reception point for soiled instruments from Perioperative Suites. Allowance for the storage of up to 15 soiled trolleys is required.

An area where loan equipment is received from outside couriers is required. The area must have double door access to the outside of the unit for receipt of the sets.

All re-processable items returned to the unit should be treated as potentially contaminated and be subjected to standard precautions. It is a receiving area for contaminated return of containers and trolleys and is an area where the staff from the cleaning room collect goods. The room provides a space to hold, unload, sort and prepare contaminated RMD that are received from Perioperative Services, Ambulatory and Ward Areas or external customers via:

- CH loading dock[2]
- a dedicated dirty lift from Perioperative Services[3]
- ambulatory or ward areas.

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[2] Requires confirmation once location of this unit determined. May be opportunity for this unit to have a designated clean/dirty dock

[3] Requires confirmation once location of this unit determined

The area should be sufficiently sized to accommodate all locally generated clinical waste and any waste products from the contaminated waste returns holding area and soiled/cleaning/disinfecting room.

The use of Loan RMD requires careful coordination between medical equipment and transport companies. Dedicated space needs to be provided to receive, manage and dispatch these RMD. Delivery transport containers may be numerous, bulky and heavy. The process is labour intensive as the contents must be:

- unpacked
- checked against the suppliers inventory for contents and damage
- photographed
- reprocessed
- delivered to customer.

On return, the RMD must be again checked. This return checking and delivery process requires an appropriate area with space to:

- stack transport containers on wheels
- benches for checking RMD
- workstation with computer for the instrument database.

After checking and re-packing process the RMD are returned to the medical equipment company via the CH loading dock[4].

8.2.4   Soiled/Cleaning/Disinfection Area

Cleaning should completely remove all soil. The function of cleaning and drying processes is to consistently produce clean, dry and disinfected equipment. It is recommended that this process should be fully automated, controlled and validated. Washer-disinfectors should be of a pass-through design, and located in such a way as to facilitate the installation of additional machines should workloads increase. The main tasks of this area are:

- disassembly and preparation of reusable medical devices and associated equipment before cleaning, disinfecting and drying
- sorting and loading of medical devices into washer-disinfectors and other cleaning equipment such as ultrasonic cleaners
- checking contaminated returns
- selective manual cleaning of RMD and accessories deemed unsuitable for automated cleaning, e.g. at open sinks
- transfer of processed items to the packing area
- facilitation of validation and routine testing of washer-disinfector and
- facilitation of maintenance of quality assurance/tracking records.

An area designated for special cleaning of delicates and will contain:

- 1 x specials ultrasonic tanks with rinse tank
- 2 x sinks for handwashing delicate items such as eye instruments and drills
- 2 x small sorting tables to allow instruments to be sorted and counted

There will be a pass through hatch to allow for the by-passing of the washer-disinfectors for RMD where appropriate. Otherwise, RMD will pass through the washer-disinfector to the packing area.

Key requirements:

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[4] Requires confirmation once location of this unit determined. May be opportunity for this unit to have a designated clean/dirty dock

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- Washer-disinfectors should be located in such a way as to facilitate the installation of additional machines should workloads increase
- All items, including trays and containers should be cleaned and dried using a fully automated process
- facilities to manually clean RMD unsuitable for automated processing
- a high pressure cold water gun at a sink position to facilitate cleaning of instruments with lumens
- where lubrication and function testing of power tools using compressed medical-quality air is undertaken, local extract ventilation is required
- a separate pass-through hatch to transfer manually cleaned items which cannot be passed through a washer-disinfector for drying. Basket and instrument trays are returned to the cleaning area are returned from the packing area through a separate hatch. All hatches linking the cleaning room with the packing room should be airlocks with inner and outer interlocking doors. An intercom should be installed in both rooms adjacent to the hatches
- pass through (dirty to clean) trolley wash to provide effective cleaning of each collection trolley/container before its re-use as a delivery trolley. Area also needed to hold approx. 8 trolleys awaiting disinfection
- suitable access to enable the delivery and removal of equipment
- height adjustable workbenches, equipment, sorting benches and sink depths should be designed to minimise manual handling
- adequate clear space for servicing, maintenance and cleaning of equipment
- staff access to the area should be via the gowning room only
- radio-frequency identification (RFID) – front of washers, in/out sterilisers
- trolley parking for receipt of soiled instrumentation
- space for decontamination of trolleys
- access to the loan kit room area for the transportation of loan kit trolleys
- access to the storage area
- access to a dedicated cleaners room
- controlled access into the packing and preparation area
- handwashing facilities.

8.2.5   Inspection, assembly and packing area (clean workroom)

This area will receive goods from the cleaning and disinfecting room and materials from the materials transfer room. Cleaned and disinfected RMD will undergo inspection, function testing with assembly onto trays and procedure packs in preparation sterilisation. Trolleys do not pass in or out of this area. All wet processes including handwashing should take place outside this space to minimise contamination of devices during preparation or production.

Key requirements:

- The packing area is a controlled environment. It is mechanically ventilated with filtered air. The room is positive pressure. Alarms should be provided to alert staff to any failure in the ventilation system
- An area/room adjacent to this space should be designated for staff to change into PPE before they enter the room.
- Humidification may be required to avoid dehydration and subsequent processing problems associated with absorbent materials
- Washed and disinfected goods received from the cleaning room are inspected, assembled, packed and scanned ready for sterilisation. For sterile products it is essential the adventitious contamination be minimise by all practical means. Workflow should accommodate the following principle activities:
  - Inspecting, assembling, function testing, packing and labelling of discharged items from the cleaning room and manually cleaned items from the clean room transfer hatch

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- All workstations shall have overhead tooled air and overhead GPO's
- Discharging items to the steriliser loading area
- Returning wash containers and carriers to the cleaning room.
- Dedicated area for hollow ware and items intended for low temperature sterilisation.
- The room should be sufficiently sized and suitable arranged to accommodate enough workstations for the smooth running and flexibility of the workflow
- Adequate space must be planned for parking and manoeuvring the transfer trolleys for the pass through sterilisers. Space required for parking and manoeuvring the equipment.
- Suitable access must be provided to enable the delivery and removal of equipment and workstations
- Emergency eye wash station
- Handwashing facilities

8.2.6.   Sterilising and Cooling Area

Most reprocessed items will require sterilisation by steam, however there are some heat sensitive items which require low temperature hydrogen peroxide sterilising. 3-phase power is required to the Hydrogen Peroxide Sterilisers. The sterilisation area is where sterilisers are loaded, and set into operation and unloaded for cooling following sterilisation. The packed goods are moved to the packed product transfer area where the RMD then proceed to be placed onto a loading shuttle that moves along the front of the sterilisers and delivers the rack to the next available piece of equipment.

Enough space is required for the storage and movement of steriliser loading trolleys and racks. The room should enable terminally disinfected items, or those requiring a sterilisation process other than high pressure steam, to be identified and segregated to prevent improper processing.

In addition to a general unloading area a separate cooling area is required where the trays, packs and supplementary items can cool off prior to storage or release.

A PPE bay should be provided (heat resistant gloves)

Key requirements:

- An area painted in light/white colours to assist in the QA checking of items
- enough space for the number of trolleys/racks expected to be held at any one time until they have been cooled and inspected
- loading trolleys to minimize double handling
- RFID – in/out sterilisers
- fully automated pass through sterilisers with loading shuttle
- controlled access to the post sterilisation unloading/load cooling area
- ideally (if collocated with perioperative services) direct access from the cooling area into the Perioperative Suites sterile store via a dedicated sterile/clean corridor or dedicated clean lift for the transportation of sterile equipment
- direct access to a despatch area where sterile imprest of re-processed items for patient clinical areas can be collected
- Handwashing facilities

8.2.7.   Processed Product Store – Sterile RMD Storage Area

The processed product store is a room used for the short term storage of processed products released for distribution.

Key requirements:

- storage of RMD at agreed par levels with agreed customers

- shelving shall facilitate storage of products and ensure first in, first out stock rotation. Shelving shall have smooth surfaces to prevent damage to products and should be movable, flexible and easily cleaned
- shelving should be appropriately sized and spaced to allow good circulation of air and prevent damage to products. The ideal weight of an individual RMD is less than 5kg but no more than 7kg according to ACORN Standards and NSW Workcover guidelines "Design and Handling of Surgical Loan Instrument Transport Cases"
- space required between shelving to allow trolleys to be manoeuvred without difficulty
- storage of RMD off the floor, with the lowest shelf at least 300mm above floor level to facilitate cleaning and prevent infestation and 400mm from the ceiling to facilitate workplace safety
- storage areas must be temperature, humidity, air quality and light controlled
- Provide an isolated "Quarantined Area" for RMD used for suspected Creutzfeldt – Jakob Disease (CJD) with-in the Sterile RMD Store
- Storage space will be based on 20 Operating Theatres and 4 Interventional suites

8.2.8.   Despatch Area

The function of this area is to assemble batches of processed products for distribution, loading of transport containers and trolleys, parking decontaminated distribution trolleys and transport containers to be loaded with products for despatch and receipt of decontaminated trolleys and containers.

Key requirements:

- Space for the number of trolleys expected to be held at any one time and should allow for the trolleys to be manoeuvred without difficulty
- The area must be secure and controlled to prevent unauthorised access
- Sufficient space to incorporate the administrative function of despatch of products

8.2.9.   Non Sterile Store (deboxing area)

This store receives and stores raw materials and consumables used in the manufacturing process. The raw materials and consumables predominantly comprise paper, detergents, replacement unsterile RMD, implants, and hollowware.

Key requirements:

- The area should be large enough to receive deliveries of cartons and pallets
- Shelving should facilitate storage of goods, first in, first out stock rotation and good manual handling and ergonomic principles
- Shelving should allow for the storage of a variety of packaged incoming goods of differences shapes and sizes
- Shelving should have the lowest shelf at least 300mm above floor level to facilitate cleaning and prevent infestation and 400mm from the ceiling to facilitate workplace safety
- space required between shelving to allow trolleys to be manoeuvred without difficulty
- provision should be made for segregation of incompatible goods, and products with special handling/storage requirements

8.2.10.   Staff amenities

Offices and workstations

As per the ACT Health Office and Workstation Accommodation Guidelines

Staff Room

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A room used for the preparation and consumption of drinks and snacks, staff breaks. Eating and drinking should be restricted to this area only. It should have convenient access to the meeting/training room and ease of access from the entry and to the work areas.

Key requirements

- If staff breaks are staggered the size of the room and facilities provided should be designed to serve the needs of 60% of the maximum number of staff on duty at one time.
- A preparation rea, washing up facilities and handwashing basin with appropriate seating will be required – seating should accommodate varying size staff members
- Equipment and appliances should be supplied to enable staff to prepare light meals and drinks
- Telephone, voice communication, TV and hot desks with data will be required.

Staff Changing/WC/Shower

Full changing facilities should be provided for male and female staff to change from outdoor clothing to working dress, secure valuables, use the WC and shower (contaminated/chemical splashes) and for grooming and handwashing.

Key requirements:

- Should be located with external access and convenient and separate internal access to clean and dirty operational areas. There should be no cross flows for staff accessing clean and dirty areas of the unit.
- Separate facilities for male and female staff are required with individual lockers[5] for staff.
- Segregated shower are affording privacy
- WC, hand basins and wall mirrors – suitable to be used by a person living with a disability.

Education and training

All staff need regular training. A training room should be provided if such an area is not available nearby. It should be separate to the main work areas, providing a space where teaching materials and work samples will be secure.

8.3. Other support areas

The following components are required:

- dedicated reverse osmosis water filtration system
- dedicated automated remote chemical management system
- dedicated clean loading dock[6]
- contingency plan for steam generator
- waste disposal.

8.4. Endoscope Reprocessing Area

A dedicated area is required for the cleaning and disinfecting of endoscopes and accessories. The endoscopy reprocessing area may be located in a dedicated fully self-contained endoscopy unit or with in the SS unit collocated with the Perioperative Suites using shared facilities. If located within SS the process should be separate to instrument processing and follow a unidirectional dirty to clean pathway from cleaning to disinfection then storage.

The reprocessing area will have three distinct zones:

- a dirty zone where used scopes are cleaned

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[5] Number will be dictated by the number of staff employed

[6] Depends on final location

- a clean zone where automated flexible endoscope reprocessors (AFER) units are used to decontaminate scopes
- a storage zone with HEPA-filtered pass-through cupboards for the storage of cleaned scopes. The cupboard will pass through to the procedure areas where they will be used.

The ability to efficiently and safely process endoscopes is critical to the functioning of the Endoscopy Unit. Endoscope and instrument processing is a multi-step procedure involving decontaminating dirty scopes/ instruments, sterilising of scopes and packaging/ storing of clean scopes. Processing of the endoscopes commences as soon as the procedure is complete. Endoscopes, both flexible and non-flexible undergo a process of disinfection using chemical cleaning agents by manual washing or automated reprocessing machines. The process requires large sinks and tanks of disinfecting solution or automated machines. Instruments are leak tested, then manually pre-cleaned in an enzyme solution, followed by high level disinfection with an approved disinfectant in a fume cabinet or enclosed automated machine. Compressed filtered air is required for the drying process.

Key requirements:

- the dirty and clean zones require negative pressure and be ventilated to remove vapours of chemicals used in the process
- scope storage areas must be positively pressured and HEPA filtered to prevent contamination of clean endoscopes
- sinks for soaking and rinsing sufficiently sized to prevent tight coiling of the endoscope which may damage the fibre-optic cables in the instrument
- ultrasonic cleaner for accessory equipment used in procedures
- automated endoscope cleaning/ disinfecting machines
- compressed air to aid drying of endoscopic equipment after cleaning
- handwashing basin
- safety eyewash facility
- stainless steel benches with space to accommodate the length of the endoscopes
- storage for disinfected scopes on a bench or shelf.
- scopes may be stored in properly ventilated and temperature controlled cabinets which allow for endoscopes to hang without coiling preventing damage to either end of the scope. Specific design requirements.

8.5. General

- circulation pathways to and from the Peri-operative Suites must be direct
- there must be separate entry and exit points for the movement of clean and dirty items
- the education/meeting room must be located on the periphery of the unit to enable access by company representatives and others without having to cross internal areas of the SS unit
- access must be provided for the maintenance and servicing of sterilisers and other major equipment such as the reverse osmosis water treatment plant room
- packing tables require power and data for use with computers, printers and instrument scanners
- air conditioning systems and controls must be configured to maintain appropriate environmental conditions
- natural light is highly desirable particularly in the packing area. Natural and artificial lighting must take into account the bench layout and occupational health and safety requirements for staff
- supply staff will require access to manage bulk supply of chemicals (with the ability to manage pallets).

8.6. Technology

8.6.1 CSSD ICT Tracking System

The CSSD ICT Tracking System is required to

- trace, track and recall RMD through all the processes involved in sterilisation
- improve safety and productivity
- provide inventory control
- increase efficiency and plan for demand
- be smart, flexible technology
- be compatible with other ICT systems within Perioperative Services and Canberra Hospital.

8.6.2 Radio Frequency Identification

Radio Frequency Identification (RFI) is a technology that is available for RMD and implants. This technology is required as it enables the detection and tracking of items (including RMD) from a distance, even when not visible.

8.6.3 Other Technology

- Wi-Fi and data outlet access to network is required for computers to facilitate equipment traceability and staff training
- antenna connection for the free to air access for the tea room TV
- ceiling data outlets to packaging tables
- all washer-disinfectors and sterilisers equipment will be data logged and networked
- telephone and data outlets to workstations.

8.7. Engineering Requirements

- adequate supply of power, boiler capacity, RO plant (2 reverse osmosis water systems), and steam generation
- both steam and electric generation to allow flexibility and redundancy (both ideal); two steam generators would be required should steam to stream sterilisers be used - currently electric sterilisers that generate their own steam are in use
- fully automated chemical dosing systems to all washer disinfectors and sinks
- compressed air and tool air will be required in the reprocessing areas
- cooling chamber for waste water to meet trade waste standard AS 3500
- the department will require HEPA filtration as per the relevant standards
- two ring main loop systems will be required
- height adjustable sinks will be required gross decontamination of instruments and gross decontamination of scopes.

9. Functional relationships

The following functional relationship will be required within SS unit.

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9.1.   Internal relationships

Figure 1:Sterilising Services Department internal functional relationships

9.1.1.   Immediate

- soiled/cleaning/disinfection are to contaminated returns area
- soiled/cleaning/disinfection area to general waste/disposal/laundry return room
- soiled/cleaning/disinfection area to loan store
- soiled/cleaning/disinfection area to trolley wash
- soiled/cleaning/disinfection area to cleaners room
- soiled/cleaning/disinfection area to gowning room
- soiled/cleaning/disinfection area to inspecting/packaging area
- packaging area to sterilisation area/unload area
- packaging area to non-sterile store (materials transfer)
- packaging area to gowning room
- packing area to cleaners room
- sterilisation area to cooling area
- sterilisation area to sterile RMD store
- sterile RMD store to processed products despatch
- hot desk to Tea Room

9.1.2.   Direct

- reception to managers office
- reception to Administration Area
- meeting room to Administration Area
- soiled/cleaning/disinfection area to soiled lift[7]
- processed products despatch to clean lift[8]

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[7] If lift required for vertical transportation

[8] If lift required for vertical transportation

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9.2. External relationships

The SS unit should be located in close proximity (horizontal or vertical adjacency) to the Interventional Suites and accessed via restricted circulation. Should the CSSD not be located on the same level as the Interventional Suites in SPIRE then a dedicated vertical transport system will be required for the movement of RMD with separation of clean and dirty flows to be maintained.

Key external functional relationships are prioritised in the following table as per the criteria in Table 3.

Table 2: External functional relationships for Sterilising Services Department

Service/Unit	Priority	Comments
New Peri-operative Suite	Immediate	Movement of equipment and staff
Interventional Suite	Immediate	Movement of equipment and staff
Day Surgery Unit	Ready	Movement of equipment and staff
Cardiac Interventional Unit	Ready	Movement of equipment and staff
Medical Imaging	Ready	Movement of equipment and staff
Emergency	Ready	Movement of equipment and staff
Administration Centre	Easy	Movement of staff
General (Hotel) Services	Easy	Movement of staff, supplies, linen & waste
Outpatient Clinics	Easy	Movement of equipment
Inpatient Units (ICU)	Easy	Movement of equipment
Site Interfaces		
Loading Dock	Ready	Movement of staff and goods
Car parking – Staff	Easy	Movement of staff; swipe card access control (particularly on call staff)
Public Transport	Easy	Movement of staff

Table 3: Priority of external functional relationships

Immediate (<1 minute)	Being the shortest direct, horizontal route. The route must be an unimpeded route. Door to door travel time between the two areas or services identified as having an "Immediate" functional relationship must not exceed one minute.
Direct (<2 minutes)	Being a direct horizontal or vertical route. The route must be an unimpeded route. Door t door travel time between the two areas or services identified as having a "Direct" functional relationship must not exceed two minutes and there must be minimal corner turns between the two areas or services.
Ready (<5 minutes)	Being a horizontal or vertical route. Door to door travel time between the two areas or services identified as having a "Ready" functional relationship must not exceed five minutes.
Easy (<10 minutes)	Being a horizontal or vertical route. Door to door travel time between the two areas or services identified as having an "Easy" functional relationship must not exceed ten minutes.

10.   Future service developments and innovation

- requirement to increase volume and turnaround times for many day/minimally invasive procedures, combined with a necessity to meet more stringent infection control standards will impact on facility design, equipment set-up and instrumentation inventory levels.
- new and changing technologies and instrumentation will impact on the reprocessing facilities and equipment required to process intricate and often difficult to re-process instrumentation.
- the implementation of RFID systems for tracking instruments and implants
- potential to implement the use of rigid containers
- RMD Laser Marking for individual RMD tracking where possible
- tunnel reader
- Introduction of AGV's.

11. Schedule of Accommodation

AusHFG Code	Deviation from HPU Y/N	Room / Space	Quantity	Room Area	Total Area	AHFG's Standard Component Size m2	Deviation from Standard Component m2
STERLISILNG SERVICES							
	Y	Reception	1	15	15	8	7
	Y	Waiting	1	5	5	0	5
	Y	WC - visitors	1	3	3	0	3
OFF-S9	N	Office - Single Person	1	9	9	9	0
OFF-S12	N	Office - 2 Person, Shared	1	12	12	12	0
		Subtotal			44		15
		Discounted Circulation		20%	9	0	3
		Total			53		18
NON CLINICAL SUPPORT							
		Non Sterile Store	1	170	170	100	70
		Cleaners room	1	8	8	8	0
		General Waste Disposal/Laundry Returns	1	15	15	15	0
		Female change	1	50	50	34	16
		Male change	1	20	20	20	0
		Subtotal			263		86
		Discounted Circulation		20%	53		17
		Total			316		103
RECEIVING CLEANING							
		Receiving/cleaning/disinfecting	1	195	195	195	0
		Trolley Wash	1	15	15	15	0
		Cleaners Room	1	8	8	8	0
		Test equipment/data room	1	10	10	0	10
		Gowning room	1	6	6	6	0
		Chemical store	1	20	20	0	20
		Subtotal			254		30
		Discounted Circulation		20%	51		6
		Total			305		36
PACKING/ STERLISATION							
		Packing / Clean Workroom/Steriliser Loading area	1	185	185	166	19
		Gowning Room	1	6	6		6
		Cleaners Room	1	8	8		8
		Unloading Steriliser/ Cooling Zone	1	133	133	60	73
		Sterile Stock Store – processed product	1	160	160	40	120
		Subtotal			496		226
		Discounted Circulation		20%	99		45
		Total			595		271
OTHER							
		Store – loan consignment	1	80	80	50	30
		Despatch - to internal/external customers	1	15	15	15	0
		After hours cupboard	1	5	5	0	5
		Staff Room	1	22.5	22.5	22.5	0
		Meeting/training Room	1	23	23	23	0
		Subtotal			145		35
		Discounted Circulation		20%	29	0	7
		Total			168		42
Endoscopy Reprocessing Unit							
Receiving / Decontamination							
		Endoscope receiving	1	15	15	0	15
		Cleaning/decontamination	1	50	50	10	40
		Scope Reprocessing	1	50	50	12	38
		Endoscope Store	1	20	20	4	16

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				1	5	5		5
			Despatch	1	5	5		5
			Subtotal			140		114
			Discounted Circulation		20%	28	0	0
			Total for endoscope reprocessing[1]			168		114
						Total Area		Deviation from Standard Component m2
			Total Room Area			1342		506
			Total Discounted Circulation	Ave	20%	269		79
			Total Department / Unit Area			1611		585

12. Abbreviations

Abbreviation	Description
AFER	Automated Flexible Endoscope Re-processor
AGV	Automated Guided Vehicle
AusHFG	Australasian Health Facility Guidelines
CH	Canberra Hospital
CCTV	Closed Circuit Television
CHS	Canberra Health Services
CRU	Central Reprocessing Unit
HPU	Health Planning Unit
ICT	Information Communication Technology
ICU	Intensive Care Unit
PPE	Personal Protective Equipment
PRSU	Pre rinse sterilising unit
RFID	Radio-frequency Identification
RMD	Reusable Medical Devices
RO	Reverse Osmosis
SPIRE	Surgical Procedures, Interventional Radiology and Emergency
SS	Sterilising Service

13. HPU Brief development participants

The following personnel were consulted in the preparation of this HPU.

Position	Name
Senior Health Facility Planner	Sally-anne Kinghorne

ACT Government | **ACT Health**

ACT HEALTH

DATE: OCTOBER 2018

ACT Government | **ACT Health**

HEALTH PLANNING UNIT BRIEF

ACUTE CARDIAC CARE UNIT & INTERVENTIONAL CARDIAC LABORATORIES

ACT HEALTH

DATE: OCTOBER 2018

Approvals

Name	Position	Signature	Date
	Executive Director, Division of Medicine		
	Deputy Director General, Canberra Hospital and Health Services		
	For Information - Executive Sponsor, Chief of Clinical Operations, ACT Health		

Outstanding issues

Subject	Issue
Holding Bays	Currently no holding bays scoped for inpatients who are attending the ACCU for cardiac echo

Document version history

Rev No	Issue Date	Issued By	Issued To	Reason for Issue
Draft v0.1	11/4/2018	Capital Insight	ACT Health	Preliminary Draft
Draft v0.2	19/4/2018	ACT Health	User Group	Comments added
Draft v0.3	23/4/2018	User Group	Capital Insight	User group feedback v0.2
Draft v0.4	23/4/2018	ACT Health	User group	Updated for user group feedback
Draft v0.5	30/4/2018	Capital Insight	ACT Health	Updated for User Group feedback and consultation
Draft v0.6	1/5/18	Capital Insight	ACT Health	Final Draft
Draft v0.7	8/10/2018	HSPU	BHSP	For Proof of Concept

Table of Contents

1. Introduction

In September 2016, ACT Government announced the construction of a Surgical Procedures, Interventional Radiology and Emergency (SPIRE) Centre to be built at Canberra Hospital (CH). This infrastructure project is part of the ACT Government's 10-Year Health Plan and is in response to the increasing demand on ACT hospitals and health services across the territory.

The ACT Government 2017 Budget provided funding for the first stages of the SPIRE project which includes planning and the commencement of design. A Health Planning Unit (HPU) Brief is a planning document that defines the activities and functions to be undertaken within a unit/ service. This HPU Brief has been developed as part of the SPIRE planning component and articulates the operational requirements, functionalities and relationships for which the prospective design consultant can develop a suitable design response.

ACT Health engaged Capital Insight Pty Ltd to undertake the HPU development in collaboration with staff from Health Services Redesign and Building Health Service's Program. Development of this document occurred between April and May 2018 with internal ACT Health stakeholders who have been identified within this document. Outstanding issues that require resolution over the next design phases are noted at the beginning of this document.

2. Description of the service

The Department of Cardiology at the CH is the tertiary diagnostic and therapeutic centre for acute and chronic cardiac diseases. Cardiology is a specialist service designed to care for and facilitate consultation for inpatients and outpatients with suspected or proven cardiovascular diseases, and to provide advice on the management of cardiovascular diseases. CH provides level 6 role delineation Cardiology services to adult patients. It is the tertiary level referral service for the ACT and surrounding Southern NSW and provides lower complexity cardiac services to the residents of southern Canberra.

Cardiology services at the CH encompasses

- Acute Cardiac Care Unit (ACCU)
- Interventional Cardiology Laboratories (ICL)
- Cardiac Diagnostic and Imaging Services
- Ambulatory Cardiology Care

The Cardiac Diagnostic and Imaging Services and Ambulatory Cardiology Care are outside of the scope of this document.

This document outlines the functional requirements for the following the Cardiology Services at CH:
- ACCU
- Interventional Cardiac Laboratories.

2.1. Acute Cardiac Care Unit (ACCU)

The ACCU is a discrete unit including step-down and telemetry beds for monitoring of patients with acute coronary syndrome, heart failure or life threatening arrhythmias. It provides a full range of invasive and non-invasive monitoring for cardiac patients, with access to the full range of cardiac investigations and 24 hour on call echocardiography, angiography, angioplasty and permanent pacemaker services.

Facilities include:
- Multi day beds including acute beds and an ST-Elevation Myocardial Infarction (STEMI) bed

- Sub-acute beds
- Chest Pain Evaluation Unit (CPEU)
- ACCU Procedure rooms
- Clinical Support area, including central analysis station for electrocardiography transmission

2.1.1   Multi day beds

Provides acute inpatient cardiology beds and an ST-Elevation Myocardial Infarction (STEMI) bed. These beds are cardiac protected and require specialised cardiac monitoring, networked to a central monitoring station.

2.1.2   Sub-acute beds

These beds provide an intermediary space between Acute Cardiology and ward beds. They are cardiac protected and have telemetry monitoring.

2.1.3   Chest Pain Evaluation Unit

This unit is a dedicated area within the ACCU used for the evaluation of chest pain, and to initiate treatment under protocol. It will require access to the ACCU procedure room for exercise stress testing (treadmill exercise testing) 18 hours per day. They are cardiac protected and have telemetry monitoring.

2.1.4   ACCU Procedure Room

The procedure rooms provide internal access for the ACCU to dedicated non sterile procedure space i.e. cardiac ultrasound, stress testing, and advanced cardiac monitoring.

2.1.5   ACCU Clinical Support Area

Location of staff station to support the staff functions within the clinical environment, including central monitoring and Central Analysis Station.

2.2   Interventional Cardiology Laboratories (ICL)

The Interventional Cardiology Laboratories consisting of the Cardiac catheterisation Laboratories, Electrophysiology Laboratory, Procedure rooms and Day unit are specialised diagnostic and interventional therapeutic services within cardiac services at the CH. The ICL is staffed by experienced interventional cardiology teams.
Interventional activities are supported by the ACCU.

2.2.1   Cardiac Catheterisation Laboratories (CCL)

The CCL will undertake both emergency and elective diagnostic and interventional cardiac catheterisation procedures in dedicated cardiac catheterisation laboratories.
The CCL require dedicated control rooms to support the functionality.

2.2.2   Electrophysiology Lab (EP Lab)

The EPLab activity includes diagnostic, mapping, ablation, myocardial biopsy and implantable cardiac device. Some EPS are done as day procedures, although patients that receive ablation may require admission.
The EP lab requires a dedicated control room and computer equipment room to support the functionality and ensure compliance with design requirements. There will be a shared anaesthetic room between the EP lab and the hybrid laboratory.

2.2.3   ICL Procedure Room

The procedure room will provide a dedicated clinical sterile space for transoesophageal echocardiograms and sterile procedures.

2.2.4. Interventional Cardiology Day Unit

The ICL day unit will support the ICL through the provision of a waiting, admission, holding, and recovery area, staffed by specifically trained nursing staff.

2.2.5. Hybrid Cardiac Catheterisation Laboratory (shelled)

The Hybrid Cardiac Catheterisation Laboratory is a soft shelled space, which has capacity to support future development in interventional technology and practice. The exact use will be determined by future demand.

The Hybrid Cardiac Catheterisation Laboratory requires a dedicated control room and computer room. There will be a shared anaesthetic room between the EP lab and the hybrid laboratory.

2.2.6. ICL Clinical Support

Location of staff station to support the staff functions within the clinical environment.

3. Scope of service

The key components of the ACCU and ICL are summarised in the following table.

Table 1: Functional Planning Units for Acute Cardiac Care Unit and Interventional Cardiology Laboratories

HPU	Room type (FPU)	Current 2018/19	Projection 2026/27
Acute Cardiac Care Unit (3 pods of 8 beds)	Acute beds & ST-Elevation myocardial Infarction bed	11	16
	Sub-Acute beds	4	4
	Chest Pain Evaluation Unit	4	4
	ACCU Procedure Rooms	1	3
	ACCU Clinical Support, including central analysis station	1	1
Interventional Cardiology Laboratories (ICL)	Cardiac Catheterisation Labs	2	2
	Electrophysiology Lab	Incl. in above	1
	ICL Procedure Room	0	1
	Interventional Cardiology Day Unit	6	14*
	Hybrid Cardiac Catheterisation Laboratory (Shelled)	0	1
	ICL Clinical Support area	1	1

*The determination of Cardiology Day Unit beds is based on the AIMS Projection formula, and supported by ACT Health ACTPAS report and Hardes modelling.

AusHFG recommend 6 recovery beds per interventional laboratory. However this does not account for patients going directly from the interventional laboratory to inpatients wards.

4. Model of care summary

The vision for Cardiology services is to provide improved care and outcomes for patients with, or at risk of, cardiovascular disease. This means person-centred care from early diagnosis to end of life care, with improved access for vulnerable groups and a seamless patient journey. [5]

The Model of Care (MoC) incorporates concepts of a 'Healing Environment' including appropriate décor to create a relaxed ambiance for patients, acoustic attenuation in consulting and testing rooms to ensure adequate privacy for patients and single rooms to increase privacy.

Health care at CH is delivered in a way that is:
- person-centred – providing care that is respectful, responsive and focused on the patient's needs
- safe – avoiding harm to patients from care that is intended to help them
- effective – providing services based on scientific knowledge and which produce a clear benefit
- timely – reducing waits and sometimes harmful delays
- efficient – avoiding waste and reducing cost
- equitable – providing care that does not vary in quality because of a person's characteristics.

The MoC for cardiology services is an integrated service including acute cardiology inpatient beds, inpatient and ambulatory procedural services, and ambulatory chest pain evaluation.

Patients attending for planned procedures will be directly admitted directly to the ICL, where they will be immediately directed to the Day Unit in the ICL. The Day Unit will be an extended day stay unit (07:30 – 22:00 hours Monday to Friday).

Patients requiring inpatient management will be transferred to the ACCU or other appropriate IPU following their procedure. Day-only cases will be managed in the ICL Day Unit prior to discharge.

5. Workforce

The workforce for the ACCU and ICL will be a multidisciplinary team consisting of Cardiology specialists, registrars and residents, cardiac nurses, allied health including Cardiac sonographers, cardiac scientist's s, administration and operational personnel. Projected staff profiles have been developed to inform this stage of planning and will be subject to adjustment both in numbers and classification as better clarity is gained around MoC/service delivery models. Below is a staffing profile table outlining workforce for ACCU and ICL which is required to develop the schedule of accommodation only (e.g. offices, staff stations and receptions). Staff profiles are subject to review by Workforce Policy and Planning.

Table 2: ACCU and ICL workforce profile

Position Levels	FTE		Headcount	
	Current	Additional	Current	Additional
Cardiologists / Fellows (includes 1.2 Cardiac Electrophysiologist)	7		10	
Electrophysiologist	1.2	0.2	2	1
Registrars				
Residents				
ADON (shared with Division of Medicine	1	0	1	0
Nurse Manager (Shared with Division of Medicine)	1	0	1	0
Clinical Nurse Consultant	2	0	2	0
Clinical Nurse Educator	1	0	1	0
Registered Nurses			TBA	
Senior Cardiac Technologist (HP5)	1		TBA	
Cardiac Technologists (HP3)	2		TBA	
Cardiac Technologist (HP2)	4		TBA	
Cardiac Sonographer (HP4)	3	1	TBA	
Technical Officer (Shared with Cardiology OPD)	1		TBA	

6. Policies impacting on the built environment

ACCU and ICL will operate in accordance with Australian Council on Health Care Standards, ACORN guidelines, WorkCover Design and Handling of Surgical Instrument Transport Cases 2011, Australian Standard AS4187, 2014, Reprocessing of reusable medical devices in health service organizations, NSW nursing standards and the NSW Day Surgery Facility Professional Standards Advisory Committee.

The ACCU and ICL will adhere to the relevant design and space standards outlined in the *Australasian Health Facility Guidelines (AusHFG) Part B – Health Facility Briefing and Planning*:

- AusHFG 170 – Cardiac Investigation Unit (**https://aushfg-prod-com-au.s3.amazonaws.com/HPU_B.0170_2_0.pdf**)
- AusHFG 260 – Cardiac Care Unit (**https://aushfg-prod-com-au.s3.amazonaws.com/HPU_B.0260_7%20_0.pdf**)
- AusHFG 270 – Day Surgery Procedure Unit (https://aushfg-prod-com-au.s3.amazonaws.com/HPU_B.0270_6_2.pdf)
- Australian Commission on Safety and Quality in Health Care. Acute Coronary Syndromes Clinical Care Standard. Sydney: ACSQHC, 2014
- ARPANZA guidelines

7. Operational description and associated design requirements

7.1. Access

7.1.1. Hours of Operation

The cardiac service operates 24 hours a day, seven days per week. More specifically:

- ACCU operates 24 hours a day, 7 days a week with afterhours emergency access
- ICL provides emergency, Primary Percutaneous Coronary Interventions (PCI) 24 hours a day, seven days a week and planned elective interventions during business hours
- occasionally patients will require emergency interventions in the EPLab, although this will be dependent on the availability of an Electrophysiology Cardiologist.

7.1.2. Access points for staff, patients and visitors

Patients and visitors will enter the ACCU and the ICL via a central entry. Entry into the ACCU for visitors will be controlled from the central staff station through an audio-visual intercom. Family and carers will be able to visit a patient at any time, subject to the patient's condition. There is to be an addition back of house/staff entry that is non-public thoroughfare. Prior to entering the ACCU and ICL everyone must wash their hands with Alcohol Based Hand Rub (ABHR).

7.1.3. Admission to the unit

- patient flow and bed allocation will be coordinated through the Bed Management Unit
- planned admissions will have an appropriate pre-admission assessment, either at the cardiology pre-admission clinic or by telephone
- a centralised day of surgery admission model will be in place for all booked surgical patients, however cardiology patients will be immediately directed to the ICL Day Unit
- unplanned admissions will be admitted via ED, CH inpatient units, NSW hospitals, or Ambulance services via the STEMI pathway (see Model of Care document, section 4.1)

- it is anticipated that a high percentage of patients will be admitted as day of surgery/ procedure admission
- discharge planning will commence at pre-admission for surgical/ procedural patients.

Patients may be ambulant, in a wheelchair, on a hospital bed or trolley.

7.1.4. After-hours access, and how this will be controlled

After 2100 hours and before 0600 hours, family and carers will enter CH via the after-hours entrance and present to the security office in order to gain access to the ACCU.

7.2. Core services

7.2.1. Diagnostic Imaging

Access to Cardiac CT and MRI is required. Patients that require this investigation are generally low risk planned patients that will be referred from the CPEU or the Cardiology Outpatient Clinics

For other investigations, patients will be transferred to diagnostic imaging for imaging and imaging procedures. Where the patient is to be transferred to the diagnostic imaging department, they may require a wards person and nurse escort, with or without cardiac monitoring equipment. Mobile ultrasound will be available on the ward as required.

7.2.2. Pathology

These services will be provided by the onsite ACT Pathology Service onsite.

Pathology specimen collection will be attended by ACCU staff. Requests for pathology are made electronically. Pathology services will include the use of point of care testing and have rapid access to pathology labs through the use of pneumatic tube located in the staff station and electronic result system. Some pathology samples are required to be hand delivered by ACCU staff or courier.

Specimens collected by procedural staff in the ICL will be transferred to the Pathology Laboratory by pneumatic tube system, or where necessary hand delivered by courier.

7.2.3. Pharmacy

Pharmacy services will be provided by the CH Pharmacy Service.

Medication management will be electronic utilising Electronic Medication Management (EMM) and Workstations on Wheels. Capacity is required to adapt to other EMM devices as these become available.

In the ACCU and ICL day unit, imprest medications will be stored in the imprest storage system within Clean Utility rooms. A wall mounted safe will be provided for the storage of controlled and restricted drugs of addiction (S4D & S8). Access to medication storage areas will be access controlled and limited to authorised persons.

The Cardiology services will adopt the recommended storage and preparation of medications as endorsed by the Medication Safety Standard Committee including facilities for the monitored refrigeration of medications.

Provision will be made for installation of Automatic Dispensing Machines (ADM) which provide staff with instant information and access to stocked medication 24 hours a day, 7 days a week. The ADMs will interface with the pharmacy inventory management system, meaning orders are automated and delivered by pharmacy staff to cater for the individual ACCU's stock requirements. Par levels can be tailored for each ADM.

The Workstations on Wheels can also safely store patient medication close to the patient's bedroom. They are stocked by the nursing / pharmacy staff from the ward imprest, or are ordered individually. The trolleys require tethering for security purposes, but are easily untethered by staff to take to the patient bedside for medication administration.

Every patient's medication profile and therapy will be reviewed by a ward based clinical pharmacist. Patients will receive medication counselling prior to discharge.

Any patient medications brought in on admission will be stored in a small safe in accordance with Medicine, Poisons and Therapeutic Goods regulations 2008.

The ICL will require wall mounted medication safes for storage of S4D and S8 medications within a clean utility room. There is to be visibility from this room into the labs.

There is to be the facility to store anaesthetic related medication medications in the anaesthetic room, accessible to the laboratory, with staff proximity access.

The Pharmacist and staff will communicate via a large white board in a secure, confidential location.

Stock for return to Pharmacy must be stored in a locked receptacle.

7.3 Non-clinical support

7.3.1 Administration

A ward clerk will operate from the main staff station in the ACCU and from a staff station in the Interventional Cardiology Suite. A single ward clerk will move from staff station in the ACCU to the ICL as dictated by demand.

The ward clerk will have a designated work area in the Staff Station oversighting the entry to the unit and in close proximity to the clinical workroom.

7.3.2 Environmental and Supply Services

Supplies

Stores are delivered two to three times per week with stock levels monitored against the Purchasing and Inventory Control System (PICS).

Clinical supplies will be provided using an imprest system. Supply staff will do reordering.

In the ACCU and ICL, point of care cupboards are to be distributed evenly throughout. The lower half of the cupboard will open to store the Pathology point of care trolley. The cupboard above will house consumables such as incontinence pads, detergent, wipes and alcohol based hand rub will be provided.

In addition to the dedicated Medication Room, unboxed sterile consumables, bulk IV fluids and miscellaneous items will be stored in a General Store Room. An Equipment Room will accommodate reusable equipment, some of which will require charging. Mobile equipment bays will be provided to make available commonly used items (e.g. hoists, IV poles, vital signs monitors). Non-core medical equipment will be stored in a central medical equipment store with 24/7 access.

Sterile interventional stock will be stored within the sterile stock area of the ICL.

Reusable medical devices, procedural sets from CSSD and sterile linen packs will be collected to agreed operation checklists within the sterile stock area in preparation for the planned and emergency lists. An open trolley system will be used. Special consumables will also be held in the sterile stock

area and added to the collections as required. A computerised bar coding system will be used for tracking instruments.

Waste

Waste management and removal will occur as per the facility wide policy for managing waste. Waste will be segregated at the source and will include general, biohazard and recyclable as a minimum.

Waste streaming is to be available in both the ACCU and ICL.

Dirty utility rooms will accommodate two 660L bins for general waste and co-mingle recycling, and two 240L clinical waste bins. A disposal room will be located in the shared space on the perimeter of the ACCU, close to a service corridor and back of house lifts. Waste will be removed from dirty utility rooms to the Disposal rooms by staff once to twice daily depending on area, demand and agreed schedule.

7.3.3 Transport

Day of Surgery Admission (DoSA) patients will be transferred to the ICL procedure room on a day surgery bed/wheelchair.

Following the procedure, patients admitted overnight will be transferred to the inpatient unit on an inpatient bed. Bed holding space will be provided within the ICL.

7.3.4 Food

Breakfast, lunch, dinner, morning and afternoon teas will be provided for inpatients within the ACCU according to the menu. Sandwiches and beverages will be provided to day procedure patients. Fresh bread will be available daily.

The management of inpatient diet orders and meals will be through the My Meal system – an integrated food services management system, with assistance rendered by Patient Support Assistants and Nutritionists as required.

Food service staff will deliver a retherm food trolley to the ACCU which is docked at the retherm bay. A food services staff member delivers meals to the patients.

7.3.5 Sterilising services

All contaminated materials will be removed from the ICL via the clean-up rooms. At the end of each case, the used instruments will be wiped off and returned to the supply trolley, together with anaesthetic equipment, for transfer to the Sterilising Services Department (SSD) via a dedicated route. TOE probes are sterilised in the endoscopy during business hours and in the pre rinse sterilising unit in the perioperative suite after hours.

All routine sterilisation of equipment will be carried out in the Central Sterile Supply Unit.

7.4. Amenities for patients, staff and visitors

7.4.1 Patient areas

Amenities for patients will be provided as per the design requirements and the Schedule of Accommodation. There is to be dedicated secure storage for use by the day patients in each bed bay and in the single rooms of admitted patients.

Patients will engage in rehabilitation activities as soon as clinically appropriate to facilitate early recovery and prevent deconditioning. These activities will occur in the bed area and/or a therapy space adjacent to the inpatient unit, dependent on the nature of the activity.

7.4.2 Visitors

Where patients are having a day procedure in the ICL, family members will be given an estimated of length of time for procedure, and be instructed to return to the cardiology day ward at that time. A lounge space will be required for use by ACCU visitors, with phone access to local/STD calls available. A beverage bay is required adjacent to the lounge.

Family members are encouraged to be involved in the patient's activities of daily living and their recovery as appropriate. Each bedroom is to have a carer zone, with a built in overnight bed and a single chair located next to patient beds to accommodate visitors. A quiet room will be provided for use by distressed or grieving families, with phone access to local/STD calls.

7.4.3 Staff

Office space will be allocated as per the ACT Health Office Accommodation Policy.

Staff will have access to a staff room with beverage bay, refrigerator and microwave and the ability to lounge, eat and debrief with colleagues. The location will provide privacy to staff away from patients/carers. The staff room will need to accommodate up to 10 staff at the same time. The room is to be provided in the shared zone outside the unit. There will be a conference room for staff education/meetings. Overnight staff accommodation will be provided for elsewhere in the Hospital.

7.5. Security requirements

7.5.1 Access cards, telephones, call points and alarms

Staff will enter the Cardiac unit and staff only areas with a proximity access card. Staff access to and within the ICL will be controlled by proximity access card. Access to the various holding, procedural and recovery areas will be controlled from the reception point and/or staff station. Patients will be brought into the ICL by staff. Entry into the ACCU for visitors will be controlled from the central staff station.

7.5.2 Mobile/personal duress systems

Personal duress capability is required, however fixed duress will be located in any room where a staff member has discussions with family / patients e.g. interview rooms, meeting rooms, lounge, and reception. Staff will be able to utilise the multifunctional wireless phones in addition to fixed duress systems.

Security personnel will respond to critical incidents within the unit automatically on activation of duress alarms and as required on request from clinical staff.

7.6. Infection control

7.6.1 Acute Cardiology Care Unit

Standard precautions will be implemented for patients known or suspected to be infectious or who are immunosuppressed. 90% single bed rooms will ensure standard isolation for all patients. Negative pressure (Class N) single bed rooms will be used for patients with airborne infections.

Alcohol based hand rub (ABHR) will be available at the entrance for use by all staff, patients and carers before entry to the unit. ABHR will be used as an adjunct to clinical hand washing and are to be provided on the end of each bed, at the entrance to patient rooms and distributed around the Unit. They will be fixed to the wall, with a strip of vinyl behind them.

Clinical hand wash basins and associated equipment and consumables will be provided in medication, treatment, utility and bed rooms – located so that staff wash their hands upon entry/exit from the room.

Clinical hand wash bays are to be provided at a ratio of one per four beds in the corridors. All basins will have basin set up as per the ACT Health Infection Prevention and Control (IPC) Departures from the AusHFG's Document including vinyl to 2700mm behind the basin and will have electronic sensor tap wear.

Specifically:
- a pair of rooms will have detergent wipe bracket.
- Personal Protection Equipment (PPE) racks are to be provided at the entry to each bed area.
- PPE waste holding bays are to be provided at a ratio of one per five beds.
- Furniture Fittings and Fixtures (FFE) should allow for ease of cleaning and discourage accumulation of dust.
- finishes to be washable and approved by IPC.

7.6.2   Interventional Cardiac Laboratories

Patients with a known multi-resistant organism (MRO) infection will be transferred straight to the procedure room and will not wait in a holding bay. Isolation rooms will be provided in or adjacent to holding and recovery areas. Clinical hand wash basins (Type B) will be provided at the ratio of 1 per 4 holding/recovery bays and in utility rooms – located so that staff wash their hands upon entry / exit from the room. Non-alcohol based hand rub will be provided in all patient care areas.

7.7. Information Communication Technology (ICT)

ICT services technology changes rapidly and the design process must acknowledge continuous development of policy and the impact it may have on implementation. The ACT Health ICT foundations comprises of four key areas:

Patient Record Systems that provide a consolidated, shareable patient-centric health record enabling information to be available to the right person at the right place and time to enable informed health care and treatment decisions. This program includes systems such as:
- Electronic Health Record fully integrated for ICU and IPU patients
- Personal Electronic Health Record (PEHR) incorporating an ACT Health smart card
- Clinical Portal/Centralised Order Entry/Provider Index
- e-Referral system
- Integrated Chronic Disease Management tools
- Electronic Medical Record System for patient admissions and discharges (CRIS replacement).

Clinical Decision Support Systems that provide healthcare professionals with better access to clinical research and evidence, and clinical decision-support tools to enable improvements in the quality, safety and efficiency of clinical practices. This includes:
- EMM
- Clinical Protocol System
- Community Care System
- Renal Dialysis Application
- Theatre System Integration.

Support Services that use technology to efficiently manage the resources which support ACT Health in the provision of patient care, for example the management of staff, food and beds.

The Digital Hospital Infrastructure designed to provide:
- the secure technological capability to ensure a complete view of patient information at the point of care
- high availability technologies needed to support a 24/7 care environment

- electronic systems needed to support the coordination of health care
- support for technologies required by staff in the delivery of health care services at the point of care
- readily accessible facilities to allow patients to review and update their details, manage appointment bookings and access health care information and education materials provided in the e-health environment
- enhanced patient health care experience
- support for the future expansion of clinical ICT systems across both public hospitals.

ICT will be used to support self-management and health literacy and to promote healthy choices e.g. health kiosks, web-based education.

Video conferencing and Telehealth will be available using a range of technologies including fixed equipment in large bookable meeting venues, mobile equipment and internet based desktop applications.

7.7.1   Acute Cardiac Care Unit

Specific ICT requirements in the ACCU include:

- bedside data entry:
    - staff will need access to computers at each bedside, staff stations and in consultation, treatment and procedure rooms
    - access is required to a mobile device platform (workstation on wheels) for the purpose of data entry. One device will be used between two bed spaces.
    - use of tablets, smart phones etc. will also need to be supported.
- secure storage of and charging facilities for mobile clinical devices such as workstations on wheels, handsets, batteries on wheels, in close proximity to the staff workroom.
- Wi-Fi and blue tooth
    - provision for medically safe wireless networking throughout the clinical area
    - Wi-Fi internet access will be provided throughout the inpatient unit (including lounge/wait areas) for use by staff and visitors.
    - Bluetooth and Wi-Fi will be required for communication between portable medical devices to enable equipment tracking and remote diagnosis of equipment faults to Biomedical Engineering.
    - Radio Frequency ID (RFID) tracking to enable equipment tracking throughout the hospital
- Multi-function devices
    - MFDs are required at the staff station and clinical workroom
- hearing Loop
    - hearing loop is to be available at the staff station near the ward clerk and in one clinical treatment space, treatment space or bedroom and ensuite
- patient monitoring
    - wireless telemetry on all beds to be monitored at the bedside and at central staff station
    - telemetry to be compatible with other critical care areas within the hospital, including ED, ICU and Interventional Suite
- patient beside entertainment
    - an integrated bedside communication system will include services such as television, computer monitor, patient health education, access to PEHR, my meal etc.
    - bedside data entry for clinical staff will be provided by an alternate system
- communication
    - the most appropriate latest technology will be required for: communicating during systems fail or in disaster response; audible communication in all clinical and non-clinical areas with access to points in multiple locations.

Nurse call systems will be linked to multifunctional wireless phones enabling staff response to calls across various locations. This will include the capacity for staff to communicate with each other and patients remotely. The Nurse call system will be extended to fully integrate with the bedside systems which currently link to the reception and the central security monitoring room of CH increasing safety and security for patients, visitors and staff.

The nurse call system will be a smart system with the capacity for the patient to be able to identify what the needs are prior to a staff member physically attending the patient. Staff will wear a handset integrated with the nurse call system. This system will facilitate 'rounding', reminding staff at intervals that they must check a patient or do observations. Cancellation of the nurse call occurs automatically when a staff member wearing the device enters the room of the nurse call origin. The head set utilises Real Time Location System (RTLS).

Data and power points are to be located at a mobile platform bay. These devices will facilitate integration with the electronic records systems and accessible by card reader. Devices will be protected by RTLS.

7.7.2.   ICL

Three wall mounted computers per interventional laboratory (1 anaesthetist, 1 interventionist, 1 nursing) will be required with access to RFID to ensure instrument tracking/scanning.

The EPLab will require a dedicated control room.

For each anaesthetic machine requires a computerised integration reporting system with print facilities. A report should be available indicating patients physiological monitoring and ventilator parameters.

Further requirements:
- a computer is required in each anaesthetic bay/room
- a staff write-up bay with computer access is required
- one fixed personal computer per recovery space. One mobile device for every procedure rooms or recovery spaces will be required.
- charging bays for mobile equipment
- secure Wi-Fi available throughout the interventional environments.

The interventional laboratories should have pendant mounted cameras capability for the recording and real time transmission of operative procedures for clinical review and training purposes.

An internal communication/call system within the CCLs with annunciator panels (location to be determined during the design phase).

7.8. Teaching, training and research

The service will provide teaching and learning opportunities for trainee doctors and for medical and nursing students etc.

The Department of Cardiology is an accredited site for Advanced Training in Cardiology by the Royal Australasian College of Physicians (RACP) and office study space is a requirement for trainees. In-service education will be routinely conducted on the unit and will require access to a shared meeting room with capacity for 20 people adjacent to the Unit.

Staff are encouraged to take up and complete professional development packages and will require access to computer workstations to access eLearning applications.

Multidisciplinary learning and development opportunities are promoted and encouraged. Medical teaching rounds are conducted regularly.

Clinical placement is provided for nursing, allied health and medical students. These clinical placements, lasting up to ten weeks, are provided for students from Australian National University, other Universities and Canberra Institute of Technology.

Access to clinical simulation facilities is required.

8. Specific design requirements

8.1. Overarching design requirements

The design must:
- incorporate safe design principles including visibility between staff and patients and vice versa, standardisation, automation (if possible), acoustic attenuation, immediate accessibility to information close to the point of service and the minimisation of patient movement around the facility
- support maximum productivity and efficiency, short travel distances, and ensure flexibility to allow operational models, nursing staff structures and the MoC to change over time, including nurse to patient ratios
- facilitate efficient and effective patient flow though areas
- have universal design of individual patient treatment areas to offer greater flexibility and adaptability for multiple purpose use.

Bariatric patients up to 250kg will be managed within the service. There will be one bed space to accommodate a super bariatric patient, up to 500kg.

There is to be sufficient storage and mobile trolley bays to ensure trolleys do not clutter the corridor.

Floor and wall coverings are to support acoustic attenuation. Carpet tiles may be used in the staff station, staff workroom, interview room and offices if an appropriate cleaning regime can be agreed.

8.2. Specific design requirements

8.2.1. Acute Cardiac Care Unit (ACCU)

Patient areas will comprise of 24 beds set up as three pods of eight. One pod will be set up as a combined step down and CPEU, providing monitored space for ambulant patients and a space for chest pain evaluation.

Staff will be able to observe patients without entering the room. Doors will be on soft close to reduce noise.

Decentralised clinical write-up bays will be required for each pod of 8 beds to enable nursing staff to oversee the patients in their care and to enable patients to easily see nursing staff. Each bay will have space to accommodate two to three staff including non-nursing members of the care team.

Room features will include:
- acoustic attenuation
- locally controllable dimmable lighting
- access to TV
- night lighting (floor lighting)

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- all single bedrooms to have an ensuite
- ability to charge personal devices by the bed
- storage for patient and family possessions
- integral privacy blinds in the patient observation window – controllable from outside the room.

The following staff work areas will be provided:
- three staff bases within the unit
  - one central staff base is to be large enough to accommodate the ward clerk and pneumatic tube station
  - all staff bases will provide good observation of patients in their bed rooms
  - satellite bases will accommodate up to three staff with computer access close to the point of care
  - orientation of the staff bases will ensure staff have optimum viewing of patient bed rooms
- a clinical workroom located adjacent to the larger staff base to allow privacy for case discussions, write-up by members of the extended team and students and handover
- a CNC office located in the ACCU
- a Senior staff specialist (Clinical Lead) office
- other staff office accommodation.

The staff station will make provision for:
- central area for ECG transmission and central monitoring
- storage of paper files
- photocopier bay in the clinical workroom
- a bay to accommodate a patient file trolley
- receptacle for pathology requests
- wall mounted storage for paper work associated with patient files.

The work room will have:
- access via the staff station
- an electronic patient journey board
- confidential space for staff to work quietly without interruption
- adequate charging points for wireless phone system (mobile nurse call devices)
- space for the log on computer for the mobile nurse call devices
- lockable cupboards for hand held devices
- MFD
- electronic patient board in a position that provides patient confidentiality
- display of confidential information
- adjacent access to stationery/photocopy bay (access controlled).

Staff change rooms, incorporating toilet, shower, change facilities and staff/student locker bay will be provided in the Unit.

Clean utility rooms are to be designed to house all unit medications and associated consumables in one location including imprest drugs, refrigerated drugs, space for sterile manipulation of intravenous admixtures, electronic prescribing, controlled drug storage and storage of patients own medications, if not at the bedside or in the workstation on wheels.

Provision for power and data is to be made for the installation of Automated Dispensing Machines (ADM). Bench space will be provided for medication preparation. A secure container will be provided for staff to return medications to pharmacy.

8.2.2 Interventional Cardiology Laboratories (ICL)

The accommodation requirements of the ICL are as per the Schedule of Accommodation.

The ICL will include two cardiac Catheterisation Laboratory, one to be configured as a Hybrid Cardiac Catheterisation Laboratory (shelled) and one Electrophysiology Laboratory (i.e. total of four laboratories).

- ICL Day Unit will be collocated with the procedural area
- meeting rooms and staff amenities can be shared with the CCL
- the ICL requires an uninterrupted power supply
- Hybrid CCL size and capability to manage trans-catheter valve replacements, ECMO support and cardiopulmonary bypass support in selected cases that are not open heart surgical cases
- all CCLs are to have the ability to manage General Anaesthetics, if required
- there will be two anaesthetic induction rooms in the ICL adjacent to a hybrid CCL and the EPLab
- staff line of sight of patient bays is paramount for patient safety and support.
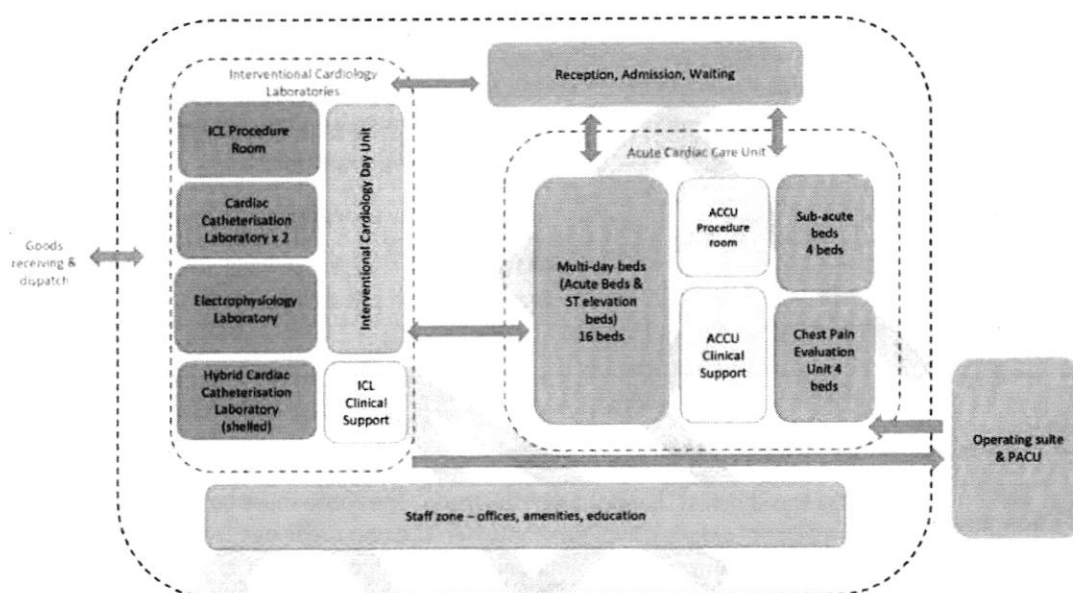
9. Functional relationships

9.1. Internal relationships

The internal functional relationships for the ACCU and CIS are shown in the following figure.

Figure 1: Cardiology Services internal functional relationships

9.2. External relationships

The Cardiac Care Unit will be located in the SPIRE building. Key external functional relationships are prioritised in the following Table 3 and as per the criteria in Table 4.

Table 3: Cardiology services external functional relationships

Service/Unit	Priority	Comments
Perioperative and Interventional Centre	Immediate	Movement of staff and patients to the Cardiothoracic OT
Emergency Department	Ready	Movement of patients and staff
ICU/HDU	Ready	Movement of patients
Ambulance entry	Ready	Admit patients
Cardiology Outpatients	Ready	Movement of patients and staff
Medical Imaging	Easy	Movement of patients
Pathology	Easy	Movement of patient samples via pneumatic tube
Allied Health	Easy	Movement of staff

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Security	Easy	Movement of staff. e.g. black alert, staff from all points urgently attend
Administration Centre	Easy	Movement of staff and consumers (admissions, patient flow etc.)
Pharmacy	Easy	Movement of staff and medications
General (Hotel) Services	Easy	Movement of staff, meals, linen & waste
Mortuary	Easy	Movement of patients
Discharge Lounge	Easy	Movement of patients
Site Interfaces		
Drop off/Pickup	Easy	Movement of staff & consumers; Ambulance, Security, Patient Transport
Car parking – Visitors	Easy	Movement of visitors and consumers
Car parking – Staff	Easy	Movement of staff; swipe card access control (particularly on call staff)
Public Transport	Easy	Movement of visitors, consumers and staff

Table 4: Priority of external functional relationships

Immediate (<1 minute)	Being the shortest direct, horizontal route. The route must be an unimpeded route. Door to door travel time between the two areas or services identified as having an "Immediate" functional relationship must not exceed one minute.
Direct (<2 minutes)	Being a direct horizontal or vertical route. The route must be an unimpeded route. Door to door travel time between the two areas or services identified as having a "Direct" functional relationship must not exceed two minutes and there must be minimal corner turns between the two areas or services.
Ready (<5 minutes)	Being a horizontal or vertical route. Door to door travel time between the two areas or services identified as having a "Ready" functional relationship must not exceed five minutes.
Easy (<10 minutes)	Being a horizontal or vertical route. Door to door travel time between the two areas or services identified as having an "Easy" functional relationship must not exceed ten minutes.

10. Future service developments and innovation

The following future service developments are anticipated:

- increase in structural heart interventional procedures
- increase in cardiac electrophysiology ablation procedures
- increase in complexity of procedures given high risk ageing population
- increase in day procedures for less complex interventions
- increase in hybrid procedures
- delivery of support services via Automated Guided Vehicles (AGV)
- provision for scanning devices to be accessible throughout the unit
- installation of Automated Dispensing Machines (ADMs)
- provision of eHealth integration throughout the unit including at the bed side
- increased point of care testing.

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11.Schedule of accommodation

AusHFG Code	Deviation from HPU B.0520 Y/N	Room / Space	Quantity	Room Area	Total Area m2	AHFG's Standard Compnent Size m2	Deviation from Standard Compent m2
ADMISSIONS / RECEPTION							
RECL-10	Y	Reception / Clerical, 10m2	1	10	10	10	0
OFF-2P	Y	Office - 2 Person Shared, 12m2	1	12	12	12	0
STPS-8	Y	Store - Photocopy / Stationery, 8m2	1	8	8	8	0
WAIT-20	Y	Waiting, 20m2	1	20	20	20	0
WCAC	Y	Toilet - Accessible, 6m2	1	6	6	6	0
WCPU-3	Y	Toilet - Public, 3m2	1	3	3	3	0
		Subtotal			59		**0**
		Discounted Circulation		32%	19	32%	19
		Total			78		19
ICL DAY UNIT							
WAIT-10	N	Waiting, 10m2	1	10	10	10	0
CONS	N	Consult room	1	12	12	12	0
INTF	N	Interview Room	1	12	12	12	0
BBEV-OP	N	Bay - Beverage, Open Plan, 4m2	1	4	4	4	0
PBTR-H-9	N	Patient Bay - Holding, 9m2	24	9	216	9	0
	N	Property Bay - Patient	1	3	3	3	0
WCPT	N	Toilet – Patient, 4m2	4	4	16	4	0
ENS-ACC	N	Ensuite – Accessible, 7m2	2	7	14	7	0
SSTN-10	N	Staff Station, 10m2	1	10	10	10	0
OFF-CLW	N	Office - Clinical Workroom	1	15	15	15	0
BMEQ-4	N	Bay - Mobile Equipment, 4m2	1	4	4	4	0
BRES	N	Bay - Resuscitation	1	1.5	1.5	1.5	0
BHWS-B	N	Bay - Handwashing, Type B	6	1	6	1	0
BLIN	N	Bay - Linen	1	2	2	2	0
BBW	N	Bay - Blanket	1	2	2	2	0
CLUR-12	N	Clean Utility / Medication Room	1	12	12	12	0
DTUR-10	N	Dirty Utility	1	10	10	10	0
BMT-4	N	Bay - Meal Trolley	1	4	4	4	0
		Subtotal			354		**0**
		Discounted Circulation		35%	124	35%	0
		Total			477		0
INTERVENTIONAL ROOMS (CCL, EPLAB, ICL PROCEDURE ROOM, HYBRID)							
	N	Procedure Room	1	30	30	0	30
ANIN	Y	Anaesthetic Induction Room, 18m2	2	18	36	18	0
	Y	Hybrid Cardiac Catheter Laboratory, 75m2	1	75	75	0	75
	Y	Hybrid OR Control Room	1	15	15	0	15
	Y	Hybrid OR Computer Room	1	12	12	0	12

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AusHFG Code	Deviation from HPU B.0520 Y/N	Room / Space	Quantity	Room Area	Total Area m2	AHFG's Standard Compnent Size m2	Deviation from Standard Compenent m2
SCRB-8	Y	Scrub-up / Gowning	1	0	0	0	0
SETUP-8	Y	Set-up Room	1	0	0	0	0
	Y	Exit Bay	1	0	0	0	0
CLUP-15	Y	Clean-Up Room, 15m2	1	0	0	0	0
CLAB	N	Catheter Laboratory Procedure Room	2	55	110	55	55
CLCT	N	Catheter Lab Control Room	2	14	28	14	14
CLUR-12	Y	Medication Room, 12m2	1	12	12	12	0
OFF-4P	Y	CCL Reporting room	1	20	20	20	0
	N	EP Laboratory	1	75	75	55	20
	N	Control Room - EP Lab	1	15	15	15	0
	N	Computer Equipment Room	3	10	30	10	20
SCRB-6	N	Scrub-up / Gowning	2	6	12	6	6
	N	Bay - Lead Aprons	4	1	4	1	3
	N	Store Sterile Stock / Set Up Room	1	20	20	20	0
		Subtotal			494		250
		Discounted Circulation		35%	173	35%	88
		Total			667		338
ICL CLINICAL SUPPORT							
STEQ-16	N	Store - Equipment	1	16	16	16	0
STGN-9	N	Store - General, 9m2	1	9	9	9	0
CLRM-5	N	Cleaner's Room, 5m2	1	5	5	5	0
DISP-10	Y	Disposal Room	2	10	20	10	0
BPTS	N	Bay - Pneumatic Tube	1	1	1	1	0
COMM	Y	Communications Room	1	12	12	12	0
BPATH	N	Bay - Pathology	1	3	3	1	2
		Subtotal			66		2
		Discounted Circulation		35%	23	35%	1
		Total			89		3
STAFF AREAS							
MEET-L-30	Y	Meeting Room, 30m2	1	30	30	30	0
OFF-S9	Y	Office - Single Person, 9m2	3	9	27	9	0
CHST-10	N	Change - Staff (Male / Female), 10m2	1	10	10	10	0
OFF-WI-3	N	Office - Write-up, 3m2	2	3	6	3	0
SRM-15	N	Staff Room, 15m2	1	15	15	15	0
WCST	N	Toilet - Staff, 3m2	2	3	6	3	0
		Subtotal			94		0
		Discounted Circulation		32%	30	32%	0
		Total			124		0
MULTI-DAY BEDS (16 BEDS)							
IBR-SP-B	N	1 Bed Room - Special Coronary Care, 20m2	15	20	300	20	0

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AusHFG Code	Deviation from HPU B.0520 Y/N	Room / Space	Quantity	Room Area	Total Area m2	AHFG's Standard Compnent Size m2	Deviation from Standard Compent m2
1BR-IS-N2	N	1 Bed room - Isolation	1	20	20	20	0
ANRM	N	Anteroom	1	6	6	6	0
ENS-ST	N	Ensuite - Standard, 5m2	14	5	70	5	0
1BR-BA	N	1 Bed Room - Bariatric, 20m2	1	20	20	20	0
ENS-BA	N	Ensuite - Bariatric, 7m2	1	7	7	7	0
ENS-ACC	N	Ensuite - Accessible, 7m2	1	7	7	7	0
		Staff Base	2	5	10	5	0
SUB-ACUTE (4 BEDS)							
IBR-ST	N	1 Bed Room - Inboard Ensuite,16m2	3	20	60	20	0
ENS-ST	N	Ensuite - Standard, 5m2	3	5	15	5	0
	N	1 Bed Room - Bariatric, 18m2	1	18	18	18	0
ENS-BA	N	Ensuite - Bariatric, 7m2	1	7	7	7	0
LNPT-10	N	Lounge - Patient/Family	1	15	15	15	0
	N	Staff Base	1	5	5	5	0
CHEST PAIN EVALUATION UNIT (4 BEDS)							
4BR-ST-A	N	4 Bed Room - Inboard Ensuite, 42m2	1	58	58	58	0
ENS-ACC	N	Ensuite - Accessible, 7m2	1	7	7	7	0
	N	Staff Base	1	5	5	5	0
ACCU PROCEDURE ROOM							
PROC-20	Y	Procedure Room, 20m2	1	20	20	20	0
PROC-20	Y	Procedure Room, 20m2	2	20	40	20	0
ACCU CLINICAL SUPPORT AREAS							
BPPE	N	Bay - Handwashing / PPE	4	2	6	2	0
SSTN14	Y	Staff Station, 14m2	1	16	16	14	2
OFF-CLW	N	Office - Clinical Workroom	1	15	15	15	0
BPTS	N	Bay - Pneumatic Tube	1	1	1	1	0
BPATH	Y	2	1	3	3	1	2
OFF-S9	N	Office - Single Person, 9m2	2	9	18	9	0
CLUR-14	N	Clean Utility Room, 14m2	1	14	14	14	0
DTUR-14	N	Dirty Utility, 14m2	1	14	14	14	0
DTUR-S	Y	Dirty Utility - Sub, 8m2	1	8	8	8	0
CLUR-12	Y	Medication Room, 12m2	1	12	12	12	0
BLIN	N	Bay - Linen	2	2	4	2	0
	Y	Bay - Dirty linen	2	0.5	1	0.5	0
BMEQ-4	N	Bay Mobile Equipment, 4m2	4	4	16	4	0
BRES	N	Bay - Resuscitation	2	1.5	3.0	1.5	0
STEQ-20	N	Store - Equipment, 14m2	1	20	20	20	0
STGN-9	N	Store - General, 9m2	1	9	9	9	0
BBEV-OP	N	Bay - Beverage, Open Plan, 4m2	1	5	5	5	0
BMT-4	N	Bay - Meal Trolley	1	4	4	4	0
CLRM-5	N	Cleaner's Room, 5m2	1	5	5	5	0

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AusHFG Code	Deviation from HPU B.0520 Y/N	Room / Space	Quantity	Room Area	Total Area m2	AHFG's Standard Compnent Size m2	Deviation from Standard Compent m2
INTF	N	Interview Room	1	12	12	12	0
		Subtotal			876		0
		Discounted Circulation		38%	333		
		Total			1209		
STAFF AREAS							
MEET-L-20	N	Meeting Large, 20m2	1	20	20	20	0
SRM-18	N	Staff Room, 18m2	1	18	18	18	0
OFF-4P	Y	Office - 4 Person Shared, 20m2	1	20	20	20	0
WCST	N	Toilet - Staff, 3m2	2	3	6	3	0
PROP-2	N	Property Bay - Staff	1	3	3	3	0
SHST	N	Shower - Staff, 3m2	1	3	3	3	0
		Subtotal			70		4
		Discounted Circulation		32%	22		1
		Total			92		5
SHARED WITH INTERVENTIONAL CARDIAC LABORATORIES							
MEET-L-15	Y	Meeting Room, 15m2	1	15	15	15	0
DISP-10	N	Disposal Room, 10m2	1	10	10	10	0
	Y	Pharmacy - Satellite	1	10	10	0	10
WAIT-20	Y	Waiting, 20m2	1	20	20	20	0
WCAC	N	Toilet - Accessible, 6m2	1	6	6	6	0
WSPU-3	N	Toilet - Public, 3m2	2	3	6	3	0
		Subtotal			67		10
		Discounted Circulation		32%	21		3
		Total			88		13
					Total Area m2		**Deviation from Standard Component m2**
		Total Room Area			2080		266
		Circulation Allowance	Ave	36%	745		112
		Total Department / Unit Area			**2825**		**378**

12.Abbreviations

Abbreviation	Definition
ACCU	Acute Cardiac Care Unit
ADON	Assistant Director of Nursing
ADM	Automated Dispensing Machines
ASD	Atrial Septal Defect
BCA	Building Code of Australia
BiPAP	Bilevel Positive Airway Pressure
CCL	Cardiac Catheterisation Laboratory
CCTV	Closed Circuit Television
CHCHWC	Centenary Hospital for Women and Children
CPAP	Continuous positive Airway Pressure
CPEU	Chest Pain Evaluation Unit
CRT	Cardiac Resynchronisation Therapy
DO	Day Only
DOSA	Day of Surgery Admission
ECMO	Extracorporeal Membrane Oxygenation
ECG	Electrocardiogram
ED	Emergency Department
EMM	Electronic Medication Management
EPLab	Electrophysiology Laboratory
FFE	Furniture, Fittings and Equipment
FPU	Functional Planning Unit
FTE	Full Time Equivalent
HPU	Health Planning Unit
IABP	Intra-Aortic Balloon Pump
ICD	Internal Cardiac Defibrillator
ICL	Interventional Cardiology Laboratories
ICT	Information Communication Technology
LAA	Left Atrial Appendage
MoC	Model of Care
MRO	Multi Resistant Organism
PCI	Percutaneous Coronary Intervention
PEHR	Personal Electronic Health Record
PFO	Patent Foramen Ovale
PPE	Personal Protective Equipment
RFID	Radio Frequency Identification
RMD	Reusable medical devices
RTLS	Real Time Location System
STEMI	St-Elevation Myocardial Infarction
SSD	Sterile Supply Unit
SPIRE	Surgical Procedures, Interventional Radiology and Emergency
TAVI	Transcatheter Aortic Valve Implantation
TOE	Transoesophageal Echocardiogram
TTE	Trans Thoracic Echocardiogram

13.HPU brief development participants

Participants in the development of the ICU HPU Brief	
Position	Name
Director of Cardiology	Dr Ren Tan
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HEALTH PLANNING UNIT BRIEF

INTENSIVE CARE UNIT

ACT HEALTH

DATE: OCTOBER 2018

Approvals

Name	Position	Signature	Date
Narelle Boyd	Executive Director, Critical Care Division		
	Deputy Director General, Canberra Hospital and Health Services		
	For Information - Executive Sponsor, Chief of Clinical Operations, ACT Health		

Outstanding issues

Subject	Issue
Scope of service	Data projections required to inform bed numbers
Specific design requirements	Exact design of ICU pod separation requires further exploration during the design phase.

Document version history

Version	Issue Date	Issued By	Issued To	Reason for Issue
Draft v0.1	17/4/2018	Capital Insight	User Group	Draft for review
Draft v0.2	17/4/2018	Kathleen Evans	Capital Insight	Incorporation of feedback
Draft v0.3	23/4/2018	Capital Insight	ACT Health	Updated for User Group feedback
Draft v0.4	30/4/2018	Carly Silberberg	Capital Insight	Client feedback
Draft v0.5	30/4/2018	Capital Insight	ACT Health	Final draft
Draft v0.6	9/5/2018	HSPU	BHSP	For progression to Principle Design Consultant

TABLE OF CONTENTS

1. Introduction

In September 2016, ACT Government announced the construction of a Surgical Procedures, Interventional Radiology and Emergency (SPIRE) Centre to be built at Canberra Hospital (CH). This infrastructure project is part of the ACT Government's 10-Year Health Plan and is in response to the increasing demand on ACT hospitals and health services across the territory.

The ACT Government 2017 Budget provided funding for the first stages of the SPIRE project which includes planning and the commencement of design. A Health Planning Unit (HPU) Brief is a planning document that defines the activities and functions to be undertaken within a unit/ service. This HPU Brief has been developed as part of the SPIRE planning component and articulates the operational requirements, functionalities and relationships for which the prospective design consultant can develop a suitable design response.

ACT Health engaged Capital Insight Pty Ltd to undertake the HPU development in collaboration with staff from Health Services Redesign and Building Health Service's Program. Development of this document occurred between April and May 2018 with internal ACT Health stakeholders who have been identified within this document. Outstanding issues that require resolution over the next design phases are noted at the beginning of this document.

This HPU Brief defines the activities and functions to be undertaken in the Intensive Care Unit (ICU). It is not the role of the HPU Brief to design the space, but rather to articulate the operational requirements, functionalities and relationships for which the architect can develop a suitable design response. The HPU brief has been developed in alignment with the Australasian Health Facility Guidelines. This Health Planning Unit will comprise of:

- Adult ICU (AICU)
- Paediatric ICU (PICU).

2. Description of the service

The Intensive Care service at CH provides care for critically ill adult and paediatric patients and close monitoring for those patients most at risk of further deterioration. It is the only tertiary care intensive care service in the region. The ICU will be a 48 bed department providing complex multi-system life support and ongoing advanced management to a range of critically ill patients with life threatening illnesses, injuries and complications.

Historically patients admitted to the ICU have been loosely defined as either "Intensive care" or "High dependency" type patients and in the past were physically moved around the footprint of the unit depending on these categories of care. In the evolution of this specialty service it is recognised that these tight definitions are no longer applicable as this describes only the nursing: patient ratios (1:1 care for intensive care and 1:2 for high dependency level patients) and is a fluid determination which can change multiple times in a day. These changing care needs are now seen as part of the critically ill patient's journey while they remain within the physical ICU, and there are no physical separations of an intensive care or high dependency care bed.

The CH ICU is a tertiary referral service providing level 5 and 6 services as per the NSW Role Delineation, for the Territory and neighbouring regional centres in Southern NSW (comprising approximately 50% of admissions). The CH ICU is a level 3 ICU as per the College of Intensive Care Medicine (CICM) of Australia and New Zealand Guidelines, capable of providing complex multi-organ

support for adult patients for indefinite periods of time. The service will provide care to both adult and paediatric patients and will offer the following services:

- Intensive Care Services for adults aged 16 years and over, requiring single or multiple organ support, including enhanced services e.g. extra corporeal membrane oxygenation (ECMO) support, bereavement support, integrated psychological and social support
- Intensive Care Services for paediatrics aged 28 days to 16 years (new service)
- ability to quarantine one ICU pod (12 beds) to manage infectious threats (new capability)
- emergency response within the CH and management of the Medical Emergency Team (MET)
- ICU Outreach service - monitoring/consultation/liaison/follow-up services/ tracheostomy service to patients on inpatient units
- trauma response in the Emergency Department (ED)
- an ICU outpatient service (follow-up of patients who have been discharged from the Hospital) using the bookable space in the Ambulatory Care Centre (ACC)
- a satellite base for DonateLife (the promotion of organ and tissue donation service) whilst its admin function will remain in a remote location of the Hospital campus
- Capital Region Retrieval Service - emergency, intensive care and anaesthetic consultants and senior registrars are employed as the medical flight crew to the service and will be involve in telemedicine support
- clinical research.

The AICU will provide care for critically ill patients, in single or multiple organ failure, and those at risk of further deterioration (e.g. post complex surgery). Adult ICU patients will receive either 1:1 or 1:2 nursing care with input from medical and allied health care personnel in a self-contained unit. The level of nursing care will be altered over the course of a day according to patient acuity. An integrated ICU/HDU Model of Care (MoC) will be implemented in each pod to maintain staff skills across specialties and support less experienced staff in caring for patients requiring different levels of care. All patients will be managed by intensive care specialists. Adult spinal and burns patients are resuscitated, stabilised, and retrieved to specialised ICUs in NSW. This arrangement is expected to continue.

The PICU is a new service envisaged to provide ongoing care for critically ill patients in single or multiple organ failure, and those at risk of further deterioration (e.g. post complex surgery), from 28 days of age through to 16 years. It is proposed that the majority of critically ill paediatric patients requiring critical care interventions will be managed in the PICU, however a small number of children with complex care needs will continue to be retrieved to the Sydney Children's Hospital network for specialised services not available in the ACT e.g. for ECMO, specialised surgical or transplant management. On occasion, the PICU will provide short-term care and management of critically ill children, aged two years and over, awaiting retrieval to a specialist Sydney Hospital.

Paediatric patients will receive 1:1 nursing care with input from medical and allied health care in a dedicated PICU pod within the AICU. All patients will be managed by paediatric intensive care specialists. It is envisaged that PICU staff will also provide emergency response to deteriorating paediatric patients in the Centenary Hospital for Women and Children (CHWC), tracheostomy review and care, trauma response and PICU follow-up. Staff and support areas will be shared with the ICU. Paediatrics requiring High Dependency type services will be managed in the CHWC.

Neonatal Intensive Care (NICU) services and super specialty services such as ongoing management of severe burns and transplant surgery are not provided by the ICU. Emergency response to infants in the neonatal period will continue to be provided out of the NICU.

3. Scope of service

In 2016/17, CH had 2,293 AICU and HDU admissions to the ICU. The median number of patients in the ICU at any given time was 21, with a requirement additional beds to provide surge capacity at peak times. Initial activity analysis suggests that additional admissions would occur if capacity was available. Length of stay can be a short as 12 – 24 hours post-surgery, or 18 months or more for some conditions. The following table outlines the required functional planning units (FPU) for the ICU to 2026/27.

Table 1: Functional Planning Units required for ICU

Health Planning Unit	Room type (FPU)	Future Number (2026/27)
Intensive Care Unit	Class N Enclosed Bay	8
	Class P Enclosed Bay	4
	Class S Enclosed Bay	8
	Open Patient Bay	28
Total		48

Operationally the AICU will provide capacity for 12 HDU beds, however HDU beds are not designated and the whole unit is specified to AICU requirements to optimise operational flexibility. An integration of AICU/HDU beds is planned to minimise patient movement and address staffing ratios.

This following section outlines the existing usage of AICU services at the CH. Table 2 shows activity at CH for patients treated in the AICU from 2013-14 to 2016-17, which shows consistent growth in activity.

Table 2: AICU and HDU admissions at Canberra Hospital 2013-14 to 2016-17

Admissions	2013-14	2014-15	2015-16	2016-17
Canberra Hospital	1,995	1,998	2,024	2,293

Source: ACT Health Performance Reporting and Data.

4. Model of Care summary

The mission of the CH ICU is to deliver seamless, outstanding care to critically ill patients and their families. The unit will provide complex multi-system life support for an indefinite period to adults and paediatrics, as well as high dependency care to adults.

The ICU MoC is a multidisciplinary team (MDT) based approach to holistic patient care, including compassionate care for patients' families and friends. Highly specialised medical, nursing and allied health staff work collaboratively with referring clinicians to adopt the most appropriate evidenced based care for each patient. Clinical management includes but is not restricted to multidisciplinary ward rounds conducted at least twice daily, continuous monitoring and treatment provision, family meetings and regular multidisciplinary and multispecialty meetings.

An enhanced ICU capability is anticipated for patients requiring ECMO resulting in fewer patients requiring retrieval to Sydney. Patients for solid organ transplant and/or left ventricular assist

device/artificial heart implantation will continue to be retrieved to Sydney as these highly specialised services will not be provided in the ACT.

Patient cohorts will be organised across four pods to reflect similar treatment needs, for example:

- general medicine
- cardiovascular including cardiothoracic surgery patients, patients with cardiac failure, and in future ECMO therapy patients
- surgical patients including elective surgery, trauma and neurosurgery
- chronic critical illness
- paediatric patients.

One pod will be fully self-contained to enable quarantine in the event of an infectious threat. Each pod will have designated staff. The AICU/PICU pods will have a range of isolation capability and access for bariatric patients. There will be a dedicated ICU multi-purpose therapy gym/rehabilitation space for all eligible patients' to access to enable functional rehabilitation, minimising loss of condition and promote recovery. The gym will have overhead tracking and contain parallel bars, tilt table, double plinth, treadmill, weights and a cage to attach slings.

Patients will also have access to outdoor areas in which multi-organ support can be maintained, known to promote wellbeing and recovery. In addition, the involvement of and care for families is pivotal in the service delivery model. Comfortable amenities will be provided for families to stay overnight for extended periods of time and for visitors to gather, including amenities for children.

A specific requirement is consideration of the patient and family who are undertaking a process of organ donation. The 'donation after cardiac death' process requires urgent transport between the area of palliation and the operating suite within minutes of the declaration of death.

The ICU also provides the following outreach services:

- MET response providing rapid assistance for emergency management
- management of admissions to the ICU (e.g. admitting office for direct referrals from ED and retrieval service)
- trauma response
- tracheostomy care (TRACS) – twice weekly rounds
- follow up of ICU survivors (new service to be established)
- Capital Region Retrieval Service
- disaster and post disaster management for the ACT region.

It is the intention that all patients remain in the same room/space for the duration of their admission in ICU unless they develop additional conditions which would require a move e.g. acquisition of resistant/easily transmitted organism or chronic critical illness.

5. Workforce

The staffing profile is based on a 48 bed unit. Projected staff profiles have been developed to inform this stage of planning and will be further developed during detailed strategic business case development and clarification around MoC's/Service delivery model.

Table 4: Proposed ICU workforce profile

Position Levels	FTE			Headcount		
	Current 2017/18	Additional to 2026/27	Total	Current	Additional	Total
Medical						
Staff specialist (consultants)	13.0	11.0	24	19	16	35
Provisional Fellows	2.0	2.0	4	3	3	6
Senior Registrars	7.0	6.0	13	10	9	19
Registrars	20.0	14.0	34	30	20	50
Senior Residents	12.0	15.0	27	18	22	40
Nursing						
ADON (RN 4.3)	1.0	0.0	1.0	1	0	1
CNC (RN 3.2)	2.0	0.6	1.6	1	1	2
CCC (RN 3.1)	6.7	4.7	11.4	13	9	22
NUM (RN 3.2)	1.0	0.0	1.0	1	0	1
CSN/MET (RN 3.1)	2.0	2.4	4.4	4	5	9
CDN (RN2)	2.0	2.0	4.0	4	4	8
RN 2	44.0	78.0	120.0	88	156	244
RN 1	84.0	93.0	177.0	168	186	354
HSO	2.0	4.4	6.4	4	9	13
Administrative						
Receptionist	0.0	3.2	3.2	0	4	4
Ward Clerks	3.2	0.0	3.2	4	0	4
Personal Assistant for Director	1.0	0.0	1.0	1	0	1
ASO3 support for supervisors	1.0	0.0	1.0	1	0	1
ASO2/3 support for rostering	1.0	0.0	1.0	1	0	1
ASO2/3 support for education	1.0	0.0	1.0	1	0	1
Allied Health						
Physiotherapy	5.2	2.3	7.5	6	3	9
Pharmacy	2.0	2.5	4.5	2	3	5
Social Work	1.6	5.9	7.5	2	6	8
Dietetics	1.0	0.8	1.8	1	1	2
Speech pathology	0.4	1.4	1.8	1	2	2
Psychology	0.0	1.8	1.8	0	2	2
Occupational Therapy	0.0	2.0	2.0	0	2	2
Allied Health Assistant	0.0	1.0	1.0	0	1	1
Podiatry	As needed/on call					
ALO	As needed/on call					

6. Policies impacting on the built environment

The ICU will adhere to the relevant design and space standards outlined in the *Australasian Health Facility Guidelines (AusHFG) Part B – Health Facility Briefing and Planning* and additional college standards and policies:

- 360 Intensive Care-General and 0540 Paediatric/Adolescent Unit https://aushfg-prod-com-au.s3.amazonaws.com/HPU_B.0360_6_0.pdf
- College of Intensive Care Medicine of Australia and New Zealand. IC 01 2011. Minimum Standards for Intensive Care Units

- College of Intensive Care Medicine of Australia and New Zealand. IC-02 2011. Intensive Care specialist practice in hospitals accredited for training in Intensive Care Medicine
- College of Intensive Care Medicine of Australia and New Zealand. IC-03 2014. Guidelines for ICUs seeking accreditation for training in Intensive Care Medicine
- Australian College of Critical Care Nurses (2003). Intensive Care Nursing Staffing
- Ebola virus disease (EVD) or Other Viral Haemorrhagic Fevers (VHF), CHHS 16/137.

Other policies impacting on the built environment include:

- ACT Health (2012) – Work Health & Safety Act and Regulations and Management Systems Policy
- ACT Health (2012) - Clinical Records Management Policy
- ACT Health (2012). Breastfeeding friendly workplace policy
- ACT Health - Electronic Medicines Management Policy
- ACT Health Office and Workstation Accommodation Policy (2018)
- Infection Prevention Control Policy
- Disability Discrimination Act, 1992
- Centralised Equipment Services(CES)
- National Health and Medical Research Council (2010). Australian Guidelines for the Prevention and Control of Infection in Health Care
- ACT Health (2014). Draft Action Plan: Improving patients sleep at CH.

There will need to be capacity to address the impact of new and updated policies as they come on line.

7. Operational description and associated design requirements

7.1 Access

7.1.1. Hours of operation

The unit operates 24 hours-a-day, seven days per week. Organ Donation Specialist Nursing Coordinators are on call 24/7 to identify and facilitate organ and tissue donations.

7.1.2. Admission to the unit

Admission to the ICU is through the clinical team and the ICU on-call Staff Specialist. Patients can be admitted to ICU from any location within CH. Patients will be admitted to the AICU or PICU from the Emergency Department (ED), CH Inpatient Units, CHWC, other hospitals, the Perioperative service and the Acute Adult Mental Health Unit. Patients may be transferred from the ICU to Inpatient Units (including CH, CHWC and Mental Health Unit), the Perioperative Suite, Medical Imaging, other hospitals, occasionally home, hospice or mortuary.

Direct admissions also occur from Calvary Public Hospital Bruce ICU/ED or other hospitals via the retrieval service.

Booked post-procedural admissions (elective cases) will be referred through the Perioperative Service (including Angiography service) and transferred post-surgery to the ICU. Most elective

patients who do not require post-operative ventilation, transition through the Post Anaesthetic Care Unit (PACU) before admission to the ICU.

Emergency admissions are generally referred via the ICU Outreach team and generally originate from the ED, Perioperative Service (including Angiography service), Inpatient Units (IPU), and inter-hospital transfers.

7.1.3. Access points for staff, patients and visitors

Family members and visitors will be welcomed in the unit via a controlled access point via the ICU main reception area. Patient and staff flows will be separated from the public access. There are no restrictions on visiting times.

7.1.4. After-hours access, and how this will be controlled

After hours the Hospital's Main Entry is locked. Access to the ICU is arranged by contacting security via the intercom at the Main Entry.

7.2. Clinical support

7.2.1. Diagnostic Imaging

Diagnostic Imaging services to support the ICU will be available 24/7. Mobile X-ray and ultrasound are available in the Unit (with adequate storage for ready access provided on the Unit and/or per pod as required). Patients are transferred to Medical Imaging for other imaging procedures with staff escort. A networked Radiology Information System and Picture Archiving and Communication System will manage data collection, retrieval and reporting throughout the facility.

7.2.2. Pathology

These services will be provided by the ACT Pathology Service onsite. Samples will be taken by ICU staff. Pneumatic tubes or similar automated system will be used to transfer samples from the ICU and will be located within each pod. Point of care testing machines will be located in each pod in close proximity to the clinical zone. Tests will be ordered on-line from terminals located in patient rooms/ bays and staff stations. Results will be reported via computer at the point of care and a notification capacity will be included.

7.2.3. Pharmacy

Pharmacy services for ICU will be supplied by the hospital Pharmacy Service and will be extended to seven days per week. Supplies will be stored in the central clean utility/medication room within each pod. The space will need to be capable of holding Automated Dispensing Machines (ADM) including power and data requirements and drug safes fixed to the wall or floor according to the relevant legislation and a monitored medication fridge. Medications stored in the clean utility are restocked by a pharmacy technician.

It is anticipated that many patient medications will be stored in a trolley in the patient bed bay. The trolley will have two lockable drawers to accommodate medications and some consumables.

A lockable cupboard will be located at the nurses' desk for S4 and S8 drugs, in accordance with legislation. The cupboard will be re-stocked by a pharmacy technician. A pneumatic tube system (separate from pathology) and / or courier will be used to deliver non-imprest drugs from the Pharmacy to the ICU as required.

7.2.4.   Sterilising services

Sterilising services will provide cleaning and sterilising of non-disposable specialised equipment onsite. Most instruments/consumables used in the Unit are disposable.

7.2.5.   Bio-Medical equipment management

Services will be provided by the Biomedical Service in CH. A Biomedical workroom and satellite workshop will be provided in the Unit. The workroom will be used for pre-operation testing and functional verification of equipment used within the unit. The workshop will store equipment and facilitate timely access to critical pieces of equipment requiring maintenance. Support space for administrative activities will also be provided. Biomedical presence in the ICU minimises the risk of sensitive medical equipment being damaged during transportation to and from the main workshop.

7.3 Non-clinical support

7.3.1.   Administration

Provision for unit based clerical support is made at the main ICU reception, in the staff stations and clinical workroom. Additional administrative functions in supporting staff specialists, education, and research activities are located in the ICU office area.

7.3.2.   Environmental and supply services

Supplies

Stores are delivered daily with stock levels monitored against the Purchasing and Inventory Control System (PICS). To reduce staff walking distances, point of care cupboards are to be distributed evenly throughout the Unit.

Clinical supplies will be provided using an imprest system. Supply staff will do reordering.

In addition to the dedicated Medication Rooms, unboxed sterile consumables, bulk intravenous (IV) fluids and miscellaneous items will be stored in a General Store Room. An Equipment Room will accommodate reusable equipment, some of which will require charging. Mobile equipment bays will be provided to make available commonly used items (e.g. hoists, IV poles, vital signs monitors). Non-core medical equipment will be stored in a Central Medical Equipment Store with 24/7 access.

Linen

Supplies will be delivered by Capital Linen Service and delivered daily. Clean linen supplies will be stored on trolleys in designated linen bays in the inpatient unit. Restocking will be by a trolley exchange system. Dirty linen will be collected from the source and stored in dirty linen hampers in the dirty utility room. Collection and transfer to a central soiled linen holding room at the loading dock will occur as per ACT Health Policy.

Cleaning

Cleaning services will ensure that facilities are clean and hygienic as per Infection Prevention Guidelines and contemporary best practice. All inpatient clinical areas will be cleaned at least daily and upon discharge of the patient. A Cleaners' room (lockable) will be located in the unit. It will accommodate a cleaner's trolley and related consumables, and stock storage (e.g. toilet paper, paper towels). A dedicated bulky equipment store will accommodate floor polishers, steam cleaners and ride on polishers.

Waste

Waste management and removal will occur as per the facility wide policy for managing waste. Waste will be segregated at the source and will include general, biohazard and recyclable as a minimum. Dirty utility rooms will accommodate two 660L bins for general waste and co-mingle recycling, and two 240L clinical waste bins. Waste will be removed from dirty utility rooms and disposal rooms once to twice daily depending on area, demand and agreed schedule. A disposal room will be located in the shared space, close to back of house lifts. An additional disposal room will be provided in the quarantine pod with direct external access to prevent cross contamination.

7.3.3. Food

Some patients may receive meals. Many patients will require enteral feeding. Food services are delivered to the unit in a dedicated retherm food trolley. A recess/docking station for the food trolley is required. Meals are not generally provided to families. However, tea and coffee making facilities are provided along with re-heating facilities and a fridge on each pod. External to the ICU, the family and visitors waiting room area is also equipped with a pantry for tea, coffee and food reheating.

7.4. Amenities for patients, staff and visitors

7.4.1. Patient amenities

Patients will have access to outdoor areas that support continuous ventilation.

Class N and Class P isolation rooms will have dedicated ensuites. Other bed spaces will access shared ensuites located within the pod. One bathroom will be provided for the whole Unit. Ensuites will support continuous ventilation.

7.4.2. Staff amenities

Staff access to and within the unit is controlled by proximity access card. Staff will have access to a staff room with beverage bay, refrigerator and microwave and the ability to lounge, eat and debrief with colleagues. The location will provide privacy to staff away from patients, family members and visitors.

Staff change rooms will include lockers for shift by shift use. Staff toilets will be located in staff areas on each pod and in staff change rooms. A dedicated change room with shower and toilet will be located in the quarantine pod with direct access internally and externally to facilitate infection control requirements when the pod is managing an infectious threat event.

Staff who are breastfeeding will have access to a Parenting Room with feeding, changing and refrigeration facilities, in accordance with ACT Health policies.

Staff office space will be consistent with the ACT Health Office Accommodation Policy.

7.4.3. Family/visitor amenities

A family lounge, pantry for food/drink preparation and toilet facilities will be provided in the Unit, but outside of the clinical zone. A family friendly waiting area with play area will also be provided, allowing for some privacy among family groups.

The Unit will provide overnight accommodation for family members of critically ill patients. ICU accommodation will be located in a shared visitor amenities zone. PICU overnight accommodation will be located adjacent to the PICU pod.

A room will be set up for palliative care that can accommodate for larger families including children.

7.5. Security requirements

Security arrangements will be in line with ACT Health Policies and Procedures.

7.5.1. Access cards, telephones, call points, alarms

The Unit will be access controlled with the ability to lock the ICU if required. Lifts adjacent to the ICU will have access control for after-hours use. There is to be an audio/visual intercom controllable from the staff station. An efficient, integrated communication system, voice/paging and nurse call to facilitate contact between the staff bases, isolation rooms, and the reception desk is required.

7.5.2. Mobile/personal duress systems

Personal duress are required in designated areas within the unit. Fixed duress will be located in all rooms where a staff member is required to have discussions with family/patients e.g. interview rooms, meeting rooms, lounge and reception. Staff will be able to utilise multifunctional wireless phones in addition to fixed duress systems.

Security personnel will respond to critical incidents within the Unit automatically on activation of duress alarms and as required on request from clinical staff.

7.5.3. Additional secure areas/zone

All staff only areas are to be electronically accessed controlled including medication/clean utility, general store, equipment store, clean utility, staff toilets, staff room, change rooms.

Security must be able to be maintained during power failure and all public access points must be able to be locked down during a disaster.

CCTV systems will only be installed in areas accessed by the public, specifically reception and waiting areas. Cameras will be placed in public view.

7.6. Infection control

The Unit will adhere to the relevant design and space standards outlined in the Australasian Health Facility Guidelines (AusHFG): Part D: Infection Prevention and Control.

https://healthfacilityguidelines.com.au/part/part-d-infection-prevention-and-control-0

Particular emphasis to be placed on ensuring surfaces and materials are not textured, and can be cleaned easily.

- alcohol based hand rub will be located at the entrance to the Unit and throughout the Unit for use by all staff and visitors
- hand-washing basins will be located near the entrance of the Unit, each room and throughout the Unit
- Personal Protection Equipment (PPE) racks are to be provided within each pod. PPE waste holding bays are to be provided at a ratio of one per five beds
- Furniture Fittings and Fixtures (FFE) should allow for ease of cleaning and discourage accumulation of dust
- finishes to be washable and approved by IPC
- pan sanitiser in a sub-dirty utility room in conjunction with the isolation anterooms
- flows through the Unit must separate clean and dirty flows for infection control reasons.

7.7. Information Communication Technology (ICT)

ICT services technology changes rapidly and the design process must acknowledge continuous development of policy and the impact it may have on implementation.

The ACT Health ICT foundations comprises of four key areas:

Patient Record Systems that provide a consolidated, shareable patient-centric health record enabling information to be available to the right person at the right place and time to enable informed health care and treatment decisions. This program includes systems such as:

- Electronic Health Record fully integrated for ICU and IPU patients
- Personal Electronic Health Record (PEHR) incorporating an ACT Health smart card
- Clinical Portal/Centralised Order Entry/Provider Index
- e-Referral system
- Integrated Chronic Disease Management tools
- Electronic Medical Record System for patient admissions and discharges (Clinical Record Information System (CRIS) replacement).

Clinical Decision Support Systems that provide healthcare professionals with better access to clinical research and evidence, and clinical decision-support tools to enable improvements in the quality, safety and efficiency of clinical practices. This includes:

- Electronic Medication Management (EMM)
- Clinical Protocol System
- Community Care System
- Renal Dialysis Application
- Theatre System Integration
  - ACT Patient Administration System (ACTPAS)
  - Purchasing and Inventory Control System (PICS)
  - T-Doc™ (electronic sterile supply management and tracing system).

Support Services that use technology to efficiently manage the resources which support ACT Health in the provision of patient care, for example the management of staff, food and beds.

The **Digital Hospital Infrastructure** designed to provide:

- the technological capability to ensure a complete view of patient information at the point of care
- high availability technologies needed to support a 24/7 care environment
- electronic systems needed to support the coordination of health care
- support for technologies required by staff in the delivery of health care services at the point of care
- readily accessible facilities to allow patients to review and update their details, manage appointment bookings and access health care information and education materials provided in the e-health environment
- enhanced patient health care experience
- support for the future expansion of clinical ICT systems across both public hospitals.

MetaVision is an electronic Clinical Information System (CIS) used within the ICU at CH. It supports both clinical and administrative processes. Staff within the ICU will manage all clinical documentation electronically, including progress notes, medication management, assessments, and patient observations. The system facilitates improved clinical outcomes by providing an integrated and complete view of patient health information at the point of care, and enhances patient safety by reducing transcription and documentation errors.

A centralised electronic bed management tool linked to Pathology, ACTPAS and MetaVision systems is required to ensure efficient coordination of patient activity/flow within the department and timely access to ICU services.

Specific ICT requirements include:

- patient monitoring at bed spaces, and selected other spaces (e.g. patient gym) will be configured for monitoring at a central location with real time reporting
- mobile devices for bedside data entry will include workstations on wheels (WOWS), laptops, notebooks, palm computers and tablets, in addition to multifunctional wireless phones and mobile phones. Staff will be able to select from this range of devices to find a solution that fits their needs and the requirements of systems being utilised
- secure storage of and charging facilities for mobile clinical devices such as WOWs, handsets, batteries on wheels, in close proximity to the staff workroom
- Wi-Fi and blue tooth:
  - provision for medically safe wireless networking throughout the clinical area
  - Wi-Fi internet access for use by staff and visitors
  - communication between portable medical devices to enable equipment tracking and remote diagnosis of equipment faults to Biomedical Engineering
  - radio frequency ID tracking to enable equipment tracking throughout the Hospital
- annunciator and PA system located in each pod able to communicate to all pods and office spaces
- printers are required at the staff station, clinical workroom and in proximity to staff offices
- hearing Loop is to be available at the staff station near the ward clerk, one bed bay and ensuite per pod
- patient beside entertainment will consist of an integrated communication system including services such as television, computer monitor, patient health education, access to PEHR, menu ordering etc
- headphones which meet infection control guidelines will minimise disruption to other patients and families. The system should be connected to hospital TV/movie systems
- the Unit will require improved communication devices and processes for staff due to the increased size and layout of the unit. A voice activated paging system will be used by nursing staff when requiring assistance from inside patients' rooms
- MET, in its outreach role, will operate a monitoring service to monitor at-risk patients throughout the Hospital. The Patient track system uses network infrastructure using a combination of desktop web-based (https) clients and Wi-Fi networked mobile devices.
- televisions at each bed space are required for patient diversion therapy
- personal duress alarm capability will be available in all single enclosed rooms for staff security
- nurse call systems are to be extended to link with reception and the security monitoring room
- medical emergency buttons will link to doctors' and nurses' offices. A record data system will be provided to log times