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MRI Room

Room Code	MRI
Briefed Area	46.00 m²
Ceiling Height	2.7 m
Occupancy	1 patient; Up to 3 staff
Hours of Operation	Up to 24 hours

Description

The MRI Imaging Room is designed for undertaking Magnetic Resonance Imaging (MRI) scanning with direct overview from the adjoining MRI Control Room. The MRI Imaging Room must have the MRI Equipment Room immediately adjacent for accommodating supporting power and control equipment.

Electrical
- PROTECTION: body protected ☑
- PROTECTION: cardiac protected ☐

Lighting
- LIGHTING: general ☑
- LIGHTING: colour corrected ☐
- LIGHTING: dimmable ☑
- LIGHTING: indirect ☐

Nurse Call and Duress
- NURSE CALL SYSTEM: buttons / handset ☑
- NURSE CALL SYSTEM: annunciator ☐
- DURESS: fixed ☑
- DURESS: wireless coverage ☑

Security
- ACCESS CONTROL: to door ☐
- ACCESS CONTROL: to item / joinery ☐
- INTERCOM: service communications ☐
- INTERCOM: security and access control ☐
- CCTV: camera coverage within room ☐
- INTRUSION DETECTION: door monitoring ☐
- INTRUSION DETECTION: spatial monitoring ☐

ICT and Audio Visual
- AUDIO VISUAL: patient entertainment system ☐
- AUDIO VISUAL: visitor experiance system ☐
- AUDIO VISUAL: virtual collaboration system ☐
- AUDIO VISUAL: clinical support system ☐
- AUDIO VISUAL: digital operating room system ☐

Accessibility
- AUDIO: hearing augmentation ☐
- VISUAL: luminance contrast ☑
- SIGNAGE: accessible, statuatory ☐

HVAC
- AIRCONDITIONING: general ☑
- AIRCONDITIONING: HEPA filtered ☐
- AIRCONDITIONING: positive pressure ☐
- AIRCONDITIONING: negative pressure ☐
- VENTILATION: exhaust ☐
- VENTILATION: supply ☐
- VENTILATION: natural ☐

Medical Gas
- MEDICAL GAS: general anaesthesia ☐
- MEDICAL GAS: special care ☐
- MEDICAL GAS: special care, neonatal ventilation ☐
- MEDICAL GAS: birthing ☐

Hydraulic
- WATER: drinking ☐
- WATER: specialty ☐
- DRAINAGE: sanitary ☐
- DRAINAGE: specialty ☐

Fire
- DETECTION: smoke ☑
- DETECTION: heat ☐

Shielding
- SHIELDING: ionising radiation ☐
- SHIELDING: magentic and radio frequency ☑

Acoustics

SPEECH PRIVACY:

not private ···· moderate ···· **private** ···· confidential ▼

NOISE SENSITIVITY:

not sensitive ···· **medium sensitive** ···· sensitive ▼

NOISE GENERATION:

low ···· moderate ···· **high** ···· very high ▼

Additional Considerations
- The MRI Imaging Room is located within Zone IV as set out in the RANZCR MRI Safety Guidelines.
- Magnetic and Radiofrequency shielding is to be as advised by specialist consultant.
- The entrance of the MRI Imaging Room must be visible from the MRI Control Room.
- Appropriate warning signs are required indicating the presence and permanency of a strong magnetic field and identifying items for which entry is prohibited.
- There shall be a designated site outside the MRI Imaging Room, outside the 0.5m T line and away from the room entry door, for patients to be brought to if requiring emergency treatment.
- Equipment is to be installed to manufacturer's specifications with sufficient clearances for maintenance access. Installation and replacement access routes should also be considered. Additional building services connections and outlets are to be coordinated

to suit equipment requirements. Cable ducts for services between imaging unit, the equipment room and the control room will be required and must be coordinated with the MME vendor.

● Structural assessment is required to ensure the floor of the MRI Imaging Room and the access route for installation/replacement of equipment will accommodate the weight of the MRI unit.

● A removable panel to the wall of the MRI Imaging Room is required to allow MRI Unit replacement.

● Depending on service requirements, general anaesthesia may be administered in this room. This must be confirmed by project teams to ensure appropriate workflows are provided to support this model of care, to confirm the correct building services are provided to ensure patient safety, and to determine medical gas system requirements.

● Provision of reticulated nitrous oxide is optional and must be confirmed to suit local jurisdictional policies and operational service requirements. The use of nitrous oxide in operating theatres and procedural suites and emergency departments is declining due to a range of clinical and environmental concerns. Reticulated systems have been found to increase leakage of nitrous oxide (a potent greenhouse gas) to atmosphere, can increase facility operating costs and potentially expose staff to nitrous oxide. Reticulated nitrous oxide and associated scavenge outlets are not mandatory for any healthcare service and point of care cylinders can meet clinical requirements for the majority of healthcare facilities. Due consideration must be given to a range of operational considerations including monitoring and measurement of usage, management of leakage, WHS requirements relating to the use of cylinders, approach to the provision of scavenge where cylinders are used, appropriate storage for cylinders, and security of gas sources given it is used as a recreational drug.

● Waveguide ports, also known as penetration panels, are specialised openings in the walls designed to allow the passage of various items like tubing and cables without compromising the magnetic and radiofrequency shielding. Waveguide ports are required from the MRI Control Room to the MRI Imaging Room. Where a service includes administration of anaesthetic, waveguide ports are required from the Anaesthetic Preparation Area to the MRI Imaging Room, along with an observation window with clear view of the patient.

● All equipment and fittings in the room to be MRI compatible and constructed of non-ferrous material

● Consideration for the use of multi-parameter MRI compatible monitors and infusion pumps to be confirmed at project level to suit local jurisdictional policies and operational service requirements. Where not provided, a cable port may need to be installed to run clinical leads from outside the imaging room to the patient for continuous monitoring and provision of care.

● Florescent light fixtures are not permitted in the MRI Imaging Room

● Temperature and Humidity control are required.

● In planning, room location to be considered in relation to location and movement of metal object outside the MRI Room, such as beds, trolleys, lifts, motor vehicles, trains, trams, AGV's, transformers and AC cables. Room location must also take into consideration static elements such as steel beams and reinforcement, especially beneath the MRI Unit.

● Room location to consider building vibration limits that can impact image quality. This may include new building works and potential refurbishments nearby.

● Smoke detection within the MRI room shall be multi-aspirated detection with the sampling unit located outside of the risk area. Fire sprinklers and pipework shall be of non-ferrous material and suitable for an MRI room. A performance solution shall be completed to address the minimum fire protection requirements of the MRI room.

● The room will require sufficient clearance to allow access for a patient on an MRI compatible trolley. Trolley movement into, around and out of the room, and patient transfer should be considered during planning to reduce manual handling.

● Patient transfer aids such as patient slides and hover mats are to be considered for assisted patient transfers to and from the MRI table. Final selection of transfer aids will be dependent on service requirements, the needs of the anticipated patient cohort (e.g. for ambulatory services, acute services, etc.), as well as WHS risk assessments/policies. All equipment to be used within the room must be non-ferrous/MRI compatible.

● Acoustic treatment to be considered to manage noise from the imaging device and the adjacent equipment room. All finishes must be meet infection prevention and control requirements.

● Dimmable light may be considered to support patient comfort. Similarly, feature artwork on the ceiling may be considered above the MRI table.

● Time tracking requirements (i.e. provision of electric or synchronised clock) is to be confirmed to suit service requirements.

● The type, extent and configuration of storage within the room for consumables, linen, equipment, etc. will be dependent on service requirements, operational policies for stock centralisation/decanting and infection prevention and control policies.

● Hours of operation depend on the service in which this room is located. Ambulatory medical imaging services may only operate during business hours or extended business hours, some small hospital services may have an on-call, after-hours service. Large units are likely to provide a 24-hour service, especially where a satellite service is provided with an emergency department.

● Size, type and quantity of waste bins is dependent on waste management policies (e.g. for waste separation, frequency of waste removal, etc.) and service requirements.

● Requirement for fixed and/or mobile duress to be confirmed to suit service requirements.

● An operational model for responding to calls from staff/patients will be needed to support the inclusion of a nurse call system and is to be determined based on service requirements.

● Provision of an intercom for staff communication within the department is dependent on service requirements. This function may be provided as part of the telephone system.

- The final services and configuration of the Medical Services Panel (MSP) - medical gases, nurse call, power and data - will be dependent on service requirements.
- The need for and extent of emergency power and UPS must be reviewed to suit site specific requirements and confirmed based on risk assessment considering the impact of a power outage on patient care/safety.

Doors and Windows

CODE	DESCRIPTION	COMMENT
DOSP-141	DOOR: hinged, 1 leaf, 1200 clear opening, radio frequency shielding, MRI imaging room	
AFDPR-006.01	DOOR PROTECTION: plate, to 900H	MRI compatible, to both sides of door
MIMR-121	BARRIER: MRI, retractable belt, wall mounted	
WIFX-008.04	WINDOW: fixed, internal, single glazed, sill at 1050H, radio frequency shielding	for observation from control room (see MRI-CTRL)
WIFX-008.04	WINDOW: fixed, internal, single glazed, sill at 1050H, radio frequency shielding	for observation from anaesthetic preparation area

Finishes

CODE	DESCRIPTION	COMMENT
FLSK-021	SKIRTING: vinyl, integral with floor vinyl, coved	
FLVY-101	FLOOR FINISH: vinyl, seamless, standard slip resistance	
WLFI-002	WALL FINISH: paint, clinical areas	
WLFI-011.06	WALL FINISH: vinyl, to 2100 AFFL	
MIMR-112	ACCESS PANEL: penetration, waveguide port, MRI	2 to control room, 2 to anaesthetic preparation area
MIMR-101	CABIN: radio frequency shielding, faraday cage, MRI	
CLFS-012	CEILING: flush set, suspended, acoustic	ceiling tiles are also acceptable, grid must be MRI compatable
CLFI-002	CEILING FINISH: paint, clinical areas	
CLCN-031	CORNICE: square set	

Joinery

CODE	DESCRIPTION	GROUP	QTY	COMMENT
JOCU-021	CUPBOARD: tall, double door	1	5	all materials and hardware to be MRI compatible
JOGE-001	BULKHEAD: joinery	1	2	

Fittings, Furniture and Equipment (FF&E)

CODE	DESCRIPTION	GROUP	QTY	COMMENT
FIHR-101	BRACKET: suction bottle, wall mounted	2	2	MRI compatible
FIHR-341	BRACKET: television/AV system display screen, single, articulated, wall mounted	2	1	optional - to functional MRI display screen if provided, MRI compatible
FIHR-408	BRACKET: patient monitor, articulated, wall mounted	2	1	optional - to slave patient monitor if provided, MRI compatible
FQGE-161	STOOL: step	3	1	MRI compatible

CODE	DESCRIPTION	GROUP	QTY	COMMENT
ITAV-151	SPEAKER: AV system, ceiling mounted	1	1	MRI compatible
ITCL-051	CLOCK: electric, analogue	1	1	MRI compatible
ITCL-351	DISPLAY SCREEN: patient treatment information	1	1	optional - for functional MRI, MRI compatible
ITCL-437	CAMERA: patient observation, MRI compatible, wall mounted	1	2	
MIGE-052	INJECTOR: contrast, MRI compatible, pedestal	3	1	
MIMR-041	TROLLEY: patient, transport, MRI compatible	3	1	
MIMR-046	MACHINE: anaesthetic, MRI compatible	3	1	
MMGE-191	CANNISTER: suction bottle	3	2	MRI compatible
MMPM-051	MONITOR: patient, slave	3	1	optional - depending on service requirements, MRI compatible
MMRA-042	LASER: patient positioning, radiotherapy, overhead, MRI compatible	2	1	optional - as required for radiotherapy planning

Major Medical Equipment (MME)

CODE	DESCRIPTION	GROUP	QTY	COMMENT
MIMR-001	IMAGING DEVICE: MRI, gantry	2	1	refer to manufacturer's requirements for quench pipes and other associated equipment
MIMR-006	TABLE: patient, MRI	2	1	mobile table with electronic docking capability, detachable table also acceptable, use of detachable table may negate need for additional MRI compatible patient transport trolley
MIMR-036	PIPE: quench, MRI	1	1	installed to manufacturer's specifications with minimal bends

Engineering Services

CODE	DESCRIPTION	GROUP	QTY	COMMENT
ELGP-101	GPO: single, wall mounted	1	1	to clock
ELGP-106	GPO: single, ceiling mounted	1	1	optional - to laser positioning light if provided
ELGP-131	GPO: single, emergency power, wall mounted	1	2	to patient observation cameras
ELGP-161	GPO: single, UPS, wall mounted	1	2	optional - 1 to slave patient monitor, 1 to FMRI monitor
ELPR-071	RCD: residual current device, wall mounted	1	1	
ELSW-021	SWITCH: light, dimmer	1	1	to general room lighting
ELSW-121	BUTTON: emergency stop, wall mounted	1	1	main power emergency stop, refer to equipment manufacturer for safety and compatibility with equipment
ITCL-191	BUTTON: nurse call, emergency, with cancel, wall mounted	1	1	above medical services panel
ITIN-016	OUTLET: data, single RJ45, wall mounted	1	2	optional - 1 to slave patient monitor, 1 to FMRI monitor
ITIN-016	OUTLET: data, single RJ45, wall mounted	1	2	to patient observation cameras
ITSE-061	BUTTON: security, duress, fixed, wall mounted	1	1	
MEGE-061	SENSOR: oxygen depletion	1	1	connection to BMS to be confirmed by project

Medical Services Panels and Pendants

CODE	DESCRIPTION	GROUP	QTY	COMMENT
Panel 1				
MMSP-051	MEDICAL SERVICES PANEL: wall mounted	①	1	MRI compatible
ELGP-146	GPO: single, emergency power, on service panel	①	4	
ELGP-176	GPO: single, UPS, on service panel	①	2	extent of UPS to be confirmed to suit service and equipment requirements
ELPR-033	PANEL: UPS status indicator, on services panel	①	1	
ELPR-073	RCD: residual current device, on services panel	①	2	1 to emergency power circuit, 1 to UPS circuit
ITCL-183	BUTTON: nurse call, staff assist, with cancel, on services panel	①	1	MRI compatible
MGAS-022	OUTLET: medical air, on services panel	①	1	
MGAS-032	OUTLET: nitrous oxide (N2O), on services panel	①	1	optional; provision of reticulated nitrous oxide to be confirmed to suit project and service requirements
MGAS-042	OUTLET: oxygen (O2), on services panel	①	2	
MGAS-052	OUTLET: scavenge, on services panel	①	1	optional; provided if reticulated nitrous oxide provided - provision of reticulated nitrous oxide to be confirmed to suit project and service requirements
MGAS-062	OUTLET: suction, on services panel	①	2	
MGFP-021	FLOWMETER: medical air	③	1	MRI compatible
MGFP-041	FLOWMETER: oxygen	③	2	MRI compatible
MGFP-061	ADAPTER: suction	③	2	MRI compatible