

SAFE WORK PROCEDURE (SWP)

Workplace: NeuRA Imaging Centre

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TASK/OPERATION: Magnetic Resonance Safety – Emergencies (SWP04)

Operating Procedure Developed by: Facility Manager with MRI Facility Committee

Approved:
COO

Date:
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Reviewed by: MRI Facility Imaging Director
WHS & Clinical Consultant
1.0

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Purpose:

The purpose of this document is to outline the procedures used to deal with various emergencies.

Rationale:

The Magnetic Resonance (MR) environment provides unique challenges when dealing with emergency situations varying from cardiac arrest to fire to quenches of the magnet.

Emergency situations within the MRI Facility are to be dealt with in line with NeuRA's Emergency Policies and Procedures (FAC01, FAC02, WHS20, WHS31). Please refer to [NeuRA's Emergency Procedure Guide](#) for instructions in relation to particular types of emergencies.

Procedures:

1) Generic Procedure for Dealing with Medical Emergencies

- Terminate the MRI procedure.

- Call 000 if emergency services are required.
- Research Radiographer¹ to commence and maintain first aid procedures until medical assistance arrives.
- Notify staff in the immediate area of the situation, inform MRI Reception and NeuRA Reception of the situation, requesting medical staff or a trained first aider if not immediately available.
- No emergency equipment or devices are to be brought into the Magnet Room at any stage.
- Bring the FlexTrak table frame into the Magnet Room, dock it against the table and remove the participant from the Magnet Room and place them in the Bed Preparation Room if it is safe to do so. This may require pat-sliding if table controls fail (see below.)
- Ensure doors to all scanning rooms are closed.
- Monitor the participant until first aid or medical treatment is no longer required.

2) Cardiac Arrest

In the event of a participant experiencing a cardiac arrest while in the Magnet Room the following procedure should be followed:

- Call 000 providing details of location and type of emergency.
- Notify MRI Reception, NeuRA Reception and the Director of NeuRA Imaging of the situation, requesting medical or first aid assistance with a defibrillator being required.
- Notify staff in the immediate area of the situation
- Terminate the MRI procedure
- Bring the FlexTrak table frame into the Magnet Room, dock it against the table and remove the participant from the Magnet Room and place them in the Bed Preparation Room if it is safe to do so. This may require pat-sliding if table controls fail (see below.)
- The participant must be removed from the Magnet Room by **MRI staff ONLY** and transferred to the Bed Preparation Room
- Ensure doors to scanning rooms are closed
- Commence and maintain resuscitation or first aid procedures until medical assistance arrives.

3) Person Pinned to the Magnet:

In the event of someone being pinned to the MRI machine by a metal object the following procedure should be followed:

- The Radiographer should be alerted immediately.
- A medical assessment of the pinned person and the cause of the entrapment must be quickly undertaken to decide the appropriate course of action
 - Based upon the assessments the Radiographer will choose to adopt one of the following courses of action:
 - Quench the magnet
 - Contact service personnel from Philips so that the magnetic field can be ramped down.
 - Attempt to manually free the pinned person.
- Once the person has been freed the incident should be treated as a trauma medical emergency (see Point 1 above.)
- After any medical emergency has been dealt with, the Director NeuRA Imaging should be informed.

¹ NeuRA's Research Radiographer is First Aid certified.

- The accident/incident should be reported (protecting the privacy of the participant if required), on the NeuRA WHS accident and incident reporting tool on the intranet.

4) Quenches

Note: helium displaces oxygen creating a risk of asphyxiation

- If magnet quenches and no helium enters the magnet room:
 - remove persons from scanner room,
 - shut down scanner,
 - notify the NeuRA radiographer
 - contact Philips immediately on 1800251400
- If magnet quenches and helium enters the magnet room:
 - evacuate everyone from the MRI Facility,
 - remove persons from magnet room if safe to do so,
 - remember helium is light so stay low, there is likely to be a lack of oxygen in the room
 - shut down scanner,
 - notify the NeuRA radiographer,
 - contact Philips immediately

5) Fire

The procedure for dealing with a fire in the MRI Facility is in accordance with the NeuRA Evacuation Policy. Procedures specific to the MRI Unit are listed below.

- There is a MRI compatible fire extinguisher in the control room (**Do not take any other firefighting equipment into the magnet room**)
- The MRI Security Door unlocks during a fire alarm
- Remain low to avoid smoke and possible helium when exiting the room.
- Ensure the fire alarm has been activated. Use a break glass alarm at the nearest exit if necessary.
- The Radiographer will remind the arriving fire response team about the magnetic field hazard

6) Power outages/Failure

In the event of a power outage, the following procedures should be followed:

- Emergency lighting will come on immediately and all locks to the Facility will fail safe open i.e. locked doors become unlocked during power outages
- Without power, all table locks become disabled so the Radiographer can pull the table out of the scanner.
- The table cannot be lowered without power.

- If the participant is ambulant, then they will need to safely step off. Otherwise, use the MR compatible step.
- If the participant is non-ambulant: (A minimum of two people will be required for safe sliding/manual handling).
 - Bring the second FlexTrak frame, table and pat slide into the Magnet Room and put it beside the current table. The second FlexTrak frame is kept in the bed prep room. The pat slide is kept in the control room.
 - Adjust the height of the second table to its maximum height using the manual pump on the end.
 - Use the slide sheet or a bed sheet and safely put it under the participant. Slides sheets are kept in the shelf of the scan room and in the cupboard in the bed prep room.
 - Put the pat-slide under the participant (grip side down) by rolling them slightly. Ensure there is enough pat slide to bridge the gap between the two beds
 - Slide the participant onto the second table with care. Ensure everyone is ready and count down. The head coil may need to be removed and a pillow provided to prevent the head/neck being caught during the slide. The person on the side of the current table, pushes the participant at the shoulder and hip. The person on the second table reaches over, grabs the pillow and the slide sheet and guides the participant down. If the participant is tall then a two-step slide process may need to be done with legs or feet being the final part to come across.
- Bring the table or the participant out to the Bed Preparation Room.
- The scan room door is to be closed and locked if the power failure persists for a significant length of time.
- Once power has been re-established, check the chiller is on (small grey monitoring box on the wall immediately to the right of the entrance of the computer room). If it is off, call the Facilities Manager.
- Check for the “tweeting” or bird-like sound of the cold head system.
- Philips will need to be contacted for reporting/problem solving if chiller or cold head system problems persist.

7) Power interruption to the Chiller Unit

The magnet depends on a supply of chilled water to function. Check the chiller is on (small grey monitoring box on the wall immediately to the right of the entrance of the computer room). If it is off, call the NeuRA Facilities Manager. If chilled water supply to the scanners fails call Philips/UAP Cooling immediately.

8) Please utilise the NeuRA Emergency Procedures Guideline for any other emergencies relating to:

- Bomb Threat
- Hazardous Materials
- Environmental Hazards
- Personal Threats

Any incident or accident causing injury/damage to an individual, facility or equipment in the Magnetic Resonance Imaging Facility must be reported using the procedures outlined in the Magnetic Resonance Safety – Incidents (SWP03)

Relevant Personnel:

- MRI Radiographer – Ryan Castillo – Ext. 1110 – Mobile: 0431 773 626
- Radiologist – Ron Shnier – Ext. 1206
- NeuRA Imaging Director – Caroline Rae – Ext. 1211 – Mobile: 0407 467 677
- NeuRA Facilities Manager – Mark O'Hara – Ext. 1821 – Mobile: 0414 793 683
- Administration and Compliance Manager – Deborah McKay – Ext. 1676 – Mobile: 0402 403 955
- Philips Customer Support – 1800251400
- UAP Cooling - 1300886270

Codes of Practice/Standards:

The Royal Australian and New Zealand College of Radiologists:

- <https://www.ranzcr.com/search/ranzcr-mri-safety-guidelines>
- <https://www.ranzcr.com/our-work/quality-standards>

Other Procedures:

- Critical Incident Management Plan Policy (FAC01)
- Critical Incident Management Plan Procedure (FAC02)
- NeuRA First Aid Procedure (WHS20)
<https://intranet.neura.edu.au/pages/viewpage.action?pagelId=6848643&preview=%2F6848643%2F16450180%2FWHS20+FirstAid+Procedure.pdf>
- Follow NeuRA Emergency Procedures Flipchart 2018 located near the MRI control room phone or on NeuRA Intranet
<https://intranet.neura.edu.au/download/attachments/6062404/Emergency%20Procedures%20Flipchart%20-%20Dec%202018.pdf?api=v2>
- NeuRA Online Accident & Reporting Tool <https://forms.neura.edu.au/login>
- NeuRA Incident Report & Investigation Procedure (WHS31)
<https://intranet.neura.edu.au/pages/viewpage.action?pagelId=6848643&preview=%2F6848643%2F19824750%2FWHS31+Incident+Report+%26+Inv+estigation+Procedure+v2.0.pdf>
- Philips Instructions For Use: Ingenia CX/ Achieva dStream, Release 5, English, The Netherlands (2017)
- Philips MR Engineer Practical Tutorial