

Cardiac Arrest or Medical Emergency in FMRIB 3T

OUH PPE guidance – The minimum PPE for resuscitation, including compressions is gloves, surgical mask and apron. For COVID positive or suspected COVID patients, a FFP3 mask and eye protection are advised (resus trolley bottom draw). Rescue breaths are a personal choice, compression only CPR is acceptable until help arrives.

On suspicion of participant cardiac arrest or any medical emergency during scanning.

Scanner Operator	Researcher
Remove scanner bed from magnet bore	Wait
Check for response and breathing - is the Crash Team required?	
If Crash Team required ask Researcher to call 2222	<p>If instructed dial 2222 for the Crash Team and read the following to the Switchboard:</p> <p style="text-align: center;">ADULT team* to MAIN Building Level 0 FMRIB CENTRE Next to MRI</p> <p style="text-align: center;">*or Paediatric team for anyone under 18 years of age</p>
Prepare for transfer - remove equipment / coils and detach scanner table	<p>With Scanner Operator transfer scanner table to the 3T Prep Room and close Magnet Room door</p>
With the Researcher transfer scanner table to the 3T Prep Room	
Start CPR, when crash trolley arrives attach pads and start defibrillator	Take the resuscitation trolley to the 3T Prep Room (kept in the 7T corridor)
	Go to FMRIB main entrance and the direct Crash Team
	When a porter arrives request they collect the Resuscitation Grab Bag from OMRI and the LUCAS machine from the Emergency Department

UNDER NO CIRCUMSTANCES SHOULD ANY RESUSCITATION EQUIPMENT SUCH AS DEFIBRILLATORS BE TAKEN INTO THE MAGNET ROOM.

Quench in FMRIB 3T

Background

Superconducting magnets may occasionally lose field abruptly due to a process known as a spontaneous quench. Alternatively a quench may be performed deliberately in an emergency where life is at risk or the fire brigade must enter the magnet room.

If the magnet is properly installed and the cryogen levels are adequately maintained, spontaneous quenches are an extremely rare event. A quench, whether spontaneous or performed deliberately, will in general be accompanied by a loud bang and the emission of large quantities of cold gas. In normal circumstances this gas will be vented outside the building through quench piping.

For a quench where helium gas has vented externally

The O2 alarm will not be triggered.

Quickly remove the participant from the scanner using the table controls, lock the magnet room door, and call a Senior MR Staff Member.

For a quench where helium gas has entered the magnet room

The O2 alarm will be triggered (remember the O2 sensor intermittently trips so secondary evidence of a quench is required before treating the situation as one).

If a quench occurs and a volunteer is in the magnet room

- Stay calm and act quickly, immediate evacuation of the volunteer is required.
- Instruct the volunteer what is happening and, where possible, ask them to leave the MRI.
- Check for obvious signs of helium release (e.g. a white cloud of gas coming from the top of the magnet) before entering the room.
- Tell a second member of staff to wait outside.
- Enter, keeping low to the floor, and assist the volunteer.
- If the volunteer cannot leave immediately or the situation is severe, then press the fire alarm button and assemble by the main entrance.
- Using the external phone outside the FMRIB entrance, dial **4444** and ask for “**FIRE**”. When the Fire Service operator replies say “**Helium gas leak at**”:

**FMRIB Centre, John Radcliffe Hospital
Headley Way, Oxford, OX3 9DU**

Do not hang up until the address has been repeated back to you correctly. Proceed directly to the assembly point:

Car Park 1 (Car park to rear of FMRIB)

Senior member of FMRIB to advise fire crew on arrival of magnet hazard. Call a Senior MR Staff Member. Do not re-enter the magnet room or control room until a Senior MR Staff Member has confirmed that O2 levels have returned to normal.

Projectile or Ferromagnetic Incident in FMRIB 3T

Volunteer is **NOT** pinned or trapped by the object

DO NOT press the Quench button if the volunteer can be safely removed from the scanner.

Remove the volunteer, lock the magnet room door, and immediately inform a Senior MR Staff Member.

DO NOT attempt to remove the object. Doing so risks injury to yourself or damage to the magnet.

Volunteer is pinned or trapped by the object **AND less than 15min have passed**

Press either Magnet Quench button (located under a plexiglass cover).



The magnet field will take approx. 30-40 seconds to collapse. Do not take anything ferromagnetic into the magnet room until it has been confirmed the magnetic field has dissipated (the object will no longer be attracted to the magnet).

The situation should now be treated as per **Cardiac Arrest or Medical Emergency in FMRIB 3T**.

Volunteer pinned or trapped by the object **AND more than 15 minutes have passed**

DO NOT press the Quench button. The volunteer is at risk of crush syndrome and removing the object must be done under direct medical supervision.

Call a Senior MR Staff Member and then the crash team. Until there is a Senior MR Staff Member present you are responsible for screening any members of the crash team that require access to the magnet room.

Fire in FMRIB 3T Controlled Areas

Note the Siemens Electrical Power Off buttons will only stop power to the scanner, console computer and Siemens cabinets in the equipment room. The magnetic field will still be present.

On discovering a fire or smoke in one of these areas immediately press the Emergency Power Off switch. If it is quick and safe to do so, remove the participant from the scanner and close the magnet door.

DO NOT press the magnet quench button unless requested to do so by a Senior MR Staff Member or a member of the fire brigade.



Leave the control room, press the fire alarm in the outside corridor and summon help if possible.

If no-one is in the magnet bore take the CO2 fire extinguisher from the kitchen, and if it is safe to do so, attempt to extinguish the fire.

If there is someone in the magnet bore take the water fire extinguisher from the kitchen

- If possible remove the participant from the bore, extinguishing any fire on their person first before tackling the magnet fire.
- If removing the participant isn't possible, for example, due to greater risk of injury, direct the water extinguisher into the bore to attack the fire.

If the fire cannot be extinguished, lock the magnet room door if safe to do so and leave by the nearest fire exit. Once outside use the external intercom at the FMRIB entrance to dial **4444** and ask for **"FIRE"** (alternatively you can dial 999). When the Fire Service operator replies say **"Fire at"**:

**FMRIB Centre, John Radcliffe Hospital
Headley Way, Oxford, OX3 9DU**

Do not hang up until the address has been repeated correctly by the fire service. Proceed directly to the assembly point:

Car Park 1 (Car park to rear of FMRIB)

Senior member of FMRIB to advise fire crew on arrival of magnet hazard.

Electrocution in FMRIB 3T

Note the Siemens Electrical Power Off buttons will only stop power to the scanner, console computer and Siemens cabinets in the equipment room. The magnetic field will still be present.

If someone is being electrocuted from contact with the scanner, console computer or Siemens cabinets in the equipment room, **press the Electrical Power Off button.**



DO NOT press the magnet quench button unless requested to do so by a Senior MR Staff Member or a member of the fire brigade.

Remove the volunteer from bore of magnet by pulling the magnet table manually by disengaging the clutch and pulling on the handle at the foot of the bed.

If volunteer has been injured follow the procedure for **Cardiac Arrest or Medical Emergency in FMRIB 3T.**

Ensure the MRI scan room door is shut and secured and call a Senior MR Staff Member.