

BAMRR MRI Safety Week 2025



Day 5: Fire, Flood, Power Outage, RF Door Failure, Unwell patient,

Projectile Incident, Phantom Spillage, Gradient Error and Scenario Training in MRI:

Fire:

- Follow your organisational policies and procedures
- Ensure you are familiar with your local fire plans
- In the event of fire in MRI, only MR Safe or MR conditional fire extinguishers should be used to tackle a fire



Do you :

- Know where the panel for turning off any medial gases in MRI in an emergency is located?
- Know what types of fire extinguishers (CO2, foam etc) you have in your department and where they are located?
- Have an illuminated sign to alert any external staff of the dangerous magnetic field?



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- If members of the fire service need to bring any standard firefighting equipment into the MR Environment then appropriate to quench the magnet first.
- However, even if the fire is in the MR Environment, the fire service may decide they do not need to enter the room and so it may be worth postponing a decision to quench the magnet until they arrive.
- If necessary, cut the electrical power to the MR scanner using one of the emergency mains power off buttons.
- Ensure that any key non-MRI personnel who may be involved in responding to a fire in the MRI unit are aware of the hazards and are happy with the local procedures if such an event occurs

The MHRA recommend that *'Departments invite their local fire service to visit so they can familiarise themselves with the department or mobile MRI scanner trailer'*.



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Flood:

- Follow your organisational policies and procedures
- Location of the flood is important- Does it involve the technical room, magnet room, just outside magnet room?
- Potential for water damage to RF cage?
- Consider cutting the electrical power to the MR scanner to minimise the risks associated with water seeping into electrical connections.
- The emergency mains power off buttons should be clearly labelled to avoid potential confusion with the magnet quench button.
- Is there a need to protect other MR equipment- RF coils, monitors, GA machines, contrast pump injector in the magnet room?
- Do you have a leak detection system cable in your technical room floor?
- Where does it alarm? – via the estates building management system (BMS) or locally within MRI?
- Who responds to the alarm if goes off out of hours?



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Power Outage:

- Follow your organisational policies and procedures
- How you will move non-ambulatory patients out of the MRI scanner in the event of a power cut?
- Does your table undock or do you use an MR conditional trolley?
- Do you keep a patslide and glide sheet together in the magnet room for emergencies?
- Do you need to re-set the compressor in the technical room or will it restart automatically?
- Do you need to reset any other buttons?
- Are there emergency lights in the magnet room and department?
- Is critical equipment plugged into special emergency sockets?
- Does your scanner have an uninterrupted power supply (UPS) box to prevent data loss?
- If you are working on a mobile scanner, do you know how to access the external trailer lockers and internal cupboards that house the power supply unit, fuses and compressor?
- What about the trailer lift and shutter door?



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RF Door Failure:

- Follow your organisational policies and procedures
- Most scan rooms have only one entrance (except intraoperative systems) through an RF door with a lock.
- The RF door could fail to open if a mechanical handle breaks or even a fixed style handle can break.
- Consider how you will deal with the possibility of the magnet room RF door mechanism failing if it is power operated?
- What happens if your RF door handle breaks?
- Is there a 'cat flap' or override system if it is a pneumatic door?
- Is it something stuck under the door preventing it from opening?
- How do you contact estates or RF door manufacturer?
- Do you need to smash the RF window in order to escape?



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Unwell Patient/Cardiac Arrest:

- Follow your organisational policies and procedures
 - Engage regularly with your resuscitation team.
 - Practice 'pretend evacuation drills' on different days, so all MRI staff can attend.
 - Feedback on what worked well and what could be improved upon.
 - Do you know where your nearest crash trolley, emergency drugs and defibrillator are kept?
 - Do you keep a patslide and glide sheet together in the magnet room for emergencies?
 - Does your scanner table undock or do you use an MR conditional trolley?
 - Do you know how to use the quick table release function?
 - Can you use a defibrillator on your scanner table?
-
- If you are working on a mobile MRI unit, have the local resuscitation team visited the trailer?
 - What resuscitation equipment is kept on the unit? (Defibrillator, O2, grab bag, emergency drugs)
 - Do you know how to use the MR conditional trolley?



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Projectile Incident:

- Follow your organisational policies and procedures
- Any ferromagnetic object inadvertently brought into the magnetic field surrounding an MRI scanner will be pulled towards the scanner causing a projectile incident
- If a projectile incident results in a person becoming pinned to the MRI scanner in a life-threatening manner, then an emergency magnet quench should be initiated.
- Be aware that ferromagnetic objects will fall away from the scanner once the magnetic field drops off (typically within a few seconds after the magnet quench is initiated).
- Particularly with larger ferromagnetic objects care should be taken when this happens to avoid further harm.
- In a non-life-threatening incident staff should not attempt to pull large ferromagnetic objects off the MRI scanner since there is a possibility of damage to the magnet windings in addition to the risk of injury to the person.
- Instead the MRI manufacturer should be informed and a controlled ramp down of the MRI scanner can be performed by engineers in order to release the object.
- Do you have an SOP for a stray untethered object in the scanner room? (eg an unsafe oxygen cylinder on a trolley that is already pinned to the scanner but the cylinder is not but has the potential to become a projectile)

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Phantom Spillage:

- MR phantoms are used for quality assurance testing of the MR system.
- They are usually filled with aqueous paramagnetic solution.
- Whilst handling a sealed phantom is not hazardous, if it were to leak or be dropped and smash, the contents (nickel) can be toxic.
- MR departments should follow the manufacturers' guidance in accordance with COSHH, on the storage and handling of MR phantoms, keeping a record of their contents, to be passed onto the fire team in the event of a fire within the magnet room.
- Do you have a risk assessment for MRI phantoms?
- Do you have an SOP for dealing with phantom spillages, clean up and disposal?
- Do you have a phantom spill kit in your department?
- Personal protective equipment (apron, gloves, face mask and glasses) must be worn when dealing with spillages and pregnant staff should not deal with a spillage.



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Gradient Error Warning :

➤ This pop up dialog box will appear on the scanner console when a gradient malfunction is detected

An alarm message

Scanner hardware error

Automatic shutdown!

Evacuate patient immediately from the examination room!

To prevent further damage, the system will be switched to Standby within 1 minute!

Immediately move the patient out of the magnet bore by pressing the Home Position button.

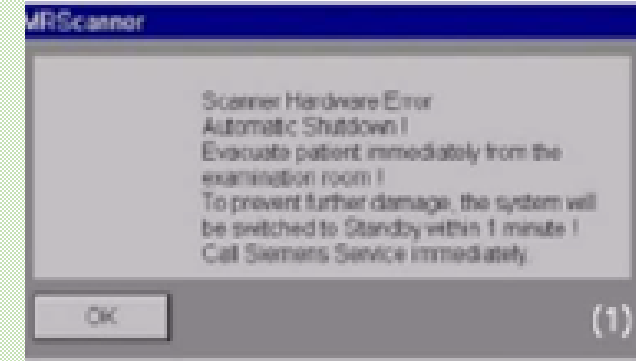
Within the next 60 seconds, the system will be switched to Standby automatically.

Then, the patient table motors can not be operated any longer.

Call Siemens Service.

➤ The box is usually located above the gradient cabinet in the technical room

Have you been shown this?



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Scenario training

Advantages of scenario training	Difficulties with scenario training
Hands on-practice	Time constraints- waiting list pressures
Encourages team building	Magnet room availability- lists 24/7 now
Importance of feedback and de-briefing sessions	Staff availability – shift patterns makes scheduling hard and extended days mean fewer days in work
Improved staff confidence and team working	Infrequency means reduced retention of information and not habitual.

BAMRR would once again like to thank **e-learning for Healthcare** (elfh) for their permission to reproduce some materials from the MR safety course and would encourage you to visit their website and undertake the MRI training sessions.

<https://www.e-lfh.org.uk/programmes/mri-safety/>

BAMRR are also pleased to direct you to what BIR and ISMRT and SCoR have produced for MR Safety Week

<https://bir.org.uk/get-involved/special-interest-groups/bir-magnetic-resonance.aspx>

<https://www.ismrm.orgmr-safety-links/mr-safety-week-2025//>

<https://www.sor.org/>

Materials from MR Safety Week from previous years are available on the BAMRR website <https://www.bamrr.org/safety/>

Finally, BAMRR hopes you have found the information provided on alarms, system monitoring and preparing for emergency situations in MRI useful.

- Are you confident about responding to alarms and emergency situations in MRI?
- Do you have clear policies about when you should and should not scan regarding all alarms/faults?

To find out more information about BAMRR membership options, upcoming BAMRR courses and details of our annual BAMRR conference in London, please check out our website at <https://www.bamrr.org/>

Hope to see you at one of our events soon. **BAMRR** 😊

Until then, please stay



BAMRR Conference London 4th October 2025



BOOK NOW

<https://www.bamrr.org/bamrr-2025-conference/>



Holiday Inn
Kensington High St,
London W8 5SP



SCAN ME TO BOOK

Agenda to include:

- Neuro
- Safety
- MR Guided Intervention
- Remote Scanning
- ..and much more!

Get inspired at our annual conference! Expert speakers, CPD and networking opportunities!