NHS Greater Glasgow and Clyde

**ID: DR-GGC-RISK-086**

# Risk Assessment Form

Use this form for any detailed risk assessment unless a specific form is provided. Refer to your Summary of Hazards/Risks and complete forms as required, including those that are adequately controlled but could be serious in the absence of active management. The Action Plan and reply section is to help you pursue those requiring action.

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|---|---|---|---|
| **Name of Initial Assessor /Reviewer:** | Blair Johnston | **Post Held:** | Clinical Scientist |
| **Department:** | **Imaging** | **Date (Initial Review):** | **31/05/2021** |

**Subject of Assessment:** E.g.: hazard, task, equipment, location, people

MRI: RF magnet room door failure

**Hazards** (Describe the harmful agent(s) and the adverse consequences they could cause)

The majority of MRI scan rooms have a single mode of entry, through a radiofrequency (RF) shielded door. If this door fails to open, patients may become trapped in the room.

**Description of Risk**
Describe the work that causes exposure to the hazard, and the relevant circumstances. Who is at risk? Highlight significant factors: what makes the risk more or less serious – e.g.: the time taken, how often the work is done, who does it, the work environment, anything else relevant.

There have been a number of reported incidents across the UK where these RF doors have failed to open. This is most common in doors that use a mechanical handle, as opposed to push/pull doors but there has been a report of an object becoming wedged under the door preventing access which could occur with any door design[1].

Whilst this is concerning for any patient, this presents a greater risk in the event of an emergency e.g. a fire, spontaneous magnet quench, cardiac arrest or anaphylactic reaction to a contrast agent. This situation is also particularly problematic for patients with specific monitoring or care requirements such as children, anaesthetised patients or those with breathing difficulties. Patients may also become distressed due to an inability to get out of the magnet bore or magnet room.

At least one scanner vendor advises that contingencies are in place in the event of a door failure.

The RF window in the MR control room is often suggested as a possible emergency access point. However, the MHRA guidelines state “It will be very difficult to break the control room window as it may consist of four layers of glass with mesh bonded between each of 2 layers”[2]. This was echoed by a RF cage manufacturer representative who stated it “would be quicker to dismantle the door” (George Byers, 2021 personal communication).


1. McCann AJ, McKenna L, Wilson PC, Kanal E & McGrath C (2019) “Scanner Room Doors – An Overlooked Hazard in MRI?, IPEM MR Safety Update
2. MHRA Safety Guidelines for MRI Equipment in Clinical Use v4.3 – February 2021

| Existing Precautions | Describe how they might fail to prevent adverse outcomes. |
|---|---|
| 1. Most incidents have occurred in RF doors with mechanical handles. These are less common in newer MRI sites.<br>2. The more common fixed handle designs are less likely to fail.<br>3. For MR scan room doors with powered mechanisms, the emergency override should allow the door to open in most cases<br>4. Some sites have an emergency exit or a hatch in the door that would allow the patient to escape or staff to enter to attend to the patient.<br>5. If the patient is able, it is possible they can remove themselves from the scanner and assist with dislodging the door.<br>6. Where these incidents have occurred, sites have reported estates were able to open the door or they could break the RF window<br>7. All departments should have a hammer (similar to those near emergency exits on trains) in the event the RF window needs to be smashed.<br>8. A preventative maintenance schedule should be in place for scanner room doors. This should include repair or replacement of loose or twisted RF fingers, and cleaning of deposits around door frames and floor sills which may cause sticking.<br>9. Security locks (e.g. dead bolts) should be separate from the closing/latching mechanism, and should be openable from inside the room without need of a key. They should not be engaged while the room is occupied as this presents an additional risk of entrapment. Other security measures (i.e. zoning, access control, physical barriers) should be in place during scanning hours to prevent unauthorised entry to the room.<br>10. During design or renovation, MRI departments should opt for doors less likely to fail through mechanical fatigue (e.g. push-closed, fixed-handle designs).<br>11. However, no design is immune from failure or compromise (e.g. jamming due to the presence of a foreign body), therefore designing multiple entrances to the scanner room should be considered where possible. | Whilst access to the MR scan room will be restored, it may take some time. This may be a risk for vulnerable patients or in the event of an emergency situation. These more critical circumstances may require faster escalation. |

**Level of Risk -** Is the control of this risk adequate?
Give more than one risk level if the assessment covers a range of circumstances. You can use the 'matrix' to show how 'likelihood' and 'consequences' combine to give a conclusion. Also, be critical of existing measures: if you can think how they might fail, or how they could be improved, these are indications of a red or orange risk.

### Risk Matrix

| Likelihood | Impact/Consequences | | | | |
|---|---|---|---|---|---|
| | Negligible | Minor | Moderate | Major | Extreme |
| Almost Certain | Medium | High | High | V High | V High |
| Likely | Medium | Medium | High | High | V High |
| Possible | Low | Medium | Medium | High | High |
| Unlikely | Low | Medium | Medium | Medium | High |
| Rare | Low | Low | **Low** | Medium | Medium |

**Very High** **High** **Medium** **Low**

### Current risk level

Given the current precautions, and how effective and reliable they are, what is the current level of risk? **Green** is the target – you have thought it through critically and you have no serious worries. Devise ways of making the risk green wherever you can. **Yellow** is acceptable but with some reservations. You can achieve these levels by reducing the inherent risk and or by effective and reliable precautions.
**High (Orange) or Very High (Red) risks are unacceptable and must be acted on: use the Action Plan section to summarise and communicate the problems and actions required.**

## Action Plan (if risk level is **High (Orange) or Very High (Red)**

Use this part of the form for risks that require action. Use it to communicate, with your Line Manager or Risk Coordinator or others if required. If using a copy of this form to notify others, they should reply on the form and return to you. Check that you do receive replies.

Describe the measures required to make the work safe. Include hardware – engineering controls, and procedures. Say what you intend to change. If proposed actions are out with your remit, identify them on the plan below but do not say who or by when; leave this to the manager with the authority to decide this and allocate the resources required.

| **Proposed actions to control the problem**<br>List the actions required. If action by others is required, you must send them a copy | **By Whom** | **Start date** | **Action due date** |
|---|---|---|---|
| | | | |

**Action by Others Required - Complete as appropriate: (please tick or enter YES, name and date where appropriate)**

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|---|---|
| **Report up management chain for action** | |
| **Report to Estates for action** | |
| **Contact advisers/specialists** | |

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| **Alert your staff to problem, new working practice, interim solutions, etc** | |

**Reply**

**If you receive this form as a manager from someone in your department, you must decide how the risk is to be managed. Update the action plan and reply with a copy to others who need to know. If appropriate, you should note additions to the Directorate / Service Risk Register.**

**If you receive this as an adviser or other specialist, reply to the sender and investigate further as required.**

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|---|---|---|---|
| **Date of last review:** | As per QPulse record | **Next review date:** | As per QPulse record |