

MR safety terminology

Clarity is required when describing the risk posed by bringing an object into the MR environment. There are 3 established terms which have specific definitions: MR Safe, MR Conditional and MR Unsafe. These terms have an associated colour-code and specified symbols which can be used on item marking. It is recommended that all equipment which may be taken into the MR Environment is clearly labelled using these markings. These terms are defined in the MHRA guidelines [1] in the following way:

MR Safe

An item that poses no known hazards resulting from exposure to any MR environment. MR Safe items are composed of materials that are electrically nonconductive, nonmetallic, and nonmagnetic



MR Safe

MR Conditional

An item with demonstrated safety in the MR environment within defined conditions. At a minimum, address the conditions of the static magnetic field, the switched gradient magnetic field and the radiofrequency fields. Additional conditions, including specific configurations of the item, may be required.



MR Conditional

MR Unsafe

An item which poses unacceptable risks to the patient, medical staff or other persons within the MR environment.



MR Unsafe



This anaesthetic machine is MR conditional, but static field conditions require attention to distance to the scanner and field strength markings (arrow)

Older items, including equipment (such as wheelchairs and trolleys) and implantable devices (such as aneurysm clips or coils) may have been labelled as MR Safe or listed in databases as MR safe at specific field strengths. This refers to an older version of the terminology. Under the current terminology, these would now be labelled as MR Conditional.

If an MR Conditional item is to be brought into the MR environment it is necessary to know the conditions and how they apply. Abbreviated conditions may be written on the device, but devices with complex conditions and implanted devices will require reference to the device manual or similar document. The conditions will depend on the type of equipment and its use and construction. Equipment intended for use outside the scanner bore may need to remain a distance from the scanner in order to meet static field limits. Equipment intended for use in the scanner, such as patient monitoring, or implanted devices will require more conditions. The 2018 BIR safety week contains more detail on safety parameters which may impact on MR conditions. [2]

MR conditions may change with time as a result of reported incidents, errors in the original labelling or better understanding of the physics. It is important to ensure that the most recent copy of the conditions is used.

A new term "MR unlabelled" has recently been introduced to allow some flexibility where a particular object or implant has not been tested. This is the subject of the next sheet.

[1] <https://www.gov.uk/government/publications/safety-guidelines-for-magnetic-resonance-imaging-equipment-in-clinical-use>

[2] <https://www.bir.org.uk/media-centre/news/2018/july/mri-safety-week-advice-sheets/>