*Cover sheet for the position statement*

*Nordic Societies for Radiographers (NSR)*

*Date: 26.05.2025*

*Position statements from the NSR can be used in societies political work, aiming to impact policy, practice, and public awareness by clearly articulating a stance on an issue.*

*The topic MR safety and the role of the radiographers has been discussed at national level for several years, together with a demand to establish a cooperation on the topic at Nordic level. After a ISRRT MR Safety seminar in Copenhagen September 2024, the Nordic Societies of Radiographers (NSR) decided to establish a working group to develop a joint policy document.*

*At a workshop in January 2025, the group drafted a joint position statement supported by a well-recognised list of references, that outlines the essential role of radiographers in MR safety and the recommended competencies necessary to maintain a safe MR environment. It was also decided to ask for endorsement of the position statement from the international societies ISRRT and EFRS, together with the ISMRT.*

*This position statement on MR safety, aims to influence policymakers, best practice guides, raises awareness, builds consensus, and supports advocacy efforts. It may be a powerful tool for driving change and aligning actions with expert consensus and evidence.*

## Improving patient safety in Magnetic Resonance (MR) scanning

### Several accidents in recent years increase the need for a greater focus on MR safety for patients and personnel

The Nordic Society of Radiographers (NSR) promotes the highest standards of MR safety. This position statement outlines the essential role of radiographers in MR safety and the recommended competencies necessary to maintain a safe MR environment, drawing on the guidelines established by leading scientific and medical societies [1-5]. In addition to secure safe MR procedures, it is imperative that they are conducted by highly qualified and specialized radiographers to ensure optimisation of image quality, and to maintain the highest standards of medical care [6].

A well-known example of a fatal accident is from 2001 in New York, where a 6-year-old boy was killed by a metal oxygen tank during the MR-exam [7]. In recent years, several deaths have been reported internationally. Also, in the Nordic region, there have been life-threatening accidents. Furthermore, it is known that many incidents are not reported [8-10].

### Increasing challenges ensuring patient safety at MR

MR is a common modality. There are around 800 MR units in the Nordic Countries [11] and the number of exams has increased by approximately 10% per year [12]. MR units are also installed in various environments, such as operating theatres, research facilities, nuclear medicine-, radiotherapy- and cardiology departments. Also challenging is the discrepancy between the increase of MR equipment and the need for qualified personnel, not only to operate it but also to ensure quality, and most of all, safety.

Ensuring MR safety in medical imaging is dependent on several stakeholders and has become increasingly complex due to several factors [13, 14], i.e. increasing throughput, number and demands for MR examinations, a move towards more diverse field strengths, development of hybrid MR modalities like MR-Linac and PET-MR, more implants and device interference, increasing shortage of radiographers and implementation of remote MR scanning.

**Legislation regarding patient safety and safety for workers**

All Nordic countries adhere to the WHO's definition of patient safety and have a comprehensive framework for patient safety that emphasizes the importance of knowledge, skills, competencies, and responsibilities for healthcare professionals [15].

Legislation regulating the activities of radiographers is subject to laws in each Nordic country [15], including the Health Personnel Act, the Radiation Protection Regulations, and the Specialist Health Services Act. In addition, radiographers are regulated by their own authorisation as professionals. Patient safety related to MR examinations is not specifically detailed in any of the Nordic Countries, but the laws stipulate that the principle of professional soundness must be maintained at both individual and organizational levels.

**Role of Radiographers in MR Safety**

Radiographers are essential in ensuring the safe operation of MR equipment and the safety of patients, staff, and the public. The responsibilities of radiographers include, but are not limited to:

1. **Knowledge of MR Physics and Technology**: Understanding the principles of MR, including the behaviour of magnetic fields and radiofrequency pulses, and the operation of MR equipment to ensure patient safety and examination quality.
2. **Patient Screening and Preparation**: Performing thorough patient screening to identify any implants or objects that may need further investigation before entering the magnetic field of the scanner. Prepare the patient for the exam, including ensuring compliance with any MR-specific implant conditions.
3. **Staff screening**: Screening of staff and/or external personnel to identify MR unsafe conditions of devices.
4. **Patient Care and Communication**: Showing great patient care, including clear and effective communication to explain the procedure, ensure patient safety and help ease any anxiety.
5. **Safety Protocols**: Implementing and adhering to established MR safety protocols to prevent accidents and ensure compliance with regulatory standards.
6. **Education and Training**: Providing education to internal and external personnel about MR safety, including the importance of removing metallic objects and understanding the risks associated with the MR environment.
7. **Emergency Response**: Being prepared to respond to emergencies, such as patient distress and technical issues, with appropriate actions and interventions.
8. **Equipment Inspection**: Regularly inspecting MR equipment to ensure it operates safely and effectively.
9. **Continuing Professional Development**: Engaging in ongoing professional development to stay current with advancements in MR technology and safety standards.

**Need for a higher level of specialised competencies in MR safety.** Radiographers with relevant post-graduate education and training have a specialised role within the MR safety framework. Various publications and guidelines refer to the role as an MR Safety Officer (MRSO) including a teamwork approach with MR Medical Director/MR Research Director (MRMD/MRRD) and MR Safety Expert (MRSE) [1, 3, 5]. The role of MRSO is often carried out by the senior Radiographer [5]. Multiple MRSOs could be appointed, provided only one is in charge at a given time.

The Nordic Society recommends the MRSO role for a senior radiographer with post-graduate education, preferably an education with ECTS points associated, and relevant clinical experience in MR for a minimum of two years. The senior radiographer in this role should have responsibilities such as, but not limited to, what is described in the EFRS' *Magnetic Resonance Safety Officer (MRSO) Role Descriptor: An European Qualifications Framework (EQF) benchmarking document* [1, 2].

1. **Policy Development and Implementation**: Developing and implementing MR safety policies and procedures in accordance with national and international guidelines.
2. **Safety and Risk Assessment**: Conducting regular risk assessments to identify potential hazards and implementing measures to mitigate these risks.
3. **Training and Competency Assessment**: Ensuring that all MR staff are adequately trained and competent in MR safety practices. Coordinate the definition of internal training guidelines and the organisation of internal training and refresher courses. [14, 16]
4. **Incident Investigation**: Investigating any MR safety incidents and implementing corrective actions to prevent a recurrence.
5. **Regulatory Compliance**: Ensuring compliance with all relevant regulatory requirements and standards.

**Conclusion**

The Nordic Societies of Radiographers emphasize the crucial role of radiographers in ensuring and maintaining MR safety. However, the current lack of specific legislation and regulation on MR safety poses a significant risk. It is imperative that stakeholders address this gap, recognising the role of Radiographers as qualified personnel and implementing comprehensive MR safety standards. Recognized MR Safety education and specialised roles, such as the MR Safety Officer, are essential in ensuring a safe MR environment. All stakeholders must take proactive measures to ensure the safety of patients and healthcare workers.

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The Position Statement is endorsed by the International Society of Radiographers and Radiological Technologists (ISRRT), The European Federation of Radiographer Societies (EFRS) and the International Society of MR Radiographers and Technologists (ISMRT).

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