Short-term effects during examinations in an actively shielded 7T MR

The number of magnetic resonance (MR) examinations in clinical routine and research are increasing rapidly along with the range of indications and body parts to be examined. Technical advances have allowed an increase in MR field strengths to ultra-high fields (UHF above a Tesla), homogeneous enough to create images of very high quality, and opening up new insights into disease pathophysiology. Increasing field strength, new technical advances, such as actively shielded UHF scanners, and the urge to move to diagnostic clinical scanning at UHF, justify taking another look at nursing care factors related to possible short-term effects experienced during MR examinations.

The purposes of our study are to collect information on frequency and quality of short-term effects reported by research personnel after examinations (n=54) performed during a six-month period in an actively shielded UHF 7T MR, to extract knowledge from the data that allows us to design patient-oriented and personalised care models and to facilitate future examinations that are both as comfortable as possible and of the highest diagnostic quality.

Special focus is set on the occurrence and strength of short-term effects, their dependence on spatial position and motion in the scanner in relation to isocenter, and the comparison to published data from passively shielded magnets. Research subjects undergoing 7T MR within the department of radiology & nuclear medicine of the EMC, which is a five-star facility.

ECT Today: Your radiology department joined the EuroSafe Imaging Stars initiative. What is your opinion on the EuroSafe Imaging survey findings? Will you apply the EuroSafe Imaging Stars initiative? If so, what arguments would you use to convince them?

BY BOEL HANSSON

Information and support is provided before entering the 7T magnet.

EuroSafe Imaging Stars is EuroSafe Imaging’s latest initiative to promote quality and safety in medical imaging. By recruiting a network of imaging departments committed to best practice in radiation protection, the Stars initiative makes radiation protection efforts greater visibility, have a direct impact on clinical practice and establish a EuroSafe Society of Radiology to collect data for analysis and benchmarking.

The EuroSafe Imaging Stars institutions is the department of radiology & nuclear medicine, headed by Professor Gabriel P. Kraus, part of the Erasmus Medical Center in Rotterdam. The EMC is the Netherlands’ largest university medical center, committed to a healthy population and excellence in healthcare through research and education.

Please read below an interview with Dr. Marcel van Straten from the department of radiology & nuclear medicine of the EMC, which is a five-star facility.

Marcel van Straten: We applied for the Imaging Stars network because it allows us to share our experience in medical radiation protection with others and to share it with our patients. This initiative reflects our own efforts on this topic within our department.

ECRT: What are your suggestions for improving the EuroSafe Imaging Stars initiative? Will you apply the EuroSafe Imaging survey findings? Will you recommend other facilities to become EuroSafe Imaging Stars? If so, what arguments would you use to convince them?

Marcel van Straten: I expect that the Stars initiative will give radiation protection the direct impact on clinical practice that it deserves.

Willengnusse to undergo a future 7T MR was high both as research subject and patient (90%, 96%). Actively shielded 7T MR examinations are well tolerated although short-term effects such as inconsistent movement, dizziness and tinnitus are more commonly reported compared to literature on passively shielded UHF systems.

Healthcare managers assuring patient compliance with UHF MR could preferably focus on increasing acceptance of short-term effects by means of cognitive and behavioural methods to cope with short-term effects combined with practical measures facilitating an examination for patients – such as increased comfort, balanced information and instructions, reassurance during examinations and empathic care.