The methods to improve occupational well-being in MRI units

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ABSTRACT

MRI units are unique workplaces where workers may experience adverse health effects due to strong magnetic fields. The symptoms can vary from vertigo to disturbance in eye-hand coordination. These are mainly caused by movement in a static magnetic field which induces electric fields inside the body.

In addition, the personnel are exposed to an average of 80-90 dB noise level during a MRI scan (even 130 dB peaks).

Changing of a 3 T MRI coil between scans.

PURPOSE

A three year project on occupational well-being in MRI units in Finland was started in the beginning of 2012. The aims of the project are to improve

- working conditions,
- well-being, and
- safety of workers in MRI units.

These end-points will be achieved by

- assessing accident risks,
- identifying factors influencing well-being at work,
- measuring motion induced fields,
- measuring noise levels and
- developing practices for physical examination of the personnel in MRI units.

METHODS

The project consists of two parts:

1. A questionnaire to MRI personnel (X-ray workers used as controls)
   - to investigate the practices in different MRI units
   - to find out if the safety levels are sufficient
   - to survey the attitude of different occupational groups to the exposure to magnetic fields and noise
   - to get information on the quality of life, work stress, and subjective discomfort caused by the exposure
2. Measurements of static magnetic fields and noise near 1.5 T and 3 T MRI scanners. Special interest in:
   - movement in strong static magnetic field -> exposure to motion induced fields will be determined in typical working situations and the results will be compared to the proposed guidelines of ICNIRP
   - noise level outside the scan room (in a control room)

RESULTS

The project will provide:

- an extensive summary of the safety of current MRI imaging practices as well as about the future scenarios
- valuable information to avoid the inconveniences of the strong magnetic fields and to improve the acoustic comfort of working environment
- instructions to reporting accidents and near-miss situations -> better chances to react to common problems in MRI units
- code of practice for healthcare personnel for safe working with MRI

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