TITLE: Acoustic Noise During Magnetic Resonance Imaging Scan: Harms and Guidelines

DATE: 26 March 2015

RESEARCH QUESTIONS

1. What are the harms associated with acoustic noise produced while adult patients are undergoing a magnetic resonance imaging (MRI) scan?

2. What is the clinical evidence for providing hearing protection to adult patients undergoing an MRI scan?

3. What are the evidence-based guidelines regarding acoustic noise and hearing protection for adult patients undergoing an MRI scan?

KEY FINDINGS

Two non-randomized studies were identified regarding acoustic noise during magnetic resonance imaging scans.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2015, Issue 3), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2010 and March 14, 2015. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.
SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

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<th>Table 1: Selection Criteria</th>
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<td>Population</td>
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| Intervention | MRI scan using 1.5 or 3.0 Tesla MRI scanner  
Use of hearing protection |
| Comparator | No comparator  
No hearing protection |
| Outcomes | Noise levels associated with patient harms (e.g., hearing)  
Guidelines for accepted threshold value of acoustic noise during MRI  
Guidelines for provision of hearing protection to patients during MRI |
| Study Designs | Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, evidence-based guidelines |

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

Two non-randomized studies were identified regarding acoustic noise during magnetic resonance imaging scans. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, or evidence-based guidelines were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

Two non-randomized studies\(^1\)\(^2\) were identified regarding acoustic noise during magnetic resonance imaging (MRI) scans. One study\(^1\) fitted patients with foam earplugs before undergoing MRI scans and reported that patients did not experience a temporary threshold shift in their hearing. Another study\(^2\) reported no significant relationship between hearing protection policy and potential acoustic trauma cases after MRI scans; however, potential acoustic trauma cases were more commonly reported in facilities with 3 T scanners.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses
No literature identified.

Randomized Controlled Trials
No literature identified.

Non-Randomized Studies


Guidelines and Recommendations
No literature identified.

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APPENDIX – FURTHER INFORMATION:

Systematic Reviews – Pediatric Population


Non-Randomized Studies – Pediatric Population


Clinical Practice Guidelines – Methodology Uncertain
