TITLE: Advanced MRI Technologies for Brain Imaging: Clinical Effectiveness

DATE: 31 October 2011

RESEARCH QUESTION

What is the clinical effectiveness of advanced magnetic resonance imaging (MRI) technologies versus standard imaging technologies for patients requiring brain imaging?

KEY MESSAGE

Evidence suggests that MRI technologies with increased magnet strength provide better image quality and increased detection of brain lesions. Advanced MRI technologies, including functional MRI, diffusion tensor imaging, and magnetic resonance spectroscopy, are clinically useful in providing diagnostic information for specific diseases.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2011, Issue 10), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials and non-randomized studies. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2006 and October 24, 2011. Internet links were provided, where available.

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 and non-randomized studies.

One health technology assessment report, one systematic review, and twenty-four non-randomized studies were identified regarding the clinical effectiveness of advanced MRI.
technologies for patients requiring brain imaging. Additional references of potential interest are provided in the appendix.

Health Technology Assessments


Systematic Reviews and Meta-analyses


Randomized Controlled Trials
No literature identified.

Non-Randomized Studies

Functional MRI


MRI - 3 Tesla versus 1.5 Tesla


Diffusion tensor imaging


Magnetic resonance spectroscopy


APPENDIX – FURTHER INFORMATION:

Review Articles


Non-randomized studies – MRI versus CT/PET scan


