Title:	Breast magnetic resonance imaging
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Reference:	MSAC Application 1098 Assessment report First printed May 2007 ISBN 1 74186 203 5

Aim: To assess the safety, effectiveness and cost-effectiveness of magnetic resonance imaging (MRI) of the breast as an addition or replacement to mammography with or without breast ultrasound for screening asymptomatic high-risk women under the age of 50 years; and in those aged 50 years and older.

Results and conclusions
Safety: Breast MRI is a safe procedure in patients without contraindications to exposure to magnetic fields.
Effectiveness: No randomised controlled trials have assessed MRI in breast screening for evidence about its impact on patient outcomes. Accuracy studies have provided strong evidence that MRI is a more sensitive and less specific test than mammography for detecting breast cancer. There was consistent evidence that adding MRI to mammography provides a 2.6-fold increase in test sensitivity (MRI+mammography sensitivity 94% [95% CI 86-98%]; mammography sensitivity 36% [95% CI 25-48%; incremental sensitivity of MRI 58% [95% CI 46-70%]). Estimates of test specificity using MRI varied, but one study showed a 3-fold increase in the rate of investigations for false positive findings. Existing evidence that mammography has a higher sensitivity in older women suggests the incremental accuracy of MRI is likely to be lower in this age group. There was a lack of clinical evidence to determine the health benefits gained by earlier detection of breast cancer in women at high risk.
Cost-effectiveness: Based on modelled estimates of the effects of early detection, MRI may potentially be cost-effective for screening very high-risk women such as BRCA1 mutation carriers aged 35-54 years, but is unlikely to be cost-effective for screening BRCA2 carriers or women with a wider risk or age distribution. The total additional cost of implementing MRI for breast cancer screening will depend on the cost and uptake of the procedure, the sensitivity of standard mammography screening protocols that include the option of performing a screening ultrasound and patient baseline risk.

Recommendation: Breast MRI, when combined with mammography, is safe and effective in the diagnosis of breast cancer in asymptomatic women at high risk, when used as part of an organised surveillance program. Evidence suggests that breast MRI in combination with mammography may be cost-effective when compared with mammography alone in high risk women aged less than 50 years.
MSAC recommends interim public funding for breast MRI in the diagnosis of breast cancer in asymptomatic women with a high risk of developing breast cancer when used as part of an organised surveillance program. Evidence should be reviewed in not less than 3 years.The Minister for Health and Ageing endorsed this recommendation on 5 February 2007

Methods: MSAC conducted a systematic review of the biomedical literature up to March 2006 to assess the safety and effectiveness of breast MRI. A published evaluation of the cost-effectiveness of MRI for screening women at high risk of breast cancer in the United States was used to discuss economic considerations. A secondary economic analysis was performed based on this model, but excluding indirect costs and applying Australian relative prices.