

Title:	Faecal occult blood testing for population health screening
Agency:	Medical Services Advisory Committee (MSAC) Commonwealth Department of Health and Ageing GPO Box 9848 Canberra ACT 2601 Australia
Reference:	MSAC Reference 18 Assessment Report First printed: October 2004; ISBN 0 642 82545 9 http://www.msac.gov.au

Aims

To assess the relative performance and cost-effectiveness of commercially available faecal occult blood tests (FOBTs) for population health screening. To provide suggestions as to the most promising FOBTs available at this time and to advise on the most cost-effective setting for FOBT screening.

Conclusions and results

Safety

The head-to-head studies identified in this assessment of the relative screening performance of different FOBTs in an average-risk population did not report any safety data. Therefore, the performance of the various FOBTs for population health screening cannot be assessed on the basis of safety data.

Effectiveness

Three head-to-head studies estimated the sensitivity and specificity of various FOBTs using the interval cancer rate. Two more studies reported data that enabled calculation of the relative true positive rate (TPR) and the relative false positive rate (FPR) of the FOBTs compared. There were no studies of a suitable quality available to allow assessment of the relative accuracy of the different FOBTs for the detection of adenomas.

HemeSelect was found to be significantly more sensitive than Hemoccult, whereas the Hemoccult test was significantly more specific than HemeSelect. There was no significant difference in sensitivity between Hemoccult and Fecatwin Sensitive/Feca; however, Hemoccult was significantly more specific than Fecatwin Sensitive/Feca EIA. There was no significant difference in sensitivity between Hemoccult Sensa and HemeSelect, but HemeSelect proved to be significantly more specific than Hemoccult Sensa.

Cost-effectiveness

An economic model was designed to assess the relative cost-effectiveness of various FOBTs for population health screening to reduce CRC mortality. The base-case setting was biennial screening in individuals aged 55–74 years. The economic model indicated that FOBTs with greater sensitivity for colorectal neoplasia detection offered better overall survival outcomes. A key driver of the difference in the total cost associated with the FOBTs is the specificity of the test. Tests with lower specificities are associated with higher diagnostic follow-up costs and increased levels of resource wastage. The incremental cost per life-year gained for HemeSelect was \$3172 in a comparison against Hemoccult, and \$21,533 for Hemoccult Sensa in a comparison against HemeSelect. These findings should, however, be constrained to the context of the head-to-head data upon which they are based. That is, there is a level of uncertainty about the magnitude of the difference in sensitivity between tests. This is particularly due to the low prevalence of CRC in the populations tested in the FOBT studies and the scarcity and poor quality of data on the sensitivity for adenoma detection. Therefore, between the pairs of FOBTs evaluated, those with higher specificity were shown to be less costly overall, while the magnitude of the impact of the differences in sensitivity on effectiveness is still unclear.

Summary of outcomes

The MSAC considers that faecal occult blood testing is useful for population health screening to reduce CRC mortality. The available evidence indicates that there is no apparent class effect for the guaiac versus immunochemical FOBTs with regard to their effectiveness or cost-effectiveness. Different brands of FOBTs possess different sensitivities and specificities for the detection of CRC within an average-risk screening population.

The specificity of the FOBTs was a major determinant of the total associated costs of FOBT screening, inclusive of diagnostic follow-up and treatment. An economic model indicated that biennial screening was more cost-effective than annual screening, within the context of the main analysis. Lowering the minimum eligible screening age from 55 to 50 years offered benefits in terms of cost-effectiveness. Increasing the maximum screening age from 75 to 80 years did not offer the same degree of benefit.

The immunochemical tests included in the assessment are no longer available and have been replaced by newer assays. There was no available evidence suitable for assessing the comparative performance of currently available immunochemical tests in an average-risk population health screening setting. However, the results of the analyses of the immunochemical tests used may reflect those for FOBTs with similar technical characteristics (ie, in vitro diagnostic accuracy for the detection of haemoglobin). Therefore, it is suggested that currently available and new immunochemical tests with promising technical characteristics be evaluated against established FOBTs within the context of an ongoing screening program.

Methods

MSAC conducted a systematic review of the medical literature pertaining to FOBT screening in an average-risk population. Those citations that met predefined inclusion criteria were included in the review of evidence. The relative cost-effectiveness of the FOBTs when used for screening was evaluated using a decision-analytic economic model.