

## Should Faecal Occult Blood Tests (FOBT) be used in the screening of colorectal cancer?

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### Colorectal Cancer

Colorectal cancer (CRC) is the third most common cancer and the second leading cause of cancer deaths in the UK, with over 16,000 people dying from it each year<sup>1</sup>. Equally prevalent in males and females it is most common in those aged 60-70 years<sup>2</sup>.

Surgery remains the mainstay of treatment, but early detection through screening may improve the chance of cure. It is predicted that deaths from bowel cancer could drop by 15% as a result of screening and screening could save approximately 1,200 deaths from CRC each year in the UK<sup>3</sup>.

Colorectal cancer has a defined natural history with recognised early stages. Most cancers result from malignant change in polyps (adenomas) that have developed in the lining of the bowel 10-15 years earlier. Evidence suggests that 10% of adenomas will go on to become malignant after 10 years. Around 90% of adenomas can be removed at colonoscopy, avoiding the need for surgery<sup>4</sup>. As it takes a long time for malignant change to occur and outcomes are improved by early detection, screening asymptomatic individuals may significantly reduce disease mortality.

### Screening options

For a screening test to be applicable to large populations it has to be inexpensive, reliable, and acceptable.

Questionnaires provide a simple and inexpensive method of detection. However they have poor sensitivity and only detect cancers when the disease is in the advanced stage.

Digital rectal examination and rigid sigmoidoscopy only detect rectal or rectosigmoid cancers and are unpleasant for the patient.

Flexible sigmoidoscopy can detect up to 80% of colorectal cancers. Although more expensive than rigid sigmoidoscopy, it is generally more tolerable for patients.

Colonoscopy remains the gold standard technique for examination of the colon and rectum. Nevertheless it is unacceptable for population screening due to its expense, the need for full bowel preparation and sedation, and the small risk of perforation. However, it is the investigation of choice for screening high risk patients such as those with hereditary polyposis, strong family histories and longstanding ulcerative colitis.

Barium enema and CT colography, like colonoscopy, examine the whole colon and rectum. Although cheaper and with a lower complication rate than colonoscopy, they do not allow removal of polyps or biopsy.

FOBT detects blood that is not visible in the motions. It is relatively cheap, non-invasive and can be carried out by patients at home. However, it has low sensitivity and specificity for cancer. Consequently any positive test requires further investigation, usually colonoscopy, and cancers will be missed if they are not bleeding at the time of stool testing.

### Faecal occult blood tests (FOBT)

FOBT testing is the most extensively studied screening test for colorectal cancer. Biennial screening using FOBT is the basis of the current UK CRC screening programme for those aged between 60 and 69. The FOBT detects haematin from partially digested blood in the stool. Blood vessels on the surface of colorectal polyps or cancers are fragile and easily damaged. Damaged vessels release small amounts of blood into the faeces. Individuals with more than four out of six positive tests are referred for colonoscopy.

## Advantages of using FOBT

A meta-analysis of 4 randomised controlled trials showed participants allocated to screening using FOBT had a 16% reduction in the relative risk of colorectal cancer mortality<sup>5</sup>. Of those screened two percent had a positive FOBT of whom one in ten had a cancer and a quarter adenomas. Cancers detected at screening tended to be at an earlier stage than those presenting symptomatically, so increasing the chance of cure<sup>6</sup>.

The costs associated with FOBT are the lowest when compared to other viable options and similar to that of breast cancer screening.

## Disadvantages of using FOBT

Unfortunately the overall sensitivity and specificity of FOBT is only 50-60%<sup>4</sup>. Not all cancers bleed and FOBT cannot determine the source of the blood it detects. Non-cancer sources of bleeding include ulcers, haemorrhoids, diverticulitis, bleeding gums, inflammatory bowel disease and non-steroidal anti-inflammatory drugs<sup>1</sup>. Consequently patients may require unnecessary investigations. Furthermore interval cancers may develop between tests and some cancers may be missed at colonoscopy. Overall 50% of cancers will not be picked up by biennial FOBT screening<sup>6</sup>. A meta-analysis of all studies with 3 million patient-years follow up has shown no impact of screening on overall mortality. The reduction in CRC mortality in the screened group is matched by an almost identical increase in non-CRC mortality when compared with controls<sup>7</sup>. Patients undergoing colonoscopy are at a 1 in 2000 risk of bowel perforation. However, this is largely in therapeutic colonoscopy (endoscopic polypectomy) rather than in diagnostic procedures. Mortality from such events is rare<sup>4</sup> but all these difficult statistics must be taken into account when judging the value of CRC screening.

A further dilemma with any cancer screening programme is the psychosocial impact that the test may have on an individual. Studies have demonstrated that for each screening-prevented death from cancer, at least 200 false-positive results are given<sup>8,9,10</sup>. In the case of mammography screening, studies have shown that the receipt of a false-positive result has substantial negative psychosocial consequences for women which can persist for up to three years after the screening procedure<sup>11,12</sup>.

False-positive cancer screening results can have a negative impact on psychosocial domains such as anxiety, fear, mood, behaviour, sleep, sexuality and social functioning<sup>13</sup>. However in the Nottingham trial no longstanding psychological morbidity from the screening programme was found. Similarly, no evidence exists that screening for colorectal cancer leads to false reassurance from negative tests<sup>4</sup>.

Controversy however exists regarding the methods employed to detect the psychosocial impact of screening tests on recipients. Brodersen et al<sup>13</sup> argue that studies reporting on psychosocial aspects of cancer screening have mostly employed questionnaires that have poor content validity and/or that have not been validated for this purpose consequently leading to an underestimation of the detrimental impact that the test may have.

## Conclusion

Screening for colorectal cancer using faecal occult blood tests is feasible and can save lives at a cost similar to that of the existing breast cancer screening programme. Pending conclusive data once only flexible sigmoidoscopy may present a promising alternative to faecal occult blood screening<sup>14</sup>. But screening also has the potential to be harmful. Potential reductions in mortality from cancer need to be compared with the psychosocial consequences of false-positive screening results. When weighing up

the benefits and adverse effects of screening, patient-centred as well as population-centred outcomes must be taken into account.

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