

Position Statement

Colorectal cancer screening in the UK: Joint Position Statement by the British Society of Gastroenterology, the Royal College of Physicians, and the Association of Coloproctology of Great Britain and Ireland

Impact of colorectal cancer in the UK

Colorectal (large bowel) cancer is the second commonest cause of cancer related death in the western world and there are more than 30 000 new cases per annum in the UK with an average five year survival of 40%.¹⁻³ Symptoms of colorectal cancer include change in bowel habit, rectal bleeding, anaemia, and abdominal pain but patients with colorectal cancer often have no symptoms until the cancer is advanced. Ninety per cent of cases are currently not diagnosed until the cancer has penetrated through the bowel wall or spread to lymph nodes or elsewhere (Dukes' stages B-D).⁴ Such cases have a much worse chance of surviving five years (64%, 38%, and 3%, respectively for Dukes' B, C, and D) than patients who present with cancer confined to the bowel wall (Dukes' A) who have approximately 83% chance of surviving five years. Because so many patients with colorectal cancer do not develop symptoms until their cancer is advanced, detection of a greater proportion of cases at an earlier stage can only be achieved by screening of asymptomatic individuals.

It is thought that 70-90% of cases of colorectal cancer arise from premalignant (adenomatous) polyps.⁵ They often have a stalk which consists of healthy tissue and allows them to be removed simply and completely by endoscopic snaring. This polyp to cancer sequence adds a strong intellectual argument in support of screening for colon cancer as it provides an opportunity not only to achieve early diagnosis (for example of Dukes' stage A carcinomas) but actually to prevent cancer development by removal of premalignant polyps.

There is evidence that approximately 10% of colorectal cancers are due to genetic causes but that about 90% of the cause is accounted for by environmental factors, particularly diet.⁶ The dietary factors involved are not fully understood but there is evidence that colorectal cancer is associated with diets that are high in red meat and fat and low in vegetable content. However, in spite of considerable publicity over the past 20 years about the potential benefits of dietary measures⁷ there is at present no sign that this is reducing death from colorectal cancer.

Screening for early cancer and precancerous polyps therefore offers the best chance of reducing mortality from colorectal cancer in the near future.

Evidence for the efficacy of screening for colorectal cancer

The colon and its waste products are aspects of the body that most people prefer to ignore and this makes screening potentially difficult. Currently available screening tests require inspection of samples of faeces for non-visible (occult) blood, and examination of the bowel by colonoscopy, flexible sigmoidoscopy, or barium enema, or by a combination of these tests. A positive faecal occult blood test is associated with an approximately 1:10 chance of cancer or a 37% chance of a polyp.⁸ When the test is positive a further

examination, as described above, is always necessary. A population screening programme based on some combination of these screening tests will therefore be relatively unpleasant, will subject many people who do not have cancer to a small but definite risk of harm, and will, like all diagnostic tests, have an error rate for missing cancer.

There are two screening tests which have been shown in clinical trials to reduce mortality from colorectal cancer: faecal occult blood testing and sigmoidoscopy.

Two randomised controlled trials, one in Nottingham⁸ and one in Denmark,⁹ have shown that the use of faecal occult blood tests every two years to screen normal risk individuals reduces mortality from colorectal cancer by 15-18% and a further controlled trial in the USA showed a reduction in mortality of 33% with annual testing.¹⁰ A 20% reduction in mortality would imply a reduction of 3600 cancer related deaths per year in the UK assuming 30 000 cases per year with a current mortality of 60%. Although prospective randomised controlled trials of sigmoidoscopy have yet to be completed, case control studies have demonstrated efficacy when rigid sigmoidoscopy is used as the screening test^{11 12} with a reduction in mortality of 60% from cancers within the reach of the sigmoidoscope (about 60% of all colorectal cancers if a flexible sigmoidoscope is used).¹³

The United States Preventive Task Force advocates annual faecal occult blood testing or flexible sigmoidoscopy every five years in those over 50 years¹⁴ and the American Cancer Society recommends that all Americans 50 years or older should consider undergoing periodic screening by both methods.¹⁵

Risks of screening

In the Nottingham occult blood study,⁸ 2% of those screened required further investigation but only 11% of these were found to have colorectal cancer and 37% polyps. As a consequence, a substantial number of patients without colorectal cancer will undergo further investigation. If this is done by total colonoscopy there is a small but significant mortality rate of 1-3 per 10 000 (associated mainly with perforation of the colon).¹⁶ Hopefully, this incidence of procedure related mortality will fall with time as a result of improvements in equipment and expertise but if applied to a screening programme in England and Wales it has been calculated that this could lead to 12 deaths per year from the 60 000 colonoscopies that this would generate.¹⁷ If positive occult bloods were investigated by a combination of flexible sigmoidoscopy and barium enema, the complication rate would probably be lower although there are as yet no published figures to confirm this and the

This position statement will be reviewed again in January 2001. Surveillance of high risk individuals such as those with previous colorectal cancer or longstanding inflammatory bowel disease is not within the remit of this document.

effectiveness of the approach, particularly for the diagnosis of polyps, might be lower than that of colonoscopy.

The screening procedure would inevitably cause anxiety and it would need to be made clear to each individual that a negative screening test would by no means guarantee protection from future colorectal cancer. In the Nottingham study slightly more patients presented with colorectal cancer in the follow up period (median 7.8 years) having initially tested negative than those who were diagnosed on the basis of an initial positive test—that is, only 49% of cancers in this study population were identified by a positive occult blood test on initial screening.

If screening is to be used what method is preferable?

Faecal occult blood testing as the initial test is the only approach to have been proved beneficial in prospective controlled trials.^{8–10} Evidence for sigmoidoscopy comes mainly from retrospective (case control) studies in which subjects with colorectal cancer were found to be less likely to have had previous sigmoidoscopy than carefully matched controls without colorectal cancer. There are however strong theoretical grounds for believing that flexible sigmoidoscopy (a technique which allows direct visualisation of approximately the lower third of the colon where about 60% of cancers occur) may prove more effective than occult blood testing as the initial test¹³ and it has been estimated that it could reduce deaths from colorectal cancer by 35% in those who undergo the test.¹⁸ This could be an underestimate as there is some evidence that patients with proximal cancers that are beyond the reach of the flexible sigmoidoscope tend to have more distal polyps which will prompt more extensive investigation and result in an overall reduction of mortality of almost 50%.^{13 19 20} Flexible sigmoidoscopy has the advantage of allowing immediate removal of any polyps found.

Compliance for both faecal occult blood testing and flexible sigmoidoscopy in the UK is similar—45% for flexible sigmoidoscopy (75% attendance by the 60% who initially expressed an interest in screening)²¹ and 38% for faecal occult blood (assessed as the percentage who completed all the tests that they were offered, 60% having completed the initial occult blood test).⁸

Ongoing UK trials

Two trials are in progress. A prospective controlled trial of once only flexible sigmoidoscopy at age 55–64 in 14 UK centres has completed enrolment and the first results demonstrating its effects on cancer mortality are expected in 7–10 years. This trial is funded jointly by the Medical Research Council and NHS Research and Development. The government has recently announced funding for two pilot centres to assess faecal occult blood screening in a study organised by the National Screening Committee and funded by the NHS. The National Screening Centre occult blood pilots and the MRC/NHS flexible sigmoidoscopy trial will both provide important information which is likely to affect future screening policy in other countries as well as the UK and we strongly support them.

Who should be screened in the UK now?

HIGH RISK INDIVIDUALS

In individuals who have a first degree relative who developed colorectal cancer before the age of 45 the lifetime risk for colorectal cancer is 1 in 10. There is already a consensus that such individuals should be offered screening, probably by total colonoscopy, five yearly, starting 5–10 years younger than the age at cancer presentation of the relative.^{19 22} Individuals who have two first degree relatives with colorectal cancer have a 1 in 6 lifetime risk

and are similarly offered screening, as are patients with a family history of familial adenomatous polyposis or hereditary non-polyposis colon cancer.

NORMAL RISK INDIVIDUALS WHO REQUEST SCREENING?

The cumulative rate for death from colorectal cancer in the general population of England and Wales is about 3% by age 75 but rises to nearly 7% by age 85.²³ It could be argued either (i) that there is already good evidence that lives can be saved in normal risk individuals by screening and that some form of screening should be offered to all or, conversely, (ii) that there is insufficient evidence that the general population will benefit from screening applied outside the format of a research study and that institution of screening should be deferred until the results of the occult blood pilot studies and the flexible sigmoidoscopy trial are known. It can also be argued that these trials will be much less likely to produce a clear answer if the randomly selected controls also have easy access to screening. In the meantime, however, many patients have become aware of the potential benefits of screening either through the media or the Internet. When normal risk individuals approach their primary care practitioners expressing anxiety about colorectal cancer it is increasingly common practice for a faecal occult blood test to be performed and for a colonoscopy or barium enema to be requested if this is positive. It is important to realise that this form of “screening on demand” is already happening and will probably increase with time with greater public awareness of colorectal cancer. However, this approach has not been planned or funded and is increasing the pressure on diagnostic services for colorectal cancer which are already seriously overburdened.

Predicting future developments

It seems inevitable that some form of screening for colorectal cancer, either faecal occult blood testing or flexible sigmoidoscopy, will become widely recommended for normal risk individuals within the next 5–10 years. In the meantime there is likely to be a rapid increase in identification of high risk individuals who already merit screening and also a rapid increase in self-referral by normal risk individuals.

Implications for resources and training, now and in the future

Colonoscopy and colonoscopic polypectomy were introduced into UK gastroenterology practice about 20 years ago and there has been a massive expansion in their use since then. Colonoscopy is performed both by colorectal surgeons and by gastroenterology physicians. Training, staffing, and equipping of endoscopy units has not kept pace with the demand and it is now commonplace for UK hospitals to have waiting lists of up to 12 months for colonoscopy. Colonoscopy is a technically demanding procedure and the likelihood of a successfully completed colonoscopy with visualisation of the entire colon is 85–95% with an experienced colonoscopist who has done 200–300 procedures or more but falls to as low as 50% with a less experienced colonoscopist.²⁴ There is evidence from audits that rates for successful completion in some UK centres are unacceptably low.²⁵ Establishment of a UK training scheme for doctors performing screening colonoscopy may be essential to achieve an acceptable target of 90–95% complete colon examinations. It is estimated that introduction of an occult blood screening programme for normal risk individuals will generate at least a further 10 000 colonoscopy sessions (at six cases per session) per annum in the UK⁴ or one session per week for each district general hospital serving a population of 250 000. Alterna-

tively, introduction of once only flexible sigmoidoscopy for normal risk individuals aged 55–64 would generate 22 500 flexible sigmoidoscopy sessions per year, assuming compliance of 45%, 12 cases per session, and a total screening population of 600 000.¹³ This would generate a further 2.25 sessions per week for a district general hospital serving a population of 250 000. Screening of high risk individuals, which is already recommended but unfunded, will generate (imminently) a further 13 000 colonoscopy sessions per annum, assuming six colonoscopies per session²¹ or 1.25 sessions per week for a district general hospital serving a population of 250 000. Given that there is already too high a ratio of inexperienced (trainee) colonoscopists to consultants this shortfall urgently needs to be met by the training and appointment of additional consultants as well as a substantial investment in endoscopy nursing staff and endoscopy equipment. Without proper support for this increasing workload any benefit of screening is likely to be overridden by problems arising from the complications of poorly performed colonoscopy including avoidable deaths due to perforation or missed bowel cancer. There will also be a substantial increase in demand for barium examination, as there will be a failure rate for completion rate of colonoscopy which is likely to be around 15% across all centres initially.⁴ Diagnostic colonoscopy may in the future be replaced by computer tomog-

raphy or magnetic resonance scanning with computer reconstruction “virtual colonoscopy”²⁶ but even then there would need to be a massive expansion over the current provision for therapeutic colonoscopy. The colonoscopic polypectomies will generate a substantial increase in workload for histopathologists, and the occult blood tests will require funding. The current level of funding for the investigation of colorectal cancer is inadequate and the inevitable introduction of screening (immediately for high risk groups and over 5–10 years for normal risk individuals) will cause an intolerable overload on the facilities for colorectal cancer diagnosis unless there is a rapid increase in targeted funding.

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Summary points

- There is good evidence that the introduction of some form of screening should substantially reduce the death rate from colorectal cancer.
- High risk individuals should already be offered screening by some combination of colonoscopy, flexible sigmoidoscopy, and barium enema.
- Mass screening for normal risk individuals should await the results of the ongoing clinical trials, particularly the NHS pilot study of occult blood testing and the MRC/NHS trial of flexible sigmoidoscopy.
- When individuals at low risk of bowel cancer request screening, they should be informed about the limitations and possible risks of the tests. Occult blood testing should only be offered when there are agreed protocols between primary and secondary care that are backed up by the necessary resources for further investigation of individuals with a positive test.
- There is already a serious deficiency in the provision of diagnostic facilities for the investigation of symptoms which are suggestive of colorectal cancer. These facilities will be stretched still further by the current and rapidly increasing provision of screening to high risk individuals and the pressure for and likely provision of screening “on demand” to normal risk individuals over the next 5–10 years.
- Further targeted funding for colorectal cancer is urgently needed to allow expansion of staffing (particularly at the consultant grade), training, and equipping of colorectal cancer diagnostic services.

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