

# The NHS Bowel Cancer Screening Programme

## Information for Primary Care

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# Preface

The purpose of this booklet is to inform the primary care team about the new NHS Bowel Cancer Screening Programme (NHS BCSP) and to supply reference material to assist in providing information to patients. Full details of the evidence supporting this booklet are available from the NHS Cancer Screening Programmes website ([www.cancerscreening.nhs.uk](http://www.cancerscreening.nhs.uk)).

# 1. Background information: bowel cancer

## 1.1 Incidence and mortality

Bowel cancer is the third most common cancer in the UK, with approximately 34 900 new cases diagnosed per annum. It is the second most common cause of cancer death, with approximately 16 100 deaths per annum.<sup>1</sup> Bowel cancer is more common on the left side of the colon than on the right,<sup>1</sup> with approximately 63% of cases occurring in the colon, 29% in the rectum and 8% in the rectosigmoid junction.<sup>2</sup> The lifetime risk of being diagnosed with bowel cancer is around 1 in 20 for women and 1 in 18 for men.<sup>1</sup>

## 1.2 Staging, survival rates and cancers detected at screening

Five year survival rates according to the Dukes' stage of classification<sup>1</sup> are shown in Table 1. Table 2 shows the proportions of cancers detected by screening for each Dukes' stage during the first phase of the screening pilot in England.<sup>3</sup>

**Table 1** Five year survival rates by Dukes' stage

Dukes' stage	Five year overall survival
A	85–95%
B	60–80%
C	30–60%
D	<10%

**Table 2** Cancers detected at screening by stage

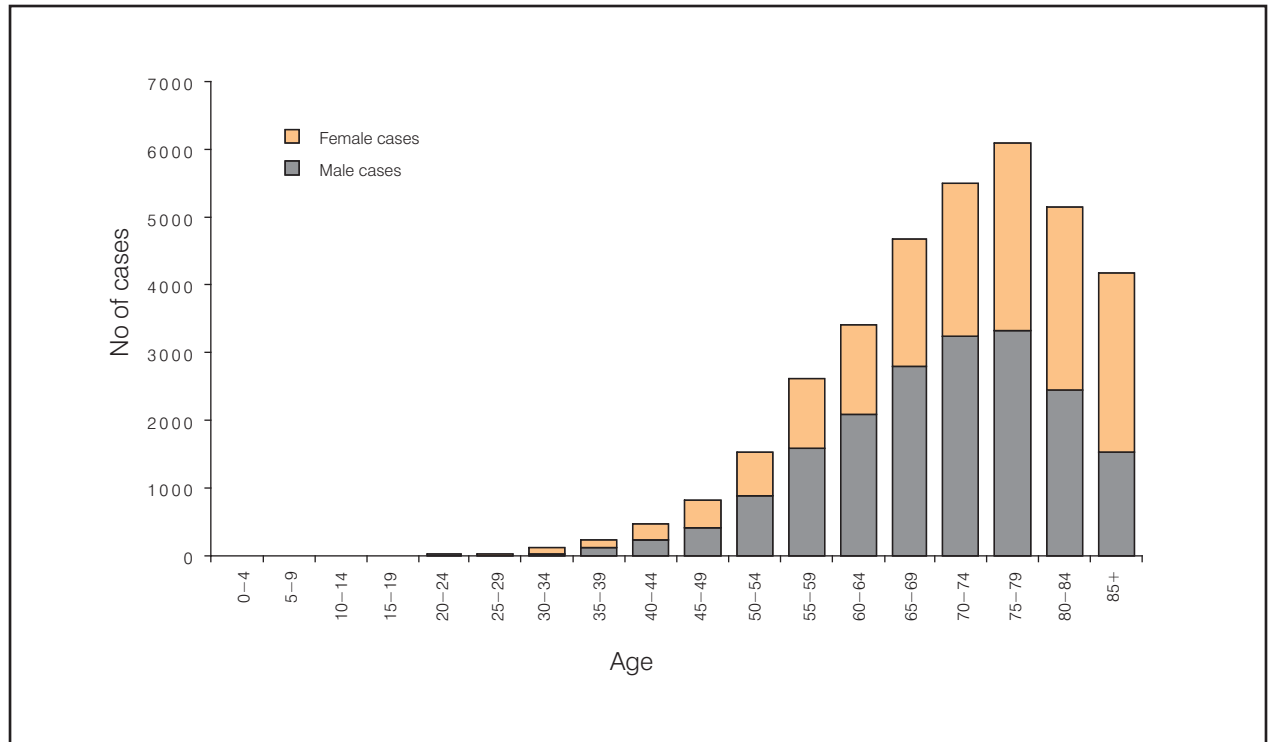
Stage	Cancers detected
Unstaged polyp cancers	16.8%
Dukes' stage A	25.2%
Dukes' stage B	26.0%
Dukes' stage C	25.2%
Dukes' stage D	1.5%
Other unstaged cancers	5.3%

## 1.3 Risk factors

Although the causes of bowel cancer are not fully understood, possible risk factors have been identified, several of which are outlined below.

### 1.3.1 Age/sex

The development of bowel cancer is strongly associated with age, with more than 80% of cases occurring in those aged 60 and over. Men and women have a similar risk of developing bowel cancer up to age 40, but after this rates are higher for men. Figure 1 shows UK cases of bowel cancer by age and sex.<sup>1</sup>



**Figure 1** UK cases of colorectal cancer by age and sex, 2002.

### 1.3.2 Diet and lifestyle

There is some evidence to suggest that individuals who rarely exercise,<sup>4</sup> individuals who are overweight<sup>5</sup> and individuals who have a diet high in red meat,<sup>6</sup> low in fruit and vegetables<sup>7</sup> and low in fibre<sup>8</sup> are at increased risk of developing bowel cancer.

### 1.3.3 Family history

Individuals with either one first-degree relative diagnosed with bowel cancer before the age of 45 or two first-degree relatives diagnosed at any age have an increased risk of developing bowel cancer. For these individuals, the lifetime risk increases to 16–25% in men and 10–15% in women. Having one first-degree relative diagnosed at over 65 years of age leads to only a slightly increased lifetime risk of developing bowel cancer.<sup>9</sup>

### 1.3.4 Genetic conditions

**Familial adenomatous polyposis (FAP)** accounts for around 1% of cases of bowel cancer. Patients develop hundreds or thousands of polyps in the colon and rectum in their twenties and thirties, and have almost a 100% chance of developing bowel cancer by their forties.<sup>1</sup> Individuals with FAP are usually offered prophylactic colectomy in their teens or twenties.

**Hereditary non-polyposis colorectal (bowel) cancer (HNPCC)** accounts for around 2–5% of cases of bowel cancer.<sup>1</sup> Polyps develop at a younger age and at a greater frequency than in individuals who do not have the disease, but not in such large numbers as in FAP. HNPCC is linked to bowel cancer in younger age groups, and is the cause of around 40% of cases in individuals under 30 years of age.

## 1.4 Disease course

Over 90% of bowel cancer cases are adenocarcinomas, arising mainly from adenomatous polyps.<sup>1,10</sup> Adenomatous polyps increase in prevalence with age, and are present in approximately one in four people by the age of 50.<sup>11</sup> Studies suggest that 1–10% of polyps change into invasive cancers.<sup>12</sup> The development of a polyp into a cancer can take more than 10 years,<sup>13</sup> with larger size, villous history and severe dysplasia being important indicators of progression to invasive cancer.<sup>14</sup> Flat adenomas account for 10% of lesions, are harder to detect and may carry a higher risk of malignancy.<sup>10</sup>

## 1.5 Symptoms and signs

Rectal bleeding, a change in bowel habit and anaemia are the most common presenting symptoms of bowel cancer. Nausea, weight loss, abdominal pain and anorexia may be experienced in more advanced disease.<sup>15</sup> Individual symptoms may be poor predictors of bowel cancer; however, the use of a combination of signs and symptoms is more sensitive and specific.<sup>16</sup>

## 1.6 Referral guidelines

The National Institute for Health and Clinical Excellence (NICE)<sup>16</sup> recommends urgent referral for patients:

- Aged  $\geq 40$  years who report rectal bleeding with a change of bowel habit towards looser stools and/or increased stool frequency persisting for six weeks or more
- Aged  $\geq 60$  years who report rectal bleeding persisting for six weeks or more without a change in bowel habit and without anal symptoms
- Aged  $\geq 60$  years who report a change in bowel habit to looser stools and/or more frequent stools persisting for six weeks or more without rectal bleeding
- Of any age with a right lower abdominal mass consistent with involvement of the large bowel
- Of any age with a palpable rectal mass (intraluminal and not pelvic; a pelvic mass outside the bowel would warrant an urgent referral to a urologist or gynaecologist)
- Who are men of any age with unexplained iron deficiency anaemia and a haemoglobin level of  $\leq 11$  g/100 ml
- Who are non-menstruating women with unexplained iron deficiency anaemia and a haemoglobin level of  $\leq 10$  g/100 ml

## 2. The NHS Bowel Cancer Screening Programme

### 2.1 Research evidence

Four randomised controlled trials (RCTs) of mass screening using the faecal occult blood test (FOBt) have been carried out: one in the UK,<sup>17</sup> one in Denmark,<sup>18</sup> one in the USA<sup>19</sup> and one in Sweden.<sup>20</sup> These trials demonstrated a reduction in bowel cancer specific mortality in the screened groups, using biennial screening, annual screening or a combination of the two and with follow up periods ranging from 11 to 18 years. A meta-analysis of these four trials<sup>21</sup> reported a 16% reduction in bowel cancer specific mortality with screening [odds ratio (OR) 0.84; confidence interval (CI) 0.78–0.89], and a 15% reduction in those trials using only biennial screening (OR 0.85; CI 0.78–0.93).

### 2.2 Pilot programme

Following these demonstrations of mortality reduction, the Department of Health commissioned a pilot screening programme to assess the feasibility of using biennial FOBt screening as a population screening tool for bowel cancer in the UK. Three pilot screening rounds for men and women aged 50–69 years were successfully implemented in Coventry and Warwickshire in England and in Tayside, Grampian and Fife in Scotland. The first round of screening demonstrated that screening for bowel cancer using the FOBt is feasible within the context of the NHS.<sup>22</sup>

### 2.3 Structure of the programme

The NHS Bowel Cancer Screening Programme (NHS BCSP) will comprise five programme hubs and approximately 90–100 local screening centres, each serving populations of 500 000 to 2 million people. The programme will be phased in over a three year period. The programme hubs will perform call/recall services, testing of FOBt kits and dispatch of test results. Hubs will also be responsible for arranging screening nurse clinic appointments at local screening centres for individuals with abnormal FOBt results. The local screening centres will provide screening nurse clinics and endoscopy services and act as the primary source of information, working jointly with the local health community and leading on promotion of the service to the public. Screening centres will be responsible for managing patients from the first screening nurse clinic appointment through all necessary investigations for bowel

cancer to the point where they can be discharged. Discharge will be back to the screening programme, to a local polyp surveillance programme, to the care of the patient's GP or for treatment under a named consultant.

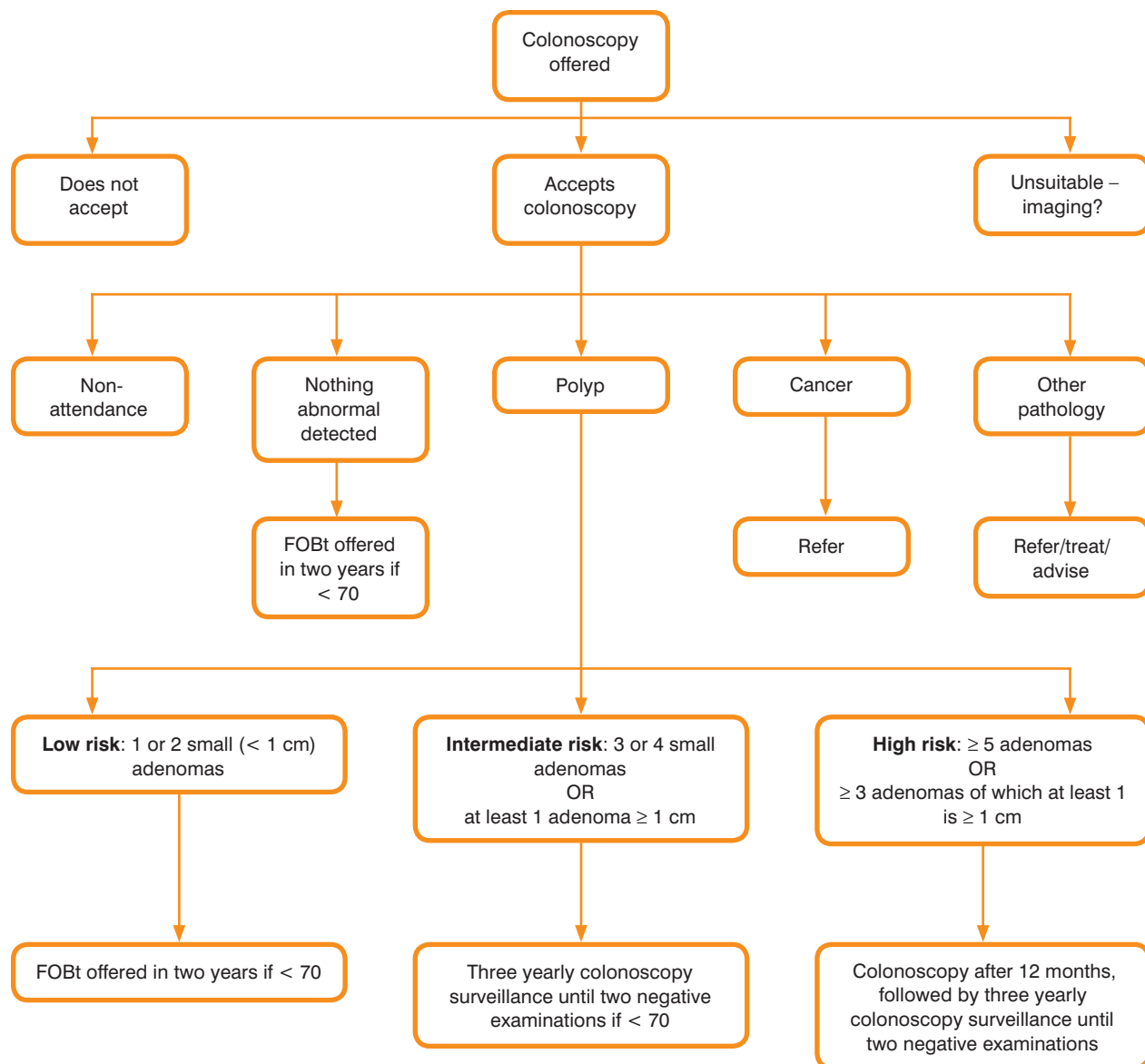
### 2.3.1 Process

Initially, invitations will be sent to individuals aged 60–69; these will be followed by a guaiac-based FOBt kit. The invitation to screening will be extended to individuals in this age range every two years. Individuals aged 70 or over can request a test kit from their programme hub, but not more than once every two years. Every abnormal FOBt result will be accompanied by an appointment to see a specialist screening nurse. This will be the participant's first contact with a health professional during the screening process. The appointment will include an explanation of the implications of the result and a discussion about the colonoscopy procedure (including risks), if one is to be carried out. An assessment of fitness for colonoscopy will be conducted, and an appointment for a colonoscopy offered if appropriate. Imaging may be offered to individuals who are unable to undergo colonoscopy. Figure 2 shows the treatment and surveillance pathways for patients referred for colonoscopy.

The NHS BCSP targets an asymptomatic population of men and women aged 60–69. It is not designed to screen individuals with existing bowel conditions or related genetic conditions (such as FAP). Individuals with these conditions should be treated or referred separately from the screening programme.

## 2.4 The role of the GP

A retrospective survey and prospective audit of general practice staff following the screening pilot demonstrated a 'discernible, albeit modest,' impact on primary care workload. Of particular relevance were increases in paperwork, administration and information provision to patients.<sup>23</sup>



**Figure 2** Treatment and surveillance pathways for patients referred for a colonoscopy.

## 3. The faecal occult blood test (FOBT)

### 3.1 Testing and analysis procedures

One week after the initial invitation letter, individuals will be sent an FOBT kit, which is to be completed at home. The kit comes with full instructions, cardboard sticks with which to collect the samples from bowel motions and a freepost envelope in which to return the kit for analysis at the programme hub laboratory.

There are three flaps on the test kit, each with two 'windows' underneath. Two tiny samples are taken from a bowel motion and spread onto each of the two windows using the cardboard sticks provided. The flap is then sealed, and the process is repeated for the second and third bowel motions (using the windows under the second and third flaps respectively). Once all six windows have been used, the kit is then returned to the laboratory for analysis. The kit must be returned within 14 days of the first sample being taken to ensure that a result can be obtained.

### 3.2 Possible faecal occult blood test results

Participants should receive a letter giving them the results of their test within two weeks of the FOBT kit being received for analysis at the laboratory. The possible results of FOB tests are shown in Table 3.

**Table 3** Possible FOBt results and implications

	FOBt result				
	Normal	Unclear	Abnormal	Technical failure	Spoilt kit
Explanation	0 positive spots	1–4 positive spots	5 or 6 positive spots	Technical problem in the laboratory's processing of the kit	Unreadable test kit due to incorrect use
Action	Participants are sent a discharge letter. The letter also contains a list of the symptoms of bowel cancer to promote awareness between screening rounds and after age 70. FOBt offered again in two years if < 70	Participants are sent a covering letter and another kit. If the second kit gives an abnormal or unclear result, participants are offered a nurse clinic appointment. If the second kit is normal, participants are sent another kit to confirm a normal result overall	Participants are sent a covering letter containing a nurse clinic appointment for not more than one week after the date of receipt of the letter. GP notified	Participants are sent a covering letter and one further kit	Participants are sent a covering letter and a replacement kit

Individuals who receive an unclear result following their first FOBt are sent up to two further test kits. On completion of the second test kit, participants with a normal result are sent a third kit. If the third kit is normal, participants return to routine screening and are offered a test kit in two years if they are still within the age limit. However, if the second or third kit shows another unclear (or an abnormal) result, this will result in an appointment for the participant at the screening nurse clinic to discuss colonoscopy.

### 3.3 Accuracy of faecal occult blood testing

The **sensitivity** of FOBt, ie the proportion of individuals who have bowel cancer that test positive, has been reported to be 55.0–92.2% in RCTs.<sup>21</sup>

### 3.4 Diet and the faecal occult blood test

It has been suggested that certain foods, for example red meat and some vegetables, may react with the FOBt and increase the rate of false positive results if the tests are rehydrated (by adding distilled water to the test at analysis). Data from RCTs using unrehydrated test kits have demonstrated no significant effect of dietary restriction on positivity rates, but that more severe dietary restrictions may decrease participation.<sup>24</sup> Dietary restrictions are not advised for people undergoing the FOBt in the NHS BCSP, which uses unrehydrated tests.

## 4. Diagnostic testing

### 4.1 The colonoscopy procedure

Individuals undergoing colonoscopy will be given the bowel preparation and dietary restriction requirements during their meeting with the screening nurse. Patients are advised that the procedure may be uncomfortable, but that most people do not report it to be significantly painful.<sup>25,26</sup>

### 4.2 Polyp management

Polyps found during the colonoscopy procedure are usually removed. If a biopsy is taken, patients will be informed immediately after the procedure. If the result confirms a benign biopsy, a results letter will be dispatched within three weeks. A diagnosis of cancer will prompt an outpatient appointment with the screening nurse, who will discuss the result face to face. Polyps are classified as low risk, intermediate risk or high risk. Table 4 shows actions for patients found to have polyps at colonoscopy.

**Table 4** Classification and follow up of polyps detected at colonoscopy

	Polyp type		
	Low risk	Intermediate risk	High risk
Explanation	1 or 2 small (< 1 cm) adenomas	3 or 4 small adenomas OR At least 1 adenoma $\geq$ 1 cm	Either $\geq$ 5 adenomas OR $\geq$ 3 adenomas of which at least 1 is $\geq$ 1 cm
Action	FOBT offered in two years if patient < 70	Three yearly colonoscopy until two negative examinations	Colonoscopy at 12 months THEN Three yearly colonoscopy until two negative examinations

### 4.3 Accuracy of colonoscopy

The **sensitivity** of colonoscopy, ie the proportion of abnormalities that are detected by colonoscopy, is thought to be greater than 90%.<sup>27</sup> In about 5% of cases, a bowel obstruction or difficulty in negotiating the colonoscope around the bowel may result in the colonoscopy being incomplete;\* either a repeat colonoscopy or imaging is offered in such cases.

## 4.4 Complications of colonoscopy

The most serious complications of the colonoscopy procedure include heavy bleeding caused by tissue or polyp removal (about a 1 in 150 risk), perforation of the bowel (about a 1 in 1500 risk) or death (about a 1 in 10 000 risk).<sup>\*</sup> Complications are more common as a result of polypectomy than diagnostic colonoscopy.<sup>\*</sup>

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<sup>\*</sup> This represents an estimate. Full details based on the supporting evidence can be found on the NHS Cancer Screening Programmes website ([www.cancerscreening.nhs.uk](http://www.cancerscreening.nhs.uk)).

## 5. Outcomes of screening

### 5.1 Faecal occult blood test uptake

Approximately 59% of test kits were returned by participants aged 60–69 during the first phase of the screening pilot in England, with lower uptake in areas with the highest proportion of residents from the Indian subcontinent (after adjusting for deprivation). Across all sites, uptake was higher for those in less deprived areas and for women.<sup>3</sup>

### 5.2 Faecal occult blood test results

For every 1000 individuals returning at least one test kit during the first phase of the screening pilot in England, there were approximately three positive results, 958 negative results and 39 unclear results after the first test kit.

After a possible two further tests for individuals with unclear results, there was an overall total of approximately 16 positive results and 980 negative results per 1000 individuals returning at least one test kit.<sup>3</sup>

### 5.3 Colonoscopy uptake

During the first phase of the screening pilot in England, approximately 16 out of every 1000 participants returning a test kit were offered a colonoscopy, with uptake of colonoscopy reaching 78%.<sup>3</sup>

### 5.4 Colonoscopy results

During the first phase of the screening pilot in England, cancer was detected in approximately 10% of individuals undergoing colonoscopy, with adenoma being detected in 40% and nothing abnormal being detected in 50% of individuals.<sup>3</sup>

## 6. Treatment

If bowel cancer is detected at colonoscopy (or via other further investigations), the care of the patient will be handed over from the screening centre to the relevant multidisciplinary team (MDT). Following consultation by the MDT and discussion with the patient, an individual programme of treatment and care will be agreed. Around 8 in 10 people who have bowel cancer detected will have surgery to remove the cancer.\* After surgery, over 50% of people will live for more than five years.\* Pre- or postoperative chemotherapy or radiotherapy may be offered to patients.

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\* This represents an estimate. Full details based on the supporting evidence can be found on the NHS Cancer Screening Programmes website ([www.cancerscreening.nhs.uk](http://www.cancerscreening.nhs.uk)).

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