Screening for the Early Detection of Colorectal Cancer

Colorectal cancers are common, and early detection improves prognosis. See the separate Colorectal Cancer article.

Why is early detection important?

Early detection is important because:

- Colorectal cancer is common and has significant mortality. In the UK\(^\text{[1]}\):
  - Bowel cancer is the third most common type of cancer, both in men and in women. (It is the fourth most common cancer overall.)
  - In 2015, 41,804 people were diagnosed with bowel cancer.
  - In 2016, 16,384 people died from bowel cancer.
  - The estimated lifetime risk of being diagnosed with bowel cancer is 1 in 15 (7%) for males, and 1 in 18 (6%) for females born after 1960 in the UK.
  - Five-year survival rates have more than doubled over the period of 40 years. 57% are now expected to survive for \(\geq 10\) years. Over 90% of those picked up in the early stages are expected to survive more than five years.

- Early detection improves outcome\(^\text{[2]}\).
- It is achievable and is cost-effective.

Early detection can be achieved by:

- **Identifying those at risk.** For example, the risk of colorectal cancer increases with age. 95% of cases occur in people aged over 50. Those with an affected first-degree relative have an 80% higher risk\(^\text{[3]}\). Around 5% are associated with the genetic syndromes familial adenomatous polyposis (FAP) and hereditary non-polyposis colon cancer (HNPCC). These patients tend to present at a younger age. Those with inflammatory bowel disease have a 70% increased risk and risk increases with duration of the disease\(^\text{[4]}\).
- **Case recognition** through clinical awareness of the disease, including knowledge of those at risk, clinical presentations and when and how to refer.
- **Screening programmes.** Screening involves a national screening programme for patients without symptoms, and normal population risk, and targeted surveillance programmes for those who are at special risk (eg, inflammatory bowel disease or a strong family history)\(^\text{[5]}\).

National screening programme for the general population

A national call and recall system with local hubs has been rolled out across the UK\(^\text{[6]}\).

Currently patients are sent faecal occult blood (FOB) test kits. Local screening centres analyse samples, despatch results, provide endoscopy investigation services, specialist screening nurse clinics and, if necessary, referral to a local hospital multidisciplinary team (MDT) for people with abnormal results.

Men and women are screened every two years between the ages of 60 to 74 in England, Wales and Northern Ireland, and between the ages of 50 to 74 in Scotland. People with an age above the screening age group can request a screening kit by calling the freephone helpline unique to each country's programme. Details are available via the UK screening portal\(^\text{[6]}\).

Results obtained from the first three years of screening indicated that on average 1.9% of tests are positive (rates are slightly higher as age increases, in men and in Scotland). Cancer was identified in 1.62 per 1,000 people screened; of these, 48% were Dukes' stage A, and only 1% were found to have metastasised at diagnosis. Of those with a positive initial test, 10.9% will have a cancer and 35% an adenoma\(^\text{[7]}\).

In 2018 an independent expert screening committee recommended that bowel cancer screening in England should start 10 years earlier at age 50\(^\text{[8]}\). Following a thorough review of the evidence, the committee recommended that screening should be offered from age 50 to 74 using the **faecal immunochemical test (FIT)** - a home test kit. **FIT** is a new test due to be introduced into the screening programme in autumn 2018 and will initially be offered every two years to men and women at the current age range of 60 to 74. This test is easier to use than the current test (only one sample to take) and is more accurate in detecting potential cancers.

The current bowel screening programme has a complementary procedure, bowel scope, also known as flexible sigmoidoscopy, which is a one-off test offered to men and women at 55. The committee recommends maintaining bowel scope screening in England, where it is currently rolled out until **FIT** is offered to the same age group.
The American Cancer Society (ACS) recommends that people who do not have an increased risk of colorectal cancer start regular screening at age 45\textsuperscript{[9]}. This can be done either with a stool-based test, or with a test that looks at the colon and rectum - bowel scope. People who are in good health with a life expectancy of more than 10 years should continue regular colorectal cancer screening through the age of 75. Between 76 and 85 years, the decision to be screened should be based on a person's preferences, life expectancy, overall health, and prior screening history. People over 85 should no longer get colorectal cancer screening.

Identifying moderate-risk and high-risk patients\textsuperscript{[5]}

These are more targeted screening programmes and protocols which select out sectors of the population at particularly high risk of colorectal carcinoma. These groups usually require endoscopic screening methods. High-risk groups include patients with:

- Previous resection of a colorectal cancer.
- Previous colorectal adenomatous polyps (see below).
- Inflammatory bowel disease (see below).
- Ureterosigmoidostomy - annual flexible sigmoidoscopy beginning 10 years after the original operation.
- Acromegaly - regular colonoscopic screening from the age of 40 years:
  - Patients with an adenoma at first screening or elevated IGF-1 level should be offered three-yearly screening.
  - The remainder should be offered screening colonoscopy every 5-10 years.
- Family history of colorectal cancer. Patients with a personal or close family history (first-degree relative) consistent with an autosomal dominant cancer syndrome or a characterised polyposis syndrome should be referred for assessment, genetic counselling and mutation analysis. High-risk patients are first-degree relatives (where the patient developed cancer aged <50). These genetic conditions are:
  - HNPCC, or Lynch's syndrome - colonoscopy every two years from the age of 25 until the number of polyps make prophylactic colectomy advisable. Upper gastrointestinal (GI) endoscopy every two years from the age of 50.
  - FAP - usually requires prophylactic colectomy between the ages of 16 and 25 years. Upper GI endoscopy surveillance three-yearly from the age of 30.
  - MUTYH-associated polyposis (MAP) - colonoscopy every 2-3 years from the age of 25, upper GI endoscopy every 3-5 years from the age of 30.
  - Juvenile polyposis - colonoscopy every 18-24 months from the age of 18 (or earlier if there are any symptoms) and upper GI endoscopy every 1-2 years from the age of 25.
  - Peutz-Jeghers syndrome - two-yearly colonoscopy and upper GI endoscopy from the age of 25.

Recommendations for screening protocols for individuals identified as having moderate-to-high risk or low-to-moderate risk are complex - see the British Society of Gastroenterology (BSG) guidelines\textsuperscript{[8]}.

Colonoscopic surveillance for prevention of colorectal cancer in people with ulcerative colitis, Crohn's disease or adenomas\textsuperscript{[10]}

**Adenomas**

- Low risk (one or two adenomas smaller than 10 mm):
  - Consider colonoscopy after five years.

- Intermediate risk (three or four adenomas smaller than 10 mm, or one or two adenomas if one is 10 mm or larger):
  - Offer colonoscopy after three years.

- High risk (five or more adenomas smaller than 10 mm or three or more adenomas if one is 10 mm or larger):
  - Offer colonoscopy after one year.

**Inflammatory bowel disease**

- Colonoscopic surveillance should be offered to people whose symptoms started 10 years previously and who have ulcerative colitis (but not proctitis alone) or Crohn's colitis involving more than one segment of colon.
- Offer a baseline colonoscopy with chromoscopy and targeted biopsy of any abnormal areas to determine the risk of developing colorectal cancer:
  - Low risk (left-sided ulcerative colitis or Crohn's colitis, or extensive but quiescent ulcerative colitis or extensive but quiescent Crohn's colitis):
    - Offer further colonoscopy with chromoscopy after five years.

- Intermediate risk (extensive ulcerative or Crohn's colitis with mild active inflammation confirmed endoscopically or histologically, or post-inflammatory polyps, or family history of colorectal cancer in a first-degree relative aged 50 or over):
  - Offer further colonoscopy with chromoscopy after three years.

- High risk (extensive ulcerative or Crohn's colitis with moderate or severe active inflammation confirmed endoscopically or histologically, or primary sclerosing cholangitis (including after liver transplant), or colonic stricture in the preceding five years, or any grade of dysplasia in the preceding five years, or family history of colorectal cancer in a first-degree relative aged under 50):
  - Offer further colonoscopy with chromoscopy after one year.
Further reading & references

- Familial risk-colorectal cancer; ESMO Clinical Practice Guidelines; European Society of Medical Oncology (2013)

1. Bowel cancer statistics; Cancer Research UK
5. Guidelines for colorectal cancer screening and surveillance in moderate and high risk groups; British Society of Gastroenterology (May 2010)
8. Bowl screening to start at 50; Press release Public Health England, 2018
9. American Cancer Society Guideline for Colorectal Cancer Screening; American Cancer Society (May 2018)
10. Colonoscopic surveillance for prevention of colorectal cancer in people with ulcerative colitis, Crohn’s disease or adenomas; NICE Clinical Guideline (March 2011)

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