

**NATIONAL INSTITUTE FOR HEALTH AND CARE  
EXCELLENCE**

**Diagnostics Assessment Programme**

**Early value assessment: COLOFIT algorithm to  
guide colorectal cancer pathway referral in  
primary care**

**Final scope**

May 2023

## **1 Introduction**

The topic selection oversight panel identified COLOFIT algorithm as suitable for early value assessment by the Diagnostics Assessment Programme based on a topic briefing. This allows the NICE diagnostics advisory committee to consider the technology more quickly, and outline further data needed, potentially alongside use of the test in the NHS.

The final scope was informed by discussions at the scoping workshop and assessment subgroup meeting held on 4<sup>th</sup> May 2023.

A glossary of terms is provided in appendix A.

## **2 Description of the technology**

This section describes the properties of the diagnostic technology based on the information provided to NICE by developers and experts, and information in the public domain. NICE has not carried out an independent evaluation of this description.

### **2.1 Purpose of the medical technology**

Colorectal cancer may be associated with symptoms of rectal bleeding, a change in bowel habits, weight loss, anaemia, abdominal or rectal mass, abdominal pain and blood in stool (faeces). Several other conditions may present with blood in stools.

Early value assessment: COLOFIT algorithm to guide colorectal cancer pathway referral in primary care

However, the presence of small amounts of hidden blood in stools (known as faecal occult blood) can indicate that there is bleeding from potentially malignant (cancerous) growths on the inner lining of the large intestine. Currently, this can be tested for using faecal immunochemical testing (FIT). FIT is designed to detect small amounts of blood in a faecal sample by using antibodies specific to human haemoglobin. FIT is currently recommended by NICE to guide referrals for some people with specific symptoms, but guidance is being updated to expand its use more widely (see section 3.2.2).

NHS endoscopy services are under considerable strain and there are long waiting lists for colonoscopy (see section 6.4). These capacity constraints have worsened since the Covid-19 pandemic. Clinicians have observed that many people on the suspected colorectal cancer referral pathway have no abnormal pathology found at colonoscopy. Therefore, improved colorectal cancer risk prediction is still needed to optimise patient referrals and reduce instances of overdiagnosis and overtreatment. Algorithms that combine the FIT result with additional patient characteristics and clinical data could help improve the predictive performance of FIT. This could ensure that people with the highest risk of colorectal cancer are referred more quickly, while people unlikely to have colorectal cancer can avoid colonoscopy, and so reduce the strain on colonoscopy services.

## **2.2 Product properties**

### **2.2.1 COLOFIT**

COLOFIT is an ongoing NIHR-funded study designed to develop a risk-based algorithm that combines the FIT result with variables such as patient characteristics and laboratory tests that could influence a person's risk of colorectal cancer. These variables are yet to be confirmed but may include age, sex and information obtained from blood tests (for example, haemoglobin, platelet count, mean cell volume (MCV) and ferritin). The COLOFIT developers have indicated that the algorithm can be used for anyone with symptoms of colorectal cancer undergoing a FIT test but that they will explore other populations in their study. For example, offering COLOFIT to those at certain FIT thresholds. The algorithm produces a probability that the person has colorectal cancer, which could help optimise the use of FIT to guide referral

Early value assessment: COLOFIT algorithm to guide colorectal cancer pathway referral in primary care

Final scope May 2023

2 of 18

decisions for people with suspected colorectal cancer in primary care. In practice, it is anticipated that the COLOFIT algorithm will be accessed by NHS laboratories that process the FIT samples. The aim is that the results will then be sent back to GPs.

### **3 Target conditions**

#### **3.1 Colorectal cancer**

Colorectal cancer is a form of cancer that starts in the colon and rectum. It is the fourth most common cancer in the UK with approximately 43,000 new cases and around 16,800 deaths per year ([Cancer Research UK](#)). Almost half of the people diagnosed with colorectal cancer in England and Wales survive at least 10 years after diagnosis. Early diagnosis is thought to improve survival. Risk factors for colorectal cancer include older age, dietary and lifestyle factors, genetics and family history of the disease (particularly conditions such as familial adenomatous polyposis or Lynch syndrome), having a history of previous cancer, having colorectal polyps, and having ulcerative colitis or Crohn's disease.

Diagnosis of colorectal cancer frequently requires more than 1 investigation. Diagnostic investigations involve an assessment of clinical symptoms in primary care followed by referral to a specialist for visual examination. Symptoms of colorectal cancer include rectal bleeding, a persistent change in bowel habits, persistent abdominal pain, persistent blood in stool, weight loss, anaemia and abdominal or rectal mass (see section 2.1).

#### **3.2 Diagnostic and care pathway**

##### **3.2.1 Referral on suspected cancer pathway**

NICE's [guideline on suspected cancer](#) includes advice on assessing people presenting to primary care with certain clinical signs and symptoms that may be indicative of colorectal cancer. It makes recommendations about who should be referred on a suspected cancer pathway referral according to age, clinical symptoms, and/or results from faecal immunochemical testing (FIT).

A suspected cancer pathway referral means an urgent (2-week wait) referral directly by the GP after a clinical assessment of symptoms. The referral would be for the most appropriate test (for example, colonoscopy or CT colonography), or an urgent appointment with a specialist. These symptom-based criteria for referral have resulted in an increase in the number of referrals but there has not been a corresponding increase in the proportion of patients that are investigated who have cancer (Mozdiak et al. 2019). In addition, in 2020-21, a total of 377,163 people with suspected lower gastrointestinal cancer were seen under a suspected cancer pathway referral, of whom 88.9% were seen within 2 weeks (compared with an operational standard of 93%; [NHS England 2021](#)). Of 15,053 people treated for lower gastrointestinal cancer in 2020-21 under a suspected cancer pathway referral, only 50.6% received treatment within 62 days following an urgent GP referral (compared with an operational standard of 85%).

FIT combined with the COLOFIT algorithm can potentially help to rule out suspected colorectal cancer and allow for alternative diagnostic testing. NICE's [guideline on suspected cancer](#) recommends safety netting for people with symptoms associated with an increased risk of cancer who do not meet the criteria for referral or other investigative action. Safety netting refers to processes used to avoid missing disease (cancer or otherwise) in people with negative test results (see section 6.2).

### **3.2.2 Testing for occult blood**

NICE's diagnostic guidance on [quantitative faecal immunochemical tests to guide referral for colorectal cancer in primary care](#) currently recommends using the OC Sensor, HM-JACKarc and FOB Gold quantitative tests to guide referrals for people without rectal bleeding who have unexplained symptoms but do not meet the criteria for a suspected cancer pathway referral according to [NICE guideline NG12](#). In COLOFIT, the developers aim to validate the algorithm using the OC Sensor and HM-JACKarc tests. People with positive test results should be referred using a suspected cancer pathway for colorectal cancer.

In 2022, the Association of Coloproctology of Great Britain & Ireland (ACPGBI) and the BSG published guidance on [faecal immunochemical tests in patients with signs or symptoms of suspected colorectal cancer](#). It recommends that FIT should be

used in primary care for all people with clinical features of colorectal cancer to prioritise referral for urgent investigation. In October 2022, [NHS England published a letter endorsing the use of the ACPGBI and BSG guidance](#) on FIT in primary care. NICE is currently assessing the use of FIT in all people with symptoms of colorectal cancer in the [ongoing diagnostics assessment on quantitative FIT](#).

[Scottish referral guidelines for suspected lower gastrointestinal cancer](#) recommend using quantitative FIT, where available, for all people with persistent new colorectal non-urgent (see section 6.2) symptoms where referral to secondary care is being considered. The guideline notes that, if a person with high-risk symptoms is unable to complete, declines or is unlikely to return a test (see sections 3.3 and 7) then urgent referral is recommended.

The guidelines above currently recommend using a FIT threshold of 10 micrograms Hb/g and this has been adopted by many centres to triage a symptomatic population (that is, people with a FIT result of more 10 micrograms Hb/g or more should be referred for a 2 week wait appointment).

Clinical experts advised referral decisions should not be made using FIT results alone, and that symptoms and results from other tests (such as a full blood count) should also be considered. If people with symptoms do not return FIT kits (see section 3.3), referral should not be inappropriately delayed.

### **3.2.3 Diagnosis of colorectal cancer**

Colonoscopy is often used for diagnosing colorectal cancer in people without major comorbidities. It can visualise the entire colon and biopsies can be taken and examined histologically to confirm a diagnosis, unless this is contraindicated (for example, in people who have recently had a heart attack). It is most frequently performed as an outpatient procedure. It requires adequate preparation of the colon using diet modification and laxative. Most people undergoing the procedure are offered sedation, painkillers or nitrous oxide gas. Clinical experts noted that colonoscopy is not a perfect test and can miss important signs of disease.

Because of its invasive nature and the risk of dehydration during colon preparation, colonoscopy may not be suitable for elderly people and those with comorbidities.

Early value assessment: COLOFIT algorithm to guide colorectal cancer pathway referral in primary care

For those people, CT colonography which is less invasive than conventional colonoscopy is an alternative imaging investigation of choice. [ACPGBI/BSG guidance](#) recommends that CT colonography is equivalent to colonoscopy for detection of colorectal cancer, and the choice should be determined by local expertise and availability.

Clinical experts advised that, for some people, other diagnostic techniques such as colon capsule endoscopy or flexible sigmoidoscopy may be appropriate to investigate signs of potential colorectal cancer. Experts in secondary care said that, where available, FIT results are often used to inform the choice of further investigation based on capacity (see section 6.4).

### **3.2.4 Treatment of colorectal cancer**

The most common finding during a colonoscopy is colorectal polyps, which can be removed using cauterisation or a snare. Some types of polyp (called adenomas) can become cancerous. If colorectal cancer is confirmed, [NICE's guideline on colorectal cancer](#) recommends further imaging tests, such as CT or MRI, to stage the cancer and determine what treatment is needed. Colonoscopy may also find other bowel diseases such as Crohn's disease, ulcerative colitis and diverticulosis, which may need further treatment and follow-up (see section 6.2). People with no abnormalities detected during colonoscopy may be referred for further testing if a clinician thinks this is needed.

## **3.3 Patient issues and preferences**

People presenting with symptoms, including abdominal pain, change in bowel habit, weight loss or anaemia may have varying severity of symptoms. False positive FIT results (that is, no abnormal pathology found at colonoscopy despite a positive FIT result) could lead to inflated COLOFIT risk scores that may cause anxiety and lead to unnecessary further investigations such as colonoscopy or CT colonoscopy. Colonoscopy is an invasive procedure which is associated with various complications (including bleeding, infection, perforation of intestine) and very rarely death.

False negative FIT results (that is, abnormal pathology found at colonoscopy despite a negative FIT result) could lead to misleadingly low COLOFIT risk scores. This may lead people to be inappropriately reassured that they are not at risk of colorectal cancer and consequently they may ignore ongoing symptoms. Alternatively, people may experience significant anxiety because of ongoing symptoms. False negative FIT results and low COLOFIT risk scores could lead to delayed diagnosis which could have longer term consequences for that person.

Careful consideration should be given to if and how risk results are communicated to people. Interpretation of risk can vary widely and depend on a number of factors.

Some people may not return FIT samples, either because they are unable to use the sample kits, or because they find the sampling process unacceptable (see section 7). [ACPGBI/BSG guidance](#) recommends that clinicians should follow-up with people with no FIT result to encourage them to return a sample or offer a replacement kit. Clinicians should inform people who decline to return a FIT test that their symptoms have not been fully investigated and encourage them to complete the test. Where no FIT result can be obtained, existing national or local guidelines should be used to assess the risk of colorectal cancer. Clinical experts advised that if people with symptoms do not return FIT samples, then referral should not be inappropriately delayed. Because COLOFIT uses the FIT result to calculate a risk of colorectal cancer, if no sample is returned then the algorithm could not be used.

Some people may have received a negative FIT result from participating in the [NHS bowel cancer screening programme](#). If subsequently presenting to primary care with symptoms suggestive of colorectal cancer, clinical experts advised that doing FIT would still be appropriate, as a much lower threshold would be used for a symptomatic population (see section 6.1). Therefore, COLOFIT could still be used for these people and it would need to be clearly communicated to them why they may have had a negative result on their screening test but are now being referred for further investigation.

## 4 Comparator

The comparator is faecal immunochemical testing (FIT) without the COLOFIT algorithm.

## 5 Scope of the assessment

**Table 1: Scope of the assessment**

<b>Decision question</b>	<ul style="list-style-type: none"> <li>Does COLOFIT in combination with quantitative faecal immunochemical testing have the potential to be a clinically and cost-effective way to reduce the number of people without significant bowel pathology who are referred to the suspected cancer pathway for colorectal cancer, taking into consideration potential colonoscopy or CT colonography capacity constraints for urgent and non-urgent referrals?</li> <li>What evidence is available to support the value proposition outlined in the scope and where are the evidence gaps?</li> </ul>
<b>Populations</b>	<p>People presenting to primary care with symptoms or signs indicating a risk of colorectal cancer who are eligible for a FIT test.</p> <p>Where evidence is available, subgroups may include:</p> <ul style="list-style-type: none"> <li>Age</li> <li>Sex</li> <li>Ethnicity</li> <li>People with different FIT results (for example people with a result between 10 and 100 micrograms of Hb/g of faeces)</li> <li>People taking medications or with conditions which increase the risk of gastrointestinal bleeding</li> <li>People with Lynch syndrome</li> <li>People with blood disorders that could affect the performance of a FIT test (such as beta thalassaemia)</li> <li>People with anaemia (including iron deficiency anaemia)</li> </ul> <p>Although COLOFIT is proposed to be offered to the population outlined above, it is possible that introduction of the technology would have an indirect impact on people waiting for non-urgent referral to gastroenterology services and/or colonoscopy or CT colonography.</p>
<b>Intervention</b>	COLOFIT used alongside a quantitative FIT
<b>Comparator</b>	Faecal immunochemical testing (FIT) without the COLOFIT algorithm.



<b>Reference standard</b>	The reference standards for assessing the accuracy of COLOFIT are colonoscopy, CT colonography or long-term follow-up. Other reference standards will be considered where data using the preferred reference standard is unavailable.
<b>Healthcare setting</b>	Primary care
<b>Outcomes: intermediate measures</b>	<p>Intermediate measures for consideration may include:</p> <ul style="list-style-type: none"> <li>• Diagnostic accuracy at different thresholds</li> <li>• Risk of colorectal cancer in relevant subgroups according to COLOFIT result</li> <li>• Prognostic implications of false negative results</li> <li>• Number/proportion of people referred to secondary care</li> <li>• Number/proportion of people followed up in primary care</li> <li>• Duration of validity of a 'negative' test (implications for follow-up)</li> <li>• Number/proportion of urgent specialist appointments</li> <li>• Number/proportion of urgent colonoscopies/CT colonography</li> <li>• Number/proportion of non-urgent colonoscopies/CT colonography</li> <li>• Time to colonoscopy/CT colonography report</li> <li>• Time to diagnosis and / or treatment of colorectal cancer or other conditions</li> <li>• Number/proportion of colonoscopies/CT colonography that do not detect colorectal cancer</li> <li>• Number/proportion of colonoscopies/CT colonography that do not detect significant bowel pathology</li> <li>• Number/proportion of people presenting to emergency departments with symptoms of colorectal cancer</li> <li>• Number of cancers missed</li> </ul>
<b>Outcomes: clinical</b>	<p>Clinical outcomes for consideration may include:</p> <ul style="list-style-type: none"> <li>• Number of colorectal cancer diagnoses</li> <li>• Number/proportion of colorectal cancer diagnoses from urgent referrals</li> <li>• Stage of detected cancers</li> <li>• Number/proportion of people identified with other bowel pathologies</li> <li>• Number/proportion of people with advanced adenomas detected or detected and treated</li> <li>• Morbidity including adverse events associated with colonoscopy or CT colonography</li> <li>• Mortality</li> </ul>

<b>Outcomes: patient-reported</b>	<p>Patient-reported outcomes for consideration may include:</p> <ul style="list-style-type: none"> <li>• Health related quality of life</li> <li>• Anxiety associated with waiting for referral or test results due to diagnostic delays, and further diagnostic workup</li> <li>• Preference for faecal testing versus colonoscopy or CT colonography</li> </ul>
<b>Outcomes: costs</b>	<p>Costs will be considered from an NHS and Personal Social Services perspective. Costs for consideration may include:</p> <ul style="list-style-type: none"> <li>• Cost of staff and associated training</li> <li>• Costs of follow up testing and care including safety netting</li> <li>• Costs associated with testing and using the algorithm</li> <li>• Implementation costs</li> <li>• Medical costs of adverse events from testing or further diagnostic work up, including those associated with false test results and inappropriate treatment.</li> </ul>
<b>Measuring cost-effectiveness</b>	<p>The cost-effectiveness of interventions should be expressed in terms of incremental cost per quality-adjusted life year.</p>
<b>Time horizon</b>	<p>The time horizon for estimating clinical and cost effectiveness should be sufficiently long to reflect any differences in costs or outcomes between the technologies being compared.</p>

## 6 Other issues for consideration

### 6.1 COLOFIT risk scores for referral

A COLOFIT risk score threshold for referral will need to be determined. A lower threshold could be used to increase sensitivity and avoid missing cases of cancer. A higher threshold could reduce burden on colonoscopy services by increasing specificity, if the detection rate of colorectal cancer was not disproportionately compromised (by the associated reduction in sensitivity).

COLOFIT risk scores could be used to define low, intermediate and high risk populations. In this scenario, people in the intermediate risk group may have more intensive monitoring of their condition than in the low risk group, or be referred to a specialist safety netting pathway (see section 6.2).

The impact of using different thresholds, either to define 2 or 3 risk groups should be investigated in the assessment.

## 6.2 Safety netting and other conditions with gastrointestinal symptoms

COLOFIT has been designed for use to guide referral decision in diagnosis of colorectal cancer. People with 'negative' or low COLOFIT risk score results may not be referred for further investigation with colonoscopy or CT colonography as a result. However, these investigations can also be used to diagnose other conditions such as Crohn's disease, ulcerative colitis and diverticulosis, which may need further treatment and follow-up. In these situations, and cases with false negative results, use of COLOFIT might introduce a delay to diagnosis.

Safety netting refers to processes used to avoid missing disease (cancer or otherwise) in people with negative test results. Clinical experts advised that current safety netting practice is highly variable and is difficult to implement (see section 8).

NICE's guideline on suspected cancer recommends safety netting for people with symptoms associated with an increased risk of cancer who do not meet the criteria for referral or other investigative action. This may be planned within a timeframe agreed with the person, or initiated by the person if their symptoms recur, persist or worsen.

Other examples of safety netting that are used for FIT testing include a letter published by NHS England that recommends safety netting could include:

- Providing clear information about who to contact if new symptoms develop or existing symptoms worsen
- Using e-referral systems to guide management of persistent or troublesome symptoms
- Offering a repeat FIT if ongoing clinical concerns remain
- Referral to a non-specific symptoms urgent cancer pathway
- Management in an outpatient setting following a non-urgent pathway.

The letter included an example of a [non-urgent FIT-negative pathway from the North Central London Integrated Care Board](#). This pathway is for people with persisting symptoms but a FIT result of below 10 micrograms Hb/g is based in secondary care and includes:

- Full blood count, repeat FIT, and virtual follow-up clinic within 8 to 10 weeks
- Consultant led virtual or telephone clinic to determine management plan
- Discharge to primary care
- Consultant upgrade to urgent cancer pathway
- Further investigations on referral to treatment pathway.

Clinical experts said that such pathways are not widely available, and that safety netting is usually conducted in primary care and is patient-led (for example, if a person has new, persisting or worsening symptoms, they will get back in touch with their GP). Safety netting should be considered in the assessment.

### 6.3 Changing guidance for standard care

Under current NICE guidance, people with certain ‘high risk’ clinical signs and symptoms that may be indicative of colorectal cancer (dependent on age) should be referred on a 2-week-wait pathway. The referral criteria are described in NICE’s [guideline on suspected cancer \(NG12\)](#).

NICE’s diagnostic guidance on [quantitative faecal immunochemical tests to guide referral for colorectal cancer in primary care \(DG30\)](#) recommends that people with unexplained gastrointestinal symptoms that do not meet the criteria for a suspected cancer pathway referral should be offered quantitative FIT. People with positive test results (that is, a test result indicating the presence of occult blood in faeces, using a threshold of 10 micrograms of haemoglobin per gram of faeces) should also be referred using a suspected cancer pathway for colorectal cancer.

The ongoing diagnostics assessment on quantitative FIT will explore how FIT can be used for all people with symptoms suggestive of colorectal cancer, unifying the population currently split between NG12 and DG30.

### 6.4 Colonoscopy capacity and waiting times for suspected cancer pathway referrals

There are currently long waiting lists for colonoscopy (see sections 3.2.1 and 8). A [letter published by NHS England](#) states that, since the pandemic, waits on the lower gastrointestinal pathway have lengthened more than for any other tumour group. In

Early value assessment: COLOFIT algorithm to guide colorectal cancer pathway referral in primary care

August 2022, 28% of people seen by a specialist for suspected colorectal cancer were not seen within 2 weeks of urgent referral, and 53% did not have a diagnosis within 28 days ([NHS cancer waiting times, August 2022](#)). Clinical experts also advised that waiting lists for non-urgent referrals to colonoscopy are currently much longer than the target 18 weeks. Introduction of COLOFIT could help identify those people who are most likely to have colorectal cancer, and so help prioritise the waiting lists for further investigation.

During scoping of the [ongoing diagnostics assessment on quantitative FIT](#), stakeholders highlighted that colonoscopy capacity is limited and therefore the Diagnostics Advisory Committee will need to consider real-world constraints during the decision-making process. The assessment should consider the constraints of current colonoscopy capacity and the impact of this on outcomes specified in the scope, including waiting times for both urgent and non-urgent referral to gastroenterology and colonoscopy services.

## **6.5 Ongoing NIHR study**

The NIHR funded [COLOFIT study](#) will investigate the optimal use of FIT for patients with symptoms of possible colorectal cancer. It consists of 4 work packages. These are a systematic review of evidence on FIT and risk factors for colorectal cancer; mathematical model of risk for colorectal cancer; a survey on views on FIT from people with suspected colorectal cancer, healthcare professionals and other stakeholders; and an individual patient level health economic model applying the results of the previous work packages to assess the cost effectiveness of a FIT-based risk algorithm for people with different levels of risk. The study is estimated to be completed in May 2023.

## **6.6 Variation in FIT analysers and validation of COLOFIT**

There could be differences between different FIT analysers. The COLOFIT study is aiming to validate the algorithm using the OC Sensor and HM-JACKarc tests.

## 7 Potential equality issues

NICE is committed to promoting equality of opportunity, eliminating unlawful discrimination and fostering good relations between people with particular protected characteristics and others.

Older people and Jewish people of central and eastern European family origin are thought to be at an increased risk of colorectal cancer. People with cancer are protected under the Equality Act 2010 from the point of diagnosis.

FIT test results are required to run the COLOFIT algorithm. FIT tests may not be suitable for use in people with an existing diagnosis of inflammatory bowel disease and thalassaemia, some of whom may be covered by the disability provision of the Equality Act 2010. People with physical or cognitive disabilities may need support to obtain and submit a stool sample using the collection devices, or to understand the purpose of the test and the implications of the test results.

Cultural or demographic preferences may influence the acceptability of tests that require collection of a stool sample. Experience from the bowel cancer screening programme indicates that socioeconomic factors can also act as barriers to engaging with FIT programmes ([Cancer Research UK](#)).

Manufacturers of FIT tests suggest that samples for FIT should not be collected under certain circumstances, including diarrhoea, constipation, bleeding haemorrhoids, blood in the urine, when taking medications that increase the risk of bleeding, or when menstruating. This could result in a delay to diagnosis if people have to wait before obtaining a sample for FIT. Clinical experts advised that many of these circumstances relate to difficulty collecting samples or potential for contamination and are either outdated or overly cautious. They suggested that the decision to offer FIT should not be influenced by these factors.

## 8 Potential implementation issues

Potential implementation issues include:

### Care pathway

Early value assessment: COLOFIT algorithm to guide colorectal cancer pathway referral in primary care  
Final scope May 2023

- There is variation in practice for referral to colonoscopy or CT colonography.
  - Most high-risk people referred from primary care attend an urgent appointment in secondary care, where decisions on the next steps are made.
  - Some people go straight to colonoscopy or CT colonography following a telephone triage.
- The cancer diagnosis pathway will change with the development of [Community Diagnostics Centres and the Faster Diagnosis Standard](#) and this may have an impact on the use of FIT and therefore COLOFIT to guide referral to the cancer pathway.
- Follow-up and monitoring of people with low risk test results or who do not return tests (safety netting) is difficult to implement without clear systematic guidance and appropriate IT systems.

### **Colonoscopy and CT colonography capacity**

- There are currently lengthy wait times for colonoscopy and increasing wait times for CT colonography. Implementation of COLOFIT has the potential to prioritise referrals for urgent colonoscopy, allowing those most in need to be seen more quickly.

### **Laboratory**

- Reporting of FIT results may vary by laboratory.
- Different tests or analysers may report different absolute values for haemoglobin concentration from the same sample, which could impact on risk scores produced by the COLOFIT algorithm.
- The developers plan to validate the COLOFIT algorithm using FIT results obtained using the OC Sensor and HM-JACKarc analysers. Clinical experts advised that these two analysers cover the majority being used in clinical practice.
- Clinical experts noted that there are potential challenges around performing the calculations and capturing all the necessary variables needed to run the COLOFIT algorithm. Some of the samples (e.g.,

haemolysis and biochemical) may not be ready at the same time. It is unclear how all the necessary information would be fed into the COLOFIT algorithm.

### **Connectivity**

- New IT connectivity may be required between laboratories, GP practices and secondary care systems to have access to test results.

### **General practice (GP)**

- Clinical experts raised some concern around the resource capacity in primary care. GPs may need logistical support and potentially will need to add patient demographics in the FIT request so that this can be fed into the COLOFIT algorithm.

## **9 Authors**

**Alice Bell, Lirije Hyseni, Simon Webster**

Topic Leads

**Judith Shore**

Technical Adviser

May 2023



## **Appendix A Glossary of terms**

### **Colonoscopy**

An investigation that allows doctors to examine the lining of the colon (large intestine) using a flexible tube that contains a camera and light source (colonoscope).

### **Computed tomography (CT) colonography**

A test that uses CT scans to check the colon and rectum.

### **Faecal immunochemical test**

A test which detects faecal occult blood using antibodies against human haemoglobin.

### **Flexible sigmoidoscopy**

An investigation that allows doctors to examine the lining of the lower section of the colon (sigmoid) using a flexible tube that contains a camera and light source (sigmoidoscope).

### **Haemoglobin**

A protein molecule found in red blood cells. Its presence in faecal samples indicates that gastrointestinal bleeding may be occurring.

### **Polyp**

A small growth on the inner lining of the colon or rectum.

## Appendix B Abbreviations

ACPGBI	Association of Coloproctology of Great Britain and Ireland
BSG	British Society of Gastroenterology
DG	Diagnostic guidance
FIT	faecal immunochemical test or testing
Hb	Haemoglobin
NG	NICE guideline

## Appendix C References

Fraser CG, Allison JE, Young GP et al. (2015) [Improving the reporting of evaluations of faecal immunochemical tests for haemoglobin: the FITTER standard and checklist](#). European Journal of Cancer Prevention 24(1);24–6

Mozdiak E, Weldeselassie Y, McFarlane M, et al. (2019). [Systematic review with meta-analysis of over 90 000 patients. Does fast-track review diagnose colorectal cancer earlier?](#) Alimentary Pharmacology & Therapeutics 50(4):348–72.