Faecal Immunochemical Testing in Acute Hospital GI Endoscopy Services

A position paper from the HSE Acute Operations Endoscopy Programme

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1. The Faecal Immunochemical Test

Lower GI tract symptoms are relatively non-specific for colorectal cancer; approximately 97% of patients referred urgently for colonoscopy due to concerning symptoms will not have CRC[1,2]. Endoscopy workload, in particular colonoscopy, is rising by approximately 5% per year and this, in conjunction with the impacts of the COVID 19 pandemic and the 2021 Cyber-attack, together with fixed endoscopy capacity, has led to significant colonoscopy waiting lists.

Faecal immunochemical tests (FITs) for haemoglobin (Hb), the main component of blood, are specific for intact human Hb and its early degradation products.[3] FIT does not require dietary restriction, is specific to lower gastrointestinal (GI) cancers as upper GI enzymes degrade human globin, and is less affected by concomitant medication use than the guaiac method to detect faecal occult blood (gFOB).[4,5] Quantitative FIT detects the globin component of haemoglobin (Hb) by immunoassay and can reliably measure the faecal Hb concentration (fHb). Elevated f-Hb levels suggest significant colorectal pathology, especially colorectal cancer. Patients can complete a FIT test in their home and send the test to a lab for analysis. This not only meets the need to move care out of the acute hospital but also increases access to care closer to home, in alignment with Sláintecare.

BowelScreen, the national colon cancer screening service, provides a FIT-based population screening programme for asymptomatic individuals between the ages of 60 and 69. The current BowelScreen FIT threshold is 45 ug/g (225 ng/mL) .

Key message

FIT tests should be incorporated into the care pathway for patients being referred for colonoscopy, as well as patients who are already waiting greater than 13 weeks for a colonoscopy. FIT can be used to prioritise patients for investigation, as colorectal cancer and other serious bowel disease is more likely at higher f-Hb concentrations.

2. New referrals for colonoscopy

FIT testing can support clinical decisions within the symptomatic service, to allow cases with a higher pre-test probability of significant GI diagnosis, such as colorectal cancer, inflammatory bowel disease or high-risk adenomatous polyps, to be prioritised for an endoscopy procedure.

There is a significant body of clinical research supporting the diagnostic accuracy of FIT in symptomatic patients utilising a range of thresholds.[6-10] The most used fHb threshold is 10 µg Hb/g (50 ng/mL). FIT is suitable for patients with low-risk symptoms as a first diagnostic step (rather than automatically scheduling a patient for a colonoscopy).

In 2017 the National Institute for Health and Care Excellence (NICE) in the UK recommended (DG30) FIT use in primary care to guide referral for suspected colorectal cancer in people without rectal bleeding who have unexplained symptoms but do not meet the criteria for a suspected cancer referral as outlined in NG12.[11] This would equate to our routine patient cohort. The positive FIT result threshold is 10 µg Hb/g of faeces. Subsequently the NICE *Suspected cancer: recognition and referral guidance (NG 12)*, which was updated in 2021, recommended using FIT for patients without rectal bleeding who do not meet the urgent referral criteria.[1]

In a recent study performed by the NICE FIT Steering Group in the UK on approximately 9800 symptomatic individual referred for colonoscopy, comprising a mix of predominantly high risk patients (75% medium/high risk, 25% low risk by NG12 criteria), colorectal cancer was detected in 3.3%.[12] The FIT positivity rate was 19% and the positive predicate value (PPV) of a FIT >10 µg Hb/g for colorectal cancer was 16% but more importantly the negative predictive value (NPV) was 99.6% - risk of colorectal cancer was 0.4% in those patients with a fHb <10 µg Hb/g faeces. The NPV for other significant colorectal pathology was also >95%; 97% for IBD and 97% for high-risk adenomatous polyps. The authors proposed that FIT should be used in primary care as a triaging tool for low-risk symptoms before referral to secondary care and that this strategy should be expanded to include all symptomatic patients.

The Fast Track FIT study which evaluated 5,040 patients undergoing colonoscopy, CTC or colorectal telephone assessment pathway showed a colorectal cancer risk of 0.5% in those with fHb <10 µg Hb/g faeces. [13] In a study of 4000 patients by Johnstone *et al*., a FIT <10 µg Hb/g, together with a normal Hb level, had a NPV for colorectal cancer of 99.96%. [14]

Patients with symptoms meeting NICE criteria and a negative FIT result (<10 µg Hb/g) had less than 0.5% chance of colorectal cancer; a very low risk, but it is important to stress that the risk is not zero. Colonoscopy is the gold standard test; however it is associated with an interval cancer rate of 0.6% in patients under surveillance and a miss rate of 11.0% for advanced adenomas and up to 26% for all adenomas.[15-17]

The Association of Coloproctology of Great Britain & Ireland (ACPGBI) in conjunction with the British Society of Gastroenterology (BSG) published guidelines for the use of FIT in patients with lower GI tract symptoms concerning for colorectal cancer[18]. The guidelines support the use of FIT for symptomatic patients being considered for referral for an urgent colonoscopy.

Specifically the guidelines recommend the use of FIT in primary care prior to referral to secondary care. The guidelines also recommend the use of FIT in primary care for patient with iron deficiency anaemia to determine referral urgency**.**

The HSE Endoscopy Programme endorses the use of FIT initially in the secondary care setting for triage of the **routine** colonoscopy cohort given the difference in triage recommendations between the HSE and NHS (NHS '2-week-wait' pathway) and current limited availability of FIT in primary care.

In line with BSG guidance, the Endoscopy Programme recommends that patients fHb ≥10 µg Hb/g should be prioritised for colonoscopy. Where laboratory reports are in ng/mL the recommended cut off point is **≥50 ng/mL**, which is the equivalent of 10 µg Hb/g.

Patients with low-risk symptoms, normal Hb and negative FIT test could be followed up in primary care. However, patients should not be excluded from secondary care assessment and/or endoscopy based on FIT testing alone. At any threshold, FIT alone is not a 'rule out' test for colorectal cancer. The Endoscopy Programme guidance will stress the need for a 'safety net' approach to FIT negative patients with persistent or worrying symptoms.

For further information please refer to the HSE Acute Operations Endoscopy Programme's publication *Triage Guidance for Upper and Lower Gastrointestinal Endoscopic Procedures (excluding ERCP and EUS)* which is available at
hse.ie/eng/about/who/acute-hospitals-division/clinical-programmes/endoscopy-programme/programme-documents/

3. Patients already on the routine colonoscopy waiting list

While not recommending widespread use of FIT in already triaged routine colonoscopy waiting lists, the ACPGBI & BSG guidelines comment that FIT could be used to 'upgrade' (clinically reprioritise) patients on routine waiting lists.

The HSE Endoscopy Programme endorses the use of FIT for stratifying the routine colonoscopy waiting list.

4. Planned (surveillance) patients

FIT testing does not currently have a role in the management of planned procedures such as polyp surveillance, post-colorectal cancer screening or chronic IBD screening, however further research is ongoing in these areas.

Appendix 1: Using FIT in clinical pathways

Fig. 1 Using FIT to triage **new referrals** to GI endoscopy services

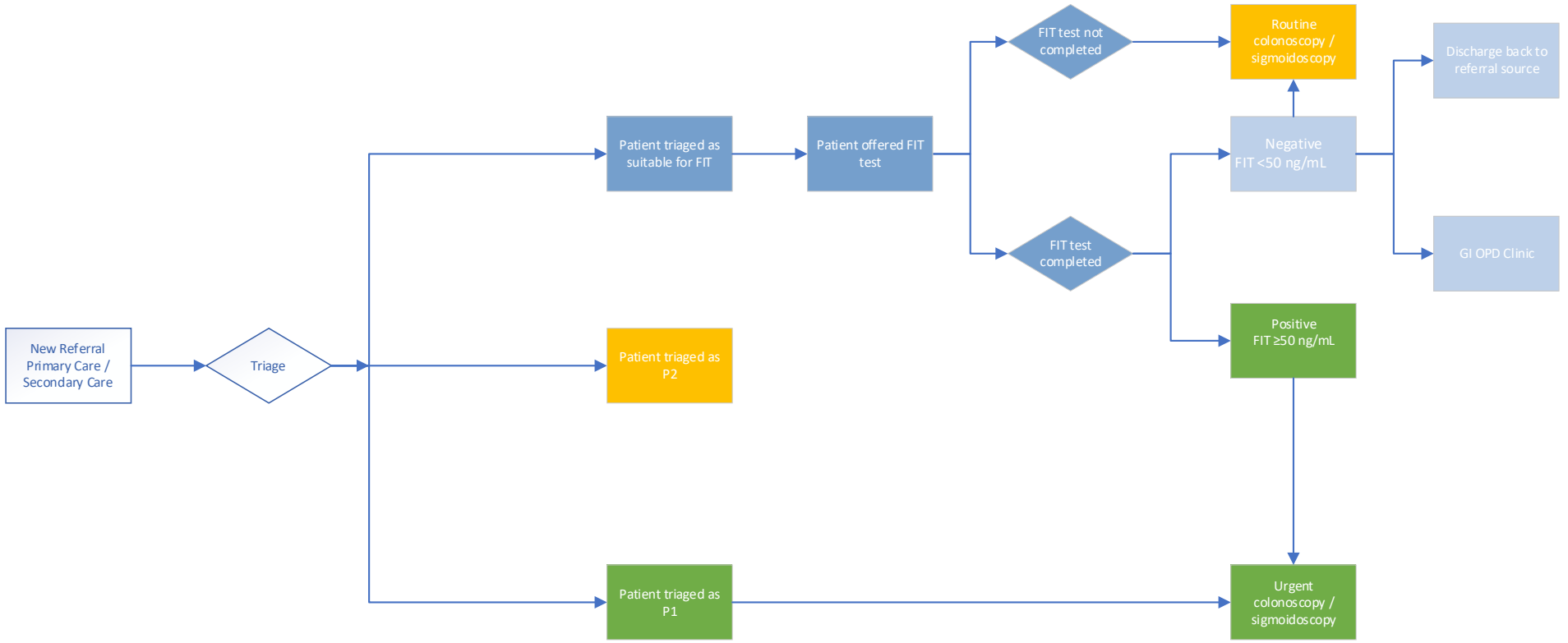
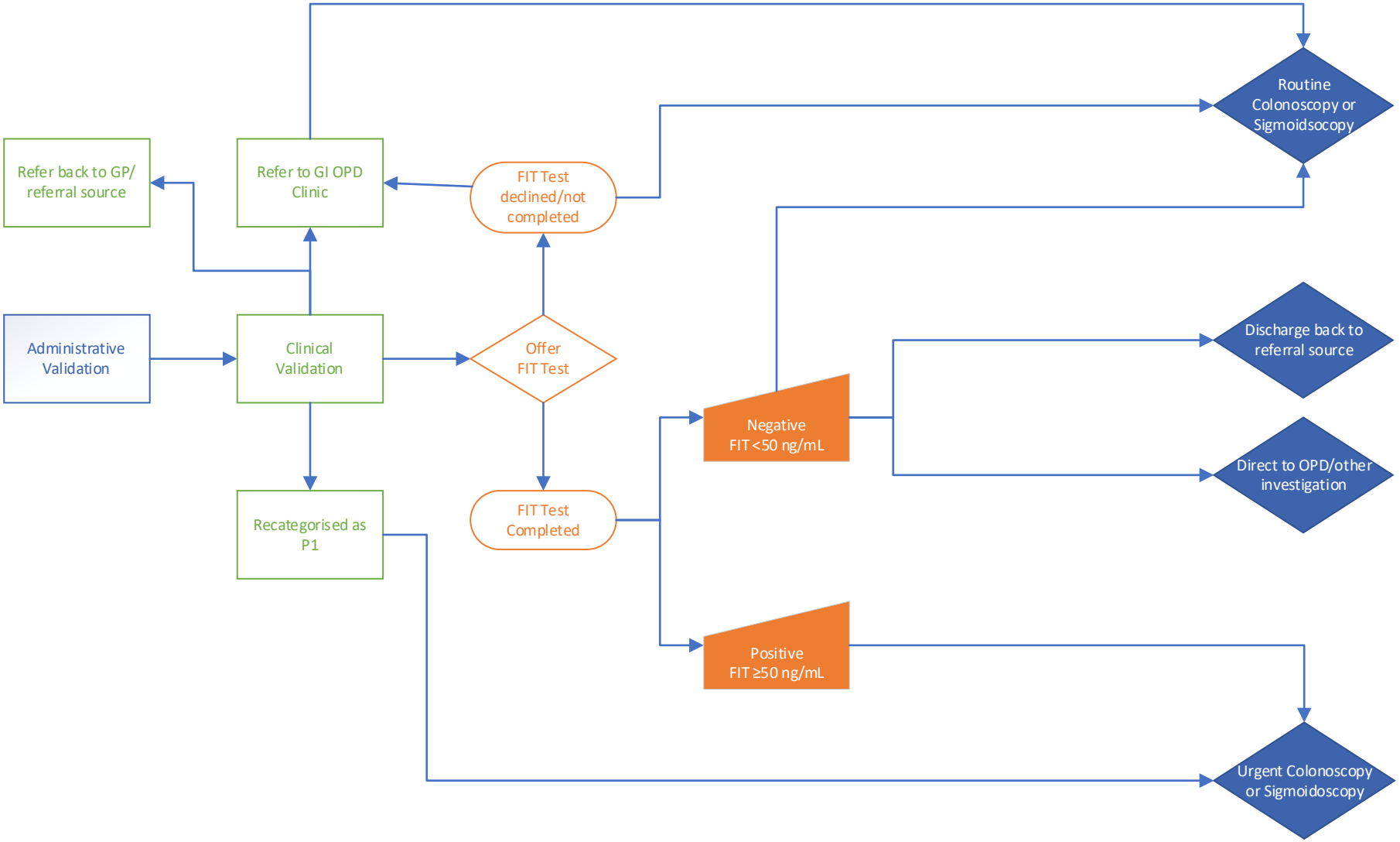


Fig 2 Using FIT with patients **already on the routine colonoscopy waiting list**



References:

Triage guidance

1. NICE. Suspected cancer: recognition and referral [NG12]. National Institute for Health and Care Excellence, 2015.
2. Jones et al. Colorectal Cancer detection rates and stage at diagnosis in routine and urgent colonoscopy referrals compared to BowelScreen populations: a single tertiary-centre evaluation. ISG 2020
3. Allison JE, Fraser CG, Halloran SP, et al. Population screening for colorectal cancer means getting FIT: the past, present and future of colorectal cancer screening using the Fecal Immunochemical Test for Hemoglobin (FIT). *Gut Liver* 2014;8:117–30.
4. Allison JE, Fraser CG, Halloran SP, Young GP. Population screening for colorectal cancer means getting FIT: the past, present, and future of colorectal cancer screening using the fecal immunochemical test for hemoglobin (FIT). *Gut Liver*. 2014 Mar;**8(2):**117-30
5. Tinmouth J, Lansdorp-Vogelaar I, Allison JE. Faecal immunochemical tests versus guaiac faecal occult blood tests: what clinicians and colorectal cancer screening programme organisers need to know. *Gut*. 2015; 64: 1327- 1337.
6. Westwood M, Corro Ramos I, Lang S, Luyendijk M, Zaim R, Stirk L, et al. Faecal immunochemical tests to triage patients with lower abdominal symptoms for suspected CRC referrals in primary care: a systematic review and cost-effectiveness analysis. *Health Technol Assess*. 2017;21(33):1-234.
7. Mowat C, Digby J, Strachan JA, Wilson R, Carey FA, Fraser CG, et al. Faecal haemoglobin and faecal calprotectin as indicators of bowel disease in patients presenting to primary care with bowel symptoms. *Gut*. 2016;65(9):1463-9.
8. Pin Vieito N, Zarraquiños S, Cubiella J. High-risk symptoms and quantitative faecal immunochemical test accuracy: Systematic review and meta-analysis. *World J Gastroenterol*. 2019;25(19):2383-401.
9. Stonestreet, J., Chandrapalan, S., Woolley, D., Uthman, U., & Arasaradnam, R. P. (2019). Systematic review and meta-analysis : diagnostic accuracy of faecal immunochemical testing for haemoglobin (FIT) in detecting CRC for both symptomatic and screening population. *Acta Gastroenterologica Belgica,* 82(2), 291–299.
10. Pin-Vieito, N., Tejido-Sandoval, C., de Vicente-Bielza, N., et al. *Gut*, doi:10.1136/gutjnl- 2021-324856
11. NICE. Diagnostics guidance [DG30]. Quantitative faecal immunochemical tests to guide referral for CRC in primary care. National Institute for Health and Care Excellence; 2017
12. D'Souza N, Georgiou Delisle T, Chen M The NICE FIT Steering Group*, et al.* Faecal immunochemical test is superior to symptoms in predicting pathology in patients with suspected colorectal cancer symptoms referred on a 2WW pathway: a diagnostic accuracy study *Gut.* 2021;**70:**1130-1138.
13. Turvill JL, Turnock D, Cottingham D. The Fast Track FIT study : diagnostic accuracy of faecal immunochemical test for haemoglobin in. *Br J Gen Pract* 2021;71:643–51.
14. Johnstone MS, Burton P, Kourounis G, Winter J, Crighton E, Mansouri D, Witherspoon P, Smith K, McSorley ST. Combining the quantitative faecal immunochemical test and full blood

count reliably rules out colorectal cancer in a symptomatic patient referral pathway. Int J Colorectal Dis. 2022 Feb;37(2):457-466

15. Robertson DJ, Lieberman DA, Winawer SJ, *et al*. Colorectal cancers soon after colonoscopy: a pooled multicohort analysis. *Gut* 2014;63:949–56
16. Heresbach D, Barrioz T, Lapalus M, *et al.* Miss rate for colorectal neoplastic polyps: a prospective multicenter study of back-to-back video colonoscopies. *Endoscopy* 2008;40:284–90.
17. Leufkens A, van Oijen M, Vleggaar F, *et al*. Factors influencing the miss rate of polyps in a back-to-back colonoscopy study. *Endoscopy* 2012;44:470–5.
18. Monahan KJ, Davies MM, Abulafi M, et al. Faecal immunochemical testing (FIT) in patients with signs or symptoms of suspected colorectal cancer (CRC): a joint guideline from the Association of Coloproctology of Great Britain and Ireland (ACPGBI) and the British Society of Gastroenterology (BSG). *Gut* Published Online First: 12 July 2022. doi: 10.1136/gutjnl-2022-327985

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