

# Diagnosing colorectal cancer in primary care

The value of symptoms,  
faecal immunochemical tests,  
faecal calprotectin and anaemia

**Cecilia Högberg**

## Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för  
avläggande av medicine doktorsexamen framläggs till offentligt försvar i  
Hörsalen Snäckan, Östersunds sjukhus,  
fredagen den 19 maj, kl. 13:00.  
Avhandlingen kommer att försvaras på svenska.

Fakultetsopponent: Professor Jörgen Månsson,  
Institutionen för medicin, avdelningen för samhällsmedicin och  
folkhälsa, enheten för allmänmedicin, Göteborg Universitet, Sverige.



**Institutionen för folkhälsa och klinisk medicin**  
Umeå universitet  
Umeå 2017

**Organization**  
Umeå University  
Department of Public Health  
and Clinical Medicine

**Document type**  
Doctoral thesis

**Date of publication**  
28 April 2017

**Author**  
Cecilia Högberg

**Title**  
Diagnosing colorectal cancer in primary care.  
The value of symptoms, faecal immunochemical tests, faecal calprotectin and anaemia.

### **Abstract**

**Background:** Most patients with colorectal cancer (CRC) initially consult primary care. Symptoms associated with CRC are common but seldom caused by CRC. Inflammatory bowel disease (IBD) can present with the same symptoms. Reliable diagnostic aids would be helpful in deciding which patients to refer. Faecal immunochemical tests (FITs) are commonly used for this purpose in Sweden, but there is little evidence to support this use. Faecal calprotectin (FC) has been suggested as an additional test.

**Aim:** To explore how primary care doctors investigate patients with suspected CRC, the value of FITs, symptoms and presence of anaemia in diagnosing CRC and adenomas in primary care, and whether FC tests could contribute to diagnosis.

**Methods:** Three studies (**1-3**) were carried out in Region Jämtland Härjedalen, Sweden. **1:** A retrospective study of patients diagnosed with CRC or adenomas with high-grade dysplasia (HGD) from 2005 - 2009 that initially consulted primary care. Symptoms, FIT results, anaemia and time to diagnosis were retrieved from medical records. **2:** A prospective cohort study of patients where primary care doctors requested FITs and/or FC tests between 30/1 2013 – 31/5 2014. Haemoglobin and iron deficiency tests were also analysed; patients and doctors answered questionnaires. Findings of CRC, adenomas and IBD were registered. **3:** A qualitative study of interviews with primary care doctors, exploring what made them suspect CRC and their practices with particular attention to their use of FITs.

**Results:** **1:** Paper I: 323/495 patients initially consulted primary care, FITs were analysed in 215. In 23 CRC cases FITs were negative; 15 had anaemia. In 33 CRC cases, FITs were performed due to asymptomatic anaemia; 10 had negative FITs. Time to diagnosis was significantly longer for patients with negative FITs. **2:** 377 patients (9 with CRC, 10 with IBD) were included. Paper II: Rectal bleeding was the only symptom related to CRC and IBD. The FIT showed a better PPV than rectal bleeding for CRC and IBD. When patients recorded rectal bleeding, the FIT had an NPV of 98.9% for CRC and IBD. Paper III: The best test for detecting CRC and IBD was the combination of a positive FIT and/or anaemia with a sensitivity, specificity, PPV and NPV of 100%, 61.7%, 11.7% and 100% respectively. The FC test had no additional value to the FIT alone. **3:** Paper IV: We identified four categories: "Careful listening – with awareness of the pit-falls", "tests can help – the FIT can also complicate the diagnosis", "to refer or not to refer – safety margins are necessary", and "growing more confident – but also more humble".

**Conclusions:** The diagnostic process can be described as navigating uncertain waters with safety margins. FITs were often used but handling of results varied considerably. Rectal bleeding was the only symptom related to CRC and IBD but the FIT showed a better PPV. The combination of a negative FIT and no anaemia may be useful as a rule-out test when CRC is suspected, this potentially also applies when patients present with rectal bleeding. Further studies are needed to confirm this and to determine the optimal FIT cut-off for this use.

### **Keywords**

colorectal cancer, faecal immunochemical test, faecal calprotectin, anaemia, symptomatic patients, primary care.

**Language**  
English

**ISBN**  
978-91-7601-680-0

**ISSN**  
0346-6612

**Number of pages**  
77 + 4 papers