

AN ANALYSIS OF FIT RESULTS AND NEOPLASTIC FINDINGS FROM THE NEWFOUNDLAND AND LABRADOR COLON CANCER SCREENING PROGRAM

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Background: Fecal Immunochemical Testing (FIT) is currently used in a number of Canadian provinces to screen for colorectal cancer. The Canadian Partnership Against Cancer (CPAC) recommends a FIT positive predictive value for neoplasia be >50%. Newfoundland and Labrador currently does not triage its colonoscopy waitlist for colorectal cancer screening beyond having one FIT value $\geq 100\text{ng/mL}$.

Aims: The aim of this study is to assess the effectiveness of different FIT cut-offs and combinations of FIT cut-offs in predicting adenomas and colorectal cancer.

Methods: Data for this study was obtained in a prospective fashion using the Newfoundland and Labrador Colon Cancer Screening Program. Those enrolled in the study were between the ages of 50-74 at average risk for colon cancer. Between July 1, 2012 and June 30, 2016, participants were provided with two FIT tests – if a minimum of one test was $\geq 100\text{ng/mL}$, participants were further evaluated via colonoscopy. Data on the patient's age, gender, FIT value, presence of adenoma, pathology, and other variables were collected.

Results: Of the 21,371 FIT kits mailed out, 16,152 (75.6%) were returned, of which, 2694 (16.7%) had at least one FIT value $\geq 100\text{ng/mL}$. The highest positive FIT values ranged from 100 to 54,017, with a mean of 942.3, 25th percentile of 145, 50th percentile of 260, and 75th percentile of 576. At the time of analysis, 1831 participants had been further evaluated by colonoscopy. Of those who had a colonoscopy, 73 (4.0%) were found to have colorectal cancer and 1092 (59.6%) were found to have an adenoma. The positive predictive value for both adenomas and colorectal cancer increased with increasing FIT values and serial positive values. Those with two FIT values $\geq 5000\text{ng/mL}$ had the highest adenoma detection rate (100.0%) and highest rate of colorectal cancer (53.8%), which was significantly higher than those with one FIT value $\geq 100\text{ng/mL}$ (p-values 0.002 and ≤ 0.001 , respectively).

Conclusions: There is a limited amount of Canadian research evaluating the performance of FIT testing within colorectal cancer screening programs. This research suggests that by increasing the FIT cut-off there is an improvement in adenoma detection rate. Patients with two FIT positive results are more likely to have colon cancer or an adenoma compared to patients with only one FIT positive result. Further triaging of colonoscopy wait lists could be considered based on quantitative FIT values and number of positive tests thus reducing the time to diagnosis for patients most likely to have colorectal cancer.

Table 1. Colonoscopy Results by FIT Cutoff

	1 FIT \geq 100	2 FIT \geq 100	1 FIT \geq 200	2 FIT \geq 200	1 FIT \geq 1000	2 FIT \geq 1000	1 FIT \geq 5000	2 FIT \geq 5000
Colonoscopy	1831	748	1106	289	290	84	62	12
Colorectal Cancer	73 (4.0%)	61 (8.2%)	66 (6.0%)	45 (15.6%)	40 (13.8%)	20 (23.8%)	15 (24.2%)	7 (58.3%)
Adenoma	1092 (59.6%)	538 (71.9%)	740 (66.9%)	228 (78.9%)	208 (71.7%)	68 (81.0%)	48 (77.4%)	12 (100.0%)

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