Screening with FIT-DNA: Impact on Colonoscopy Withdrawal Time, Adenoma Detection and Endoscopist's Recommendation for Follow-Up

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Abstract

Introduction: Limited data exist on colonoscopy after abnormal fecal immunochemical test (FIT)-DNA (a.k.a. multitarget stool DNA test). We hypothesized that endoscopists perform a more careful exam (e.g., longer withdrawal time (WT)) and recommend early re-screening after FIT-DNA+/negative colonoscopy due to expectations about test performance. We aimed to A) determine adenoma detection rate (ADR) and other lesion detection rates and B) assess endoscopist behavior regarding WT and recommendations after negative colonoscopy for 3 indications: 1) FIT-DNA+, 2) average-risk screening (SCR) and 3) abnormal fecal occult blood test (FOBT+, guaiac or FIT).

Methods: Using GIQuIC data (2019-2022) from 727 endoscopy units, we identified patients aged 50-75 years undergoing colonoscopy for FIT-DNA+, SCR or FOBT+. We excluded colonoscopy with any other indications (e.g., family history), inadequate bowel preparation or incomplete exam. If pathology was obtained but results were not available, the record was excluded from pathology-related outcomes. Generalized estimating equations clustered by endoscopist were used to assess the association between indication and outcomes while adjusting for patient characteristics and endoscopist's screening ADR.

Results: >1.8 million colonoscopies were included; demographics varied by indication (Table). FIT-DNA+ was associated with higher ADR (59.6%) than SCR (39.3%, p< 0.0001) and FOBT+ (53.8%, p< .0001) and greater detection of advanced neoplasia and sessile serrated lesions (Table). Among those with no pathology obtained on colonoscopy, WT was longer for FIT-DNA+ than for SCR and FOBT+. Among patients aged 50-65 years with no pathology and ASA < IV, a 10-year colonoscopy was recommended in only 80.1% of FIT-DNA+ patients vs. 87.2% of SCR and 86.5% of FOBT+. In multivariable models, compared to FIT-DNA+, SCR and FOBT+ are associated with shorter WT (p< 0.0001 for both), and lower odds of adenoma detection (OR 0.48 (95% CI 0.47-0.50) and 0.71 (0.68-0.74), respectively) and recommendations for re-screening in < 10 years (OR 0.64 (0.57-0.72) and 0.84 (0.74-0.96), respectively).

Discussion: FIT-DNA+ is associated with greater neoplasia detection than FOBT+ and SCR, but also with longer WT and more recommendations for early re-screening after a negative colonoscopy. Despite lower specificity of FIT-DNA vs. FOBT, endoscopists seem to have greater concern for missed pathology in FIT-DNA+/negative colonoscopies, leading to downstream impacts on healthcare utilization.

Methods and Materials

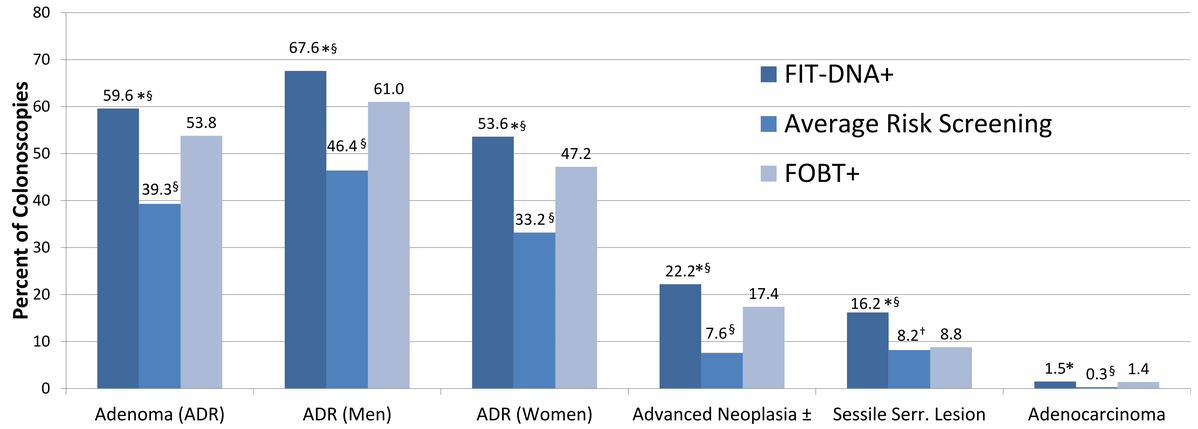
- Using GIQuIC data (2019-2022) from 727 endoscopy units
- Included patients (pt) aged 50-75 years undergoing colonoscopy for 1) FIT-DNA+, 2) average risk screening or 3) FOBT+
- Excluded colonoscopy with any other indications (e.g., family history), inadequate bowel preparation or incomplete exam
- If pathology was obtained but results were not available, the record was excluded from pathology-related outcomes
- Generalized estimating equations clustered by endoscopist was used to test the association between indication and outcomes, adjusting for pt. characteristics and endoscopist's screening ADR

Results

Table 1. Characteristics by Colonoscopy Indication.

	FIT-DNA+ (n=23,046)	Screening (n=1,760,840)	FOBT+ (n=26,455)
Age, mean (sd)	64.2 (7.1)	58.7 (7.2)	63.8 (7.2)
Male (%)	9,939 (43.1)	816,630 (46.4)	12,698 (48.0)
Female (%)	13,107 (56.9)	944,210 (53.6)	13,757 (52.0)
White (%)	15,777 (68.5)	1,022,849 (58.1)	16,387 (61.9)
Black or African American (%)	1,085 (4.7)	171,348 (9.7)	2,112 (8.0)
Asian (%)	211 (0.9)	56,644 (3.2)	959 (3.6)
Other (%)	514 (2.2)	68,966 (3.9)	1,224 (4.6)
Unknown (%)	5,459 (23.7)	441,033 (25.1)	5,773 (21.8)
Non-Hispanic (%)	14,234 (61.8)	1,018,724 (57.9)	16,691 (63.1)
Hispanic/Latino (%)	560 (2.4)	107,147 (6.1)	2,407 (9.1)
Unknown (%)	8,252 (35.8)	634,969 (36.1)	7,357 (27.8)
Total endoscopists contributing colonoscopies	2,650	4,845	3,223
Endoscopist mean ADR‡ (sd) - minimum 50 colonoscopies	Endoscopist n = 2,467 39.1% (10.2)	Endoscopist n = 3,878 39.2% (10.9)	Endoscopist n = 3,006 39.5% (10.6)

Figure 1. Colonoscopy Findings By Indication



‡ ADR includes average risk screening only, ages 50-75, photodocumentation of the cecum, adequate bowel preparation.
* p<0.0001 compared with average risk screening § p<0.0001 compared with FOBT+ † p=0.0002 compared with FOBT+
± Includes either 1) adenoma ≥10 mm, with high grade dysplasia, or with villous component; OR 2) sessile serrated lesion ≥10 mm, sessile serrated lesion with dysplasia, or traditional serrated adenoma; OR 3) adenocarcinoma

Table 2. Analysis of Subgroup with No Polyps on Colonoscopy

	FIT-DNA+	Screening	FOBT+
Next Recommended Colonoscopy (limited to age 50-65, ASA<IV, exclude 'other' & none)	(n = 2,125) *§	(n = 567,568) §	(n = 4,301)
≤3 years (%)	76 (3.6)	3,840 (0.7)	65 (1.5)
4 or 5 years (%)	333 (15.7)	65,289 (11.5)	478 (11.1)
6 – 9 years (%)	13 (0.6)	3,274 (0.6)	36 (0.8)
10 years (%)	1,703 (80.1)	495,165 (87.2)	3,722 (86.5)
Withdrawal time in minutes	(n = 4,211)	(n = 673,519)	(n = 7,455)
Median (interquartile range)	8.50 *§ (6.9 - 11.0)	7.80 (6.4 - 9.9)	7.80 (6.3 - 10.1)

* p<0.0001 compared with average risk screening § p<0.0001 compared with FOBT+

In multivariable models, compared FIT-DNA+, average risk screening colonoscopy and FOBT+ are associated with:

- lower odds of adenoma detection (OR 0.48 (95% CI 0.47-0.50) and 0.71 (0.68-0.74), respectively)
- shorter withdrawal time (p<0.0001 for both)
- lower odds of recommendations for re-screening in < 10 years (OR 0.64 (0.57-0.72) and 0.84 (0.74-0.96), respectively)

Conclusions

- FIT-DNA+ is associated with greater adenoma detection (60%) than FOBT+ (54%) and screening colonoscopy (39%), and greater cancer detection (1.5%) than screening colonoscopy (0.3%), though cancer detection is similar to FOBT+ (1.4%)
- FIT-DNA+ is associated with longer withdrawal times when no polyps are found (8.5 min) than FOBT+ (7.8 min) and screening colonoscopy (7.8 min), suggesting that endoscopists are performing a more careful exam after abnormal FIT-DNA results
- FIT-DNA+ is associated with more recommendations for early re-screening after a negative colonoscopy (20%) compared to screening colonoscopy (13%) and FIT+ colonoscopy (14%), typically recommending repeat screening within 3-5 years
- Despite lower specificity of FIT-DNA vs. FOBT, endoscopists seem to have greater concern for missed pathology in FIT-DNA+/negative colonoscopies, leading to downstream impacts including significantly shorter recommendations for f/u colonoscopy

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