

High Adenoma Detection Rate Decreases Post-Colonoscopy CRC in FIT-Based Screening Program: Quality Matters!



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This summary reviews: Wisse PHA, Erler N, de Boer SY, et al. Adenoma Detection Rate and Risk for Interval Postcolonoscopy Colorectal Cancer in Fecal Immunochemical Test-Based Screening: A Population-Based Cohort Study *Ann Intern Med* 2022; In Press. <http://www.doi.org/10.7326/M22-0301>.

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STRUCTURED ABSTRACT

Question: What is the association between physician adenoma detection rates (ADRs) and risk of post-colonoscopy colorectal cancer (PCCRC) across a broad range of ADR values in fecal immunochemical test-positive (FIT+) patients?

Design: Population-based cohort study of the Dutch CRC Screening Program, which started in 2014 and offers single FIT biennially to individuals aged 55-75 years old. With the exception of first 6 months of 2014, FIT+ defined as ≥ 47 ug of hemoglobin per gram of feces.

Setting: The Netherlands.

Patients: All FIT+ participants who underwent their first colonoscopy in 2014-16 without a CRC diagnosis within the following 6 months. Among

103,900 FIT+ individuals, complete colonoscopies to cecum with adequate bowel preparation were performed by 311 endoscopists who had performed at least 100 colonoscopies during the study period. Patient demographics: 60.0% male and the median age was 67 (IQR 63-70).

Exposure: ADR of each endoscopist who performed at least 100 colonoscopies and had complete data collection during 2014-2016 was recorded. Endoscopists who perform colonoscopies in Dutch CRC screening program have to be accredited and their procedures are audited annually for the following quality indicators: cecal intubation rate $\geq 95\%$; adequate bowel preparation (Boston Bowel Preparation Score ≥ 6 in $\geq 90\%$ of procedures); withdrawal time (≥ 6 minutes in $\geq 90\%$ of procedures); polyp resection rate ($\geq 90\%$ of polyps resected without requiring a second scheduled colonoscopy for polyp removal); and, ADR $\geq 30\%$.

Outcome: The primary outcome was time to interval post-colonoscopy CRC, diagnosed at least 6 months after a complete first colonoscopy and before scheduled surveillance colonoscopy. CRC diagnosed at or after the recommended surveillance interval were defined as “other post-colonoscopy CRC” and were not included in analysis of association between ADR and interval post-colonoscopy CRC. The colonoscopy surveillance intervals used in the Dutch program differ from those used in the US. Their scoring system is detailed and essentially equates to 10-year intervals for 0-1 small adenomas, 5-year intervals for single advanced adenoma or multiple small adenomas, and 3-year intervals for multiple advanced and non-advanced adenomas, including right-sided lesions. Study patients were followed through January 1, 2020 for identification of post-colonoscopy CRC, so maximal follow-up was < 6 years.

Data Analysis: Unadjusted hazard ratio and cox proportional hazards model that included endoscopists' ADR, endoscopy setting, patient age and gender, and diagnostic findings at first colonoscopy.

Results: After 359,589 years of follow-up (median follow-up= 52 months), 209 interval post-colonoscopy CRCs were diagnosed. Median ADR of endoscopists was 67% (range 40%-82%). The unadjusted hazard ratio for the ADR with interval post-colonoscopy CRC was 0.95 per 1% increase in ADR (95% confidence interval: 0.93-0.97; $P < 0.001$) and the multi-variate Cox model also demonstrated a 5% decrease in interval post-colonoscopy CRC for every

1% increase in ADR. There was no association with patient gender, most advanced finding at colonoscopy, or surveillance interval with risk of CRC. With respect to other quality indicators, more than 80% of endoscopists met the cecal intubation target ($\geq 95\%$), more than 90% met the adequate bowel preparation target ($\geq 90\%$) and polyp removal rate target ($\geq 90\%$), and all endoscopists met the minimal ADR threshold ($\geq 30\%$).

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COMMENTARY

Why Is This Important?

“You can’t improve what you don’t measure” is an old adage attributed to Peter Drucker, who is acclaimed as the father of management and quality improvement. Furthermore, as noted in the editorial accompanying this study¹, “if you measure it, it gets done.” Therefore, we better make sure that an endpoint is impactful before we put in the time and effort to measure it. In average-risk CRC screening colonoscopy and colonoscopy in FIT+ patients, ADR is clearly worth measuring since our goal is to prevent CRC. Since FIT+ patients are at higher risk for adenomas, these data are very helpful for establishing minimum thresholds and aspirational targets for ADR.

Before a more general discussion about the importance of continuous quality improvement with ADR, a brief note about FIT-based CRC screening may be helpful. In the Dutch program, the FIT+ cutoff of 47 ug per gram of feces is higher than the conventional cut-off of 20 ug per gram of feces used in the US and Asia, which would probably be

associated with a lower ADR. In fact, a multi-center Asian randomized controlled trial (RCT)² compared ADR in average-risk screening colonoscopy vs FIT+ individuals (20 ug hemoglobin cut-off) and reported mean ADRs of 37.5% vs 53.6% in the 2 groups. Those data may be more helpful to identify a new minimum threshold and aspirational target for ADR in FIT+ individuals.

The current minimum ADR threshold in average-risk CRC screening colonoscopy is 25%³, although recent data summarized in this publication demonstrates that each 1% increase in ADR is associated with a 3% decrease in interval post-colonoscopy CRC up to ADRs of 40%⁴. Simply achieving an ADR of 25% is a bare minimum. Yet, in a summary⁵ by Swati Patel, MD, MS, 29% of the study endoscopists in the NordiCC RCT failed to achieve this minimum threshold, which may account for a smaller reduction in CRC incidence with colonoscopy than would be estimated based on available prospective cohort studies.

Ultimately, ADR is an ideal quality improvement measure. Research demonstrates that it’s associated with the outcome of interest (reduction in CRC), is

easily measured, varies widely with ADRs ranging from 8% to 62% in the control arms of different colonoscopy RCTs⁶, and can be improved through multiple interventions, including simply measuring and reporting ADRs back to endoscopists as well as improving quality of bowel preparation, increasing withdrawal time, using distal colonoscopy attachments, and employing artificial intelligence systems to help identify polyps. Wisse and colleagues are to be commended for producing an outstanding study to confirm the importance of raising ADRs in the FIT+ screening population that undergo colonoscopy.

Caution

Sessile serrated lesions were not included in the ADR calculation, which is consistent with the current standard ADR definition. Since study patients had their initial colonoscopy in 2014-2016, median follow-up of patients was 52 months. Longer follow-up would be helpful for patients scheduled for repeat colonoscopy 10 years after initial colonoscopy. As noted above, the cut-off for FIT+ was 47ug per gram of feces, which may have contributed to the very high median ADR seen in this study.

My Practice

In our Veterans Affairs Medical Centers, the default CRC-screening tool is FIT with a positive test defined as ≥ 20 ug hemoglobin per gram of feces. Screening colonoscopy is available if patient requests it after discussion with their primary care provider. At the John D. Dingell VAMC, we report separate ADRs for colon polyp surveillance co-

lonoscopy, FIT+ screening colonoscopy, and average-risk screening colonoscopy, along with cecal intubation rate, withdrawal time for colonoscopies when no polyps are removed, and frequency of adequate bowel preparation in biannual reports. In order to improve ADRs, our endoscopists are routinely taught to take a second look in the right side of the colon and have the option of using Endocuff (Olympus America), a distal cap device used to distend folds. Fortunately, we have high-definition white light colonoscopy systems and we're scheduled to install GiGenius (Medtronic), an artificial intelligence system to improve identification of polyps in real-time during colonoscopy.

Key Study Findings

In this population of FIT+ individuals undergoing CRC screening colonoscopy, each 1% increase in ADR was associated with a 5% decrease in interval post-colonoscopy CRC across endoscopists with median ADR 67% (range 40-82%).

For Future Research

Future guidelines and position statements should be updated to reflect higher threshold ADRs when screening colonoscopy is performed in FIT+ patients. Prior summaries in this publication have outlined multiple interventions for improving ADR. Given the robust data about the impact of ADR on quality of screening colonoscopy, future research may shift focus to quantifying the number of US endoscopists/endoscopy units that routinely calculate

and report ADRs and explore implementation of quality improvement programs in units that aren't measuring it.

Conflicts of Interest

Drs. Sleiman and Schoenfeld declare no conflicts of interest.

REFERENCES

1. Corley DA. Developing Meaningful Health Care Quality Metrics: An Example from Colonoscopy and Adenoma Detection. *Ann Intern Med* 2022; In Press.
2. Wong JCT, Chiu HM, Kim HS, et al. Adenoma Detection Rates in Colonoscopies for Positive Fecal Immunochemical Tests versus Direct Screening Colonoscopies. *Gastrointest Endosc* 2019; 89: 607-13
3. Rex DK, Schoenfeld PS, Cohen J, et al. Quality indicators for colonoscopy. *Gastrointest Endosc* 2015;81(1):31-53.
4. Schottinger JE, Jensen CD, Ghai NR, et al. Association of physician adenoma detection rates with postcolonoscopy colorectal cancer. *JAMA* 2022; 327: 2114-22.
5. Patel S. Colonoscopy Reduces CRC Incidence and CRC-Related Mortality ...If You Get It! *ACG Evidence-Based GI*; Oct 2022. https://gi.org/journals-publications/ebgi/patel_october2022/
6. Hassan C, Piovani D, Spadaccini M, et al. Variability in Adenoma Detection Rate in Control Groups of Randomized Colonoscopy Trials. *Gastrointest Endosc* 2022 Oct 12;S0016-5107(22)02041-7.