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The Pursuit of Excellence in Colonoscopy: Audit and Feedback Improves Polyp Detection in Low-Performers

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This article reviews Tinmouth J, Sutradhar R, Li Q, et al. A Pragmatic Randomized Controlled Trial of an Endoscopist Audit and Feedback Report for Colonoscopy. Am J Gastroenterol 2021; 116: 2042-51. https://doi.org/10.14309/ajg.0000000000001498 PMID: 34515669

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STRUCTURED ABSTRACT

Question: Does endoscopist audit and feedback (A&F) improve colonoscopy performance?

Setting: Endoscopists in Ontario province, Canada.

Participants: Study included 881 endoscopists; >50% were surgeons, 80% male, and median annual colonoscopy volume >400. Endoscopists who were no longer practicing and those with less than 6 colonoscopies in each study period were excluded.

Intervention/Exposure: Endoscopists were randomly assigned (1:1) to either A&F and a resource sheet (intervention group, n=417) vs no A&F/usual practice (control group, n=416). A&F report included endoscopist's performance using 9 quality indicators along with the endoscopist's rank relative to others (top, middle, bottom tier), and indicator definitions generated for a 1-year pre-report period (January 1, 2014 to December 31, 2014) after which colonoscopy performance was measured over a 12-month period (post-report period). Along with the report, a cover letter, list of resources, and incentives to help improve colonoscopy practice was provided. Although the control group did not receive A&F, they did realize that their performance was being monitored and compared to A&F group during 12-month observation periods.

Outcomes: The primary outcome was polypectomy rate (PR) because adenoma pathology data was not available for the entire study period. However,

the impact of A&F on adenoma detection rate (ADR) was investigated in a *post hoc* analysis. Secondary outcomes included cecal intubation rate, rate of "poor" bowel preparation, and premature repeat after normal colonoscopy (i.e., percent of outpatient colonoscopies performed in individuals 53 years old or older and had a complete normal colonoscopy within past 3 years).

Data Analysis: The principal analysis considered all endoscopists who completed 6 or more colonoscopies in the pre-report and post-report periods. A subgroup analysis in lower-performing endoscopists, defined as endoscopists with PR <25%, was also performed. Primary and secondary outcomes were assessed using crude analysis and adjusted Poisson regression analysis.

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Results: Among all endoscopists, mean PR improved from the pre-report to the post-report period in both groups. The increase was not significantly higher in A&F group vs control group. (**Table 1**) However, among lower-performing endoscopists with PR <25%, there was significantly more improvement in polypectomy rate for the A&F arm (17.9% to 23.8%) vs controls (19.4% to 23.3%) [RR: 1.34 vs 1.11, *P*=0.02]. Among low-performing endoscopists, mean ADR also improved more in the A&F group vs controls, though the difference was not significant (RR: 1.12 vs. 1.04, *P*=0.12). No differences were found in A&F effectiveness by specialty or annual colonoscopy volume. No significant differences were found in any secondary endpoints.

COMMENTARY

Why Is This Important?

The ADR has become one of the most widely used and validated quality measures and key performance indicators for screening colonoscopies.[1] Despite its widespread recognition and the inverse association with interval colorectal cancer risk, there still exists significant variation in ADR among endoscopists.[2] Research into endoscopist characteristics and their impact on ADR have yielded mixed results. For instance, a recent study showed no significant differences in ADR based on endoscopist's specialty, sex, location of medical school, practice setting or presence of trainee during colonoscopy.[3] As such, interventions to enhance ADR such as the optimization of withdrawal times,

Outcome	Pre-Report, mean (SD)	Post-Report, mean (SD)	Rate Ratio (95% CI)	*P*-value
Polypectomy rate (all endoscopists)				
Intervention group	39.9 ± 14.8	42.4 ±15.1	1.07 (1.05-1.09)	0.09
Control group	40.0 ± 14.1	41.8 ± 14.2	1.05 (1.04-1.07)	
Polypectomy rate (lower performing endoscopists, i.e. PR <25%)				
Intervention group	17.9 ±6.2	23.8 ± 10.8	1.34 (1.16-1.54)	0.02
Control group	19.4 ± 4.7	23.3 ± 8.5	1.11 (1.06-1.17)	
Adenoma detection rate (all endoscopists)				
Intervention group	28.6 ± 10.8	29.3 ± 10.5	1.03 (1.01-1.05)	0.83
Control group	28.4 ± 11.3	29.1 ± 10.4	1.03 (1.01-1.04)	
Adenoma detection rate (lower performing endoscopists, i.e. PR <25%)				
Intervention group	18.6 ± 7.8	20.3 ± 9.4	1.12 (1.04-1.20)	0.12
Control group	19.2 ± 9.6	19.6 ± 8.7	1.04 (0.98-1.10)	

Table 1. Study Results. Mean PR showed no significant increase in audit and feedback group vs the control group. CI, confidence interval; PR, polypectomy rate; SD, standard deviation.

adoption of artificial intelligence, and utilization of technology-assisted colonoscopy are gaining traction.[4]

With current national ADR benchmarks set at greater than or equal to 25%, the need for sustainable interventions to improve this quality metric, particularly in low-performing endoscopists, has become essential. While artificial intelligence and technology-assisted colonoscopy sound promising, they are yet to reach primetime, underscoring the need for cheap, pragmatic, and scalable interventions. A&F have been shown to improve provider performance and this study by Tinmouth et al. provides evidence that it may also improve polyp detection among endoscopists with low ADRs.

Key Study Findings

Among low-performing endoscopists (i.e., endoscopists with polypectomy rate <25%), A&F led to a statistically greater improvement in polypectomy rate compared to control. A similar improvement was observed among all endoscopists, but this did not meet statistical significance. Adenoma detection rates also improved but this was not statistically different

between the intervention and control arms, though the study might have been underpowered to detect this difference.

Caution

This study provides some evidence that endoscopy performance can be improved with A&F, however, the sustainability of any impact particularly in the long-term, has not been reliably demonstrated. In addition, the authors in this study measured PR and ADR across all indications for colonoscopy, and not specifically for screening colonoscopies. As such, factors like case-mix and indication for the procedure could impact results. It is also essential to highlight that the impact of A&F on ADR was studied as a subgroup analysis and thus might have lacked the necessary power needed to detect a true change in ADR.

My Practice

Our institution (Division of Gastroenterology, Stanford University) has developed a reliable and easy mechanism to collect polyp data not just for ADR, but also serrated lesion detection rates (SLDR), advanced adenomas detection rate (AADR), and advanced serrated lesion detection rate (ASLDR) across the entire gastroenterology division over the past 7 years. This has relied on the buy-in of all endoscopists as the integrity of data collection relies heavily on the input of the group. This effort has grown to become collaborative and every quarter each endoscopist receives an email summary of their colonoscopy performance including data on the extent of exam, Boston Bowel Prep Score, withdrawal time, and indication for the colonoscopy. These data are collected for screening colonoscopies, surveillance colonoscopies, and diagnostic colonoscopies (performed for positive fecal immunochemical or multi-target stool DNA tests). Endoscopist data is compared to department averages for ADR, AADR, SLDR, and ASLDR.

We also receive feedback based on our consistency of providing surveillance recommendations to the referring provider. The ability to historically compare my performance with that of my peers has served as an internal drive that motivates me to consistently monitor the integrity and duration of my withdrawal. Personally, I (PO) use a counter on the screen in the

endoscopy suite to ensure that an adequate amount of time is spent in each colonoscopy segment. Over time, this has led to my ADR improvement, which now approaches the highest in the division.

The main distinguishing features between our program and the A&F intervention tested by Tinmouth et al. are the socialization efforts and the frequency and context of feedback. We have been able to develop, institute and sustain our processes as a group, with multiple touch points at faculty meetings and individualized communications. This was not feasible in the province-wide effort by Tinmouth et al. This probably makes a big difference.

Our experience over the past 7 years, though anecdotal, suggests that the improvement from A&F in the context of a group effort to build a culture focused on high-quality care can lead to behavior changes, but we still maintain that the sustainability of any increase in colonoscopy key performance indicators from A&F needs to be studied in a prospective and rigorous manner.

For Future Research

This randomized control trial by Tinmouth et al. was adequately powered to demonstrate the impact of A&F on polyp detection. However, the impact on ADR was studied post hoc. Further studies that are powered to investigate the impact of A&F on ADR specifically (and AADR, SLDR, ASLDR) would provide needed high-quality evidence because some endoscopists can have a high polyp detection rate but have lower rates of detecting predominantly right-sided lesions such as serrated and advanced serrated lesions. There will also soon be a need for comparative effectiveness studies investigating the impact of technology-assisted colonoscopy versus or in combination with A&F on colonoscopy key performance indicators while quantifying the risk reduction on interval colorectal cancers.

Conflict of Interest

The authors report no potential conflict of interest.

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