Reviewer #1:
Scientific Quality: Grade C (Good)
Language Quality: Grade B (Minor language polishing)
Conclusion: Minor revision
Specific Comments to Authors: The authors reviewed the non-technological techniques for enhancing polyp detection. This review focused on only three maneuvers (withdrawal time, position change, and retroflexion at the right colon), and the authors provided enormous detail in each session. The authors did a good review; however, I have a few suggestions that may improve this manuscript. -The detail in each session, including the conclusion, maybe too much and unnecessary. The authors could provide only RCT and significant prospective studies. Too much detail makes this manuscript very difficult to follow and read until the end. -The authors should provide the percentage that each maneuver improves ADR on the tables. This could help the reader easier to get the overall picture. -The topic is about improving polyp detection. The authors should provide studies of sessile serrated lesion detection rates and these maneuvers. I really appreciate the hard-working of the authors in the manuscript. I hope the authors can revise the manuscript to be more concise and gain interest from the audience.

Reviewer #2:
Scientific Quality: Grade C (Good)
Language Quality: Grade B (Minor language polishing)
Conclusion: Minor revision
Specific Comments to Authors: The author discussed aspects improve positive detection rate of colonoscopy，such as withdrawal technique, withdrawl time, dynamic position change on withdrawal and proximal colon retroflexion, except oprationors' skill. This may help endoscopists with lack of expence and skill to improve ADR. Thus, the sample is small, only a few studies are enrolled, which may limite the promotion of the conclusion.

Dear Reviewers,

Thank you for taking the time to review our manuscript and for your comments. I will address each of the points raised below.

<u>REVIEWER 1</u>
<u>The detail in each session, including the conclusion, maybe too much and unnecessary. The authors could provide only RCT and significant prospective studies.</u>

The studies highlighted in red below have been removed from the manuscript (retrospective studies). They do not appear in the current manuscript.

An initial retrospective study on 10,159 colonoscopies showed a positive relationship between increased procedural time and increased polyp detection. The procedure time was defined as the time from the arrival of the endoscopist into the procedure room to colonic extubation. A statistically significant difference in the mean procedure time (22.1 min) for endoscopists who detected above average rates of medium-sized polyps (10-20mm) than below average rates (18.9 min), p=0.009 was noted. No statistically significant difference was observed for larger polyps >2cm. The limitations of this study included the retrospective, single-centre design. Furthermore, the procedural time included the time of the endoscopist's arrival into the procedural room as a surrogate marker of the withdrawal time, which does limit the ability to draw any firm conclusions (16).

Another similar-sized retrospective study in a tertiary centre showed that longer withdrawal times correlated with greater polyp detection. The median PDR of 42.7% correlated with a withdrawal time of 6.7 minutes, p<0.0001. The association between withdrawal time and increased polyp detection, became weaker as the polyps became larger. No significant relationship between polyps ≥ 6mm in size and mean withdrawal times was found. A minimum withdrawal time of 9 minutes did not increase the number of larger polyps (>2cm), so a minimum withdrawal time of 7 minutes was recommended (17)

The first 2439 procedure study to evaluate posture conversion was published as a conference paper. Of the 2439 procedures, 1524 patients had a colonoscopy without posture conversion at a median time frame of 14 months beforehand. This study found that 30% of patients who recently had a colonoscopy without posture conversion had new neoplastic lesions(39).

In a small tandem design study, 14 patients were first randomized to colonoscopy withdrawal in either the left lateral position alone or to left lateral for caecum to the hepatic flexure, supine in the transverse colon and right lateral for the splenic flexure and descending colon, and vice versa. Video recordings were made of each examination. In this RCT a single endoscopist performed all the procedures and a different endoscopist who was blinded to the randomization limb, evaluated the videos from each patient. The main outcome was measure was luminal distension, that was scored on a scale of 1-5: 1, complete collapse; 5, wide distension. In this study, the blinded endoscopist reviewing the videos found a significantly higher score in the transverse colon (TC), splenic flexure and descending colon (DC), $p=0.02$, $p=0.002$ and $p<0.001$ respectively. If position change was not used, 43% of the patients would have a non-diagnostic score (1 or 2) in at least 1 colonic segment, $p=0.03$. This study has the merit of being a randomized controlled trial, but it is a single operator, single-centre study with only 14 patients, which is a significant limitation (36).

In a multi-centre observational study (50) across 3 centres in Japan, an evaluation of adenoma miss rates was performed for FV and RV. Like the study by Lee et al(49), the use of a cap occurred for all the 3 withdrawals. 2 standard forward view examinations were performed, and a 3rd retroflexed view was performed. The AMR for the repeated forward-view examinations was the primary outcome; this was 15.4%. An additional 291 adenomas were detected in the 2nd forward view inspection and 53 additional adenoma in the retroflexed view inspection. 3% of

Some sentences have been shorted and/or re-worded to make them more succinct. If the reviewers would like to see the changes, I can upload in a separate email, but I felt it was too onerous for them to read each one, so they are not listed.

The topic is about improving polyp detection. The authors should provide studies of sessile serrated lesion detection rates and these maneuvers.
I outline in red, where this information has been detailed below.

Results from a population-based registry study showed a statistically significant increase in the polyp and adenoma detection rate when the withdrawal time was > 9 minutes. The PDR of 53.1% and ADR of 33.6% was found to be highest at 9 minutes. Endoscopists with median withdrawal times of <6 minutes, were significantly worse than endoscopists with median withdrawal times of > 9 minutes; PDR was 10.5% less, and ADR was 9.8% less respectively. Serrated polyp detection rates were 4.5% higher amongst endoscopists with median withdrawal times of 9 minutes compared to those with median withdrawal times of 6 minutes. Roughly 10% of the data was missing, which could cause a degree of attrition bias[28]

Sessile serrated lesions have a subtle appearance and are more difficult to detect. Their prevalence varies between 7-10%[33]. A registry-based study reported that the detection of sessile serrated lesions was higher with longer withdrawal times > 11 minutes compared to ≤ 6 minutes[5]. Most of the large studies evaluating minimum withdrawal times did not address sessile serrated lesion detection[17, 18, 20]. Two studies did report that the detection rates of sessile serrated lesions improved with increasing withdrawal times[5, 28].

This study showed that endoscopists with a lower baseline ADR (<35%) had a significant increase in their ADR when position change was adopted compared to endoscopists with higher baseline ADR (>35%). The detection of sessile serrated adenoma was also greater in the position change limb 2.3% vs left lateral position 0.8%, but this did not reach statistical significance. No statistically significant improvement in the detection of advanced adenoma was shown in the intervention limb. This RCT is the largest study conducted so far, with the additional merit of being a multi-centre trial

A recent multi-centre RCT of 692 patients with a positive FIT test[51] randomized patients to a repeat right colon examination in standard forward view or retroflexed view. The repeat examination increased the ADR by 11%, with no statistically significant difference between SFV and RV; 12% and 9% respectively, p=0.21. The detection of sessile serrated lesions in the right colon at second examination was 11.1%, with no significant difference between SFV and RV. Success of retroflexion was only 83%. This study backs existing evidence that a repeat examination improves the ADR, whichever, view (SFV or RV) is adopted.

SSLs are increasingly recognized important precursor lesions to colorectal cancer. The evidence supporting the role of colonoscopy withdrawal techniques in this sub-group is limited. Data supporting the role of minimum withdrawal times [5, 28], dynamic position change[35] and proximal colon retroflexion[52] show a positive trend towards increasing detection of SSLs. Further studies adequately powered to perform sub-group analysis for small polyps and also sessile serrated lesions are required.

The authors should provide the percentage that each manoeuvre improves ADR on the tables.

Inserted below in manuscript

Table 1. Summary of studies evaluating colonic withdrawal times

Study	Year	Design	N	Outcome
Barclay[17]	2006	Prospective	7882	WT > 6 minutes associated with increased ADR
Barclay[18]	2008	Prospective	2053	WT ≥8 minutes associated with increased ADR
Sawhney[19]	2008	Prospective	23,910	Minimum 7 minutes WT not associated with increased PDR
Gellad[27]	2010	Prospective	304	WT ≥12 minutes not associated with risk of interval neoplasia
Gromski[21]	2012	Prospective	1210	WT ≥10 minutes associated with increased ADR
Moritz[24]	2012	Prospective	4429	WT ≥6 minutes not associated with increased ADR
Lee[20]	2013	Prospective	31,088	WT up to 10 minutes associated with increased ADR
Butterly[28]	2014	Prospective	7996	WT ≥9 minutes associated with increased ADR
Zhao[29]	2022	RCT	1027	Increased ADR associated with WT of 9 minutes vs WT of 6 minutes

Table 2.   Results of studies evaluating colonic withdrawal times.

Study	Intervention Limb%	Control Limb%	P-value
Barclay[17]	28.3%	11.8%	[a]p<.001
Barclay[18]	34.7%	23.5%	[b]p>0.0001
Sawhney[19]	N/A	N/A	N/A
Gellad[27]	N/A	N/A	N/A
Gromski[21]	32.3%	9.5%	[a]p<.001
Moritz[24]	N/A	N/A	N/A
Lee[20]	47.1%	42.5%	[a]p<.001
Butterly[28]	ADR: IRR= 1.50		[c]p=0.001
Zhao[29]	36.6%	27.1%	[c]p=0.001

Table 3. Summary of studies evaluating dynamic position change

Study	N	Design	Control limb	Dynamic position change limb
East[37]	130	RCT	Left lateral	RC = left lateral, TC= supine, LC = right
Koksal[41]	102	RCT	Left lateral	RC = left lateral, TC = supine, LC = right lateral + supine
Lee[36]	1072	RCT	Left lateral	RC = left lateral, TC = supine, LC = right lateral
Ball[42]	130	RCT	Supine	RC = left lateral, TC = supine, LC = right lateral
Ou[40]	776	RCT	Usual position	RC = left lateral, TC = supine, LC = right lateral

N: Number of patients; RCT: Randomized controlled trial; RC: Right colon;

TC: Transverse colon; LC: Left colon

Table 4. Results of studies evaluating dynamic position change

Study	Year	Outcome	Control limb position	Dynamic position change limb	P-value
East[37]	2011	Increased ADR	23% ADR	34% ADR	[a]p=0.01
Koksal[41]	2013	Increased ADR	23.5% ADR	33.3% ADR	[b]p=0.002
Lee[36]	2016	Increased ADR	33.3% ADR	42.4% ADR	[b]p=0.002
Ball[42]	2015	Increased PDR in RC only	17.7% ADR	26.2% ADR	[a]p=0.01
Ou[40]	2014	No effect on ADR	37.9% ADR	40.7% ADR	[c]p=0.44

ADR: Adenoma detection rate; PDR: Polyp detection rate; RC: Right colon

Table 5. Summary of studies evaluating proximal colon retroflexion

Study	Year	N	Design	Outcome
Harrison[44]	2004	100	RCT	No difference in AMR in SFV vs RV
Hewett[46]	2011	1000	Prospective	AMR in RV comparable to 2nd examination in SFV
Chandran[45]	2015	1351	Prospective	Increased ADR in RV (26.4%) vs SFV(24.6%)
Kushnir[49]	2015	850	RCT	No difference in ADR in SFV vs RV
Lee[50]	2017	1020	Prospective	Increased ADR in RV(27.5%) vs SFV(25.5%)
Nunez Rodriguez[51]	2020	692	RCT	No difference in ADR in SFV vs RV
Rath[52]	2020	205	RCT	No difference in ADR in SFV vs RV
Michopoulos[53]	2021	655	Prospective	Increased ADR in RV(22.75%) vs SFV(14.2%)

RCT: Randomized controlled trial; AMR: Adenoma miss rate; ADR: Adenoma detection rate; SFV: Standard forward view; RV: Retroflexed view

This may help endoscopists with lack of experience and skill to improve ADR. Thus, the sample is small, only a few studies are enrolled, which may limit the promotion of the conclusion.

Inserted 2nd paragraph in the conclusion

Most of the available literature on the role of simple operator techniques in adenoma detection during colonoscopy are from retrospective and prospective studies. This poses a limitation on the conclusions that can be drawn from the findings, as the lack of randomization in these study designs introduces inherent bias. There are only a few large, multi-centred RCT's addressing this area.