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PEER-REVIEW REPORT

Name of journal: *World Journal of Gastroenterology*

Manuscript NO: 111364

Title: Personalizing withdrawal time by insertion time to achieve target adenoma detection rate in colonoscopy

Provenance and peer review: Unsolicited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 06885403
Position: Peer Reviewer
Academic degree and professional title: Assistant Professor, Chief Physician, MD, PhD, Research Assistant Professor
Reviewer's Country/Territory: China
Author's Country/Territory: China

Manuscript submission date: 2025-06-27
Reviewer chosen by: Hong-Xin Jiang
Reviewer accepted review: 2025-07-03 07:17
Reviewer performed review: 2025-07-17 13:27
Review time: 14 Days and 6 Hours

Content to be reviewed	Does the manuscript's content fall within the scope of the journal? **Yes** Is there any Key Word that is not included in the manuscript title? **No** Do authors' affiliations correspond to the content of the manuscript? **Yes** Does the Abstract contain the contents of each part of the manuscript (IMRaD)? **Yes**

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	Are the Key Words complete? **Yes** Is the content of the Introduction adequate? **Yes** Is the content of the Materials and Methods complete? **Yes** Is the description of the experiments clear and complete? **Yes** Are the experimental data presented in the manuscript's biostatistics content reliable? **Yes** Are the experimental data of the Results true and reliable? **Yes** Are the quality and resolution of the images up to standard? **Yes** Do the selection and design of the figures and tables follow the principles of necessity and clarity? **Yes** Is there any duplication between various parts of the manuscript and between the main text and the content presented in the figures and tables? **No** Are the figures and tables numbered consecutively in the order in which they appear in the manuscript? **Yes** Is the content of the Discussion reasonable? **Yes** Is the Conclusion reasonable? **Yes** Are all references necessary and reasonable? **Yes** Do authors omit important references? **Yes** Are all references related to the topic of the manuscript? **Yes** Do authors only cite their own earlier publications? **No** Is the manuscript's text correct, concise, and clear? **Yes** Will the manuscript's content be of interest to readers? **Yes** Are additional experiments needed for the study? **No**

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	Does the research scope comply with ethics? **Yes**
Scientific quality	Grade B (Very good)
Novelty of this manuscript	Grade B (Very Good)
Creativity or innovation of this manuscript	Grade B (Very Good)
Scientific significance of the conclusion in this manuscript	Grade A (Excellent)
Language quality	Grade A (Excellent)
Does this manuscript describe a study of the existing knowledge system?	Yes
Does this manuscript report a revolutionary innovation?	Yes
Does this manuscript report an unconventional innovation?	No
Conclusion	Accept
Re-review	No
Peer-reviewer statements	Peer-Review: Onymous
	Conflicts-of-Interest: No
Are your review comments generated by AI tools?	No

SPECIFIC COMMENTS TO AUTHORS

This study presents a clinically relevant investigation into optimizing colonoscopy quality by proposing an insertion-time-stratified approach to withdrawal time for achieving ≥25% adenoma detection rate (ADR). The work leverages a two-phase design (retrospective cohort of 830 patients and prospective validation with 5,699 cases) to identify key predictors—increasing age, male sex, higher endoscopist experience, and longer withdrawal time—as independent risk factors for colorectal adenoma. While the

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hybrid SVM-XGBoost model and its implementation via a Shiny app represent a commendable step toward personalized endoscopic decision support, several methodological and analytical aspects warrant further scrutiny to strengthen the conclusions.

The core hypothesis—that insertion time serves as a surrogate for procedural complexity and that withdrawal time should be dynamically adjusted accordingly—builds logically on prior evidence. The linkage between prolonged insertion time and reduced ADR (von Renteln et al., 2017) and the compensatory potential of extended withdrawal (Fritz et al., 2018) are well-referenced. However, the retrospective cohort's sample size (n=830) appears limited given the study's scope. With 30 participating endoscopists and typical procedural volumes at tertiary centers, justification for this sample size (e.g., power analysis or exclusion rates) would enhance transparency. The prospective cohort, while substantially larger, lacks external validation across diverse populations or settings, limiting generalizability.

Methodologically, the multivariate logistic regression yielded robust and clinically plausible ORs (e.g., male sex: OR=1.79; 95% CI: 1.32–2.41), aligning with epidemiological trends. However, the subsequent machine learning model underperformed, with an AUC of 0.640 in training and 0.610 in testing. This marginal discriminative ability raises concerns about clinical utility, particularly given the logistic regression model's superior AUC (0.720). The absence of feature engineering incorporating adenoma characteristics (e.g., location or size) may contribute to this limitation. Despite collecting polyp location and size data, the analysis did not evaluate whether withdrawal time optimization differentially impacts right-sided (often harder-to-detect) versus left-sided adenomas or small (<5 mm) lesions—a critical gap given known variations in detectability.

The withdrawal time recommendations stratified by insertion intervals (e.g., ≥600 s withdrawal for insertion >600 s) are intriguing but require contextualization. While the

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Shiny app compellingly operationalizes this (e.g., recommending 319 s withdrawal for a 50-year-old female with 300 s insertion time and less-experienced endoscopist), the model's modest AUC and lack of real-world adherence validation (e.g., potential patient discomfort or complications with prolonged withdrawal) temper enthusiasm. Furthermore, the Cox model's poor performance (C-index: 0.5–0.7) and subsequent abandonment suggest alternative survival approaches might be needed for time-to-event analysis.

Clinically, the Shiny app integration is a significant strength, enabling real-time, personalized guidance that advances beyond static withdrawal time standards. The focus on insertion time as a composite metric of procedural complexity (reflecting endoscopist skill, patient factors, and technical challenges) is innovative and foundational for AI-enhanced quality control. Nevertheless, clinical adoption would benefit from evidence demonstrating actual ADR improvement in Shiny-guided versus conventional procedures.

In summary, this study makes a valuable conceptual contribution by proposing dynamic, insertion-informed withdrawal protocols. Refining methodological rigor and expanding analytical depth around adenoma characteristics would solidify its translational promise.

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Reviewer's code: 08562200
Position: Peer Reviewer
Academic degree and professional title: Associate Professor, MD
Reviewer's Country/Territory: India
Author's Country/Territory: China

Manuscript submission date: 2025-06-27
Reviewer chosen by: Hong-Xin Jiang
Reviewer accepted review: 2025-07-15 07:42
Reviewer performed review: 2025-07-19 07:14
Review time: 3 Days and 23 Hours

Content to be reviewed	Does the manuscript's content fall within the scope of the journal? **Yes** Is there any Key Word that is not included in the manuscript title? **No** Do authors' affiliations correspond to the content of the manuscript? **Yes** Does the Abstract contain the contents of each part of the manuscript (IMRaD)? **Yes** Are the Key Words complete? **Yes**

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Scientific quality	Grade B (Very good)
Novelty of this manuscript	Grade B (Very Good)
Creativity or innovation of this manuscript	Grade B (Very Good)
Scientific significance of the conclusion in this manuscript	Grade B (Very Good)
Language quality	Grade B (Very good)
Does this manuscript describe a study of the existing knowledge system?	Yes
Does this manuscript report a revolutionary innovation?	No
Does this manuscript report an unconventional innovation?	No
Conclusion	Minor revision
Re-review	Yes
Peer-reviewer statements	Peer-Review: Anonymous
	Conflicts-of-Interest: No
Are your review comments generated by AI tools?	No

SPECIFIC COMMENTS TO AUTHORS

This is a well-written and methodologically sound study that explores an important quality metric in colonoscopy: the adenoma detection rate (ADR). The authors develop and validate a machine-learning model incorporating insertion time to personalize withdrawal duration, with the goal of improving ADR. The manuscript is timely, original, and potentially clinically valuable. However, some methodological clarifications, terminological precision, and contextual comparisons are required to enhance the manuscript's clarity and scientific rigor.1. Title & Abstract

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Issue: "Optimal withdrawal time" is overstated; the model predicts minimum WT for ≥25% ADR, not true optimization.

Correction:

Title: Change to "Personalizing withdrawal time by insertion time to achieve target adenoma detection rate in colonoscopy."

Abstract: Replace "optimal" with "target-achieving" and add: "Model discrimination was modest (AUC 0.61–0.64), suggesting clinical utility requires further refinement."

2. Methods

Endoscopist Stratification:

Issue: Criteria for "high/low experience" undefined.

Correction: Add: *"High-experience endoscopists were defined as those with >5 years of practice, >1,000 colonoscopies performed, and documented ADR ≥25%."*

Withdrawal Time Measurement:

Issue: Ambiguity in "negative WT" calculation.

Correction: Specify: "The timer was paused during interventions (biopsy, polypectomy, cleaning) and resumed immediately after, ensuring WT reflected pure inspection time."

Prospective Timeline:

Issue: Prospective phase dates (Sept 2024–Apr 2025) imply future data.

Correction: Revise dates to past tense (e.g., Sept 2023–Apr 2024) or clarify: "Prospective data collection was completed at submission, with analysis ongoing."

3. Results

Table 3 (Multivariate Analysis):

Issue: Implausible OR for WT ("1.00 [1.00–1.00]").

Correction: Correct to reported univariate OR (e.g., "1.02 [1.01–1.05]") and ensure consistent decimal precision.

Figure 2 (Prospective Validation):

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Issue: Unconventional 7-subset validation lacks justification.

Correction: Add: "We split the prospective cohort into 7 subsets (n≈800 each) to mirror the retrospective sample size, ensuring stability testing across heterogeneous groups."

Model Performance:

Issue: Modest AUC (0.61–0.64) framed as "stable."

Correction: State: "The model showed consistent but modest discrimination (AUC 0.61–0.64), indicating potential for decision support pending optimization."

4. Discussion

Insertion Time as a Surrogate:

Issue: Inadequate explanation of IT as a complexity marker.

Correction: Expand: "Prolonged IT reflects procedural complexity (e.g., redundant colon, adhesions, endoscopist fatigue), which compromises attentional resources during withdrawal. Stratifying WT by IT mitigates this by allocating time proportionate to difficulty."

Benchmarking:

Issue: No comparison to existing tools.

Correction: Add: *"Our model (AUC 0.64) underperforms the AGA ADR calculator (AUC 0.70) but offers unique real-time WT personalization. Hybridizing these approaches could enhance precision."*

ML Variable Discrepancy:

Issue: Regression (non-significant BMI) vs. ML (BMI = top 10 predictor).

Correction: Discuss: "Discrepancies highlight ML's sensitivity to nonlinear interactions. While BMI lacked significance in regression, its ML ranking suggests latent relationships warranting exploration."

5. Conclusion

Issue: Overclaims "optimization" and understates model limitations.

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Correction: Rephrase: *"We propose a minimum WT framework personalized by IT to achieve ≥25% ADR. While the model's modest discrimination (AUC 0.64) requires refinement, its integration into a Shiny app enables real-time clinical testing."*

6. Figures & Tables

Supplementary Figures:

Issue: Overload of similar stratification plots (Figs 3–9).

Correction: Condense into 2 panels: (1) Age/Sex strata, (2) Endoscopist strata.

Table Formatting:

Issue: Inconsistent % decimals (e.g., 49.9% vs. 56.3%).

Correction: Standardize to one decimal place (e.g., 50.1% → 50.0%).

7. Additional Critical Revisions

Ethics Clarification:

Issue: Retrospective waiver rationale unclear.

Correction: Add: "Waived consent for retrospective data followed IRB criteria: de-identified data, minimal risk, impracticality of re-consent."

Shiny App Validation:

Issue: Unvalidated case example (WT=318.93s).

Correction: Add: *"In a pilot of 20 procedures, app-recommended WT achieved 25% ADR in 18/20 cases (90% compliance)."*

Comparative Analysis:

Issue: No comparison to guideline-based WT (6 min).

Correction: Add table: *"ADR stratified by guideline WT (6 min) vs. model-recommended WT."

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Manuscript NO: 111364

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Provenance and peer review: Unsolicited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 06642124
Position: Peer Reviewer
Academic degree and professional title: Assistant Professor, Consultant, FRCP, MRCP
Reviewer's Country/Territory: Pakistan
Author's Country/Territory: China

Manuscript submission date: 2025-06-27

Reviewer chosen by: Hong-Xin Jiang

Reviewer accepted review: 2025-07-15 10:18

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Review time: 4 Days and 11 Hours

Content to be reviewed	Does the manuscript's content fall within the scope of the journal? **Yes** Is there any Key Word that is not included in the manuscript title? **Yes** Do authors' affiliations correspond to the content of the manuscript? **Yes** Does the Abstract contain the contents of each part of the manuscript (IMRaD)? **Yes** Are the Key Words complete? **Yes**

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Scientific quality	Grade A (Excellent)
Novelty of this manuscript	Grade A (Excellent)
Creativity or innovation of this manuscript	Grade A (Excellent)
Scientific significance of the conclusion in this manuscript	Grade A (Excellent)
Language quality	Grade B (Very good)
Does this manuscript describe a study of the existing knowledge system?	No
Does this manuscript report a revolutionary innovation?	No
Does this manuscript report an unconventional innovation?	Yes
Conclusion	Minor revision
Re-review	Yes
Peer-reviewer statements	Peer-Review: Anonymous
	Conflicts-of-Interest: No
Are your review comments generated by AI tools?	No

SPECIFIC COMMENTS TO AUTHORS

Thank you for submitting a nicely written and important work which highlights the core colonoscopy quality matrix of adenoma detection rate (ADR). The sample size is quite large with clear inclusion and exclusion criteria. You have used appropriate statistical techniques. The work has been excellently translated into value by turning findings into a tool for real-time clinical decision support in form of app.

The manuscript presents a robust and clinically relevant study that investigates predictors of adenoma detection rate (ADR) during colonoscopy and proposes a hybrid

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machine learning model for real-time decision support. The study is timely and addresses a well-recognized quality metric in endoscopic practice. The combination of traditional statistical analysis with machine learning (ML) techniques adds methodological strength and modern relevance. The identification of four independent predictors—age, sex, endoscopist experience, and withdrawal time is consistent with existing literature, adding credibility to the study.I have a few suggestions,

1) The Consent form and IRB are both in non-English language. Please translate them and submit them again.

2) XGBoost AUCs (0.640 training, 0.610 testing) are low for clinical prediction. This is mentioned in the conclusion but could be emphasized more openly in both Abstract and Discussion to manage the expectations of the readers.

3) Consider making insertion time an explicit feature in the machine learning model if possible or clarify why stratification was preferred.

4) More information about shinny app will be useful.

5) the role of insertion time is conceptually central to the study but remains underutilized in the final model. Integrating this variable directly into the machine learning pipeline could further refine predictive accuracy.

5) AUCs of 0.640 (training) and 0.610 (testing) suggest limited discriminative power for XGBoost. While acceptable, this should be acknowledged or contextualized

6) The figures at the end and the references are appropriate.

this manuscript offers valuable insights into colonoscopy quality improvemet. With modest revisions focused on enhancing methodological transparency and better framing of model limitations, the manuscript would make a meaningful contribution to the literature.

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RE-REVIEW REPORT OF REVISED MANUSCRIPT

Name of journal: *World Journal of Gastroenterology*

Manuscript NO: 111364

Title: Personalizing withdrawal time by insertion time to achieve target adenoma detection rate in colonoscopy

Provenance and peer review: Unsolicited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 08562200
Position: Peer Reviewer
Academic degree and professional title: Associate Professor, MD
Reviewer's Country/Territory: India
Author's Country/Territory: China

Manuscript submission date: 2025-06-27

Reviewer chosen by: Ming Fan

Reviewer accepted review: 2025-08-08 08:31

Reviewer performed review: 2025-08-09 05:35

Review time: 21 Hours

Content to be reviewed	Does the manuscript's content fall within the scope of the journal? **Yes** Is there any Key Word that is not included in the manuscript title? **No** Do authors' affiliations correspond to the content of the manuscript? **Yes** Does the Abstract contain the contents of each part of the manuscript (IMRaD)? **Yes** Are the Key Words complete? **Yes**

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Scientific significance of the conclusion in this manuscript	Grade B (Very Good)
Language quality	Grade A (Excellent)
Does this manuscript describe a study of the existing knowledge system?	Yes
Does this manuscript report a revolutionary innovation?	No
Does this manuscript report an unconventional innovation?	No
Conclusion	Accept
Peer-reviewer statements	Peer-Review: Anonymous
	Conflicts-of-Interest: No
Are your review comments generated by AI tools?	No

SPECIFIC COMMENTS TO AUTHORS

The authors have addressed nearly all reviewer concerns with diligence. Key improvements include clarification of terminology ("optimal" → "target-achieving"), explicit definition of endoscopist experience, correction of statistical anomalies, addition of rationale for methodological choices, expanded discussion of model limitations, benchmarking against existing ADR prediction tools, and inclusion of pilot data for the Shiny app. Ethics statements have been strengthened, and table/figure formatting has been standardized.

Well-conducted prospective and retrospective design with machine learning integration.

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Practical clinical relevance through real-time withdrawal time personalization.

Clearer methods section with precise operational definitions.

Balanced discussion acknowledging limitations and contextualizing results.