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PEER-REVIEW REPORT

Name of journal: *World Journal of Gastroenterology*

Manuscript NO: 111353

Title: Artificial intelligence in inflammatory bowel disease: Current applications and future directions

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 08478492
Position: Peer Reviewer
Academic degree and professional title: Academic Fellow, PhD, Postdoctoral Fellow
Reviewer's Country/Territory: Malaysia
Author's Country/Territory: Romania

Manuscript submission date: 2025-06-27

Reviewer chosen by: AI Editor

Reviewer accepted review: 2025-07-04 00:50

Reviewer performed review: 2025-07-08 02:52

Review time: 4 Days and 2 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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	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? **Not Applicable** Are the experimental data of the Results true and reliable? **Not Applicable** Are the quality and resolution of the images up to standard? **Not Applicable** 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? **No** 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 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 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?	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?	

SPECIFIC COMMENTS TO AUTHORS

The manuscript entitled "Artificial Intelligence in Inflammatory Bowel Disease: Current Applications and Future Directions" is well-structured, clearly written, and presents valuable insights into the role of artificial intelligence (AI) in the diagnosis, management, and prognosis of inflammatory bowel disease (IBD). The topic is highly relevant and timely given the rapid integration of machine learning (ML) and data-driven approaches in precision medicine. However, several aspects of the manuscript require clarification

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and enhancement to improve its clarity, completeness, and scientific impact before it can be considered for publication following minor revisions.

1. Clarification of Novelty:

The authors are encouraged to clearly highlight the novelty of their study in the abstract. While the manuscript reviews current applications, it remains unclear how this study distinguishes itself from previous reviews or systematic analyses. The authors should articulate whether their contribution lies in the scope of covered applications, the introduction of a new classification scheme, a comparative analysis of ML algorithms, or forward-looking perspectives on integration with clinical practice.

2. Clarify the Aim of the Study:

The abstract and introduction should explicitly state the central aim or hypothesis of the study. Currently, the motivation and focus are somewhat diffuse. Clarifying whether the paper is intended as a comprehensive review, a critical evaluation of current ML models in IBD, or a roadmap for future directions would strengthen the reader's understanding.

3. Inclusion of Quantitative Data:

The abstract and conclusion would benefit significantly from the inclusion of numerical data or performance metrics (e.g., accuracy, AUC, sensitivity) where applicable. These details would provide more concrete insights into the effectiveness of specific AI techniques in IBD applications.

4. Comparative Table of ML Algorithms:

It is strongly recommended that the authors include at least one comprehensive table summarizing the machine learning algorithms applied to IBD research. The table should list algorithm types (e.g., Random Forest, SVM, ANN, XGBoost), their application area (e.g., diagnosis, disease activity prediction), dataset characteristics, and reported performance metrics. Such a comparison will guide readers in identifying the most effective models and highlight trends in the field.

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To enhance the discussion of ML methods, the authors may draw inspiration from recent studies that applied ML in various scientific contexts.

While the manuscript addresses an important and rapidly evolving area, enhancing the novelty statement, clarifying the aim, providing quantitative insights, and including comparative visual summaries will considerably strengthen the manuscript's scientific rigor and value to the readership.

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Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 08147127
Position: Peer Reviewer
Academic degree and professional title: PhD, Professor
Reviewer's Country/Territory: India
Author's Country/Territory: Romania

Manuscript submission date: 2025-06-27

Reviewer chosen by: Jia-Lin Zhang

Reviewer accepted review: 2025-07-11 02:42

Reviewer performed review: 2025-07-11 02:56

Review time: 1 Hour

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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	Does the research scope comply with ethics? **Not Applicable**
Scientific quality	Grade C (Good)
Novelty of this manuscript	Grade C (Good)
Creativity or innovation of this manuscript	Grade C (Good)
Scientific significance of the conclusion in this manuscript	Grade C (Good)
Language quality	Grade C (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	Major revision
Re-review	Yes
Peer-reviewer statements	Peer-Review: Anonymous
	Conflicts-of-Interest: No
Are your review comments generated by AI tools?	

SPECIFIC COMMENTS TO AUTHORS

The abstract effectively summarizes the paper's scope and key findings. Consider adding a sentence about the practical implications or direct clinical benefits highlighted in the review, beyond just the potential.

The introduction provides a good overview of IBD and the challenges in its diagnosis and management. It effectively sets the stage for AI's role. Perhaps briefly touch upon

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the historical context of AI in medicine or gastroenterology, before delving into IBD, to give a broader perspective.

Specific Examples and Data: The section provides good examples of AI models and their performance (e.g., Yao et al. CAD system accuracy of 83.7% , CNN-based model accuracy of 80.0%-93.3% , DL algorithm reducing evaluation duration to 3.2 minutes). Ensure that all data points presented are consistent and clearly referenced.

Clinical Impact: While the section discusses how AI improves accuracy and reduces sampling errors, further elaboration on how these improvements directly translate to better patient outcomes or more efficient clinical workflows would be valuable.

Challenges of Traditional Histopathology: The paper clearly outlines the invasiveness, time-consuming nature, and subjectivity of traditional histopathological examination. This provides a strong rationale for AI.

AI Model Specificity: The discussion of specific models like the DL algorithm for eosinophil density and CNN model for neutrophil and plasma cell quantification is good. When discussing the PHRI, it's noted that it "does not accurately discriminate between different grades of inflammatory severity and does not detect the presence of dysplastic changes". This critical limitation is well-identified.

Gap in CD Research: The observation that most AI applications focus on UC, with less effort in CD histopathology, is an important point. Elaborating on

why this gap exists (e.g., differences in disease presentation, data availability, research focus) could add depth.

Comparison with Non-AI Methods: While the paper mentions limitations of traditional methods, a more explicit and systematic comparison of AI-driven approaches with current standard-of-care methods (beyond just highlighting their drawbacks) could demonstrate AI's advantages more clearly.

Limitations of AI: While some limitations are touched upon (e.g., data quality, bias, cost,

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ethical concerns), a dedicated subsection at the end of the "Current Challenges and Future Perspectives" could comprehensively list the current limitations of AI itself in IBD, rather than just the challenges of its implementation. This could include, for example, the "black box" nature of some AI models, the need for continuous retraining, or the difficulty in interpreting complex AI decisions in a clinical context.

Patient Perspective: While the paper touches on improving patient quality of life, consider adding a brief discussion on the patient perspective regarding the integration of AI in their care. This could involve issues of trust, data privacy concerns from the patient's viewpoint, or the potential for increased access to care.

Future Research Roadmap: In the "Future Perspectives," consider outlining a more concrete roadmap for future research, including specific areas that require immediate attention, interdisciplinary collaborations, or funding priorities.

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Manuscript NO: 111353

Title: Artificial intelligence in inflammatory bowel disease: Current applications and future directions

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 08531163
Position: Peer Reviewer
Academic degree and professional title: Academic Fellow, Assistant Professor, Associate Professor
Reviewer's Country/Territory: China
Author's Country/Territory: Romania

Manuscript submission date: 2025-06-27
Reviewer chosen by: Jia-Lin Zhang
Reviewer accepted review: 2025-07-11 03:22
Reviewer performed review: 2025-07-24 04:42
Review time: 13 Days and 1 Hour

Content to be reviewed	Does the research scope comply with ethics? **Yes** Are additional experiments needed for the study? **No** Will the manuscript's content be of interest to readers? **Yes** Is the manuscript's text correct, concise, and clear? **No** Do authors only cite their own earlier publications? **No** Are all references related to the topic of the manuscript? **Yes**

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	Do authors omit important references? **No** Are all references necessary and reasonable? **Yes** Is the Conclusion reasonable? **No** Is the content of the Discussion reasonable? **No** Are the figures and tables numbered consecutively in the order in which they appear in the manuscript? **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** 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** Is the content of the Introduction adequate? **No** Is the content of the Materials and Methods complete? **Not Applicable** Is the description of the experiments clear and complete? **Not Applicable** Are the experimental data presented in the manuscript's biostatistics content reliable? **Not Applicable** Are the experimental data of the Results true and reliable? **Not Applicable** Are the quality and resolution of the images up to standard? **Yes**

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	Do the selection and design of the figures and tables follow the principles of necessity and clarity? **Yes**
Scientific quality	Grade C (Good)
Novelty of this manuscript	Grade C (Good)
Creativity or innovation of this manuscript	Grade C (Good)
Scientific significance of the conclusion in this manuscript	Grade C (Good)
Language quality	Grade C (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	Major 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

The manuscript covers a timely and important topic in gastroenterology. It demonstrates comprehensive knowledge of AI advancements in IBD care. However, several critical revisions are necessary, particularly regarding methodological transparency, balanced discussion, ethical implications, and language clarity.

1.The manuscript provides a broad and well-structured overview of artificial intelligence

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(AI) applications in the diagnosis and management of inflammatory bowel disease (IBD), including endoscopic, histologic, therapeutic, and clinical trial contexts. However, some sections contain overlapping content, particularly in the discussion of AI-assisted endoscopy.

2.While this is a narrative review, it is essential to maintain transparency regarding the methodology used to identify and select the literature included. Currently, the manuscript lacks a clear explanation of the search strategy, inclusion and exclusion criteria, and data sources. I strongly suggest the authors include a brief methodological section—preferably under "Materials and Methods" or in the introduction—detailing how the literature was identified, which databases were searched, and what criteria were applied for inclusion.

3.Although the manuscript summarizes numerous AI applications across various domains of IBD, the tone is predominantly descriptive and lacks critical appraisal. Most studies are presented without adequate evaluation of their limitations, such as sample size, external validation, or risk of overfitting. I recommend the authors include a more balanced discussion that highlights not only the strengths but also the methodological weaknesses of the cited AI models, which would enhance the scientific rigor of the review.

4.The review includes a wide variety of AI models, including convolutional neural networks (CNNs), random forest classifiers, and natural language processing tools. However, the manuscript does not sufficiently address how the heterogeneity in model architecture, input data, and validation strategies impacts clinical translation and comparability. I encourage the authors to add a paragraph discussing the implications of this variability and the need for standardization in model development and benchmarking.

5.The authors briefly mention the importance of data quality in AI performance, but the

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discussion is not developed in sufficient depth. There should be an expanded discussion on potential sources of bias—such as class imbalance, site-specific imaging protocols, or retrospective data—and how these biases could affect the generalizability and fairness of AI tools in clinical practice.

6.The manuscript includes useful tables summarizing AI models applied in various domains of IBD care. However, the visual presentation could be improved by including additional graphical representations, such as performance comparisons or timelines of model evolution. I also suggest that all acronyms and abbreviations in the tables and figures be fully defined in their respective legends to improve accessibility for non-specialist readers.

7.Although the manuscript touches on ethical and regulatory challenges associated with AI implementation, this discussion is brief and lacks specificity. The authors should expand this section to include topics such as informed consent for AI-assisted diagnostics, data privacy, algorithmic transparency, and liability in cases of AI-related diagnostic errors. Referring to established guidelines such as SPIRIT-AI or CONSORT-AI would add value.

8.A noticeable imbalance exists between the discussions on ulcerative colitis (UC) and Crohn's disease (CD), with a much greater emphasis on UC throughout the manuscript. To provide a more balanced and comprehensive review, I recommend that the authors include more information on AI applications specifically developed or validated for CD, particularly in the context of transmural healing, capsule endoscopy, and postoperative recurrence prediction.

9.The final section of the manuscript discusses future perspectives in a general way but lacks actionable recommendations. I suggest the authors reframe this section to provide specific and practical guidance for future research, such as advocating for multicenter data-sharing initiatives, emphasizing external validation requirements, and encouraging

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interdisciplinary collaborations between clinicians, data scientists, and ethicists.

10.The manuscript is generally well written but contains numerous long and complex sentences, as well as occasional grammatical and stylistic issues that hinder readability. I recommend a thorough language edit by a native English speaker or professional editor to improve clarity, reduce redundancy, and ensure that key points are communicated succinctly and effectively.

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RE-REVIEW REPORT OF REVISED MANUSCRIPT

Name of journal: *World Journal of Gastroenterology*

Manuscript NO: 111353

Title: Artificial intelligence in inflammatory bowel disease: Current applications and future directions

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 08147127
Position: Peer Reviewer
Academic degree and professional title: PhD, Professor
Reviewer's Country/Territory: India
Author's Country/Territory: Romania

Manuscript submission date: 2025-06-27

Reviewer chosen by: Ming Fan

Reviewer accepted review: 2025-08-11 10:05

Reviewer performed review: 2025-08-11 10:07

Review time: 1 Hour

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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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 author has successfully addressed all the reviewer's comments and incorporated the suggested revisions. The manuscript now meets the required standards and is accepted for publication.