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PEER-REVIEW REPORT

Name of journal: *World Journal of Hepatology*

Manuscript NO: 111354

Title: Artificial Intelligence in Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD): Machine learning for Non-invasive diagnosis and risk stratification

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 02623954
Position: Peer Reviewer
Academic degree and professional title: Chief, Professor
Reviewer's Country/Territory: China
Author's Country/Territory: Egypt

Manuscript submission date: 2025-06-27

Reviewer chosen by: Jia-Lin Zhang

Reviewer accepted review: 2025-07-01 00:27

Reviewer performed review: 2025-07-01 02:12

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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	Is the content of the Introduction adequate? **Yes** 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** 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? **Yes** Are the figures and tables numbered consecutively in the order in which they appear in the manuscript? **Not Applicable** 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**

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	Are additional experiments needed for the study? **No** Does the research scope comply with ethics? **Not Applicable**
Scientific quality	Grade B (Very good)
Novelty of this manuscript	Grade B (Very Good)
Creativity or innovation of this manuscript	Grade C (Good)
Scientific significance of the conclusion in this manuscript	Grade B (Very 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

Overall Impression

The manuscript titled "Artificial Intelligence in Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD): Machine learning for Non-invasive diagnosis and risk stratification" provides a comprehensive overview of the applications of AI, particularly

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machine learning (ML) and deep learning (DL), in the diagnosis and risk stratification of MASLD. Overall, the manuscript is well-organized and offers valuable insights; however, there are some areas that could benefit from clarification and enhancement.

Specific Areas for Improvement

1. Introduction

Clarity: The introduction could be more concise and clearly state the purpose and scope of the review.

Background Information: Provide a brief summary of MASLD and its importance to set the context for the reader.

2. Literature Review

Recency: Ensure that the literature review includes the most recent publications (preferably within the last 5 years) to reflect the current state of the field.

Structure: Organize the literature review by themes (e.g., ML applications, DL in imaging analysis) to improve readability.

3. AI in MASLD Diagnosis

Methodological Details: Provide more details on the ML and DL models discussed, including their architectures, input features, and training procedures.

Performance Metrics: Clearly explain the performance metrics used (e.g., AUC, accuracy) and their significance.

4. Integration of AI with Non-Invasive Diagnostic Tools

Specific Examples: Provide specific examples of how AI is integrated with tools like ultrasound, MRI, and elastography to enhance diagnosis.

Technical Details: Explain the technical aspects of these integrations, including data preprocessing and fusion techniques.

5. AI for Risk Stratification and Disease Prediction

Case Studies: Include case studies or real-world examples to illustrate how AI-based

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models are used for risk stratification and disease prediction.

Limitations: Discuss the limitations of current AI models in this context and potential areas for improvement.

6. Challenges and Limitations

Detailed Discussion: Provide a more detailed discussion of the challenges and limitations faced in implementing AI in MASLD diagnosis.

Future Directions: Suggest specific directions for future research to address these challenges.

7. Future Directions

Concrete Suggestions: Offer concrete suggestions for future research, emphasizing areas where significant advancements can be made.

Interdisciplinary Collaboration: Highlight the importance of interdisciplinary collaboration in advancing AI applications in MASLD.

8. Conclusion

Summary: Summarize the key points discussed in the manuscript and restate the main contributions.

Impact: Discuss the potential impact of AI on MASLD diagnosis and management, emphasizing its potential to improve patient outcomes.

9. Language and Formatting

Consistency: Ensure consistent formatting throughout the manuscript, following the journal's guidelines.

Clarity: Improve the clarity of writing by avoiding jargon and ensuring precise terminology.

Grammar and Typos: Proofread the manuscript carefully to correct any grammatical errors or typos.

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Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 03742333
Position: Editorial Board
Academic degree and professional title: FACS, Full Professor, MD, PhD, Professor
Reviewer's Country/Territory: Brazil
Author's Country/Territory: Egypt

Manuscript submission date: 2025-06-27

Reviewer chosen by: AI Editor

Reviewer accepted review: 2025-06-30 13:38

Reviewer performed review: 2025-07-08 11:50

Review time: 7 Days and 22 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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	Are additional experiments needed for the study? **No** 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

I have read with great interest the manuscript entitled Artificial Intelligence in Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD): Machine learning for Non-invasive diagnosis and risk stratification, submitted to The World Journal of Gastroenterology. This mini-review provides an overview of recent advancements in the

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application of artificial intelligence (AI) for the diagnosis of metabolic dysfunction-associated steatotic liver disease (MASLD). I commend the authors for addressing a timely and increasingly relevant topic within hepatology and digital health. The integration of AI into clinical practice is rapidly evolving, and reviews such as this one are crucial to guide clinicians and researchers through emerging technologies.

That said, I believe the manuscript would benefit from further elaboration and refinement in several areas, as outlined below.

Major Comments

- The manuscript would be strengthened by a more detailed description of the specific diagnostic tests, clinical variables, or imaging modalities that the reviewed AI algorithms rely upon. Do they analyze laboratory data, imaging features, histological findings, or combinations thereof? In addition, clarification on how these algorithms are trained and integrated would add clarity. For instance, can they extract data directly from electronic health records or imaging archives? Or is manual input still required? A discussion on how feasible the implementation of these tools is within the current clinical infrastructure would greatly enhance the practical relevance of the review.
- The section Challenges and Limitations is currently too brief. The authors are encouraged to expand on technical, ethical, and regulatory challenges, including data protection concerns, algorithm transparency, and potential biases. Such a discussion would make the review more balanced and comprehensive.
- The section Future Directions is also underdeveloped. Beyond briefly mentioning possible applications, the authors should discuss realistic future scenarios, including clinical validation steps, regulatory approval pathways, and strategies for integration into clinical guidelines. Including a conceptual figure illustrating a roadmap for AI implementation in MASLD care would make the section more visually engaging and informative.

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RE-REVIEW REPORT OF REVISED MANUSCRIPT

Name of journal: *World Journal of Hepatology*

Manuscript NO: 111354

Title: Artificial Intelligence in Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD): Machine learning for Non-invasive diagnosis and risk stratification

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 02623954
Position: Peer Reviewer
Academic degree and professional title: Chief, Professor
Reviewer's Country/Territory: China
Author's Country/Territory: Egypt

Manuscript submission date: 2025-06-27

Reviewer chosen by: Ji-Hong Liu

Reviewer accepted review: 2025-09-22 11:18

Reviewer performed review: 2025-09-23 00:25

Review time: 13 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)? **No** Are the Key Words complete? **Yes**

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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?	No
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

Clarify Terminology Consistency:

The manuscript uses both "MASLD" and the older term "NAFLD" in the introduction. While the transition is explained, ensure consistent usage of "MASLD" throughout to align with current nomenclature (e.g., Abstract mentions NAFLD, but later sections use MASLD).

Enhance Table 1 Readability:

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The table formatting is disrupted (e.g., repeated headers, fragmented rows). Ensure uniformity and clarity. Consider merging performance metrics into a single column for brevity (e.g., "AUC: 0.928 (internal), 0.918 (external)").

Add a footnote explaining abbreviations (e.g., PDFF, F2/F3 fibrosis stages) for non-specialist readers.

Address Repetition:

The phrase "validated against histology or elastography in subsets of cohorts" appears redundantly in Table 1. Streamline descriptions to avoid duplication.

The "Future Directions" and "Conclusion" sections overlap in advocating for validation/standardization. Consolidate these points.

Expand on Limitations:

While data heterogeneity and interpretability are noted, briefly discuss potential biases (e.g., underrepresentation of ethnic groups in training datasets) and computational resource barriers for low-resource settings.

Figure 1 Reference:

The manuscript mentions "Figure 1" (phased AI implementation roadmap), but the figure is not included in the provided text. Ensure it is accessible or describe its key elements in the caption.

Reference Accuracy:

Check reference numbering: References 1 and 2 are duplicated in the list. Verify all citations (e.g., [6,7] appear multiple times with different studies).

Clinical Integration Details:

The "Clinical Implementation Feasibility" section could briefly mention examples of existing FDA-cleared AI tools (if any) to ground discussion in real-world progress.