

Reply to Letter to the Editor: "Translating Multimodal Intelligence into Cardiac Diagnostics: A Critical Perspective on Large Language Model-Assisted Electrogram Interpretation"

To the Editor,

We thank the authors¹ for their interest in our study.² The scenario-based design reflects the stepwise cognitive processes involved in intracardiac electrogram (EGM) interpretation in clinical practice. Our aim was not to evaluate model performance with a single overall metric, but rather to make visible the stages of the diagnostic process in which the model performs robustly or shows vulnerability. Therefore, the assessment was structured progressively, from isolated signal analysis toward context-based decision scenarios.

The EHRA case book was chosen as an initial reference because it provides an accessible and standardized assessment framework. This offers a neutral and reproducible test environment; our study does not propose EHRA as the absolute clinical gold standard.

The heterogeneity of the evaluated variables was a deliberate methodological choice to map the distribution of errors. Each variable was reported independently, and the result tables clearly demonstrate that the model is more fragile particularly in the interpretation of pacing mode and chamber relationships.

Due to class prevalence imbalance in certain EGM categories, using Cohen's Kappa alone could underestimate agreement. Therefore, the addition of PABAK represents a standard statistical adjustment to ensure a more accurate and balanced interpretation of the results.

This study is not a model optimization attempt, but an observational evaluation of raw usage behavior. Thus:

- No prompt optimization,
- No image preprocessing,
- No parameter tuning was applied. The intention was to approximate real-world clinical interaction conditions as closely as possible.

The suggestions raised in the letter are consistent with the scope and limitations already stated in our manuscript. The model:

- Is not intended to act as an autonomous clinical decision-maker,
- May serve as an assistive tool in selected situations,
- Requires additional validation before any clinical deployment.

The main contribution of this study is the first systematic characterization of the diagnostic behavior profile of large language models in EGM interpretation.

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LETTER TO THE EDITOR REPLY

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