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From Algorithmic Accuracy to Clinical Accountability: Reframing Human-AI Collaboration in Emergency Triage

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Abstract

Artificial intelligence (AI) is increasingly being explored to improve patient prioritisation in emergency departments by supporting faster decision-making and consistency in clinical assessment. However, its clinical value cannot be established through algorithmic accuracy alone. This opinion article builds on the review by Mayerhoffer and Ilić to examine the challenges of reliability, transparency and performance in complex triage situations, particularly when AI-generated recommendations conflict with nurses' clinical assessments. Evidence of variable accuracy and the risk of under-triage and over-triage highlight the need to evaluate AI through clinically meaningful safety outcomes rather than aggregate performance metrics alone. The article emphasises that human oversight must be translated into explicit clinical procedures addressing verification, disagreement, escalation and professional accountability. It advocates a shift in research from comparing AI systems with individual clinicians to evaluating whether AI-assisted nursing triage improves patient prioritisation compared with nurse-only assessment without increasing clinically important errors. Future research should examine triage errors, delays in appropriate care, nurse–AI disagreements, override decisions, resource utilisation and patient outcomes across diverse clinical settings. Ultimately, the safe integration of AI into emergency triage requires structured human–AI collaboration, continuous performance monitoring and preservation of nursing judgement. The priority should be to establish whether AI strengthens clinical decision-making while maintaining patient safety and professional accountability.

Keywords: Artificial Intelligence, Emergency Triage, Nursing, Patient Safety

Introduction

Artificial intelligence (AI) is increasingly being explored as a tool for improving patient prioritisation in emergency departments. By processing clinical information and identifying patterns, AI systems may support faster decision-making, improve consistency and assist healthcare professionals working in high-pressure environments. However, the clinical value of AI-assisted triage cannot be established through algorithmic accuracy alone. The more consequential question is whether these systems can be integrated into nursing practice in ways that improve patient safety while preserving clinical judgement and accountability.

In their review, Mayerhoffer and Ilić examined the emerging role of AI in medical triage and highlighted its potential to improve efficiency and decision-making, alongside persistent concerns regarding reliability, transparency and performance in complex clinical situations [1]. These observations raise an important issue that deserves greater attention: what should happen when an AI-generated triage recommendation conflicts with the assessment of the triage nurse?

This question shifts the discussion from whether AI can perform triage to how AI and nurses should work together safely.

Accuracy is Not the Same as Clinical Safety

The performance of AI in triage varies across clinical settings, triage systems and assessment methods. For example, Franc *et al*. reported an overall accuracy of 47.5% for ChatGPT when applying the Canadian Triage and Acuity Scale, with under-triage and over-triage rates of 13.7% and 38.7%, respectively [2]. In a separate study using simulated patients and the Simple Triage and Rapid Treatment protocol, the reported accuracy was 63.9%, with performance varying according to the prompts provided [3].

These findings illustrate why overall accuracy should not be interpreted as sufficient evidence of clinical readiness. Triage errors are not equally consequential. Under-triage may delay the assessment and treatment of patients who require urgent intervention, whereas over-triage may contribute to unnecessary escalation and inefficient use of limited emergency resources. A system that achieves reasonable overall accuracy may still make errors at precisely the points where clinical consequences are greatest.

Consequently, AI evaluation should extend beyond sensitivity, specificity and agreement with reference classifications. Research should also examine the severity and consequences of errors, the identification of time-critical conditions, delays in care, resource utilisation and patient outcomes. Performance should be assessed across different levels of acuity and clinically complex presentations rather than inferred from aggregate results alone.

Human Oversight Must Become an Operational Safeguard

The recommendation that AI should support rather than replace healthcare professionals is widely accepted. Nevertheless, the phrase "human oversight" remains insufficient unless it is translated into clear clinical procedures.

A triage nurse may agree with an AI recommendation, modify it or reject it. Each possibility requires a defined response. If the nurse disagrees with the AI, should the system prompt a second assessment? Should certain high-risk discrepancies trigger immediate escalation? How should the decision and its rationale be documented? Who is responsible for reviewing recurring disagreements and determining whether the system remains safe for use?

These are not merely technical questions. They concern professional accountability, clinical governance and patient safety.

Evidence also suggests that AI performance and clinician performance cannot be assumed to improve simply because they are combined. In a comparative study, Masanneck *et al*. found that providing large language model decision support did not significantly improve the triage performance of untrained doctors [4]. Although this finding should not be generalised to all clinical settings or nursing teams, it demonstrates that access to an AI recommendation does not automatically translate into better decision-making.

Human oversight must therefore be designed, evaluated and supported through training rather than treated as a final safeguard added to an otherwise autonomous system [5].

Reorienting the Research Agenda

Future studies should move beyond comparisons between AI systems and individual clinicians. A more clinically meaningful research question is: Does AI-assisted nursing triage improve patient prioritisation compared with nurse-only triage, without increasing clinically important errors?

Prospective comparative studies should evaluate nurse-only triage, AI-assisted nurse triage and AI-only recommendations where ethically and clinically appropriate. Relevant outcomes should include under-triage, over-triage, time to appropriate assessment, missed deterioration, escalation decisions, resource utilisation and patient outcomes. Studies should also examine the frequency and clinical significance of nurse–AI disagreement, the appropriateness of overrides, nurses' confidence in their decisions and the effects of AI implementation on workload.

Research should further investigate whether these outcomes differ across patient groups, acuity levels and emergency care settings. Implementation studies are necessary to establish whether improvements observed in simulated scenarios translate into safer practice under real-world conditions.

Conclusion

AI has potential to support emergency triage, but its clinical value cannot be determined by accuracy metrics alone. Safe implementation requires explicit responsibility, meaningful nurse verification, override authority, documentation of disagreement and continuous performance monitoring.

The next stage of AI-triage research should therefore move beyond asking whether an algorithm can classify patients correctly. It should establish whether a properly designed human–AI team can make safer and more effective decisions than nursing assessment alone. The objective is not to position AI against the triage nurse, but to determine how technology can strengthen nursing judgement without obscuring professional accountability or compromising patient safety.

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