AI-Based Sepsis Alerts: The Role of Nurses in Early Recognition and Response

Elizabeth Braden, Carrigan Burris, Alyssa Lechtenberger; Mark Brandenburgh, DNP, MSPE, RN, University of Oklahoma, Fran and Earl Ziegler College of Nursing



Sepsis is a life-threatening condition and a leading cause of in-hospital mortality. In the United States, sepsis is linked to approximately 270,000 deaths each year (Ginestra et al., 2024). Early recognition and treatment are essential because delayed recognition can contribute to clinical deterioration and prolonged hospitalization. Traditional screening methods, including manual assessment and tools such as SIRS and the Quick Sequential Organ Failure Assessment (qSOFA), remain valuable but may have limitations in identifying patients before clinical deterioration occurs. Artificial Intelligence (AI)-based (machine learning) sepsis alerts offer an opportunity to analyze patient data in real time and identify at-risk patients earlier. Pairing AI-based sepsis alerts with a standardized nurse-driven response protocol may improve early sepsis recognition, promote timely intervention, and reduce the risk of clinical deterioration.

Our review identified evidence supporting the use of machine learning for earlier sepsis recognition. Calvert et al. (2016) demonstrated that a machine learning algorithm could predict sepsis up to three hours before the first sustained SIRS episode using commonly available patient data. Similarly, Tran et al. (2023) found that a model using continuous vital sign data predicted sepsis up to six hours before onset and outperformed SIRS and qSOFA. These findings suggest that AI may provide clinicians with additional time to assess patients at risk for sepsis. However, the clinical value of the AI alert depends in part on how the alert is incorporated into clinical workflow and acted upon by healthcare professionals. Nurses play a crucial role in sepsis recognition because they perform bedside assessments, identify changes in patient condition, communicate concerns with providers, and participate in subsequent clinical interventions. Hechtman et al. (2026) found that nurses performed the majority of manual sepsis screenings, highlighting the vital role nurses play in identifying sepsis. Cooper et al. (2021) reported that implementing an automated sepsis screening tool facilitated earlier identification and reduced overall sepsis mortality. Similarly, Linnen et al. (2020) highlighted the potential for machine learning–based early warning systems to reduce unnecessary alerts and clinical evaluation workload, while Sendak et al. (2020) demonstrated how integrating machine learning into clinical routines, and can improve communication between nurses and providers. Together, these findings provide a rationale for pairing AI alerts with a standardized nurse-driven response rather than relying on technology alone.

Despite these potential benefits, successful implementation presents several challenges. Our review identified concerns related to nurses' knowledge of AI, trust in AI algorithms, training, workflow adaptation, and alert fatigue. Hassan and El-Ashry (2024) found that nurses viewed communication, collaboration, transparency, and ongoing training is important for AI integration, although they expressed concerns about overreliance on the tool and algorithm bias. Linnen et al. (2020) similarly emphasized the importance of alert timing and organization of tasks to reduce unnecessary alerts.

Our review supports AI-based sepsis alerts as a promising tool for earlier recognition and intervention. However, technology alone cannot replace nursing assessment and clinical judgment; successful implementation should include standardized nurse-driven response protocols, education, clear communication, and organizational support. Properly combining AI with nursing expertise may result in more timely and consistent sepsis care while supporting the nurses at the forefront of patient assessment and intervention. ■

References online:
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