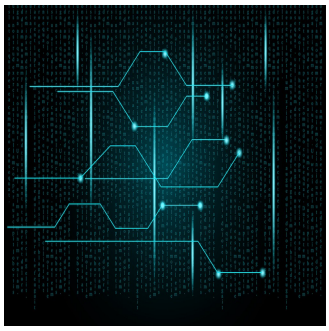
ICU
MANAGEMENT & PRACTICE

Machine Learning Alerts to Prevent Escalation of Care



Deploying and evaluating a machine learning intervention to improve clinical care and patient outcomes is a key step in moving clinical deterioration models from byte to bedside. A Mount Sinai study found that hospitalised patients were 43% more likely to have their care escalated and significantly less likely to die if their care team received AI-generated alerts signalling adverse changes in their health.

The goal of the study was to see if quick alerts made by AI and machine learning, trained on many different types of patient data, could reduce how often patients need intensive care and their chances of dying in the hospital.

Traditionally, critical care teams rely on the Modified Early Warning Score (MEWS) to predict clinical deterioration. However, this study shows automated machine learning algorithm scores that trigger evaluation by the provider can outperform these traditional methods in accurately predicting this decline. Importantly, it allows for earlier intervention, which could save more lives.

The study included 2,740 adult patients admitted to four medical-surgical units at The Mount Sinai Hospital. Study patients were divided into two groups: one that received real-time alerts based on the predicted likelihood of deterioration, sent directly to their nurses and physicians or a rapid response team of intensive care physicians, and another group where alerts were created but not sent. The primary outcome was the rate of escalation per 1000 patient bed days. Secondary outcomes included the frequency of orders for fluids, medications, and diagnostic tests and combined in-hospital and 30-day mortality rates.

In the units where the alerts were suppressed, patients who met standard deterioration criteria received urgent interventions from the rapid response team. Additional findings show that patients were more likely to receive medications to support heart and circulation with real-time alerts, indicating early action by doctors, and were less likely to die within 30 days.

These augmented intelligence tools can speed up in-person clinical evaluations by physicians and nurses and prompt the treatments that can keep patients safe and improve outcomes.

The algorithm has been deployed on all stepdown units within The Mount Sinai Hospital. As the algorithm is continually retrained on larger numbers of patients over time, the assessments by the intensive care physicians serve as the gold standard of correctness, and the algorithm becomes more accurate through reinforcement learning.

Source: Critical Care Medicine
Image Credit: iStock

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