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Timely Alerts Reduce Mortality

An automated alert system that analyses electronic health records (EHR) can help identify high-risk in-hospital patients needing interventions by rapid response teams, resulting in decreased mortality, says a Kaiser Permanente-led study (Escobar et al. 2020).

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Advance Alert Monitor (AAM), a machine-learning-based predictive model, scans EHRs hourly and issues alerts when a patient's score is above threshold, indicating significant risk of decline over the next 12 hours. The alert prompts a regional team of specially trained nurses to review the patient's medical record to determine if on-site intervention is needed. The nurses contact a rapid response team on that hospital unit, which performs a structured assessment and then works with the patient's physician to determine further action.

Study authors have cited the increased morbidity and mortality among hospitalised adults whose condition deteriorates while they are in wards – i.e. outside the intensive care unit (ICU). As such, early identification of high-risk patients could be helpful where timely intervention may improve outcomes.

AMM uses algorithms created from machine learning and data from more than 1.5 million patients. The system employs severity-of-illness and longitudinal comorbidity scores, vital signs and vital signs trends, neurological status checks, and laboratory tests.

AAM was previously tested in 2013, and the current study evaluated the deployment of the alert system to all 21 Kaiser Permanente Northern California hospitals. The AMM rollout was done on a staggered basis between August 2016 and February 2019. Outcomes for patients with and without AAM in place were compared.

The authors found that patients in the intervention cohort (n = 15,487) had lower ICU admission rates compared to non-AMM group (n = 28,462): 17.7% versus 20.9%. In addition, the AAM cohort had shorter hospital length of stay (6.7 days versus 7.5 days), and lower mortality within 30 days of an alert (15.8% versus 20.4%).

"Along with saving lives, the Advance Alert Monitor has demonstrated that it is possible to integrate predictive models into day-to-day operations in our medical centres," said lead author Gabriel Escobar, MD, a research scientist with the Kaiser Permanente Division of Research and regional director for Kaiser Permanente Northern California hospital operations research.

Dr Escobar pointed out that AAM is different from other alert systems in that AAM's prediction algorithms take into account many patient status factors. As it is fully automated, errors from manual risk calculation are avoided. Moreover, as the alerts are curated by trained nurses offsite, they don't cause distractions to bedside caregivers.

Source: Kaiser Permanente

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