

Exercise in Futility or do CART or MEWS Prevent Errors?

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“CHAIN OF SURVIVAL” has been a useful tool for improving the understanding of and the quality of the response to cardiac arrest for many years.

“CHAIN OF PREVENTION” assists hospitals in structuring their care processes to prevent and detect patient deterioration and cardiac arrest.

Patients present to the hospital in different stages of illness which evolve over time. Complications due to the disease or worsening of underlying preexisting organ failure, variable dynamics of the diseases, would result in a downhill trajectory. Recognition of deterioration in clinical status and early escalation in care is very crucial for a better outcome for patients. Outreach services like medical emergency teams led by doctors and rapid response teams (RRT) led by nurses have made significant contributions across the globe in bringing bedside critical care expertise or CRITICAL CARE WITHOUT WALLS. Collaboration and partnership of multidisciplinary teams of ICU and non-ICU caregivers ensure continuity of care to patients in healthcare systems.

Preventable patient harm costs healthcare billions annually, making strategies to improve patient safety an imperative for health systems.

In-hospital cardiac arrest (IHCA) is a major problem in the hospital and is associated with high morbidity and mortality worldwide.¹

Admissions to the ICU from wards have higher mortality when compared with patients admitted from the operating theater/recovery and accident and emergency department.² Suboptimal care, including monitoring and recognition, may contribute to higher morbidity or mortality of patients admitted from the ward. Early recognition and management would improve the outcomes. Adverse events in the wards, such as cardiac arrest and death, are rarely sudden and are often heralded by abnormal vital signs hours before the event.³

Early warning scores (EWS), tracking vital sign thresholds identify at-risk patients. Early warning scores have been recommended by NICE in the UK (NEWS2) as a patient safety alert (2018 AND updated in 2019).

Early warning scores are many, based on a single parameter, multiple parameters, and aggregate weighted systems.^{4,5} Aggregate weighted systems are the most complex of the early warning scores. They categorize vital signs and other variables into different degrees of physiologic abnormality and then assign point values for each category. They have the advantage of risk stratification of patients and responses based on severity level.

Modified early warning score (MEWS), one of the earliest aggregate weighted scoring systems, vital PAC early warning score

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(VIEWS), standardized early warning score (SEWS), cardiac arrest risk triage (CART), to mention a few of more than 100 different scores, are all expert opinion-based scoring systems.

The MEWS uses physiological parameters like heart rate, systolic blood pressure, temperature, and consciousness (APVU) to identify patients that are at increased risk of catastrophic deterioration, resulting in ICU admission or death. Critically high MEWS scores are reported to a ward nurse or physician so that appropriate changes in clinical management can be made. The tool is designed such that any medical provider with sufficient training can utilize it. The MEWS is part of nursing protocols at many hospitals. It is important to note that some hospitals or institutions may modify the scale for certain physiological parameters, add or remove parameters, or utilize a different threshold for a critical score. Modified early warning score has been validated in medical⁶ and surgical patients.⁶ In the medical ward—a critical total MEWS score of ≥ 5 or a single physiological parameter score of 3 had a significant increase in relative risk, and a higher level of care was warranted. In the surgical population, a threshold score of ≥ 4 was 75% sensitive and 83% specific for patients who required transfer to an ICU.

CARDIAC ARREST RISK TRIAGE (CART) uses respiratory rate, diastolic BP, age, and heart rate. In the original study by the creator, Mathew Churpek, CART >20 was 91.9% specific for predicting cardiac arrest within 48 hours⁷ and 90% specific in a validation cohort⁸ done by the same author.

Choosing the Optimal Scoring System—Success of a particular scoring system is determined by the sensitivity, specificity, and equally also in reducing adverse events in the wards and fatigue of health care workers. The available evidence due to variable characteristics of cohort, predictors, outcome selection, validation, and optimal strategy of EWS, is yet to be specified OR recommended.^{8,9}

In the present issue of IJCCM, in a cardiac ICU, CART and MEWS have been compared and validated. It was found in this study that

MEWS threshold of 3 and a CART score threshold of 12 identify patients at risk for clinical deterioration. The CART score had comparable accuracy to the MEWS, but the latter's computation was easier.

Early warning scores with concurrent implementation of RRT are useful in improving vital sign documentation and improved patient outcomes. Aggregate weighted scores, EWS, MEWS, and CART are more accurate for detecting cardiac arrest, mortality, and ICU transfer. Early warning scores should be diligently followed at wards, should be a standard of care, deranged physiology should be identified early, and care should be escalated on a timely basis so that patients have better outcomes.

WE ARE WHAT WE REPEATEDLY DO. EXCELLENCE, THEN, IS NOT AN ACT BUT A HABIT.

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