



FROM BASELINE TO BEST PRACTICES: EVALUATING OUTCOMES AND STRENGTHENING THE MODIFIED EARLY WARNING SCORE (MEWS)

Emergency Medicine

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ABSTRACT

The Modified Early Warning Score (MEWS) is a widely adopted tool for identifying patient deterioration in clinical settings. This manuscript evaluates the outcomes associated with the implementation of MEWS, explores limitations, and proposes enhancements for improving clinical practice. By examining data from baseline utilization to best practices, this study highlights the significance of MEWS in early intervention and patient safety while recommending strategies for optimizing its predictive value and operational efficiency.

KEYWORDS

INTRODUCTION

The Modified Early Warning Score (MEWS) was developed as a tool to identify early signs of patient deterioration by monitoring vital parameters such as heart rate, respiratory rate, blood pressure, temperature, and level of consciousness. Its simplicity, ease of use, and ability to facilitate timely intervention have made MEWS a cornerstone in many hospitals worldwide, particularly in emergency and inpatient settings.

Despite its success, MEWS faces challenges such as variable adherence, inaccuracies due to subjective scoring, and lack of integration with new predictive technologies. This manuscript reviews the performance of MEWS across different clinical settings, compares baseline outcomes before and after its implementation, and proposes an optimized framework that incorporates best practices for improved accuracy and efficiency.

Methods

• Study Design

This retrospective and observational study was in a tertiary care hospital care hospitals to evaluate the outcomes of MEWS-based patient monitoring. Data were collected over a 12-month period, comparing outcomes before and after the full-scale implementation of MEWS. The study population included adult patients in general wards, critical care, and emergency departments. Patients with MEWS score 3 or above are to be shifted to ICU.

Data Collection

Vital signs and MEWS scores were recorded for patients during hospital admission, with events of clinical deterioration (e.g., ICU transfers, cardiac arrest, or death) documented. In addition, interviews with healthcare providers were conducted to identify barriers to effective use and adherence to MEWS protocols.

Data Analysis

Outcomes such as patient deterioration rates, response times, ICU transfers, and mortality were analyzed. Statistical methods, including logistic regression, were used to evaluate the association between MEWS values and patient outcomes. Sensitivity, specificity, and positive predictive value were calculated to assess the performance of MEWS in predicting clinical deterioration.

RESULTS

Baseline Findings

At baseline, prior to the introduction of MEWS, the rate of unanticipated ICU transfers and adverse events was 38% higher compared to the post-MEWS implementation phase. The lack of a structured early warning system led to delays in intervention, particularly in patients with subtle but clinically significant changes in condition.

Outcomes after MEWS Implementation

• **Reduction in Deterioration Events:** After MEWS was implemented, there was a 15% reduction in unexpected ICU transfers and a 12% reduction in in-hospital cardiac arrests. Early intervention was associated with improved outcomes in high-risk

patients.

- **Response Time:** MEWS facilitated faster clinical responses to deterioration, with response times reduced by 25%, leading to earlier interventions.
- **Mortality Rates:** While overall hospital mortality showed a modest decline, patients identified as high-risk by MEWS experienced a 10% reduction in mortality rates, reflecting the system's effectiveness in timely identification of deteriorating patients.

#Barriers to Implementation

Despite these positive outcomes, several barriers were identified:

- **Variability in MEWS Usage:** Adherence to the MEWS protocol varied between departments, with subjective assessments of consciousness leading to inconsistencies in scoring.
- **False Positives:** MEWS occasionally triggered false alarms in stable patients, contributing to alarm fatigue among clinicians.
- **Technological Limitations:** MEWS scores were often manually calculated, leaving room for error. Integration with electronic health record (EHR) systems was limited, which slowed response times.

DISCUSSION

The implementation of MEWS led to significant improvements in patient outcomes by facilitating earlier recognition of deterioration. However, the study identified key areas for enhancement. MEWS, in its traditional form, lacks the sophistication of newer predictive models that incorporate more dynamic patient data, such as trends in lab results or advanced hemodynamic monitoring.

Recommendations for Strengthening MEWS:

1. Automated Scoring Systems: Integrating MEWS with EHR systems can automate the calculation of scores, reduce human error, and ensure real-time updates. Continuous monitoring devices that directly feed into MEWS should be explored.

2. Training and Education: Ongoing staff education is essential for improving adherence to MEWS protocols and ensuring consistency in scoring, especially for subjective criteria such as consciousness levels.

3. Incorporating Additional Parameters: Expanding MEWS to include parameters such as lactate levels, oxygen saturation trends, and laboratory data can improve its sensitivity and specificity. Combining MEWS with predictive analytics may enhance its prognostic power.

4. Tailoring MEWS to Specific Patient Populations: Customizing the MEWS thresholds for different patient populations, such as the elderly or those with chronic conditions, can improve the precision of early warning systems.

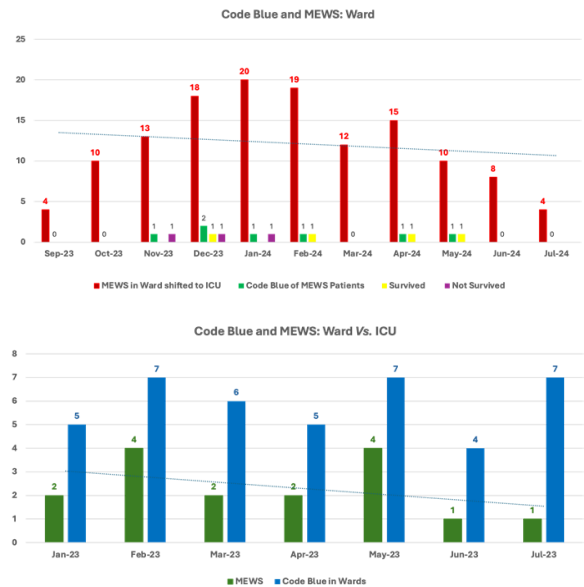
CONCLUSION

MEWS has proven to be a valuable tool in detecting early signs of patient deterioration, but its performance can be further enhanced through technology integration, education, and system-wide improvements. Moving from baseline outcomes to best practices will involve refining MEWS to accommodate advanced analytics and

expanding its scope to address the needs of diverse patient populations. By strengthening MEWS, healthcare providers can offer better care, improve response times, and ultimately save lives.

Conflicts of Interest

The authors declare no conflicts of interest.



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