Reliability Testing of a Modified Early Warning Score (MEWS) System
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Introduction
Lack of international consensus on what should be included in MEWS tools. Sparse reliability & validity testing of MEWS tools exists.

Aim
Researchers sought to report reliability testing of Covenant Health MEWS tool for use in adult medical-surgical patients.

Purpose
Purpose was to establish reliability of a MEWS tool modified for institutional use.

Background & Significance
- Patients exhibit signs of deterioration hours before cardiac or respiratory events occur.
- Vital sign & assessment findings by nurses does not necessarily translate into recognition of a deteriorating condition.
- Need exists for reliable clinical tools to quantify & stratify physiological assessment findings.
- MEWS detect & assist in recognizing subtle changes in patient conditions indicating potential clinical deterioration, thus preventing deaths.
- Tested tool created by frontline nurses.
- Adapted to include all Systemic Inflammatory Response Syndrome (SIRS) criteria.
- Modifications added to identify at-risk patients & septic patients.
- Few studies have reported reliability of MEWS tools

Setting
- 977 licensed beds
- 5000+ employees
- Largest health care institution in the West Texas & Eastern New Mexico region
- Serves a 62 county area

Research Design
- Reliability & usability tested using simulation to minimize variables
- MEWS tool design changes and revisions made based on testing results using PDCA (plan-do-check-act) cycle of change

Methodology
- Test-retest used to evaluate reliability MEWS tool
- Four scenarios were developed using low-fidelity mock hospital simulation
- One scenario tested each color on MEWS tool
- Real data from hospitalized sepsis used

As little human interaction as possible for:
- Prevention of bias
- Ensured standardization
- Allowed for reproducibility

All information needed was provided including:
- Vital signs
- Urine output measurement
- Laboratory values
- Level of Consciousness
- Oxygen Therapy Amount

Conceptional Framework
Transforming Care at the Bedside (TCAB)
Guided by TCAB framework
- Primary concept: Frontline staff providing care should play role in improving care delivered (Institute for Healthcare Improvement [IHI], 2013)
- Aim to reduce codes on medical/surgical units

Results
T1 & T2 paired scores were analyzed using Pearson’s r correlation to establish reliability of MEWS tool
- Data entered into SPSS version 22
- Statistical consultation obtained
- Pearson r Correlation coefficient calculated for “Total” scores for each participant in each scenario
- Green r=0.48, Yellow r=0.76, Red r=0.64, Orange r=0.61 (composite reliability of 0.62)
- Variable in Green scenario influenced accurate participant scoring of Green scenario using tool
- Suggests acceptable composite reliability
- Significant difference of 0.5 found between T1 & T2 among participants who indicated they “could use the MEWS tool without written instructions” t(19) = 2.77, p = 0.012

Conclusion
IHI suggests MEWS systems can save lives. Few studies have reported reliability of MEWS tools. Results of this small study suggest acceptable composite reliability of the Covenant Health MEWS tool with significant usability amongst nurses, thus providing a foundation for future research.

References