Modified Early Warning Score (MEWS) Value in the Intensive Care Unit

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Modified Early Warning Score (MEWS) Value in the Intensive Care Unit
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This presentation describes a case-control quantitative research study which examined the effects a modified early warning score (MEWS) had as a cardiac arrest event predictor in an adult ICU. Use of a MEWS tool demonstrated beneficial outcomes in its ability to enhance current treatment initiatives aimed at cardiac arrest event prevention.

Evidence
In published literature, the goal for Rapid Response Teams (RRTs) to decrease cardiac arrest events is inconsistently met. The author’s personal 7-year experience with an RRT in a 1,080-bed tertiary hospital aligned with the literature in that it did not achieve a significant reduction in cardiac arrest events. Contrasting evidence shows the use of some type of an early warning score yields positive outcomes in cardiac arrest prevention.

Study Purpose
Examine the effects of a modified early warning score (MEWS) tool as a cardiac arrest indicator.

Setting
32 bed Level 1 adult Medical-Surgical Intensive Care Unit (M/SICU) within a 1,080-bed tertiary care Magnet® Hospital.

Population
Patients ≥ age 18 admitted to the M/SICU 7/1/2011 -- 12/31/2012

Methodology
Research Design
Case-control method using retrospective medical record review.

Study Sample
Matched during identical time frame by age and gender
- Case sample – 45 subjects who experienced cardiac arrest during ICU stay
- Control sample – 45 subjects who did not experience a cardiac arrest

Tool
MEWS scores calculated on admission and at 4-hour intervals for the first 24 hours of an ICU stay.

Tool Validation
Independent data and MEWS score validation were completed to ensure accuracy of data collection and MEWS score values.

Population
32 bed Level 1 adult Medical-Surgical Intensive Care Unit (M/SICU) within a 1,080-bed tertiary care Magnet® Hospital.

Measures
- MEWS Respiratory Rate Score 8 hours before Cardiac Arrest
- MEWS Respiratory Rate Score 4 hours before Cardiac Arrest
- MEWS Respiratory Rate Score 4 hours after Cardiac Arrest
- MEWS Respiratory Rate Score 8 hours after Cardiac Arrest

Analysis
Statistical analysis using a McNemar’s test revealed a significant difference between the proportion of case and control group members exhibiting at least one MEWS score ≥ 5 or greater in the first 24 hours of an ICU stay measured at the 0.05 level. Additional outcomes from the linear regression analyses reveal that the MEWS score of the control group was 1.256 higher at each time interval than those of the matched control subjects. The difference in the linear regression analyses indicates the case group members have higher MEWS scores and a larger proportion of case samples pass at least one MEWS score ≥ 5 or greater during their first 24 hours of admission.

Tool
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Research Question #2
What differences in respiratory rate occur within eight hours prior to a cardiac arrest event?

Population
32 bed Level 1 adult Medical-Surgical Intensive Care Unit (M/SICU) within a 1,080-bed tertiary care Magnet® Hospital.

Measures
- MEWS Respiratory Rate Score 8 hours before Cardiac Arrest
- MEWS Respiratory Rate Score 4 hours before Cardiac Arrest
- MEWS Respiratory Rate Score 4 hours after Cardiac Arrest
- MEWS Respiratory Rate Score 8 hours after Cardiac Arrest

Analysis
Conduction of the Wilcoxon signed-rank test comparing the case group’s MEWS respiratory rate score parameter values immediately, fast, and eight hours prior to a cardiac arrest event revealed a statistically significant change at the 0.05 level. These outcomes of the analysis provide the foundation for the rejection of the second null hypothesis and support of the alternative hypothesis. Findings from this investigation indicate that worsening respiratory changes occur between 4 and 8 hours prior to an experienced cardiac arrest event, answering research question two.

Implications
- Use of MEWS score offers standard language to predict cardiac arrest.
- Newer software associated with EMRs automatically calculates MEWS score, alerting clinicians to emerging patient decline.

REFERENCES:

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