Modified Early Warning Score (MEWS) – Enhanced Emergency Department Flow Process

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BACKGROUND

Emergency Department (ED) overcrowding is a longstanding problem in the U.S. Admission to the inpatient floors can be a bottleneck in ED patient flow, due to the need for hospitalist assessment of patient clinical stability. Early Warning Systems (EWS) have been proposed that use vital signs to detect early signs of clinical deterioration. We set out to determine whether the use of a modified version of the EWS score (MEWS) could be used to discriminate patients in which ED streamlined admission orders could be placed prior to being seen by the hospitalist – with a goal of improving ED Length of Stay (LOS) without increasing adverse events.

METHODS

We conducted an IRB approved retrospective, observational, cross-sectional analysis of inpatient admissions from the ED at a Level 1 Trauma Center in NE PA with an annual census of approximately 90,000 visits. Subjects were included if they were ≥18 years old and admitted to the hospital medicine service. The study design compared a time period prior to implementation of a MEWS-enhanced ED admission patient flow process (Pre-MEWS: 2/19/2017-2/19/2019) with the post implementation period (Post-MEWS: 2/19/2019-2/19/2020). Post-MEWS implementation, patients with a low MEWS score (0-1) were admitted with an abbreviated order set to expedite the admission process. Those with higher MEWS scores remained in the ED until they were seen by the admitting team. Metrics such as demographics, ED LOS (minutes) and need for a Rapid Response Team were collected. .

Can the use of a modified EWS score (MEWS) shorten a patient's ED Length of Stay without increasing adverse events?

RESULTS

A total of 44,986 admissions occurred, 28,624 (63.63%) were Pre-MEWS while 16,362 (36.37%) were Post-MEWS. The average patient age was 68.53±17.27 with a younger mean age among those in the Pre-MEWS as compared to Post-MEWS (68.66±17.31 vs 68.30±17.21; p=0.03). Over half (51.8%) the patients were female without a significant difference; Pre- vs Post-MEWS periods (51.78% vs 51.85%; p=0.88). The median ED LOS was 371 minutes (Inter-Quartile Range 0(IQR): 288 to 509) with a statistically significantly shorter median ED LOS in the post-MEWS (358; IQR, 273 to 478) as compared with Pre-MEWS period (379; IQR, 288 to 509). The ED LOS in the post-MEWS did not differ when comparing those with MEWS > 1 (354; IQR, 271 to 476) with MEWS ≤ 1(360; IQR, 275 to 479) (p=0.12) while in the Pre-MEWS period the ED LOS was significantly longer among those with MEWS ≤ 1 (384(IQR, 292 to 514) vs 372(IQR, 282 to 501); p<0.0001). There were a total of 681 Rapid Response Team events of which 236 (34.65%) were within the first 24 hours of admission (RRT-24hr). When comparing the pre-MEWS to post-MEWS periods there was no significant difference in RRT-24hr (143(33.26%) vs 93(37.05%); p=0.32).

CONCLUSION

The use of a modified MEWS enhanced admission process to the hospital medicine service was associated with a significant decrease in ED LOS without a significant increase in adverse outcome as measured by RRT events within 24 hours of admission.

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