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Hravnak M, DeVita MA, Edwards L, Clontz A, Valenta C, Pinsky M. Ability of an electronic integrated monitoring system to impact duration of patient instability on a step down unit. *Am J Crit Care*, 2008; 17 (3), 279.

<http://ajcc.aacnjournals.org/cgi/reprint/17/3/276>

Purpose

We evaluated the ability of an Integrated Monitoring System (IMS) to improve nurses' ability to both detect cardiorespiratory instability according to Medical Emergency Team (MET) call criteria in patients on a SpO₂ and ECG monitored stepdown unit (SDU) and shorten duration of instability.

Background

Early discharge from ICUs to SDUs has increased, but patients are at risk of developing instability that can be undetected and under-treated in this environment of lower intensity monitoring. Failure to find and treat instability adversely affects outcome. Using an electronic IMS to continuously integrate individual minimally invasive monitoring parameters into a single index value may improve nurses' ability to detect, recognize, and attend to instability.

Methods

Prospective, longitudinal study of monitored patients (24 bed trauma SDU) in 3 phases. An IMS (Visensia™) received input from bedside monitors and used 4 vital signs (VS) (HR, RR, BP, SpO₂) to develop a single neural networked value, the Visensia Index (VSI).

- **Phase 1 (P1; 8 wks):** VSI was not displayed; patients received standard care; VSI and VS trends were background recorded.
- **Phase 2:** VSI was displayed on bedside and central station monitors; staff educated on use.
- **Phase 3 (P3; 8 wks):** staff used a clinical algorithm for response to alert of $VSI \geq 3.2$. Detection of VS parameter changes meeting MET trigger values defined instability. Data comparisons for P1 to P3 used descriptive statistics.

Results

Admissions (333 in P1; 314 in P3) and continuous monitoring hours (18,258 in P1 and 18,314 in P3) were similar. Most patients in both phases were never unstable.

Similar percentages of patients developed at least one instability event which minimally achieved MET call criteria (MET_{min}) in P1 and P3 (25% P1 and 23% P3). However, the mean duration (minutes) of instability per MET_{min} patient decreased from 39.63min/MET_{min} patient in P1 to 19.39min/MET_{min} patient in P3 (-51.1% change).

The percentage of patients who developed serious and persistent instability which fully achieved MET criteria and should have resulted in a call (MET_{full}) was less in Phase 3 (17.7% P1 vs 5.7% P3; -67.8% change).

Conclusion

Using an IMS improved detection of clinical instability as compared to conventional four channel monitoring in the SDU environment. Further study will determine if improved detection alters treatment patterns for instability.