

## **Smart pumps can reduce the incidence of dose or rate errors using soft and hard limits” Goulding and Bedard (2015).**

### Abstract:

**BACKGROUND:** Most intravenous medication errors occur during administration. Smart pumps can reduce the incidence of dose or rate errors using soft and hard limits. However, industry standard dose error reduction software misses errors that occur during titration. The dose change alert was developed to detect errors during titration.

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**PURPOSE:** To evaluate the safety implications of the dose change alert in the SIGMA Spectrum Infusion System on the administration of high-alert medications at The Ottawa Hospital.

**METHOD:** This retrospective analysis included all titratable high-alert medication infusions administered between May 1 and October 31, 2014 (inclusive). Analysis of continuous quality improvement reports included drug library compliance, dose change alerts, soft limit confirmations and cancellations, and hard limit pull-back reports for each high-alert medication and care area.

**FINDINGS:** Compliance with using the drug library was 96.8%. The percentage of dose change alert confirmations and cancellations within the soft limits were 48.1% and 1.9%, respectively. The titration of vasopressors resulted in the highest percentage (75%) of dose change alert confirmations. The titration of anticoagulants resulted in the highest percentage (12%) of dose change alert cancellations. Titration within the soft limits accounted for 65% of the alerts.

**CONCLUSIONS:** This study provided insight into the safety implications of the dose change alert on the titration of high-alert medications. Key-press errors during titration of high-alert medications can cause patient harm, even within the soft limits. Nurses can be involved in customizing the percentage dose change limit for individual drugs within each care area to



provide an additional safety check during titration.

Reference:

Goulding, C. and Bedard, M. (2015) Safety implications of the dose change alert function in smart infusion pumps on the administration of high-alert medications. The Canadian Journal of Critical Care Nursing. 26(4), p.23-7.

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