Improving Medication Infusion Safety Through Technology and Practice

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Objective

This study was conducted to determine the incidence of averted infusion-related medication events after implementing smart pump technology with practice changes and to identify potential areas of risk for continuous process improvement.

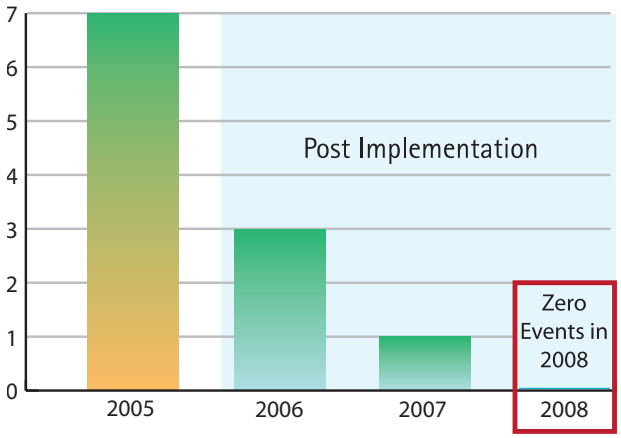
Methods

- 275 smart pumps were implemented in 2006.
- P&Ps were established to support smart pump use, to require independent double-checks for all dose overrides, and to provide random compliance checks.
- Retrospective analyses of pump data logs were conducted at three and 27 months post implementation. Data logs were analyzed for incidence of averted events, dose corrections and overrides.
- Based on analysis findings, process improvements were implemented.

Results

One year after implementation of smart pump technology and evidence-based protocols, we experienced a 57% reduction in infusion-related medication events. By year three, our infusion-related medication events were zero.

Infusion-related Medication Events 2005-2008



Analysis of the data logs demonstrated there were a total of 8 averted medication errors out of 1,536 programmed doses, representing an error rate of only 0.5%. Averted errors were associated with midazolam, propofol, vasopressin and amiodarone. No errors were associated with insulin or heparin.

Additionally, we found:

- 100% compliance with dose mode
- 100% wt-based ordering practice
- Low incidence of programming error (0.5%)

Impact of Data Analysis

- Identified dosing trends and issues
- Provided practice recommendations
- Provided drug library recommendations
- Documented 0 alerts with insulin or heparin
- Documented low incidence of error
- Documented positive results = positive staff

Discussion

Our concrete reduction in infusion-related medication events was due to:

- Easy-to-use smart pump technology
- Multi-disciplinary development of a drug library that reflected true clinical practice
- Adoption of protocols for dose mode use, override verification and compliance audits
- Ongoing education of nursing and resident staff
- Vendor support for data analysis to identify improvement opportunities and library changes
- Total engagement of management and staff
- Sharing of positive results

References

Raso, R., Velletri, J., DiCrescento, S. (2007). Making the most of data for patient safety. Patient Safety & Quality Healthcare, May/June 2007.

Acknowledgements

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Lutheran Medical Center

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