

# Establishing benchmarks and identifying opportunities to reduce alert fatigue associated with smart infusion pumps



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## PURPOSE

Reduce non-credible alerts, avoid clinical workarounds and improve drug library use through the following:

- Quantify frequency and type of drug library alerts.
- Identify top infusions causing the highest incidence of alerts.
- Explore key practice trends causing alerts.
- Analyze non-sequential study data to determine impact of both educational interventions and adjustments to drug library limits.

## METHODS

A retrospective analysis of drug library alert data was conducted using a proprietary national database.<sup>1</sup> Dataset included :

- **4,127,601 therapies**
- 50 hospitals
- 25,485 smart pumps
- 2 different pump platforms, large volume and syringe

Alert data was quantified by:

- Response type (override or correction)
- Alert and dose correction frequency
- Top therapies causing alerts

Next, alert programming sequences were analyzed to understand the underlying practices contributing to these alerts.

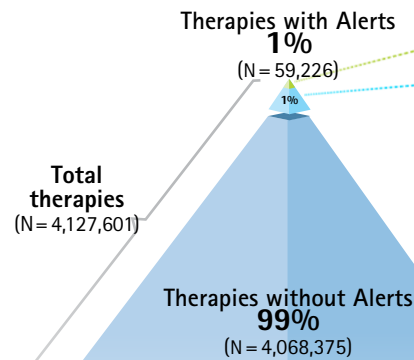
Select hospitals were identified to measure the impact of alert analysis, education and drug library adjustments.

## REFERENCES

- <sup>1</sup>DoseTrac Infusion Management Software. Data on file. B. Braun Medical Inc. 2015.  
<sup>2</sup>Vitoux, R., Lehr, J. & Chang, H. Eliminating clinical workarounds through improved smart pump drug library use. *Horizons*, Fall 2015.  
<sup>3</sup>Sullivan, C. *Improve infusion safety and reduce alarm fatigue*. Poster presentation at the AACN NTI, May 2014  
<sup>4</sup>Ruhl, C. Get smart with smart pumps. *Nursing Management*, 44(11), 17-20, 2013.  
<sup>5</sup>Cowan, D. Mission zero with smart pumps. *Nursing Management*, 40(11), 2009.  
<sup>6</sup>Bracker, P. & White, J. Analyze this: Smart pumps get an IQ boost. *Nursing Management*, 39(12), 2007.  
<sup>7</sup>Raso, R., Velletri, J., & DiCrescento, S. Making the most of data for patient safety. *Patient Safety & Quality Healthcare Magazine*, May/June, 2007.

## RESULTS

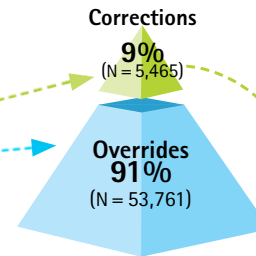
**1 Alert Frequency**  
**only 1% of total therapies**  
 (N = 59,226) *May minimize alert fatigue*



### Key Practice Trends Causing Alerts

- ✓ Hospital protocols not aligned with clinical practice and/or limits too restrictive (propofol, fentanyl, dopamine, insulin).
- ✓ Multiple entries, preparations and dosing parameters for a single drug (heparin, oxytocin, vasopressin, amiodarone, magnesium sulfate).
- ✓ Bolus dosing by increasing rate; bolus protocol not followed and/or feature not activated (propofol, insulin, dopamine, norepinephrine, fentanyl).

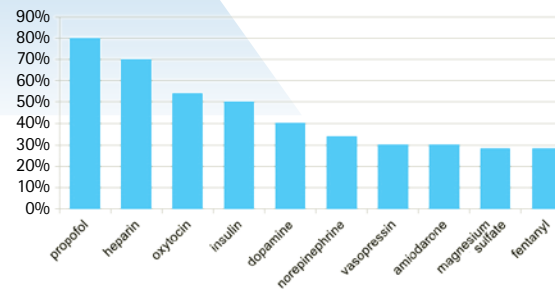
**2 Alert Response Type**



**3 Correction Frequency**  
**only 0.1% of total therapies**  
 5,465 corrections / 4,127,601 therapies  
*Low incidence of programming error*

### Top Therapies Causing Alerts

(% frequency in top 10)



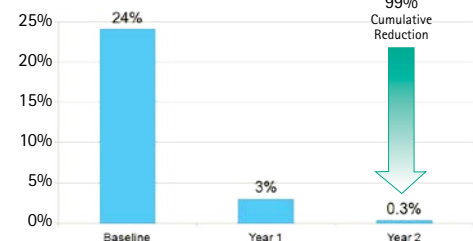
## CONCLUSIONS

- Alert data becomes **actionable** with analysis beyond the trends. Insight on top therapies and practices causing alerts was used to help hospitals reduce alerts and improve drug library use.
- Alert analysis contributes to a low alert frequency of only 1% and may help **minimize alert fatigue**.
- Low correction frequency (0.1%) indicates a **low incidence of programming error** associated with single channel pumps with non-numeric keypad interface.

## CLINICAL IMPACT

Alert analysis with targeted drug library adjustments and education has helped hospitals achieve **100% drug library use, up to 99% reduction in alerts, and 0 pump related ADEs.**<sup>1-7</sup>

### Alert Reduction Case Study<sup>1</sup> - Single Health System



## DISCLOSURES

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation: Rachel Vitoux, Helen Chang, Jennifer Lehr are employees of B. Braun Medical Inc.