PURDUE UNIVERSITY Discovery Park

Anesthesia Medication Safety: Clinician Response to Infusion Pump Alerts

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Introduction & Motivation

Perioperative settings have an increased rate of error due to the time constraints and high stress levels of the work environment. Technology-based interventions, such as smart infusion pumps, were implemented to lower error rates in medication administration. However, errors are still occurring at an alarming rate with 56,000 adverse drug events associated with smart pumps between 2005 and 2009[1]. Infusion pump alerts occur when the programmed dosage is outside the institutional limit, which serves to minimize medication errors. This project aims to analyze the frequency of infusion pump alerts and respective clinician response, using propofol as an example drug.

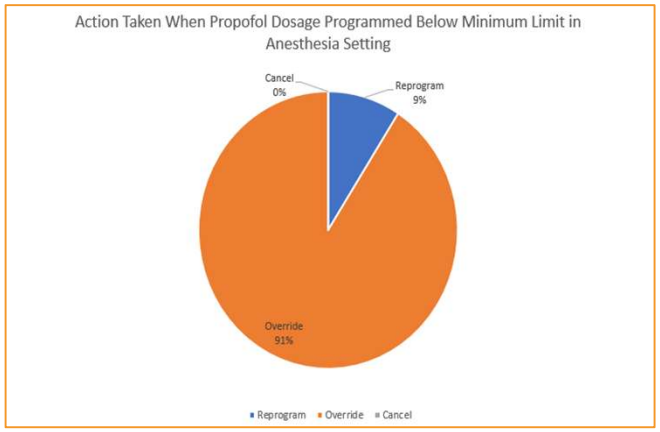
Methodology

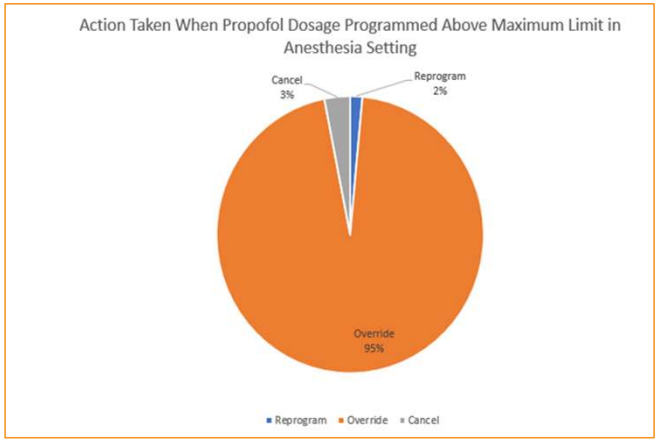
Infusion pump data was extracted from the Regenstrief National Center for Medical Device Informatics (REMEDI) Database. REMEDI shares de-identified infusion pump data between 414 hospitals globally to improve patient safety[2]. Analysis was conducted using 1042 propofol infusion alert data from one, medium sized, Midwestern hospital from April 30th to December 31st, 2019. First, characterization of action taken for overdose and underdose was determined. Then a characterization of action taken depending on degree of overdose was determined.

Results

Action Taken	Degree of Overdose		
	(1.0-2.0]	(2.0-3.0]	(3.0-5.0]
Reprogram	9	0	0
Override	562	16	7
Cancel	18	0	0

* Not including one outlier: 35x the programmed limit, and it was canceled
**Degree of overdose = programmed value / limit dosage





Discussion & Conclusions

- The majority of alerts were overridden which can contribute to alert fatigue.
- The high frequency of alerts in the lower overdose range can increase alert fatigue for providers. This can result in unsafe overrides during larger overdose ranges.
- There is a need to minimize unnecessary alerts by reevaluating institutional limits.

Limitations:
- Total number of infusions given during this timeframe is unknown.

Future Work

The reason for the high frequency of alerts within anesthesia settings should be established. This understanding could allow for a change in institutional dosage limits that would decrease unnecessary alert overrides.

References

1. U.S. Food & Drug Administration. Infusion Pumps. Available at: www.fda.gov/InfusionPumps.
2. Catalyze Care. REMEDI. Available at: www.catalyzecare.org/remedi.

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