

Medication Safety: “Bolus from the Bag”

Patricia Giovannini, MSN, RN, ACNS-BC, APNP (patricia.giovannini@aurora.org)
 Diane Melrose, MSN, RN, AGCNS-BC, RN-BC (diane.melrose@aurora.org)
 Aurora St. Luke's Medical Center, Milwaukee, WI.

Problem

- Lack of standardization of process led to variation in medication administration via smart infusion pumps
- Costs were incurred from nursing time and single dose medication use when boluses were given from individual vials rather than the running infusion bag of the same medication

Background

- The organization supports high reliability processes and efforts to improve outcomes
- The Clinical Nurse Specialist (CNS) role at Aurora St. Luke's Medical Center is one of leadership, collaboration, education, and implementing evidence based practice to achieve improved patient outcomes. The CNS's on this project were part of an inter-departmental leadership team whose goal was to improve process and outcomes
- Smart infusion pumps incorporate safety guardrails and had the ability to bolus a medication from an existing IV infusion, but the bolus functionality was not being utilized
- A gap was identified in the electronic medical record (EMR). It did not support documentation of administering a bolus of medication from an existing intravenous (IV) infusion
- Root cause analysis of a safety event revealed variation in medication administration of many intravenous drugs, including Lidocaine
- Analysis revealed workarounds in nursing practice and documentation
 - Nurses administered appropriate bolus doses through smart infusion pump but did not document appropriately in EMR leading to diversion investigation

Setting & Population

- 938-bed acute care urban medical center
 - Six intensive care units and 18 inpatient units
- One hospital as part of a large integrated health system utilizing an electronic health record for documentation
- The CNS role is unit based and works with a dyad team model consisting of the unit Nurse Manager and CNS



Methods

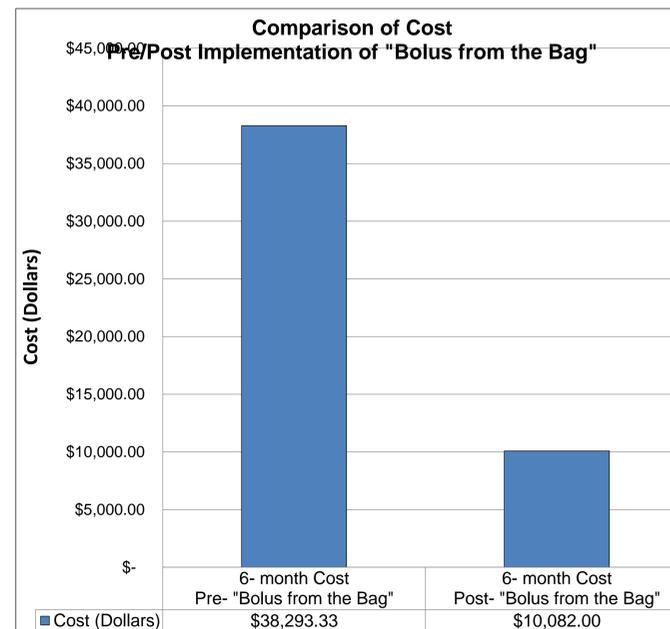
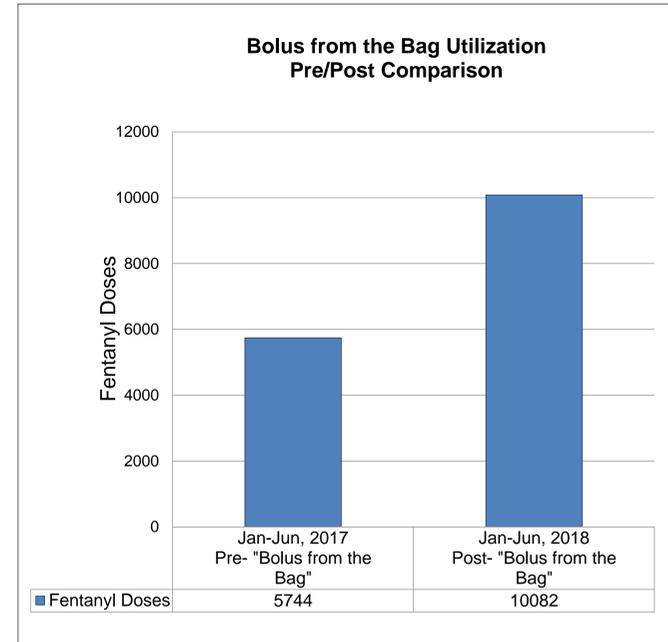
- Plan
 - Inter-professional team, led by two CNS's and a Pharmacist, collaborated to leverage and align current technology
 - This collaboration led to proposed change in current process of medication administration and EMR documentation
 - Proposed change, at the system level, was to allow nurses to administer medication boluses in adult patients through the existing IV line on the infusion pump
 - Prior to implementation, the smart infusion pump technology had 32 medications with “bolus from bag” options that were not being utilized
- Do
 - A time study on the current administration process was done in an intensive care unit to evaluate initial nurse workflow efficiency with administration of IV push Fentanyl
 - June 2017- the team met with stakeholders involved and proposed change-system teams included informatics, nursing, pharmacy, system shared governance council, and system medication safety committee
 - Proposed alignment of new workflow with concurrent Joint Commission titratable infusion project
 - August-December 2017- EMR build including building Medication Administration Record (MAR) orders to allow for charting of bolus from the bag
 - December 2017- January 2018- training for nursing done by unit based CNSs and Nurse Clinicians
 - Go-live date of January 25, 2018
- Study
 - Provides clear medication instructions to the RN on how to administer bolus dose
 - Ensures bolus is administered within safety guardrails
 - Prevents workarounds
 - Allows easier more complete documentation
- Act
 - Effective process change as evidenced by resource utilization and efficiency measures

Findings

- Fentanyl infusion utilization in Aurora Health Care Emergency Departments, Operating Rooms, and Intensive Care Units included 1,909 patients and 10,082 bolus doses during January-June, 2018
- Before go live PRN fentanyl 10,082 IV push doses were estimated to take a nurse 10 minutes for each administration. This equated to a total of 1,680 nursing hours or \$67,213.00 in nursing time
- After go live bolus from the bag doses were estimated to take 1.5 minutes per dose. This equated to a total of 252 hours or \$10,080.00 in nursing time compared to the same number of doses utilized
- If nurses had given the same volume of doses in the pre and post time frames, difference of spending 1680 hours and \$67,213 instead of 252 hours and \$10,080
- With the additional 30 medications added to the EMR bolus from the bag functionality, this has resulted in 12,433 bolus from the bag doses utilized.
- Annualized to a cost savings of over \$110,000

Conclusions

- Bolus from the Bag functionality ensures boluses are administered within safety guardrails
- New functionality has translated to financial savings
- Standardization of workflow and process eliminated variation present before implementation
- Allows for accurate documentation and improves medication safety with elimination of previous identified workarounds
- New process contributed to cost savings from decreased RN time per dose, improving workflow and efficiency
- Implementation of best practice can be difficult when proposing system level changes. Overcoming these challenges through leadership commitment to zero harm and high reliability (Chassin & Loeb, 2013) were instrumental to success of this project.
- CNS leadership of this project was instrumental to identifying high risk processes and developing workable solutions for improving patient safety.
- Technological functionality via Smart Pumps available to end users should be leveraged to improve patient safety



References

- Chassin, M., & Loeb, J. (2013). High-reliability health care: Getting there from here. *The Joint Commission. The Milbank Quarterly*, 91(3), 459–490.
- Lazim, R., Knauth, M. & Allmond, K. (2017). Improving utilization of fentanyl boluses for ventilated patients using smart pump technology. *Critical Care Medicine*, 46 (1), 1195 (Supp).
- Yip, L. & Farmer, B. (2015). High reliability organizations- Medication safety. *Journal of Medical Toxicology*, 11. 257–261 DOI 10.1007/s13181-015-0471-2

Acknowledgements

- Melissa Dahlgren, Pharm D, BCPS, Specialty Pharmacy Coordinator
 Hsieng Su, MD, ASLHC Chief Medical Officer
 Theresa Vos, MS, BSN, RN, CGRN, ASLHC Chief Nursing Officer
 Lee Jeske, MS, RN, GCNS-BC, Director of Advanced Practice Nursing
 Sara Marzinski BSN, RN CCRN-K, Magnet Program Manager
 Aurora System Clinical Documentation and Willow Pharmacy Teams
 Aurora System Medication Safety Team