

Reducing Clinically Insignificant Infusion Pump Air-in-Line Alarms During Sodium Bicarbonate Infusion With Antisiphon Valve

Emiko Ajisaka, BSN, RN, BMTCN, Nancy Ohanian Gerhard, MN, RN, AOCNS, BMTCN, CPON, Joanna Ocol, BSN, RN, BMTCN, Theresa Treadwell, MSN, RN, NP

Background

- Nurses on our inpatient unit reported frequent episodes of air-in-line (AIL) infusion pump alarms in patients receiving sodium bicarbonate.
- Safe administration of high-dose methotrexate (HDMTX) for treatment of patients with hematologic malignancies requires urine alkalinization with intravenous (IV) sodium bicarbonate to maintain urine pH greater than or equal to 7. This prevents intratubular MTX crystallization and acute kidney injury.
- Sodium bicarbonate infusions cause AIL alarms. To prevent AIL alarms, the AAMI Foundation's National Coalition for Alarm Management Safety recommends placing antisiphon valve (ASV) at end of IV tubing to increase internal pressure in IV line.

Purpose

- The pilot study seeks to reduce the number of clinically insignificant AIL alarms during sodium bicarbonate via infusion pump with an ASV.

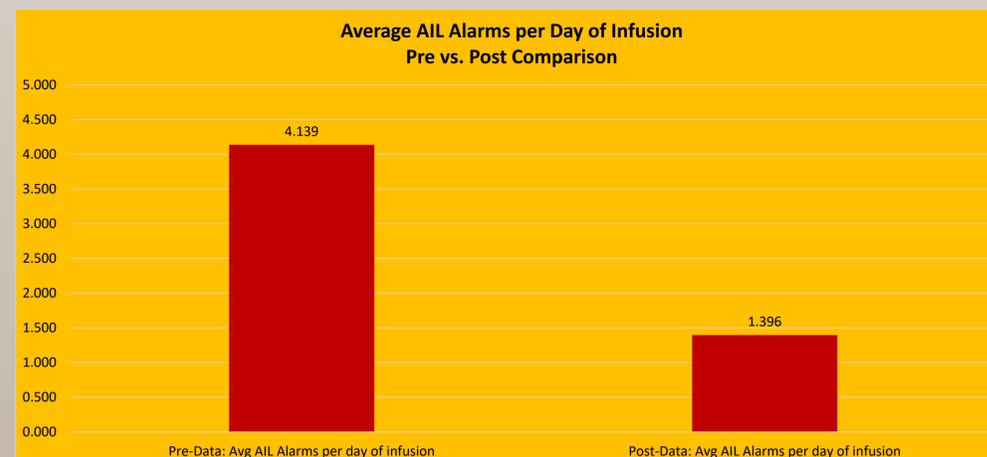
Interventions

- Following education on use of an ASV by the Clinical Nurse Specialist and Clinical Educator, nurses trialing this infusion device huddled to discuss its implementation.
- A bicarbonate IV fluid pump alarm log was created for data collection.
- Between October 14, 2020, and December 30, 2020, an ASV was used in hematology patients ordered sodium bicarbonate infusion.
- An ASV was attached at the end of primary IV tubing containing sodium bicarbonate.



Outcomes

- Sixty-seven alarms were triggered during sodium bicarbonate infusions in 12 patients over 24 days of pump data post-implementation of ASV.
- An ASV reduced the number of AIL alarms by 51.4% with an average reduction of 66.3% per day of infusion.



Implications for Practice

- The ASV can be implemented at other institutions to provide further evidence supporting use in sodium bicarbonate infusions and drive evidence-based practice.
- This is the first study using an ASV for sodium bicarbonate infusions.

References

Feinsilber, D., Leoni, R. J., Siripala, D., Leuck, j., Mears, K. A. (2018). Evaluation, identification, and management of acute methotrexate toxicity in high-dose methotrexate administration in hematologic malignancies. *Cureus (10)*1, 1-6.
https://assets.cureus.com/uploads/review_article/pdf/8594/1612427328-1612427320-20210204-30437-1pv7ljj.pdf

The Association for the Advancement of Medical Instrumentation® (AAMI) Foundation's National Coalition for Alarm Management Safety. (2018). *Managing smart pump alarms: Reducing alarm fatigue*.
https://www.aami.org/docs/default-source/foundation/alarms/infusion_therapy_quick_guide4.pdf

The Association for the Advancement of Medical Instrumentation® (AAMI) Foundation's National Coalition for Alarm Management Safety. (2017, February 13). *Pharmacy and nursing collaboration to reduce infusion device alarms*. https://www.aami.org/docs/default-source/foundation/infusion/seminars/021317_palomarhealth_aami_webinar_slides.pdf