Title:

Dilution of IV Push Medications: Challenging Tradition

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ACCEPTED

Session Title:

Evidence-Based Practice Poster Session 1 (Saturday/Sunday, 16 & 17 November)

Slot:

EBP PST1: Sunday, 17 November 2019: 11:45 AM-12:15 PM

Abstract Describes:

Ongoing Work/Project

Applicable Category:

Clinical

Keywords:

evidence-based practice, medication administration and safety

References:

1. Gorski, L., Hadaway, L., Hagle, M.E., McGoldrick, M., Orr, M., & Doellman, D. (2016). Infusion Therapy Standards of Practice. *Journal of Infusion Nursing, 39*(1S), S1-S159. https://doi.org/10.1097/NHH.0000000000000481
2. Grissinger, M. (2015). ISMP Survey Reveals User Issues With Carpuject Prefilled Syringes. *Pharmacy and Therapeutics*, *40*(9), 549-550.
3. Grissinger, M. (2017). Some IV Medications Are Diluted Unnecessarily in Patient-Care Areas, Creating Undue Risk. *Pharmacy and Therapeutics*, *42*(8), 490-508.
4. Institute for Safe Medication Practices. (2015). *ISMP Safe Practice Guidelines for Adult IV Push Medications.* Retrieved from https://www.ismp.org/sites/default/files/attachments/2017-11/ISMP97-Guidelines-071415-3.%20FINAL.pdf

5. Lenz, J.R., Degnan, D.D., Hertig, J.B., & Stevenson, J.G. (2017). A Review of Best Practices for Intravenous Push Medication. *Journal of Infusion Nursing, 40*(6), 354-358. https://doi.org/10.1097/NAN.0000000000000247

6. Prentiss, A.S., Cockerel, A., & Butler, E. (2016). Nurse Perceptions and Safety Practices of the Carpuject Syringe System. *Journal of Nursing Care Quality, 31*(4), 350-356. https://doi.org/10.1097/NCQ.0000000000000194

Abstract Summary:

Participants will learn of a practice change effort on an adult medical-surgical unit that challenged traditional nursing beliefs around IV push medication administration. Participants will review current evidence that advocates against unnecessary dilution of IV push medications. Participants will also be able to identify three established IV push medication guidelines.

Content Outline:

1. Introduction
    1. On one adult medical-surgical unit, nurses were often observed diluting and administering IV push medications by a variety of means that diverge from established guidelines, including:
        1. Using pre-filled normal saline flushes for dilution and administration of IV push medications.
        2. Withdrawing medication using a tuberculin syringe, and then transferring the medication into another syringe for administration.
        3. Withdrawing medication from pre-filled “Carpuject” cartridges into another syringe for administration.
    2. Anecdotally, nurses on the unit cited justifications for these practices that mirror those found in the literature, such as:
        1. “It’s how I was taught.”
        2. “I dilute all IV push medications.”
        3. “I have trouble measuring small doses.”
        4. “Diluting allows me to administer IV push medications slowly.”
    3. Nurses on the unit also demonstrate a lack of confidence in the use of the Carpuject syringe system, as evidenced by:
        1. Very few nurses on the unit are consistently observed using the Carpuject holder to administer medications from pre-filled cartridges.

2. Most nurses on the unit anecdotally state they were never taught how to use the Carpuject system.
3. Pre-filled Carpuject cartridges are not always available from pharmacy; single-use vials are often supplied instead.

2. Body
    1. A literature review demonstrated the need for a practice change on the unit; major findings include:
        1. Diluting medications is largely unnecessary.
            1. Most medications do not need to be diluted per manufacturer recommendations.
                1. If dilution is necessary, it should be done in the pharmacy.
                2. Manipulation of medications performed outside the pharmacy increases the risk for contamination of sterile solutions.
                3. Manufacturer guidelines for some drugs explicitly recommend against dilution (e.g. ondansetron).
            2. Unnecessary dilution complicates the medication administration process and increases risk for error.
                1. Incorrect diluents and diluent volumes are cited as some of the most common errors associated with unnecessary dilution.
                2. On the specific nursing unit where this practice change will take place, sterile water for injection is the only available diluent that is consistent with manufacturer recommendations for most IV push medications commonly administered on the unit.
            3. Reasons cited by nurses for diluting medications may not be clinically necessary (e.g. preventing discomfort at the injection site, irritant nature of the medication, etc).
        2. Pre-filled normal saline flushes are not approved for medication administration.
            1. Considered “off-label” use.
            2. Nurses and employers bear liability for any adverse events resulting from this practice.
        3. Medication should not be transferred from pre-filled syringes into another syringe for administration.
            1. Pre-filled Carpuject syringes were designed to simplify administration, and are not intended to be used as single-use vials.

2. Syringe-to-syringe transfer increases risks for medication loss, medication errors (e.g. syringes are rarely labeled), contamination, and needlestick injuries.

2. Practice Change Campaign: Methods
    1. Educational materials were developed for nursing staff in preparation for the practice change on the unit.
        1. PowerPoint presentation on the literature review was developed and submitted to unit management for review.
        2. Lists of manufacturer recommendations for IV push administration of common medications on the unit were created and included in the literature review; nurses will be encouraged to access facility resources/online drug guides (e.g. Micromedex) and contact pharmacy to confirm correct administration of unfamiliar medications.
        3. Post-test/knowledge check was developed; staff members will be encouraged to acknowledge receipt of the information presented by submitting completed post-tests to the unit nurse educator.
        4. Skills checklist on the Carpuject syringe system was developed; staff will be encouraged to complete and submit the checklist to the unit nurse educator in order to acknowledge correct use of the Carpuject syringe system and its components.
    2. Surveys
        1. Brief qualitative surveys will be distributed to staff prior to implementation of the practice change to gauge current perceptions of common IV push medication administration practices observed on the unit.
        2. After implementation, brief qualitative surveys will be distributed to staff to determine the success of the practice change effort.
        3. Management buy-in, as well as approval from nursing union leadership, will be obtained prior to distribution of surveys to nursing staff.
    3. Evaluation Process
        1. Outcomes will be determined by the success of management buy-in efforts, distribution of literature review presentation and educational materials to staff, completion of post-tests and skills checklists, and analysis of pre- and post-implementation surveys.

3. Conclusion
    1. Tradition vs. Evidence

1. Questioning the validity of practices that run counter to established guidelines is at the heart of evidence-based practice efforts in nursing.
2. Current standards of practice around IV push medication administration were established in 2014, and yet “at-risk behaviors” that conflict with these guidelines are still observed in every day nursing practice today.
3. The aim of this project is to eliminate a common nursing practice observed on one medical-surgical unit that is steeped in tradition, early career training, and unsupported clinical concerns rather than current evidence.

2. Implications
    1. This practice change has implications for patient and staff safety, as it has the potential to reduce or prevent medication errors, contamination of medications, and needlestick injuries.
    2. This practice change also has implications to extend to other inpatient areas within the facility or possibly system-wide.

Topic Selection:

Evidence-Based Practice Poster Session 1 (Saturday/Sunday, 16 & 17 November) (25743)

Abstract Text:

Diluting IV push medications has traditionally been considered best practice by many experienced nurses. On one adult medical-surgical unit, IV push medications are often transferred from single-use vials and pre-filled syringes into another syringe, such as a pre-filled saline flush, for dilution and administration. Nurses anecdotally cite common justifications for these practices, including difficulty measuring small doses, slow IV push rates, or nursing education/training. However, current evidence discourages these practices for patient safety and infection control reasons, and advocates against adding complexity to the medication administration process.

The purpose of this project is to eliminate three IV push medication administration practices commonly observed on the unit, including unnecessary dilution, syringe-to-syringe transfer of medications, and the use of saline flushes for dilution and administration.

A literature review was conducted on IV push medication administration that demonstrated the need for a practice change on the unit. Educational materials, including a PowerPoint presentation, post-test/knowledge check, and skills validation checklist on the Carpuject syringe system were developed. Pending managerial approval, these materials will be distributed to nursing staff via a variety of in-person and/or electronic methods. Staff will be encouraged to complete and submit the post-test and skills validation form to project coordinators. Brief qualitative surveys will also be conducted before and after implementation of the practice change campaign.

Results are pending implementation of an educational campaign to eliminate at-risk IV push medication administration practices observed on the unit. Completion of post-tests, skills validation forms for the Carpuject system, and qualitative surveys distributed before and after implementation will all be analyzed to determine outcomes.

Outdated IV push medication administration practices are still seen in everyday nursing practice despite established standards of care. Successful implementation of this practice change has the potential to improve the safety of patients and staff by preventing or reducing medication errors, infection risks, and needle stick injuries. While the scope of this project is focused on the nursing staff of one inpatient nursing unit, successful implementation could escalate facility-wide or even lead to system-level change.