

Dangerous IV Push Medication Practices

Earlier this year, the Institute for Safe Medication Practices (ISMP) conducted a follow-up survey to three prior surveys that uncovered many dangerous intravenous (IV) push medication administration practices among clinicians. While the latest survey found a decrease in some of the risky practices, many are still in use and may be related to drug shortages, system issues, and teaching methods that maintain these unsafe habits. Prior surveys found the following:

- Long delays in dispensing pharmacy-prepared IV solutions
- Preparation of IV medications at the bedside
- Use of prefilled medication syringes or cartridges as vials to withdraw the drug into another syringe prior to administration
- Dilution of medications that were dispensed in ready-to-administer forms
- Inappropriate use of prefilled normal saline flush syringes to dilute IV push medications that may result in mislabeled syringes

The latest survey gathered information on the impact of ongoing drug shortages and teaching methods on current IV push medication practices. Survey respondents included nurses, advance practice nurses, nurse anesthetists, anesthesiologists, and physicians, mostly working in inpatient settings. Survey findings are summarized below.

Ready-to-Administer Syringes

Most participants (75%) receive half or fewer IV push medications in pharmacy-prepared or commercially available ready-to-administer syringes. The most common medications not provided in ready-to-administer syringes include:

Antiemetics	Antibiotics with short stability	Metoprolol
Antipsychotics	Opioids	Furosemide
Benzodiazepines	Pantoprazole	

These medications are available in a prefilled syringe, however supply has been limited.

Withdrawing Medications from a Prefilled Syringe and Transferring to Another

Over 65% of respondents reported withdrawing drugs from a prefilled syringe or cartridge and filling another syringe to administer part or all of an IV push medication dose. The most common reasons for this practice include:

- To dilute the drug
- No designated syringe (cartridge) holder
- How they were taught
- Difficult to read syringe dose increments
- Syringe does not have a needleless connector or removable needle
- Drug shortage (administer partial dose to conserve a limited supply of a drug)
- Filter medications in a cracked syringe or one containing particulate matter

Dilution

References

Institute for Safe Medication Practices. (2018). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR201811.pdf>

The majority of survey participants (84%) reported that they have further diluted adult IV push medications prior to administration. Dilution was not as frequent with pharmacy-dispensed syringes containing patient-specific doses. The most commonly diluted medications were opioids, anxiolytics/antipsychotics, and antiemetics, irrespective of the container in which it was dispensed. Most participants who dilute IV push medications used a prefilled 0.9% sodium chloride (saline) flush syringe that was either prepared commercially or by the pharmacy. In addition, most responders indicated that they did not relabel the flush syringe. This practice has increased over the last several years and may be due to a shortage of saline vials at the time of the survey. Reasons for drug dilution include:

- To administer the drug slowly
- To limit patient pain
- To decrease extravasation risk
- To accurately measure small volume doses
- To comply with drug-specific requirements and facility policies
- To follow recommendations in drug references
- Due to prior education and training

Labeling

Approximately 50% of respondents stated they always label IV push medications that are prepared away from the patient's bedside. Almost 30% stated they rarely or never label syringes. Many felt that labeling was not needed if they prepared just one medication or one syringe. A few stated they could distinguish between multiple syringes without a label by checking the volume of medication or the size of the syringe; by different needles, caps, or medication colors; by placement on a tray or sterile field; or by carrying syringes in different hands or pockets.

Drug Shortage

Due to current drug shortages, respondents agreed they were:

- Giving more medications via IV push that were previously given as infusions (i.e. antibiotics, antiemetics, proton pump inhibitors)
- Required to prepare more IV push medications at the bedside (or wait longer for pharmacy to prepare and dispense medications)
- Provided with IV push drugs in unfamiliar concentrations and packages (or in volumes greater than needed for each dose)
- Given fewer prefilled, ready-to-administer syringes than previously (in the correct concentrations or volumes)

Drug shortages may also result in delays in treatment secondary to pharmacy preparation of products that are limited in supply. Medications that are prepared in prefilled syringes are often provided in amounts greater than what is needed by the patient which may lead to drug waste.

Education and Training Around IV Push Medication Administration

Clinicians typically learn how to administer IV push medications during professional training, during their first job orientation and/or current position, from drug references, and from on-the-job experiences.

References

Institute for Safe Medication Practices. (2018). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR201811.pdf>

Rate of Administration

Only 60% of respondents indicated that the rate of administration of an IV push medication is included on the patient's medication administration record. Many stated they needed to look up the rate of administration in drug references, in facility guidelines, or rely on recall. Some stated that they give all IV push medications over two to five minutes, and therefore don't need to look up or know the specific rate for each drug. Others reported that they administer all IV push medications in less than two minutes. The majority of respondent use a clock, watch, phone, or other timing device to help control the speed of IV push drug administration. Some state that they give small incremental doses frequently, and others state they apply constant pressure on the plunger.

Dangerous IV push medication administration practices have existed for decades and continue to persist today. Educators and health care administrators should ensure their students and staff are trained on the appropriate techniques for safe medication delivery.

References

Institute for Safe Medication Practices. (2018). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR201811.pdf>