

Citation Report

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|--|------------------|---|
| PMID | Category | Key Words |
| 11714895 | Randomized Trial | Rate of Administration, Adverse Events, Other |
| Author | | |
| Marsch LA, Bickel WK, Badger GJ, et al. | | |
| Title | | |
| Effects of Infusion Rate of Intravenously Administered Morphine on Physiological, Psychomotor, and Self-Reported Measures in Humans | | |
| Citation | | |
| J Pharmacol Exper Therap 2001;299:1056-1065 http://jpet.aspetjournals.org/content/299/3/1056?casa_token=_SQH1asGLnAAAAA%3AO4OPtUf3xE8TZdT_cLxYrfKzSs1O2myTYaDS79j_oCKLwtCEbaXZ4vp_e0ZvkrLXDEVYPPbhwTE | | |
| DOI | | |
| see citation | | |
| Comment | | |
| Human volunteer trial indicates that a rapid onset opioid may be more likely to create abuse but these authors found that faster morphine administration (2 vs. 15 min) produced higher plasma levels and drug effect that may contribute to abuse liability. | | |

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|--|------------------|--|
| PMID | Category | Key Words |
| 27128107 | Randomized Trial | Safety, Error, Dilution, Rate of Administration, Direct Observation, Ready-to-administer, Prefilled Syringe, Labelin |
| Author | | |
| Burger M, Degnan D. | | |
| Title | | |
| Comparative Safety, Efficiency, and Nursing Preference Among 3 Methods for Intravenous Push Medication Preparation: A Randomized Crossover Simulation Study | | |
| Citation | | |
| J Patient Saf. 2019 Sep;15(3):238-245. | | |
| DOI | | |
| 10.1097/PTS.0000000000000269 | | |
| Comment | | |
| Prefilled syringes allow for faster medication preparation and reduced preparation errors with vial-and-syringe process. Compared Carpuject and BD Simplest. | | |

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|--|------------------|---|
| PMID | Category | Key Words |
| 32131580 | Randomized Trial | Safety, Rate of Administration, Adverse Events, Nurse Administration, Economic Impact |
| Author | | |
| Dadpour B, Vahabzadeh M, Mostafazadeh B. | | |
| Title | | |
| Comparison of the efficacy of an infusion pump or standard IV push injection to deliver naloxone in treatment of opioid toxicity | | |
| Citation | | |
| Acute Crit Care. 2020 Feb;35(1):38-43. | | |
| DOI | | |
| 10.4266/acc.2020.00010 | | |
| Comment | | |
| Intermittent IV push naloxone compared with a naloxone infusion for ICU patients on mechanical ventilation after opioid overdose were compared. Infusion produced fewer complications and shorter LOS than intermittent IV push. | | |

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|--|------------------|--|
| PMID | Category | Key Words |
| 3233896 | Randomized Trial | Safety, Dilution, Adverse Events, Phlebitis, Economic Impact |
| Author | | |
| Garrelts JC, Ast D, LaRocca J, Smith DF Jr, Peterie JD. | | |
| Title | | |
| Postinfusion phlebitis after intravenous push versus intravenous piggyback administration of antimicrobial agents | | |
| Citation | | |
| Clin Pharm. 1988 Oct;7(10):760-5. | | |
| DOI | | |
| Comment | | |
| IV push beta-lactam antibiotics were compared and overall there was no difference in phlebitis rate (41 vs 47%) but for catheters discontinued due to phlebitis, the duration of use was longer for IV push 45 +/- 21 hr vs. 36 hr +/- 18hr. | | |

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|---|------------------|--|
| PMID | Category | Key Words |
| 31118678 | Randomized Trial | Safety, Rate of Administration, Adverse Events, Direct Observation, Nurse Administration |
| Author | | |
| Navari RM, Mosier MC. | | |
| Title | | |
| Crossover safety study of aprepitant: 2-min injection vs 30-min infusion in cancer patients receiving emetogenic chemotherapy | | |
| Citation | | |
| Onco Targets Ther. 2019 Apr 30;12:3277-3284. | | |
| DOI | | |
| 10.2147/OTT.S201609 | | |
| Comment | | |
| Compared new formulation of HTX-019 and rate of administration vs. effectiveness at preventing cancer induce N&V. | | |

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|--|------------------|--|
| PMID | Category | Key Words |
| 25364017 | Randomized Trial | Adverse Events, Ready-to-administer, Prefilled Syringe, Patient Satisfaction |
| Author | | |
| Mancini D, Vaillancourt R, Pouliot A, Lin A, Sharp D. | | |
| Title | | |
| Taste and Odour Disturbances in Pediatric Patients Undergoing IV Flush with Normal Saline Administered by Prefilled or Freshly Prepared Syringes: Randomized Single Blind Study | | |
| Citation | | |
| Can J Hosp Pharm. 2014 Sep;67(5):353-7. | | |
| DOI | | |
| 10.4212/cjhp.v67i5.1389 | | |
| Comment | | |
| Pediatric pts. Randomized to flush with prefilled syringe vs. hospital prepared syringe. 73% reported taste or odor disturbance with commercial syringe and 4% of the fresh hospital syringe. The source of the effect is not known. | | |

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|--|------------------------------|--|
| PMID | Category | Key Words |
| 31811297 | Guideline/Practice Statement | Safety, Compatibility, Drug Administration, Ready-to-administer, Prefilled Syringe |
| Author | | |
| Gabay M, Hertig JB, Degnan D, et al. | | |
| Title | | |
| Third consensus development conference on the safety of intravenous drug delivery systems- 2018 | | |
| Citation | | |
| Am J Health-Syst Pharm 2020;77(3);215-220. | | |
| DOI | | |
| doi.org/10.1093/ajhp/zxz277 | | |
| Comment | | |
| Conference concluded that ready-to-use was safest but threats to safety include supply chain/shortages & lack of standardization. Suggested safety improvements. | | |

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|---|------------------------------|---|
| PMID | Category | Key Words |
| 30257844 | Guideline/Practice Statement | Safety, Error, Ready-to-administer, Prefilled Syringe |
| Author | | |
| Billstein-Leber M, Carrillo JD, Cassano AT, et al. | | |
| Title | | |
| ASHP Guidelines on Preventing Medication Errors in Hospitals | | |
| Citation | | |
| Am J Health-Syst Pharm 2018;19:1493-1517 | | |
| DOI | | |
| 10.2146/ajhp170811 | | |
| Comment | | |
| Reviews a variety of strategies for error risk identification and reduction, including ready-to-use forms | | |

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|---|------------------------------|---|
| PMID | Category | Key Words |
| | Guideline/Practice Statement | Safety, Error, Preparation, Drug Administration, Ready-to-administer, Nurse Administration, Prefilled Syringe |
| Author | | |
| ISMP | | |
| Title | | |
| ISMP Safe Practice Guidelines for Adult IV Push Medications 2015 | | |
| Citation | | |
| https://www.ismp.org/sites/default/files/attachments/2017-11/ISMP97-Guidelines-071415-3.%20FINAL.pdf | | |
| DOI | | |
| Comment | | |
| Review of issues that reduce medication safety and guidelines for safe IV Push medication administration. | | |

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|---|------------------------------|---|
| PMID | Category | Key Words |
| | Guideline/Practice Statement | Safety, Error, Dilution, Drug Administration, Direct Observation, Ready-to-administer, Nurse Administration, Othe |
| Author | | |
| Joint Commission Resources | | |
| Title | | |
| Ready-to-Administer (RTA) Injectable Medication Safety Tracer Tool | | |
| Citation | | |
| https://www.rtamedsafety.com/documents/RTA_MedSafety_Assessment-PharmacyIVRoom.pdf | | |
| DOI | | |
| Comment | | |
| This tool allows hospitals to assess medication safety with current practices in purchasing, ordering, and order verification. It has specific tools for settings like the IV room, Nursing unit, and Anesthesia. | | |

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|---|------------------------------|---|
| PMID | Category | Key Words |
| 27612197 | Guideline/Practice Statement | Safety, Error, Drug Administration, Nurse Administration, Education |
| Author | | |
| Shastay AD. | | |
| Title | | |
| Evidence-based safe practice guidelines for I.V. push medications | | |
| Citation | | |
| Nursing. 2016 Oct;46(10):38-44. | | |
| DOI | | |
| 10.1097/01.NURSE.0000494641.31939.46 | | |
| Comment | | |
| Review of ISMP guidelines | | |

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|---|------------------------------|---|
| PMID | Category | Key Words |
| | Guideline/Practice Statement | Dilution, Drug Administration, Prefilled Syringe, Syringe Reuse, Infection, Infection Control |
| Author | | |
| Dolan SA, Arias KM, Felizardo G, et al. | | |
| Title | | |
| APIC Position Paper: Safe injection, infusion, and medication vial practices in health care (2016) | | |
| Citation | | |
| https://www.apic.org/Resource_/TinyMceFileManager/Position_Statements/2016APICSIPPositionPaper.pdf | | |
| DOI | | |
| | | |
| Comment | | |
| This statement was an update of their earlier position paper and describes unsafe practices and suggestions to improve safety or reduce risk of infection. | | |

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|---|------------------------------|---|
| PMID | Category | Key Words |
| | Guideline/Practice Statement | Safety, Drug Administration, Central, Peripheral, Nurse Administration, Midline Catheter, Education |
| Author | | |
| Rowley S, Clare S for the Association for Safe Aseptic Practice | | |
| Title | | |
| Standardizing the critical clinical competency of aseptic, sterile, and clean techniques with a single international standard: Aseptic Non Touch Technique (ANTT) | | |
| Citation | | |
| JAVA 2019; 24(4): 12-17. | | |
| DOI | | |
| 10.2309/j.java.2019.004.003 | | |
| Comment | | |
| Guidance for aseptic insertion and handling of IV line | | |

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|---|------------------------------|--|
| PMID | Category | Key Words |
| 33394637 | Guideline/Practice Statement | Safety, Preparation, Dilution, Drug Administration, Phlebitis, Central, Peripheral, Prefilled Syringe, Nursing Practic |
| Author | | |
| Gorski LA, Hadaway L, Hagle ME, et al. | | |
| Title | | |
| Infusion Therapy Standards of Practice 2021 | | |
| Citation | | |
| J Infusion Nurs. 2021; 44(1S): S1-S224 | | |
| DOI | | |
| 10.1097/NAN.0000000000000396 | | |
| Comment | | |
| This comprehensive update sets Standards for infusion therapy practice, patient and clinician safety, infection prevention/control, equipment, device selection/placement/management, complications, special devices, and infusion therapies. | | |

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|---|----------|-----------------------------|
| PMID | Category | Key Words |
| 30147136 | Review | Safety, Drug Administration |
| Author | | |
| Spencer S, Ipema H, Hartke P, et al. | | |
| Title | | |
| Intravenous push administration of antibiotics: Literature and considerations | | |
| Citation | | |
| Hosp Pharm. 2018;53(3):157-169. | | |
| DOI | | |
| doi.org/10.1177/0018578718760257 | | |
| Comment | | |
| | | |

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|---|----------|--|
| PMID | Category | Key Words |
| | Review | Safety, Error, Drug Administration, Ready-to-administer, Prefilled Syringe |
| Author | | |
| Montney J, Stinnett JE | | |
| Title | | |
| Are prefilled syringes worth it? | | |
| Citation | | |
| Outpatient Surgery Magazine August 2017 http://www.outpatientsurgery.net/surgical-facility-administration/surgical-supplies/are-prefilled-syringes-worth-it--08-17 | | |
| DOI | | |
| see citation | | |
| Comment | | |
| Brief review of pros and cons of prefilled syringes | | |

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|---|----------|--|
| PMID | Category | Key Words |
| | Review | Safety, Error, Preparation, Rate of Administration, Drug Administration, Adverse Events, Phlebitis, Nurse Administ |
| Author | | |
| Spader C | | |
| Title | | |
| Myths of IV push administration | | |
| Citation | | |
| https://www.myamericannurse.com/myths-of-i-v-push-administration/ May 3, 2019 | | |
| DOI | | |
| see citation | | |
| Comment | | |
| Poses myths and truths about the need to dilute medications and other medication safety issues such as transferring between syringes, labeling, avoidance of pain | | |

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|--|----------|---|
| PMID | Category | Key Words |
| | Review | Safety, Preparation, Drug Administration, Adverse Events, Central, Nurse Administration, Nursing Practice |
| Author | | |
| CDC National Center for Emerging and Zoonotic Infectious Diseases | | |
| Title | | |
| Empowering nurses to protect themselves and their patients: Exploring best practices in injection safety | | |
| Citation | | |
| https://www.youtube.com/watch?v=MuaCuRXf5wM February 22, 2018 | | |
| DOI | | |
| see citation | | |
| Comment | | |
| A You Tube video presentation | | |

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|---|----------|--|
| PMID | Category | Key Words |
| 23322752 | Review | Safety, Error, Dilution, Adverse Events, Error Rates, Nurse Administration, Other Provider Administration, Nursing |
| Author | | |
| McLeod MC, Barber N, Franklin BD | | |
| Title | | |
| Methodological variations and their effects on reported medication administration error rates | | |
| Citation | | |
| BMJ Qual Saf 2013;22:278–289 | | |
| DOI | | |
| 10.1136/bmjqs-2012-001330 | | |
| Comment | | |
| Evaluated literature and noted significant methodological variation that impacts error rate reporting. They have recommended design for future studies. | | |

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|--|----------|---|
| PMID | Category | Key Words |
| 40320 | Review | Safety, Error, Error Rates, Ready-to-administer, Other Provider Administration, Prefilled Syringe |
| Author | | |
| Wild D | | |
| Title | | |
| The benefits of prefilled syringes | | |
| Citation | | |
| www.pharmacypracticenews.com/Article/PrintArticle?articleID=40320 | | |
| DOI | | |
| see citation | | |
| Comment | | |
| Brief interview with 2 researchers. See Anesthesiology 2016, J Clin Anesth 2016 and J Patient Saf 2016 | | |

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|---|----------|--|
| PMID | Category | Key Words |
| | Review | Safety, Error, Ready-to-administer, Other Provider Administration, Prefilled Syringe |
| Author | | |
| Viscusi ER, Wagner D | | |
| Title | | |
| The roles of the anesthesiologist and pharmacist in ensuring safe handling and administration of opioids. | | |
| Citation | | |
| Anesthesiology News Suppl. 2018 | | |
| DOI | | |
| see comment | | |
| Comment | | |
| https://www.anesthesiologynews.com/Monographs-and-Whitepapers/Article/08-18/The-Roles-of-the-Anesthesiologist-and-Pharmacist-in-Ensuring-Safe-Handling-and-Administration-of-Opioids/52586 | | |

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|--|----------|---|
| PMID | Category | Key Words |
| 28781499 | Review | Error, Dilution, Drug Administration, Adverse Events, Ready-to-administer, Nurse Administration, Prefilled Syring |
| Author | | |
| Grissinger, M | | |
| Title | | |
| Some IV medications are diluted unnecessarily in patient-care areas, creating undue risk. | | |
| Citation | | |
| P T 2017;42:490-492, 508 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5521294/ | | |
| DOI | | |
| see citation | | |
| Comment | | |
| Reports on the ISMP Survey of nurses in 2014 regarding use of prefilled syringes and use of dilution strategies. Author reports criteria for appropriate dilution. | | |

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|--|----------|--|
| PMID | Category | Key Words |
| 20844691 | Review | Error, Preparation, Dilution, Adverse Events, Ready-to-administer, Nurse Administration, Prefilled Syringe, Labeling |
| Author | | |
| Grissinger, M | | |
| Title | | |
| Reducing Errors with Injectable Medications Unlabeled Syringes Are Surprisingly Common | | |
| Citation | | |
| P T .2010;35:428, 451 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2935650/ | | |
| DOI | | |
| see citation | | |
| Comment | | |
| Presents cases of patient injury to emphasize the need for labeling and other med safety strategies. | | |

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|---|----------|--|
| PMID | Category | Key Words |
| | Review | Safety, Error, Dilution, Drug Administration, Ready-to-administer, Prefilled Syringe, Nursing Practice |
| Author | | |
| Jacobi J, Burger M | | |
| Title | | |
| Is dilution destroying your sterile products? | | |
| Citation | | |
| see comment | | |
| DOI | | |
| see comment | | |
| Comment | | |
| https://www.pharmacypracticenews.com/Policy/Article/03-18/Is-Dilution-Destroying-Your-Sterile-Products-/48354 | | |

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|--|----------|---|
| PMID | Category | Key Words |
| 32287169 | Review | Safety, Error, Dilution, Ready-to-administer, Prefilled Syringe |
| Author | | |
| Degnan DD, Bullard TN, Davis MBH. | | |
| Title | | |
| Risk of Patient Harm Related to Unnecessary Dilution of Ready-to-Administer Prefilled Syringes: A Literature Review | | |
| Citation | | |
| J Infuse Nurs. 2020 May/Jun;43(3):146-154. | | |
| DOI | | |
| 10.1097/NAN.0000000000000366 | | |
| Comment | | |
| Reviews literature describing potential harms associated with unnecessary dilution of IV push medications and published guidelines for these products. | | |

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|--|----------|---|
| PMID | Category | Key Words |
| 32332508 | Review | Error, Dilution, Ready-to-administer, Prefilled Syringe, Nursing Practice |
| Author | | |
| Deutsch L. | | |
| Title | | |
| Dilution is no solution | | |
| Citation | | |
| Nursing. 2020 May;50(5):61-62. | | |
| DOI | | |
| 10.1097/01.NURSE.0000659316.76576.58 | | |
| Comment | | |
| Reviews the issues around unnecessary dilution of IV push medications and uses stories to demonstrate the process of change. | | |

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|--|----------|---|
| PMID | Category | Key Words |
| 8807912 | Review | Drug Administration, Peripheral, Nurse Administration, Nursing Practice |
| Author | | |
| McConnell EA. | | |
| Title | | |
| Administering an I.V. push injection through an existing peripheral line | | |
| Citation | | |
| Nursing. 1996 Aug;26(8):24. | | |
| DOI | | |
| Comment | | |

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|--|----------|--|
| PMID | Category | Key Words |
| 26547575 | Review | Safety, Error, Preparation, Dilution, Adverse Events, Nurse Administration, Nursing Practice, Labeling |
| Author | | |
| Paparella SF, Mandrack MM. | | |
| Title | | |
| IV Push Medication Administration: Making Safe Choices; Choosing Best Practice | | |
| Citation | | |
| J Emerg Nurs. 2016 Jan;42(1):64-7. | | |
| DOI | | |
| 10.1016/j.jen.2015.09.016 | | |
| Comment | | |
| Review of common errors in IV preparation and administration to ED patients. | | |

| | | |
|---|----------|--|
| PMID | Category | Key Words |
| 29112582 | Review | Safety, Peripheral, Nurse Administration |
| Author | | |
| Lenz JR, Degnan DD, Hertig JB, Stevenson JG. | | |
| Title | | |
| A review of best practices for intravenous push medication administration | | |
| Citation | | |
| J Infusion Nurs 2017;40 (6);354-358. | | |
| DOI | | |
| doi.org/10.1097/nan.0000000000000247 | | |
| Comment | | |
| Review of 2015 ISMP safe practice guidelines | | |

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|---|----------|--|
| PMID | Category | Key Words |
| 30846139 | Review | Safety, Error, Preparation, Dilution, Ready-to-administer, Prefilled Syringe, Labeling |
| Author | | |
| Paparella SF. | | |
| Title | | |
| IV Push Medication Matters: New Survey Points to Slow Adoption of Best Practices | | |
| Citation | | |
| J Emerg Nurs. 2019 Mar;45(2):202-205. | | |
| DOI | | |
| 10.1016/j.jen.2018.12.011 | | |
| Comment | | |
| Reports on surveys done by ISMP and ASHP to educate their readers about IV Push practices that should be avoided. | | |

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|---|----------|---|
| PMID | Category | Key Words |
| 23860193 | Review | Safety, Error, Adverse Events, Nurse Administration, Nursing Practice |
| Author | | |
| James, John T | | |
| Title | | |
| A New, Evidence-based Estimate of Patient Harms Associated with Hospital Care | | |
| Citation | | |
| J Patient Saf 2013;9: 122-128 | | |
| DOI | | |
| 10.1097/PTS.0b013e3182948a69 | | |
| Comment | | |
| Review of 4 studies looking at medical errors and discuss tools to identify errors from medical records. Not specific to IV Push. | | |

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|--|----------|---|
| PMID | Category | Key Words |
| 15452531 | Review | Safety, Error, Adverse Events, Nurse Administration |
| Author | | |
| Papparella S | | |
| Title | | |
| Avoiding disastrous outcomes with rapid intravenous push medications. | | |
| Citation | | |
| J Emerg Nurs 2004; 30:478-480 | | |
| DOI | | |
| 10.1016/j.jen.2004.08.002 | | |
| Comment | | |
| Case of rapid IV push calcium administration with resulting asystole in a verapamil toxicity patient to educate on proper terminology (avoid push or bolus term and state IV over ___ min. | | |

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|---|----------|---|
| PMID | Category | Key Words |
| 32151563 | Review | Error, Other, Labeling, Lighting/Illumination, Ampule, Misreading |
| Author | | |
| Borradale H, Andersen P, Wallis M, Oprescu F | | |
| Title | | |
| Misreading injectable medications - causes and solutions: An integrative literature review | | |
| Citation | | |
| Joint Commission J Qual Pat Saf 2020; 46:291-298 | | |
| DOI | | |
| 10.1016/j.jcjq.2020.01.007 | | |
| Comment | | |
| Studies reporting on the effects of lighting level, packaging, labeling, and visual acuity were reviewed for potential contribution to misreading label on an injectable product. | | |

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|--|---------------|---|
| PMID | Category | Key Words |
| 28902007 | Observational | Safety, Preparation, Dilution, Drug Administration, Direct Observation, Error Rates, Ready-to-administer, Nurse A |
| Author | | |
| Hertig JB, Degnan DD, Scott CR, et al. | | |
| Title | | |
| A comparison of error rates between intravenous push methods: A prospective, multisite, observational study | | |
| Citation | | |
| J Patient Saf 2018;14(1):60-65. | | |
| DOI | | |
| doi.org/10.1097/pts.0000000000000419 | | |
| Comment | | |
| RTA had lower observed error rate (2.5%) vs. traditional practice (10.4%) with 329 observations in 3 health-system sites. Still need to quantify potential harm with these errors. | | |

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|--|---------------|---|
| PMID | Category | Key Words |
| 11194136 | Observational | Error, Drug Administration, Direct Observation, Error Rates, Nurse Administration |
| Author | | |
| Dean B, Barber N | | |
| Title | | |
| Validity and reliability of observational methods for studying medication administration errors | | |
| Citation | | |
| Am J Health-Syst Pharm 2001;58:54-59 | | |
| DOI | | |
| 10.1093/ajhp/58.1.54 | | |
| Comment | | |
| UK hospitals with consecutive medication administrations observed. Concluded that observational methods to identify drug administration errors are valid and reliable. | | |

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|---|---------------|---|
| PMID | Category | Key Words |
| 26845139 | Observational | Safety, Error, Drug Administration, Direct Observation, Ready-to-administer, Other Provider Administration, Prefi |
| Author | | |
| Yang Y, Rivera AJ, Fortier CR, Abernathy JH | | |
| Title | | |
| A Human Factors Engineering Study of the Medication Delivery Process during an Anesthetic | | |
| Citation | | |
| Anesthesiology 2016; 124:795-803 | | |
| DOI | | |
| 10.1097/ALN.0000000000001040 | | |
| Comment | | |
| System vulnerabilities compared for self-filled vs. pre-filled syringes in the OR. Concluded the prefilled have the potential to improve safety and efficiency. | | |

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|---|---------------|---|
| PMID | Category | Key Words |
| 25630893 | Observational | Safety, Error, Other, Nursing Practice, Quality Improvement |
| Author | | |
| Hanrahan K, Wagner M, Matthews G, et al. | | |
| Practice | | |
| Title | | |
| Sacred Cow Gone to Pasture: A Systematic Evaluation and Integration of Evidence-Based Practice | | |
| Citation | | |
| Worldviews on Evidence-Based Nursing, 2015; 12:1, 3–11. | | |
| DOI | | |
| 10.1111/wvn.12072 | | |
| Comment | | |
| A strategic approach to eliminating outdated practices when introducing evidence-based practices and testing implementation strategies. | | |

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|--|---------------|---|
| PMID | Category | Key Words |
| 14532365 | Observational | Safety, Error, Preparation, Dilution, Drug Administration, Adverse Events, Direct Observation, Error Rates, Nurse |
| Author | | |
| Taxis K, Barber N | | |
| Title | | |
| Causes of intravenous medication errors: an ethnographic study | | |
| Citation | | |
| Qual Saf Health Care 2003;12:343–348 | | |
| DOI | | |
| 10.1136/qhc.12.5.343 | | |
| Comment | | |
| Observational study of IV medication errors | | |

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|--|---------------|---|
| PMID | Category | Key Words |
| 29880520 | Observational | Preparation, Dilution, Compatibility, Drug Administration, Nurse Administration, pH |
| Author | | |
| Gandhi RG, Steiger SN, Elshaboury RH, Lund JT. | | |
| Title | | |
| I.V. push administration of medications reconstituted with 0.9% sodium chloride injection | | |
| Citation | | |
| Am J Health Syst Pharm. 2018 Jun 15;75(12):851-852. | | |
| DOI | | |
| 10.2146/ajhp180132 | | |
| Comment | | |
| Alternatives to sterile water were needed during a shortage and 0.9% NaCl was tested for several medications and found acceptable for most drugs, other than cefepime where high osmolarity may cause phlebitis. | | |

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|--|---------------|--|
| PMID | Category | Key Words |
| 29095181 | Observational | Preparation, Drug Administration, Nursing Practice, Economic Impact, Waste |
| Author | | |
| McLaughlin JM, Scott RA, Koenig SL, Mueller SW. | | |
| Title | | |
| Intravenous Push Cephalosporin Antibiotics in the Emergency Department: A Practice Improvement Project | | |
| Citation | | |
| Adv Emerg Nurs J. 2017 Oct/Dec;39(4):295-299. | | |
| DOI | | |
| 10.1097/TME.000000000000160 | | |
| Comment | | |
| Topic arose when minibags were in short supply, but has been sustained for efficiency and economics. This paper showed reduced time to drug administration and reduced costs with IV push. | | |

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| PMID | Category | Key Words |
| 2213947 | Observational | Nurse Administration, Economic Impact, Quality Improvement |
| Author | | |
| Weigelt JA, Dyke C, Martin RL. | | |
| Title | | |
| Alternative delivery system for controlled drugs in the surgical intensive care unit | | |
| Citation | | |
| J Trauma. 1990 Sep;30(9):1141-6; discussion 1146-7. | | |
| DOI | | |
| 10.1097/00005373-199009000-00010 | | |
| Comment | | |
| Compared morphine IV push vs. via a nurse-controlled device (NCA- essentially a PCA run by nurses) and reduced time to administer and costs. | | |

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|--|---------------|---|
| PMID | Category | Key Words |
| 24250594 | Observational | Safety, Error, Rate of Administration, Adverse Events, Direct Observation, Nurse Administration |
| Author | | |
| Abbasinazari M, Hajhossein Talasaz A, Mousavi Z, Zare-Toranposhti S. | | |
| Title | | |
| Evaluating the frequency of errors in preparation and administration of intravenous medications in orthopedic, general surgery and gastroenterology wards of a teaching hospital in Tehran | | |
| Citation | | |
| Iran J Pharm Res. 2013 Winter;12(1):229-34. https://pubmed.ncbi.nlm.nih.gov/24250594/ | | |
| DOI | | |
| see citation | | |
| Comment | | |
| Observational study of med prep and admin by nurses and most common error was rapid rate, but also aseptic technique, diluent selection, monitoring for phlebitis, and drug incompatibility were observed. Indicated need for standardization and education. | | |

| | | |
|--|---------------|--|
| PMID | Category | Key Words |
| 29698190 | Observational | Error, Drug Administration, Direct Observation, Nurse Administration, High Alert |
| Author | | |
| Ding Q, Barker KN, Flynn EA, Westrick SC, Chang M, Thomas RE, Braxton-Lloyd K, Sesek R. | | |
| Title | | |
| Incidence of Intravenous Medication Errors in a Chinese Hospital | | |
| Citation | | |
| Value Health Reg Issues. 2015 May;6:33-39. | | |
| DOI | | |
| 10.1016/j.vhri.2015.03.004 | | |
| Comment | | |
| Observed frequent errors by nurses - dosing, time of admin., omission, extra dose. Rate was 9.1% excluding wrong time errors. Concluded that pharmacists needed to have a role in IV medication processes. | | |

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|--|---------------|--|
| PMID | Category | Key Words |
| 29873424 | Observational | Safety, Error, Direct Observation, Hazardous, Oncology |
| Author | | |
| Al Khawaldeh TA, Wazaify M. | | |
| Title | | |
| Intravenous cancer chemotherapy administration errors: An observational study at referral hospital in Jordan | | |
| Citation | | |
| Eur J Cancer Care (Engl). 2018 Jul;27(4):e12863. | | |
| DOI | | |
| 10.1111/ecc.12863 | | |
| Comment | | |
| Oncology nurses were observed and errors were frequent in the process and aseptic technique. Nurses trained in chemo prep and admin had a higher error rate. Nevertheless, the authors concluded that more education was needed. | | |

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|---|---------------|---|
| PMID | Category | Key Words |
| 24835141 | Observational | Error, Drug Administration, Direct Observation, Nurse Administration, Nursing Practice, Quality Improvement |
| Author | | |
| Donaldson N, Aydin C, Fridman M. | | |
| Title | | |
| Predictors of unit-level medication administration accuracy: microsystem impacts on medication safety | | |
| Citation | | |
| J Nurs Adm. 2014 Jun;44(6):353-61. | | |
| DOI | | |
| 10.1097/NNA.0000000000000081 | | |
| Comment | | |
| Direct observational assessment of 15600 doses found distractions and interruptions were common safe practice deviations. Predicted a 46% reduction in admin. error if 5% decrease in safe practice deviations. Staffing is also an important factor. | | |

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|--|---------------|--|
| PMID | Category | Key Words |
| 23129865 | Observational | Adverse Events, Central, Peripheral, Prefilled Syringe, Patient Satisfaction, Pharmacy Preparation |
| Author | | |
| Celetti SJ, Vaillancourt R, Pascuet E, Sharp D. | | |
| Title | | |
| Taste and/or Odour Disturbances in Pediatric Patients Undergoing IV Flush with Normal Saline Administered by Prefilled Syringe | | |
| Citation | | |
| Can J Hosp Pharm. 2012 Sep;65(5):368-72. | | |
| DOI | | |
| 10.4212/cjhp.v65i5.1174 | | |
| Comment | | |
| 73% of children detected alteration in taste or smell following saline flush with a commercial prefilled syringe. | | |

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|---|----------|--|
| PMID | Category | Key Words |
| 31455315 | Cohort | Safety, Drug Administration, Nurse Administration, Other Provider Administration |
| Author | | |
| Hayashi T, Hutin YJ-F, Bulterys M, et al. | | |
| Title | | |
| Injection Practices in 2011-2015: A Review Using Data From the Demographic and Health Surveys (DHS) | | |
| Citation | | |
| BMC Health Serv Res 2019 Aug 27;19(1):600 | | |
| DOI | | |
| 10.1186/s12913-019-4366-9 | | |
| Comment | | |
| Database search for unsafe injection practices, such as syringe re-use. | | |

| | | |
|---|----------|--|
| PMID | Category | Key Words |
| 15933316 | Cohort | Safety, Error, Preparation, Dilution, Rate of Administration, Drug Administration, Direct Observation, Ready-to-ad |
| Author | | |
| Cousins DH, Sabatier B, Begue D, et al. | | |
| Title | | |
| Medication errors in intravenous drug preparation and administration: a multicentre audit in the UK, Germany and France | | |
| Citation | | |
| Qual Saf Health Care 2005;14:190–195 | | |
| DOI | | |
| 10.1136/qshc.2003.006676 | | |
| Comment | | |
| Prospective audit of error rates comparing 3 sites evaluating labeling, dilution, rate of administration, and aspect technique. | | |

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|---|----------|--|
| PMID | Category | Key Words |
| 32447650 | Cohort | Safety, Dilution, Rate of Administration, Drug Administration, Nurse Administration, Economic Impact |
| Author | | |
| Burns D, Kula J, Marshall S, Ashworth E, Ornelas M. | | |
| Title | | |
| Best Practice Approach to Successful Conversion of Fosaprepitant to Aprepitant IV in a Large Multisite Community Oncology Infusion Center: A Retrospective Analysis | | |
| Citation | | |
| Adv Ther. 2020 May 23. Ahead of print | | |
| DOI | | |
| 10.1007/s12325-020-01377-z | | |
| Comment | | |
| Compared fosaprepitant IVPB to aprepitant IVP over 2 min and improved efficiency and reduced cost. | | |

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|---|----------|---|
| PMID | Category | Key Words |
| 10172048 | Cohort | Dilution, Drug Administration, Adverse Events, Phlebitis, Economic Impact |
| Author | | |
| Garrelts JC, Smith DF, Ast D, Peterie JD. | | |
| Title | | |
| A comparison of the safety, timing and cost-effectiveness of administering antibiotics by intravenous bolus (push) versus intravenous piggyback (slow infusion) in surgical prophylaxis | | |
| Citation | | |
| Pharmacoeconomics. 1992 Feb;1(2):116-23. | | |
| DOI | | |
| 10.2165/00019053-199201020-00008 | | |
| Comment | | |
| Compared IV push cefmetazole vs. IVPB (study design not known) and concluded IV push avoided more costs, was safe and phlebitis did not occur with either route (unknown duration of f/u) | | |

| | | |
|--|----------|---|
| PMID | Category | Key Words |
| 32470139 | Cohort | Safety, Drug Administration, Adverse Events, Nurse Administration |
| Author | | |
| Hays WB, Flack T. | | |
| Title | | |
| Safety and tolerability of i.v. push piperacillin/tazobactam within an emergency department | | |
| Citation | | |
| Am J Health Syst Pharm. 2020 May 29:zxaa114. | | |
| DOI | | |
| 10.1093/ajhp/zxaa114 | | |
| Comment | | |
| Retrospective review of 299 patients for safety and tolerance of IV push vs IVPB piperacillin/tazo in the ED. Allowed faster administration without documented infusion-related reactions. | | |

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|--|----------|---|
| PMID | Category | Key Words |
| 10048883 | Cohort | Safety, Rate of Administration, Drug Administration, Nurse Administration, Economic Impact, Home Care |
| Author | | |
| Nowobilski-Vasilios A, Poole SM. | | |
| Title | | |
| Development and preliminary outcomes of a program for administering antimicrobials by i.v. push in home care | | |
| Citation | | |
| Am J Health Syst Pharm. 1999 Jan 1;56(1):76-9. | | |
| DOI | | |
| 10.1093/ajhp/56.1.76 | | |
| Comment | | |
| Retrospective data following a change in process to administer specified antimicrobial agents IV push instead of IVPB> Most given via peripheral site. | | |

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|--|----------|---|
| PMID | Category | Key Words |
| 30190292 | Cohort | Safety, Dilution, Drug Administration, Osmolarity |
| Author | | |
| Pettit NN, Nguyen CT, Stahle S, Wong M, Bastow S, Pisano J. | | |
| Title | | |
| Implementing i.v. push administration of piperacillin-tazobactam in response to shortage of small-volume infusion bags | | |
| Citation | | |
| Am J Health Syst Pharm. 2018 Sep 15;75(18):1358-1359. | | |
| DOI | | |
| 10.2146/ajhp180163 | | |
| Comment | | |
| Measured osmolarity of pip/tazo when diluted for IV push and added it to the list of agents given via IV Push during minibag shortage- ED and acute care units only (not ICU). | | |

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|---|----------|---|
| PMID | Category | Key Words |
| 10476138 | Cohort | Dilution, Rate of Administration, Drug Administration, Adverse Events, Phlebitis, Home Care, Patient Satisfaction |
| Author | | |
| Poole SM, Nowobilski-Vasilios A, Free F. | | |
| Title | | |
| Intravenous push medications in the home | | |
| Citation | | |
| J Intravenous Nurs. 1999 Jul-Aug;22(4):209-15. https://pubmed.ncbi.nlm.nih.gov/10476138/ | | |
| DOI | | |
| see citation | | |
| Comment | | |
| Reviewed reports of N=1116 cases for self-administered IV push vs IVPB phlebitis rates and patient satisfaction. | | |

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|---|----------|--|
| PMID | Category | Key Words |
| 31495250 | Cohort | Safety, Dilution, Rate of Administration, Adverse Events |
| Author | | |
| Tjugum SL, Hedrick TL, Jean SJ, Heeney SA, Rohde KA, Campbell-Bright SL. | | |
| Title | | |
| Evaluation of the Safety of Intravenous Thiamine Administration in a Large Academic Medical Center | | |
| Citation | | |
| J Pharm Pract. 2019 Sep 8;897190019872584. | | |
| DOI | | |
| 10.1177/0897190019872584 | | |
| Comment | | |
| Hospital with inconsistent practice regarding thiamine administration compared adverse event rates (retrospective) for 200mg doses IV push vs infusion, and found no significant difference (likely lack of documentation or type II error, however). | | |

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|--|----------|--|
| PMID | Category | Key Words |
| 10873877 | Cohort | Safety, Drug Administration, Adverse Events, Effectiveness |
| Author | | |
| Van Wyck DB, Cavallo G, Spinowitz BS, Adhikarla R, Gagnon S, Charytan C, Levin N. | | |
| Title | | |
| Safety and efficacy of iron sucrose in patients sensitive to iron dextran: North American clinical trial | | |
| Citation | | |
| Am J Kidney Dis. 2000 Jul;36(1):88-97. | | |
| DOI | | |
| 10.1053/ajkd.2000.8276 | | |
| Comment | | |
| Patients with prior reactions to iron dextran were given iron sucrose 100mg IV push on dialysis, and safety was demonstrated compared with a 15 min. infusion. | | |

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|---|----------|--|
| PMID | Category | Key Words |
| 31932197 | Cohort | Safety, Dilution, Rate of Administration, Drug Administration, Adverse Events, Phlebitis |
| Author | | |
| McLaughlin K, Joyal K, Lee S, Corrado M, Marquis K, Anger K, Szumita P. | | |
| Title | | |
| Safety of intravenous push thiamine administration at a tertiary academic medical center | | |
| Citation | | |
| J Am Pharm Assoc (2003). 2020 Jan 10:S1544-3191(19)30544-8. | | |
| DOI | | |
| 10.1016/j.japh.2019.12.005 | | |
| Comment | | |
| IV push doses up to 250mg were tolerated without any anaphylaxis and few infusion site reactions. | | |

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|---|----------|---|
| PMID | Category | Key Words |
| 29949010 | Cohort | Safety, Dilution, Rate of Administration, Drug Administration, Adverse Events |
| Author | | |
| Davidson KE, Newell J, Alsherbini K, Krushinski J, Jones GM. | | |
| Title | | |
| Safety and Efficiency of Intravenous Push Lacosamide Administration | | |
| Citation | | |
| Neurocrit Care. 2018 Dec;29(3):491-495. | | |
| DOI | | |
| 10.1007/s12028-018-0560-6 | | |
| Comment | | |
| Confirmed a prior study that IV push dosing up to 80 mg/min was tolerated without infusion reactions. IV push was faster therapy than IVPB. | | |

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|---|----------|---|
| PMID | Category | Key Words |
| 32686466 | Cohort | Safety, Rate of Administration, Drug Administration |
| Author | | |
| McLaughlin K, Carabetta S, Hunt N, et al. | | |
| Title | | |
| Safety of intravenous push lacosamide compared with intravenous piggyback at a tertiary academic medication center. | | |
| Citation | | |
| Ann Pharmacother 2021; 55(2):181-186 | | |
| DOI | | |
| 10.1177/1060028020943569 | | |
| Comment | | |
| Lacosamide may be considered a safe alternative to IVPB administration when considering the potential for hypotension, bradycardia, sedation, and IV site reactions, based on this retrospective cohort report. | | |

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|---|----------|------------------------|
| PMID | Category | Key Words |
| 34081297 | Cohort | Safety, Adverse Events |
| Author | | |
| Adams T, Greathouse K | | |
| Title | | |
| Evaluation of time to administration, benzodiazepine use, and safety of intravenous push levetiracetam in a neuro-spine intensive care unit | | |
| Citation | | |
| Neurocrit Care. 2021; online ahead of print | | |
| DOI | | |
| 10.1007/s12028-021-01237-w | | |
| Comment | | |
| There was no difference in adverse events before vs. after a protocol change from IVPB to IV Push administration of up to 2000 mg levetiracetam. There were beneficial differences in timeliness and a reduction in benzodiazepine doses while waiting. | | |

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|--|----------|--|
| PMID | Category | Key Words |
| 33068313 | Cohort | Preparation, Rate of Administration, Drug Administration, Effectiveness, Quality Improvement |
| Author | | |
| Marsh K, Dubrovskaya Y, Jen S-PP, et al. | | |
| Title | | |
| Intravenous push versus intravenous piggyback beta-lactams for the empiric management of gram-negative bacteremia. | | |
| Citation | | |
| J Clin Pharm Ther. 2021; 46(2):373-381 | | |
| DOI | | |
| 10.1111/jcpt.13291 | | |
| Comment | | |
| Study focused on infection-related outcome during a minibag shortage period and no differences were found based on rate of administration. | | |

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|--|----------|---|
| PMID | Category | Key Words |
| 33302785 | Cohort | Rate of Administration, Adverse Events, Nurse Administration, Economic Impact |
| Author | | |
| Academia EC, Jenrette JE, Mueller SW, McLaughlin JM. | | |
| Title | | |
| Evaluation of first-dose, intravenous push penicillins and carbapenems in the emergency department | | |
| Citation | | |
| J Pharm Pract. 2020 on line ahead of print | | |
| DOI | | |
| 0.1177/0897190020977758 | | |
| Comment | | |
| IVP administration reduced time to first dose and cost savings vs. IVPB without an increase in adverse events. | | |

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|--|-------------------|---|
| PMID | Category | Key Words |
| 25477584 | Cases/Case Series | Rate of Administration, Adverse Events, Home Care |
| Author | | |
| Caulder CR, Sloan A, Yasir A, Bookstaver PB. | | |
| Title | | |
| Infusion-related reaction following daptomycin two-minute rapid intravenous administration | | |
| Citation | | |
| Hosp Pharm. 2014 Jul;49(7):644-6. | | |
| DOI | | |
| 10.1310/hpj4907-644 | | |
| Comment | | |
| Adverse reaction to daptomycin via 2 min IV push but the patient tolerated 40 min infusions on subsequent doses. | | |

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|--|-------------------|--|
| PMID | Category | Key Words |
| 3377616 | Cases/Case Series | Rate of Administration, Adverse Events, Peri-operative Setting |
| Author | | |
| Spengler RF, Arrowsmith JB, Kilarski DJ, Buchanan C, Von Behren L, Graham DR. | | |
| Title | | |
| Severe soft-tissue injury following intravenous infusion of phenytoin. Patient and drug administration risk factors | | |
| Citation | | |
| Arch Intern Med. 1988 Jun;148(6):1329-33. https://pubmed.ncbi.nlm.nih.gov/3377616/ | | |
| DOI | | |
| see citation | | |
| Comment | | |
| Vascular injury in cases vs. matched controls found female, smaller than 20 gauge, and faster infusion, with 2 or more doses increased the risk of injury. | | |

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|---|-----------------------|---|
| PMID | Category | Key Words |
| | Editorial/White Paper | Safety, Error, Preparation, Dilution, Drug Administration, Ready-to-administer, Nurse Administration, Prefilled Syr |
| Author | | |
| Spader C | | |
| Title | | |
| A matter of IV push drug safety | | |
| Citation | | |
| May 3, 2019 see comment | | |
| DOI | | |
| see comment | | |
| Comment | | |
| https://www.myamericannurse.com/wp-content/uploads/2019/04/ant4-Fresenius-IV-Push-325a.pdf Discusses the 2018 ISMP survey on how nurses prepare and administer IV push medications. | | |

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|--|-----------------------|--|
| PMID | Category | Key Words |
| 29279297 | Editorial/White Paper | Safety, Error, Other, Nursing Practice |
| Author | | |
| Wang V, Maciejewski ML, Helfrich CD, Weiner BJ | | |
| Title | | |
| Working smarter not harder: Coupling implementation to de-implementation implementation | | |
| Citation | | |
| Healthc (Amst.) 2018;6:104-107 | | |
| DOI | | |
| 10.1016/j.hjdsi.2017.12.004 | | |
| Comment | | |
| Discuss role of de-implementation as a part of organizational change and the challenges of unlearning as part of implementation of new practice. | | |

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|---|-----------------------|---|
| PMID | Category | Key Words |
| 28438828 | Editorial/White Paper | Safety, Error, Drug Administration, Ready-to-administer, Prefilled Syringe, Economic Impact, Labeling |
| Author | | |
| Fanikos J, Burger M, Canada T, Ebright P, Fleming J, Harder KA, Pham JC, Sawyer MD, Stevenson JG. | | |
| Title | | |
| An assessment of currently available i.v. push medication delivery systems | | |
| Citation | | |
| Am J Health Syst Pharm. 2017 May 1;74(9):e230-e235. | | |
| DOI | | |
| 10.2146/ajhp150830 | | |
| Comment | | |
| Expert panel report on the ideal ready-to-use system and assessment of currently available systems. | | |

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|---|-----------------------|--------------------------------------|
| PMID | Category | Key Words |
| 10317755 | Editorial/White Paper | Drug Administration, Economic Impact |
| Author | | |
| Hughes TE, Suzuki NT. | | |
| Title | | |
| IV push policy: the economic effects of IV drug administration guidelines | | |
| Citation | | |
| Hosp Formul. 1986 Jul;21(7):793-9, 802. | | |
| DOI | | |
| Comment | | |
| May be too old to acquire this paper and economics may not be relevant | | |

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|--|----------|---|
| PMID | Category | Key Words |
| | Letters | Rate of Administration, Drug Administration, Nursing Practice |
| Author | | |
| Porter JJ, Lopez TC | | |
| Title | | |
| Maximum intravenous morphine push rate: Discrepancies between the primary and tertiary literature. (letter) | | |
| Citation | | |
| J Pain Palliat Care Pharmacother 2005;19:67-68 | | |
| DOI | | |
| 10.1300/J354v19n01_12 | | |
| Comment | | |
| The maximum rate of morphine may be ~ 5 mg/min (per 70kg) in an opioid naïve patient based on trial data and this is faster than suggested in tertiary literature. | | |

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|---|----------|---------------------------|
| PMID | Category | Key Words |
| 9161666 | Letters | Dilution, Economic Impact |
| Author | | |
| Ambrose PG, Quintiliani R, Nightingale CH. | | |
| Title | | |
| Pharmacoeconomic analysis of administration of famotidine i.v. push vs. intermittent slow i.v. infusion | | |
| Citation | | |
| Ann Pharmacother. 1997 May;31(5):645. | | |
| DOI | | |
| 10.1177/106002809703100521 | | |
| Comment | | |
| | | |

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|--|---------------|--|
| PMID | Category | Key Words |
| | Miscellaneous | Safety, Error, Preparation, Dilution, Drug Administration, Adverse Events, Central, Other, Nurse Administration, P |
| Author | | |
| Perz J, Kainer MA, Wiemken T | | |
| Title | | |
| Injection safety: A system approach Medscape CE program. Slides can be downloaded | | |
| Citation | | |
| https://www.medscape.org/viewarticle/880773_slide 9/18/2017 | | |
| DOI | | |
| see citation | | |
| Comment | | |
| No longer available for continuing education credit, but slides can be viewed. | | |

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|-------------|---|---|
| PMID | Category | Key Words |
| | Miscellaneous | Safety, Error, Preparation, Dilution, Drug Administration, Ready-to-administer, Prefilled Syringe, Labeling |
| Author | | |
| ISMP | | |
| Title | | |
| | Some IV Medications Are Diluted Unnecessarily in Patient Care Areas, Creating Undue Risk | |
| Citation | | |
| | https://www.ismp.org/resources/some-iv-medications-are-diluted-unnecessarily-patient-care-areas-creating-undue-risk | |
| DOI | | |
| see comment | | |
| Comment | | |
| | Survey results from 1773 respondents (97% RN) in 2014 demonstrates frequent filution of meds that may be unnecessary and often leads to unlabeled or mislabeled syringes, contamination, erros. | |

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|--|---------------|--|
| PMID | Category | Key Words |
| 28438821 | Miscellaneous | Rate of Administration, Drug Administration, Other |
| Author | | |
| Butterfield-Cowper JM, Burgner K. | | |
| Title | | |
| Effects of i.v. push administration on Beta-lactam pharmacodynamics | | |
| Citation | | |
| Am J Health Syst Pharm. 2017 May 1;74(9):e170-e175. | | |
| DOI | | |
| 10.2146/ajhp150883 | | |
| Comment | | |
| Compared with a 30 min. infusion, change to IV push over 5 min. had minimal impact on the probability of target attainment for meropenem, cefepime, and aztreonam based on Monte Carlo simulation. | | |

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|---|---------------|---|
| PMID | Category | Key Words |
| 28625701 | Miscellaneous | Safety, Ordering, Other, Nurse Administration |
| Author | | |
| Kossover-Smith RA, Coutts K, Hatfield KM, et al. | | |
| Title | | |
| One needle, one syringe, only one time? A survey of physician and nurse knowledge, attitudes, and practices around injection safety | | |
| Citation | | |
| Am J Infect Control 2017;45:1018-1023 | | |
| DOI | | |
| 10.1016/j.ajic.2017.04.292 | | |
| Comment | | |
| A survey of physicians and nurses | | |

| | | |
|---|---------------|--|
| PMID | Category | Key Words |
| | Miscellaneous | Safety, Error, Drug Administration, Adverse Events, Nursing Practice, Education, Quality Improvement |
| Author | | |
| Spader C | | |
| Title | | |
| I.V. Push medication administration | | |
| Citation | | |
| https://www.myamericannurse.com/wp-content/uploads/2019/04/ant4-Fresenius-IV-Push-325a.pdf | | |
| DOI | | |
| Comment | | |
| Comprehensive compilation of articles to educate on risk of incorrect technique and review of evidence-based practices | | |

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|---|----------|---|
| PMID | Category | Key Words |
| | Survey | Safety, Nurse Administration, Prefilled Syringe, Waste, Syringe Reuse, Education, Quality Improvement |
| Author | | |
| Burger M, Cross C | | |
| Title | | |
| One and done: Prefilled flush syringes | | |
| Citation | | |
| Am Nurs J 2021 https://www.myamericannurse.com/one-and-done-for-prefilled-flush-syringes/ | | |
| DOI | | |
| | | |
| Comment | | |
| Review of risks of syringe reuse and results of a nursing survey on flushing practices, saline syringe reuse, and reveals a gap between best practice and actual practice. | | |

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|---|----------|---|
| PMID | Category | Key Words |
| 28439128 | Survey | Safety, Error, Dilution, Ready-to-administer, Prefilled Syringe, Nursing Practice |
| Author | | |
| Heindel GA, Stivers AP. | | |
| Title | | |
| Culture Changes Needed to Implement ISMP IV Push Guidelines | | |
| Citation | | |
| Hosp Pharm. 2017 Mar;52(3):167-168. | | |
| DOI | | |
| 10.1310/hpj5203-167 | | |
| Comment | | |
| Nurses at one hospital were surveyed and reported poor compliance with the 2015 ISMP Guidelines for IV push meds, esp. due to diluting, rate of administration reflected lack of awareness of optimal practice. | | |

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|---|---------------------|---|
| PMID | Category | Key Words |
| 10030221 | Quality Improvement | Drug Administration, Nurse Administration, Economic Impact, Home Care |
| Author | | |
| Miano B, Wood W. | | |
| Title | | |
| Implementation of the i.v. push method of antibiotic administration using the FOCUS/PDCA approach | | |
| Citation | | |
| Home Health Nurse. 1998 Dec;16(12):831-7. | | |
| DOI | | |
| 10.1097/00004045-199812000-00007 | | |
| Comment | | |
| Descriptive report of a quality improvement process change. | | |

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|---|---------------------|--|
| PMID | Category | Key Words |
| 1442814 | Quality Improvement | Dilution, Rate of Administration, Education, Quality Improvement |
| Author | | |
| Sullivan V, Koch KE. | | |
| Title | | |
| Development of i.v. push guidelines | | |
| Citation | | |
| Am J Hosp Pharm. 1992 Oct;49(10):2427, 2433. | | |
| DOI | | |
| 10.1093/ajhp/49.10.2427 | | |
| Comment | | |
| An early statement about the role of pharmacists to standardize information on rate of administration and provide it to nurses. | | |