

Reducing the risks of contamination and medication errors when flushing intravenous catheters

In managing the care of almost all patients, intravenous (IV) therapy is a major treatment modality. Intravenous access may be required to provide fluids, nutrition, chemotherapy, antibiotics and other medications. Maintaining the intravenous access site is a key responsibility of nursing staff.

At established intervals, Vascular Access Devices (VAD) must be flushed to ensure and maintain patency [1]. Flushing VAD's is also required after catheter placement, before fluid infusion, before and after drug administration, before and after blood sampling or transfusion and after the administration of total parenteral nutrition.

For most of these flushing procedures a solution of 0.9% NaCl (saline) is used, which is often prepared either at the patient's bedside, at a central place on the ward or in the Hospital Pharmacy. The saline solution is drawn into a hypodermic syringe out of a single- or multi-dose vial or from an infusion bag. In spite of many protocols that describe the importance of good hygienic procedures, various studies have proven that the self-filling of flush syringes creates situations in which the patient may be put at risk.

In a study from Calop et al, the microbiological contamination of 0.9% sodium chloride in disposable syringes which were manually filled by nursing staff for the maintenance of peripheral and central venous catheters was investigated. The study showed

that 8% of the saline solutions were contaminated with micro-organisms [2]. Trautmann et al findings were that 7.8 % of intravenous fluids were contaminated [3]. Using a contaminated saline solution to flush VAD's increases the risk of phlebitis or even a blood stream infection (BSI).

Furthermore the risk of cross contamination when using multidose vials is of great concern in settings in which this approach is used. Lagging et al [4] described the transmission of HCV in a cardiology ward. Using molecular and epidemiological methods they investigated an outbreak of HCV involving 3 patients following percutaneous coronary intervention at a Swedish hospital. They were able to identify the mode of transmission as contamination of a multidose vial of saline that had been used for the flushing of intravenous catheters.

Krause et al [5] asserts that the use of single-dose vials or prefilled saline syringes might reduce the risk for nosocomial transmission of blood-borne pathogens.

Intravenous medications are often prepared in hypodermic syringes that are similar or identical to those in which the saline flush solution is prepared. This can result in serious medication errors when syringes are mixed up. In the August 25, 1999 report from the Institute for Safe Medication Practices (ISMP) [6] a case is presented in which a three-year-old child received vecuronium, a medication meant for another patient and which was mistaken for a

normal flush solution. Both had been prepared in similar syringes. The ISMP August 24, 2000 issue [7], comments on this incident, stating "The above case is one of many in which an error could have been prevented by using commercially available prefilled syringes".

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References

1. Infusion Nurses Standard (INS), Journal of Intravenous Nursing 2000; 23:53S
2. Calop J, Bosson JL, Croizé J, Laurent PE. Maintenance of peripheral and central intravenous infusion devices by 0.9 % sodium chloride with or without heparin as a potential source of catheter microbial contamination. J. Hosp. Infection 2000; 46:161-162
3. Trautmann M, Zausser B, Wiedeck H. Bacterial colonisation and endotoxin contamination of intravenous infusion fluids. J.Hosp. Infection 1997; 37:225-236
4. Lagging LM, Aneman C, Nenonen N, Brandberg A, Grip L, Norkrans G, Lindh M. Nosocomial transmission of HCV in a cardiology ward during the window phase of infection: an epidemiological and molecular investigation. Scand.J Infect.Disease .2002;34(8):580-2
5. Krause, Gérard, Trepka, Mary Jo; Whisenhunt, Robert S; Katz, Dolly; Nainan, Omana; Wiersma, Steven T; Hopkins, Richard S; Infection control and Hospital Epidemiology: The Official Journal Of The Society Of Hospital Epidemiologists Of America; vol24, issue 2, February 2003, 122-127
6. ISMP, Issue August 24, 2000, Medication Safety Alert
7. ISMP, Issue January 24, 2001, ISMP Quarterly action agenda