



The aim of this study is to highlight how such infusion devices may impact the drug delivery of injectable drugs” Simon et al (2015).

Abstract:

**BACKGROUND:** Infusion practices have been modified, especially for antineoplastic drugs, through the use of specific infusion devices with post-administration rinsing (PAR) so as to decrease occupational exposure to drugs. The aim of this study is to highlight how such infusion devices may impact the drug delivery of injectable drugs.

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**MATERIALS AND METHODS:** Drug infusions were simulated with a radiotracer (Tc) for 30 minutes to assess nine different infusion lines: 2 infusion methods without PAR (1 gravity-fed infusion and 1 pump infusion), 2 extension lines to be connected to standard infusion devices to allow PAR, and 5 specific infusion sets allowing a PAR. Tc was compounded in 250 or 100 mL of 0.9% NaCl solution. From the continuous recording of drug concentrations at device outlets, the areas under the drug-concentration time curve (AUC) were computed and divided in two parts: the AUC<sub>adm</sub> corresponding to the administration phase and the AUC<sub>rin</sub> corresponding to the rinsing phase. Their comparison to the initial activity led to compute the drug delivery. Results between groups were compared using a Kruskal-Wallis test ( $P < 0.05$ ).

RESULTS: Using standard infusion devices lead to administer only 91% and 88% when the drug is diluted in 250 and 100mL, respectively. During the administration phase with the extension lines connected to infusion sets, between  $90.8\pm 6.9\%$  and  $94.2\pm 1.8\%$  of the drug is infused for 250 mL dilutions and  $87.7\pm 2.0\%$  for 100 mL dilutions. For specific infusion sets, the proportion of infused drug varied between  $88.6\pm 6.0\%$  and  $95.3\pm 1.5\%$  for dilutions in 250 mL and  $71.2\pm 3.1\%$  and  $90.4\pm 2.8\%$  for dilutions in 100 mL. Rinsing the lines means the remaining drug is administered with a rinsing volume ranging between  $47.0\pm 6.6$  and  $92.2\pm 8.9$  mL according to the device and drug dilution.

CONCLUSIONS: This study shows that drug delivery may differ according to infusion line and dilution volume. Further study is required to assess the impact of these devices on pharmacokinetics.

Reference:

Simon, N., Vasseur, M., Guillaussier, A., Legrand, J.F., Lebecque, M., Barthélémy, C., Décaudin, B. and Odou, P. (2015) Potential impact of infusion technique on drug delivery. Therapeutic Drug Monitoring. October 8th. .

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