

# Residual volume in semi-rigid bags used to prepare anticancer drugs: myth or reality? Evaluation and impact in practice.

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## Introduction :

- Injectable anticancer (AC) drugs are prepared by the Centralized Chemotherapy Preparation Unit (UCPC) at our Hospital Center (CH), mainly by dilution **in semi-rigid solvent bags** of 0.9% sodium chloride (NaCl) or 5% glucose (G5).
- Administration by the nurses using an infusion pump, depending on the volume to be infused and the flow rate.
- **But a residual volume (Vr) persists** at the end of the infusion.

**Objective:** to measure the residual volume remaining at the end of semi-rigid bag infusions and calculate the dose not administered to the patient.

## Materials and methods:

- **Recovery of preparations** from 22, 23 and 24 May 2023 administered in the oncohaematology day hospital unit at the CH.
- **Sampling with a 10 mL syringe** + bag perforator of residual volumes inside the isolator of 100- and 250-mL bags of NaCl and G5.
- Comparison with **controls without AC**, the procedure was reproduced on 10 bags of NaCl 100mL and 250mL and 10 bags of G5 100 mL and 250 mL not reconstituted.

## Results :

Sample analyzed = 42 bags of AC

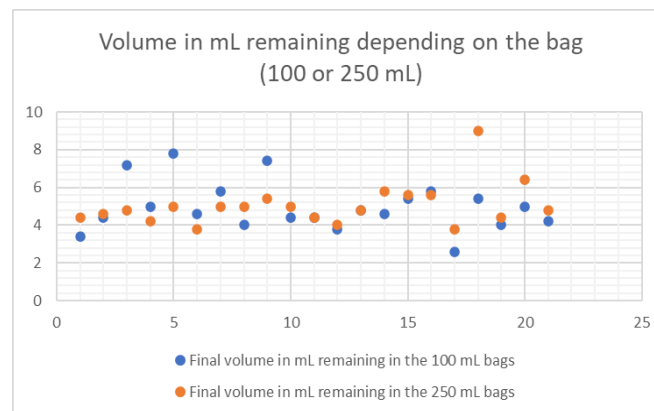
- ✓ 15 bags of NaCl 100 mL
- ✓ 6 bags of G5 100 mL
- ✓ 6 bags of NaCl 250 mL
- ✓ 15 bags of G5 250 mL

Of the 40 not reconstituted solvent bags

- ✓ Average Vr = 5.67 mL
- ✓ No significant difference according to solvent and/or initial volume.

Average residual volume of AC bags = 5 mL

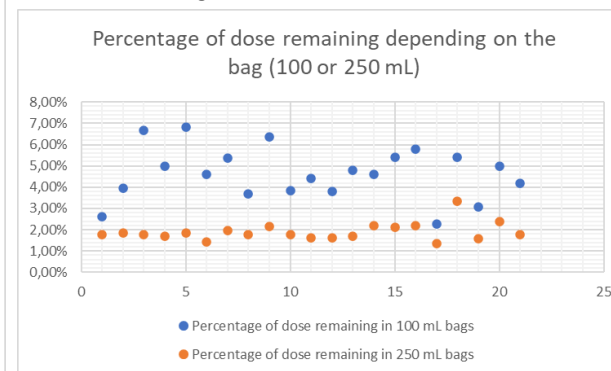
No significant difference according to initial bag volume.



Average residual dose of CA bags = 3%

[min: 1.36%; max: 6.84%].

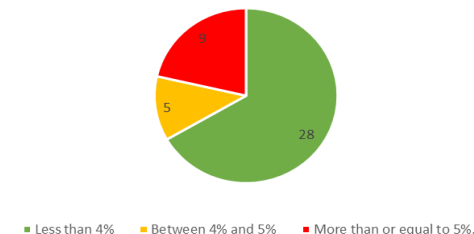
- For 100 mL bags = 4.5 %
- For 250 mL bags = 1.9 %



The 9 bags recovered with a remaining dose equivalent to **more than 5% of the initial dose** were all **100mL bags**.

=> This represents **43% of this type of preparation**.

Number of preparations according to percentage of residual dose



## Discussion and conclusion:

**Risk of under-dosing**, particularly for **100 mL bags**.

This number is probably underestimated because, despite the use of a syringe and a perforator, it was not possible to withdraw the entire residual volume. Problem specific to bags and not dependent on the product added to the solvent = **Risk to be extended to all reconstituted medicinal products**, even outside oncology.

The risk is all the greater for **drugs with a narrow therapeutic range or in pediatrics**.

→ This should lead us to change our practices

→ **Switching to flexible solvent bags** could reduce residual volume; this alternative will be studied shortly.