

Methodology for the Monetization of Vial Remnants in the Aseptic Unit



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OBJECTIVES

There is an expressed need to reduce drug wastage during the preparation of high-cost intravenous treatments. Incorrect inventory management, lengthy procurement cycles, poor storage, improper monitoring of drug expiration times, distribution problems, and irrational usage of drugs result in wastage of pharmaceuticals¹. Aseptic Unit Leads across hospitals, shared a common practice during the dose rounding process²; the optimisation of vials remnants (leftovers) utilising different manual accounting methods (i.e. manual or electronic spreadsheets) with the intention of using the remnants at the next opportunity. The objective is to discuss current processes for the optimisation vial remnants and describe the methodology followed to calculate the financial value of the vial remnants at an individual hospital.

METHODS

Working within safe dosing thresholds (mg per kg), time is spent across many aseptic units adjusting doses to optimise vials contents. After having withdrawn dose required, those vials with remnants get recorded (mls left, lot, expiry). Following this manual accounting methods, tracking lot numbers and expiry dates becomes a real burden. Hence this full tracking sometimes is not completed, resulting on missing on drugs traceability. Not having the ability to trace treatments impacts on inventory management and constitutes a risk to patients in case of recalls.

13,740 preparations were analysed. To calculate the remnants generated, the theoretical units needed from doses prescribed were deducted the final units used (that could or not include the use of remnants). Two cohorts of data points were used to calculate the financial value of the remnants; data related to prescriptions (size of the vial, doses prescribed, theoretical units (vials) needed, final units (vials) used), and data related to costs (cost per vial, cost per unit of measurement, cost per unit of measurement per vial).

RESULTS

According to Aseptic Unit Leads interviewed, manual methods achieve the optimisation of a maximum of 80% of the remnants. The other 20% gets unavoidably wasted due to stability challenges and expiration of the medication.

Number of preparations analyzed	13,740
Cost of drugs (IV Drug Budget)	5.503.095,39€
Value of Remnants	549.946,44€

PREPARATIONS									
No. of preparations	Cost per vial	Vial size	Cost per measurement unit	Total quantity of product prepared	No. of vials that represent the total quantity prepared	No. of vials used	Difference in no. of vials	Value of remnants	
1 ABRAXANE 5MG/ML 1 VIAL POLVO SUSP PARA PERF 100	205	115,71 €	100	1,16 €	36.733,96	367,34	441	73,66	8.523,03 €
2 ACIDO ZOLEDRONICO GENFARMA 4 MG/100 ML SOLUCION	386	4,16 €	4	1,04 €	1.680,08	420,02	559	138,98	578,39 €
3 ACIDO ZOLEDRONICO KERN PHARMA 4 MG/100 ML SOLUCI	284	4,37 €	4	1,09 €	1.227,76	306,94	395	88,06	384,82 €
4 ADCETRIS 50MG POLVO PARA CONCENTRADO PARA SOLUCI	19	2.354,00 €	50	47,08 €	2.021,40	40,43	47	6,57	15.470,50 €
5 AZACITIDINA 25MG/ML 1 VIAL	478	47,42 €	4	0,47 €	35.569,27	355,69	510	154,31	7.316,66 €
6 BAVENCIO 20 MG/ML VIAL 10 ML	16	384,80 €	200	1,92 €	12.800,00	64,00	64	0,00	- €
8 BORTEZOMIB STADA 3,5MG/VIAL 1 VIAL	338	42,00 €	3,5	12,00 €	680,92	194,55	338	143,45	6.024,96 €

CONCLUSION

Despite the risks involved in manually optimizing remnants, the financial outcomes outweigh the risks. More research is required to validate solutions that digitalize the workflow to optimise the use of remnants.

¹ Cozzio, M.; Melis, A.; La Fauci, G.; Guaraldi, P.; Caputo, R.; Lioi, F.; Cellini, G.S.; Santilli, G.; Scarlattei, D.; Siravo, P.; et al. Vial Sharing of High-Cost Drugs to Decrease Leftovers and Costs: A Retrospective Observational Study on Patisiran Administration in Bologna, Italy. Healthcare 2023, 11, 1013.
² Chillari KA, Southward J, Harrigan N. Assessment of the potential impact of dose rounding parenteral chemotherapy agents on cost savings and drug waste minimization. J Oncol Pharm Pract. 2018 Oct;24(7):507-510. doi: 10.1177/1078155217722205. Epub 2017 Jul 21. PMID: 28732452.