

Title

Dripping away - How to prevent waste from intravenous medications in the Paediatric Critical Care?

Problem statement

The Pediatric Intensive Care unit (PICU) of the Erasmus MC – Sophia Children's Hospital is divided over 4 units; with a total of 26 beds it is the largest PICU in the Netherlands. Time and adequate supply of medication to the bedside is important for optimal care of these patients. There are two general approaches to accomplish this: batch processing and on-demand preparation. For PICU patients, more than 35,000 syringes of intravenous (IV) medication are prepared annually by batch processing at the pharmacy department and more than 18,000 syringes of IV medication on-demand are prepared by pharmacy technicians and PICU nurses. Both processes have been optimized over the years. However, a significant portion of these preparations are thrown away every day.

IV admixtures wastage refers to medication preparations made for a patient that remain unused for a variety of reasons, and have subsequently expired, or for other reasons cannot be used for another patient (recycled), and therefore must be disposed of. The major reasons for high percentage of IV admixture waste are medication discontinuation, dose adjustments, switching from IV to oral route, patient discharge, patient transfer, or patient death.

There can be several negative consequences that result from wasted IV admixtures. On the anecdotal side, IV solution wastage could lead to reduced work satisfaction and reduced productivity in the pharmacy. It takes time and resources for technicians and pharmacists to verify the order, prepare the solution, double-check the preparations, and send it to the appropriate location. Seeing IV admixtures go to waste and realizing that all the work was done in vain can be frustrating and discouraging to the hospital staff. On the quantitative side, the financial cost of IV admixtures wastage can be a significant burden on a hospital's budget. Above all, waste has an environmental impact and footprint that could be avoided.



This assignment focuses on quantifying IV admixtures wastage and understanding the causes of wasted IV admixtures, followed by identifying reduction strategies. Lastly, quantifying IV admixtures waste and subsequent financial costs and environmental burden has the potential to create real policy changes within the pharmacy and the hospital at large.

Research question(s)

How can we reduce the environmental impact of IV admixture use at the PICU?

- What are the costs of the wasted admixtures per year?
- What is the environmental footprint of the wasted admixtures per year?
- What are important improvement measures from the moment of the prescription up to batching, delivery and usage of IV admixtures?
- What are the waste-saving and cost-saving effects of the proposed corrective measures?

Expected type of work

Literature review, interviews, material flow analysis, cost-benefit analysis, and footprint analysis.

Remarks

This project is performed in close collaboration with the Department of Hospital Pharmacy and the Department of Pediatric Intensive Care, Erasmus University Medical Center Rotterdam.

References

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- Ahmed A Alrashed, Yahya Ali Mohzari, Syed Mohammed Basheeruddin Asdaq. Evaluation and implementation of strategies to reduce the intravenous admixture returns. PMID: 33424366, DOI: 10.1016/j.sjbs.2020.11.009
- Zhang, Yujing, "Intravenous Solution Wastage in Hospital Pharmacy at Baptist Memorial Hospital-North Mississippi (Oxford)" (2017). Honors Theses. 968. https://egrove.olemiss.edu/hon_thesis/968
- Local data on intravenous admixture waste

Commissioner details

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