Implementing the production of sterilised syringes in the hospital: improving medication safety and saving healthcare costs

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What was done?
Development and implementation of sterilisable plastic syringes produced in the hospital pharmacy for large-scale production of ready to administer products.

Why was it done?
Medication administration errors are common in hospital practice. Meta-analyses suggest that about 10% of administrations are erroneous with much higher error rates occurring during intravenous drug administrations. It has been demonstrated that 21% of the errors can be eliminated when prepared syringes are used.1

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Medications are dispensed in the most ready-to-administer form available

• Preparation time of the nurses
• Reducing medications errors
• Microbial contamination \(\rightarrow 0\)
• Less disposables: syringes, needles, spikes

Savings

Efficiency

Improving medication safety and reducing total cost of ownership

Probabilistic sensitivity analysis of three scenarios
1. Conventional preparation method by nurse
2. Delivering 100% PFSS by pharmacy (ready-to-administer pre-filled sterilized syringes (PFSS)
3. 50% CPM and 50% PFSS

This uncertainty analysis shows that PFSS is cost-saving with a probability of 90% and an over 50% likelihood of saving up to 5 million Euros ($5.7 million USD).2

How was it done?

1. • Analysis of parenteral administrations in hospital
• Parenteral administrations Isala 2013
  Ready to use/ high risk
  - 711.708
  Preparation steps
  - powders
  864.246
  - 46,0%
  5,7%
  864.246
  13,7%
  27,7%

2. • Switching from RTA plastipak to RTA sterilised syringe
3. • Validation of the process of production, filling and sterilization of the syringe
4. • Qualification of the syringe as primary container
5. • Development of new RTA sterilised syringe based on top 25 API

What has been achieved?
• Introducing PFSS is cost saving for the healthcare system
• Sterilisable syringes are suitable as primary packaging material1
• Enhancement styles for better readability of labels are established4
• Already 15 products are validated and available for use in the hospital, e.g. midazolam chloride, potassium chloride, morphine, norepinephrine, metoclopramide

What next?
• Introducing more drugs as ready to administer product
• Optimizing the label of ready to administer syringes to avoid look alike errors based on the results of the review.

References
3. A science- and risk-based strategy to qualify sterilised prefilled syringes as primary packaging material in a hospital pharmacy. See abstract SPC-O42 EAHP congress 2019.