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

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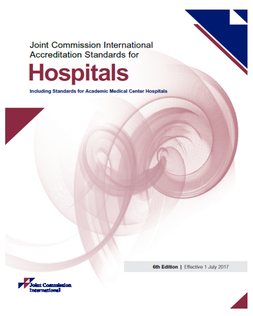
What was done?

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]



JCI Measurable Elements of MMU.5.2

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

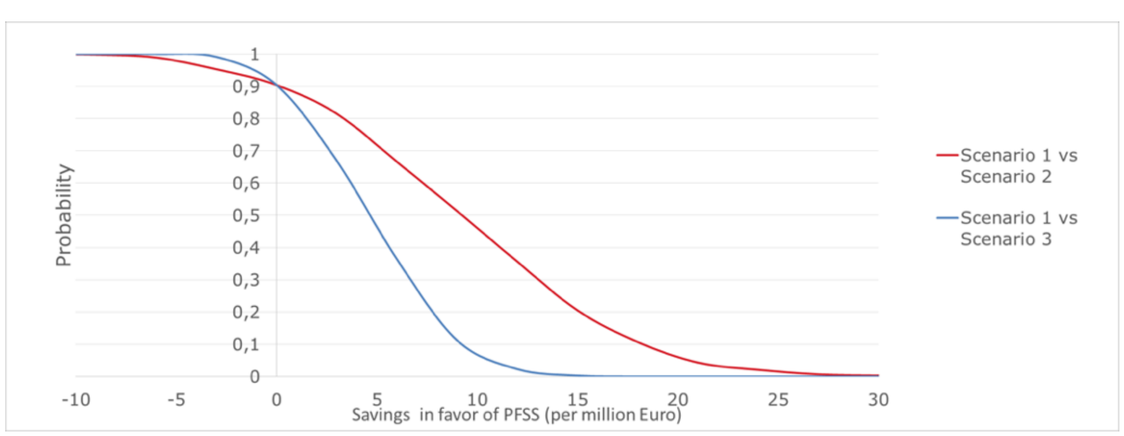
Savings

- Preparation time of the nurses
- Reducing medications errors
- Microbial contamination → 0
- Less disposables: syringes, needles, spikes

Less wastage

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 **savingup to 5 million Euros ($5.7 million USD).**[2]

How was it done?

1. **Analysis of parenteral administrations in hospital**

Parenteral administrations Isala 2013		1.575.954
Ready to use/ high risk	-	711.708
Preparation steps	-	864.246
- powders		669.275

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**

Parenteral administrations Isala with preparation step	Amount	%
RTA plastipak --> RTA sterilised syringe	**91.507**	13,7%
Development of new RTA sterilised syringe based on top 25 API	**178.489**	27.7%
RTA plastipak aseptic (antibiotics/ powders) (cefazolin)	**37.987**	5,7%
Total	**307.983**	**46,0%**

What has been achieved?

- Introducing PFSS is cost saving for the healthcare system[2]
- Sterilisable syringes are suitable as primary packaging material[3]
- Enhancement styles for better readability of labels are established[4]
- Already 15 products are validated and available for use in the hospital, e.g. midazolam chloride, potassium chloride, morphine, norepinephrine[5], 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

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