Evaluation of the production accuracy and error rate in the automated compounding of cytotoxic preparations by a robot

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BACKGROUND AND IMPORTANCE
In the pharmacy of Münster University Hospital, the robot APOTECChemochemo has been installed and implemented in the daily cytostatic production since March 2017. The fully automated production of cytostatic preparations using robot technology ensures a high dosage accuracy in the compounding of preparations and complete documentation, as well as minimizing the risk of occupational exposure of pharmacy staff, avoiding direct contact with toxic substances.

AIM AND OBJECTIVES
The aim of this analysis was to evaluate the production dosage accuracy with APOTECChemochemo and the fail rate of the robot during the production.

MATERIALS AND METHODS
Using the statistical software "APOTECAm@A", where the performance of the robot can be regularly analysed, the automated production of the pharmacy was monitored from January to October 2018, focusing the attention on the dosage accuracy of the automated compounded preparations and the robot error rate. The results of the analysis would determine the performance of the system in terms of preparations quality and safety and production efficiency.

RESULTS
The error rate of the robot was ~ 1% of the total automated production.

Regarding the dosage accuracy of the successful preparations produced by APOTECChemochemo, it has been found that 97.5% of the preparations had a dosing accuracy between 0 and +/- 3%. The remaining 2.5% of the preparations produced with the robot system were within the limits of +/- 5% dosage tolerance, which was defined by the pharmacy as a tolerance limits.

CONCLUSION AND RELEVANCE
The analysis carried out using APOTECAm@A shows a high dosage accuracy in combination with a low percentage of error regarding the automated production. The data show a high quality level as well as a high reproducibility and safety of the production with APOTECChemochemo. The standardization of the processes resulting from the introduction of a robotic solution for the cytostatic production was decisive in terms of increasing of quality and the safety of the preparations produced.