

Abstract citation ID: riad074.029

Impact of technology interventions on technology sensitive dispensing errors

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Introduction: Technology has the potential to impact significantly on dispensing error rates. Technology systems are already widely established in UK hospitals such as automated dispensing systems (robots) and electronic prescribing systems. A single technology system cannot achieve error reduction across all dispensing error types, for example, using a robot can only have impact on picking (contents) errors and not labelling errors. Quantifying the technology sensitive errors after implementation of technology systems enables us to focus on the highest risk error types and combine the most useful risk reduction strategies¹.

Aim: To quantify the technology sensitive error rate found in dispensed items after different technological interventions.

Methods: Prevented dispensing errors were collected at the Royal Cornwall Hospital in 2021 over four days. Errors were documented at the final checking stage of dispensing on a standardised data collection tool used as part of the hospital usual governance processes. Errors were categorised by error type and the technology interventions involved in the dispensing process; robot picked, robot picked and labelled, or entered by barcode. An error was defined as technology sensitive if that technology could have had a direct impact on that error type². Data was analysed in Excel. Chi-square significance testing was undertaken on those cohorts that were sized appropriately. Ethics approval was not required as the study met the definition of a service evaluation.

Results: 2461 items were dispensed in the study period. The overall dispensing error rate for the period was 2.64% (N=65). Labelling errors represented 66.9% of errors whereas contents errors 33.1%. The overall difference in the error rate in items picked by the robot versus manually was not significant. However, when excluding errors that are not sensitive to the technology e.g., label direction errors, the results become significant with a reduction of 0.86% (manually picked) to 0.05% (robot picked). Items that were entered into the stock control system by barcode showed a technology sensitive error reduction of 0.31% to 0%. It was significant that items that were packed down were associated with more dispensing errors (4.37%) compared with those dispensed as original packs (1.14%). Due to small sample size, the reduction in technology sensitive error rate from 0.34%-0.2% when using robotic labelling with robotic picking could not be tested for significance.

Discussion/Conclusion: Translation of medication orders from a prescription to a stock control system is one of the highest risk areas for error substantiated by labelling errors contributing to 66.9% of the overall errors in this study. A study has demonstrated significant reduction in dispensing error rate using integrated prescribing systems and stock control systems¹. This study and previous work found bar-coded data entry to be similarly effective³. Part pack, manual dispensing shows the greatest risk of dispensing errors and therefore technologies that can impact in this area would likely have great benefit. The study was limited by sample size in some of the technology cohorts. With the correct combination of technologies we aim to reduce errors at the point of dispensing to negligible levels.

Keywords: dispensing error; technology; medication; robot

References

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