

A comparison of HEART and FMEA risk assessment results in evaluating an automated dispensing system in hospital pharmacy

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Abstract

Automation has been advocated by the Audit Commission (2001) in being instrumental in improving patient safety because it minimises human practitioner error, specifically within the pharmacy. Several automated dispensing systems have been or are in the process of being installed across the National Health Service (NHS). However, there seems to be a lack of literature published evaluating the vulnerabilities, problems and risks of introducing such systems into the complex, and often unpredictable, domain of healthcare. This paper presents an exploratory case study examining the impact of a new automated dispensing robot on the delivery of medicines to patients within a district general hospital. Two established risk assessment methods were used to analyse and compare the pre and post automated situations for one task: the Failure Mode and Effects Analysis (FMEA) and the Human Error Assessment and Reduction Technique (HEART). Low levels of risk were observed using the methods in both pre- and post-automated situations. However, a four-fold reduction was observed in risk with FMEA after automation had been implemented. HEART revealed a slight increase in risk after implementation, reflecting user-interface issues. Further research including all tasks of the dispensing process is required to assess the risk of automation in this domain of healthcare.

Introduction

Automation reduces the human contribution to certain stages of the dispensing process, namely the picking of medicines from shelves (Fitzpatrick, 2005). Hospital pharmacies are introducing automated dispensing systems because of perceived advantages of reduction in dispensing errors, distribution incidents, faster turn-around times for prescriptions, stock control and convenient and safer out of hours supply (Whittlesea, 2004; see Figures 1 and 2).

Automated dispensing has been associated with a 16% reduction in dispensing errors at the final checking stage by a pharmacist before medicines are given to patients (Fitzpatrick, 2005). Similarly Dean and Barber (2006) reported a drop in error at the final checking stage from 2.7% before automation to 0.9% after automation. There is

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