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Evaluating the safety impact of light emitting diode (LED) guided drug picking in an outpatient pharmacy

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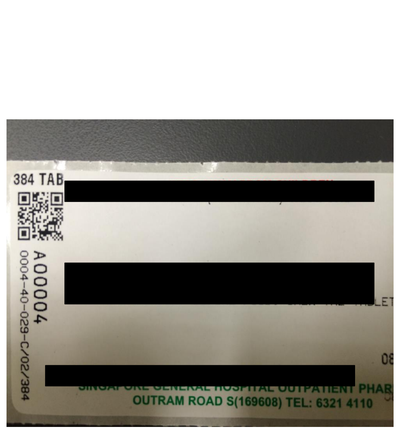
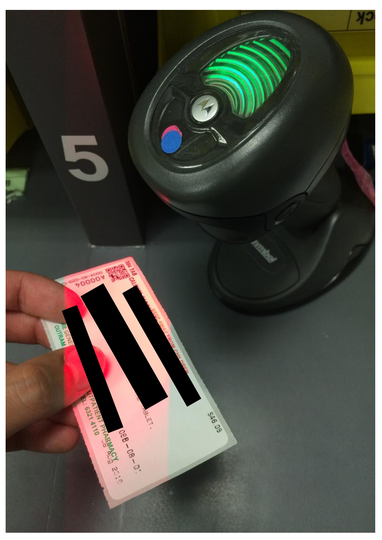
Introduction

Medication errors may occur during the drug picking process whereby the wrong drug, strength or quantity is picked. In May 2012, LED were installed and tagged to drug bins at the outpatient pharmacy in Singapore General Hospital with the intent to mitigate these errors. Upon scanning a Quick Response (QR) code on the drug label, the LED corresponding to the drug bin will light up, signaling the picker to the correct drug bin. This study seeks to evaluate the safety impact of LED-guided drug picking and pharmacy staff's acceptance of this system.



Drug label with QR code on top left corner



Scanning of QR code on drug label

LED for correct drug bin lights up

Aim

This study seeks to evaluate the safety impact of LED-guided drug picking and pharmacy staff's acceptance of this system.

Methodology

The primary outcome of this study is the safety of the drug picking process measured in terms of the frequency of picking near misses. Near miss data before (January 2012 to April 2012) and after (May 2012 to August 2012) implementation of LED-guided drug picking were extracted electronically for statistical comparison.

Recording near misses data at all stages of drug processing are an essential standard of procedure in an outpatient pharmacy.

A survey was administered on pharmacy staff to obtain their acceptance on drug picking with and without LED-guidance. Data from the survey were collated and analyzed descriptively.

Results and Discussion

Near miss reduction

The implementation of LED-guided drug picking significantly reduced near misses for wrong drug and wrong strength. There was no significant difference in the frequency of picking near misses for wrong quantity. Overall, there was a significant reduction in the frequency of total picking near misses.

Type of picking near miss	Frequency		P-value
	Pre-LED (Mean ± S.D.)	Post-LED (Mean ± S.D.)	
Wrong Drug	7.18 ± 3.17	2.71 ± 1.36	< 0.001
Wrong Strength	3.47 ± 2.48	1.82 ± 1.13	0.02
Wrong Quantity	17.8 ± 9.88	14.0 ± 4.64	0.162
Total	28.4 ± 13.2	18.1 ± 5.44	0.007

Table 1: Frequency of picking near misses

Pharmacy staff perception

Pharmacy staff's attitude towards LED-guided picking was generally positive with majority preferring the LED over no LED-guided drug picking.

Question	Frequency (%)	
	Agree	Disagree
During PEAK hours, the system reduces the chance of committing picking errors or near misses.	66	34
During NON-PEAK hours, the system reduces the chance of committing picking errors or near misses.	90	10
The system helps to save time required to locate the correct drug bins.	80	20
When LED-guided picking is available, I utilise the LED to locate corresponding drug bins.	94	6
The LED is reliable during the drug picking process.	78	22
I prefer LED-guided drug picking over manual drug picking.	80	20
Overall, LED-guided drug picking is effective in reducing picking near misses and error rates	92	8

Table 2: Survey results

Conclusion