Singapore Healthcare Management 2018

Singapore General Hospital
SingHealth

Evaluating the effectiveness of electronic near-miss reporting system implemented at Singapore General Hospital (SGH) Outpatient Pharmacy

Tay PLY, Ng J, Goh CL, Lee YC, Ng MY
Department of Pharmacy, Singapore General Hospital

BACKGROUND

Medication near misses provide valuable information to identify potential unsafe practices. Near misses are reported voluntarily by staff at Singapore General Hospital (SGH) Outpatient Pharmacy. Staff reported near-misses by recording on hardcopy forms that consists of multiple fields. Staff tended to skip near-miss reporting during peak hours or when the forms were misplaced. Near miss reports were manually entered onto an excel spreadsheet by an assigned staff. At data-entry stage, handwritten entries may be misread or contained missing information. Additional time was spent by the medication safety staff to retrieve missing data for analysis. As a result, around 6 man-hours were spent every week in reconciling and validating near miss data.

MISSION STATEMENT

The primary objective of the project was to increase near-miss reporting rate by 30% in 6 months while the secondary objective was to reduce time spent on near-miss data collection by 50% in 6 months. Target was set using SMART criteria and is in line with SGH safety goal to "Target Zero Harm".

METHODOLOGY

We identified possible root causes for non-reporting of near-misses or omitted data using *5-whys* (Figure 1). We brainstormed for solutions to increase staff near-miss reporting using a Driver Diagram (Figure 2). Final solutions were selected using a Prioritization Matrix through multi-voting based on the following criteria: confidentiality, sustainability and analysability of data. The enhancement to the pharmacy dispensing system, Fastrak, was designed to incorporate these features.

Effectiveness of the system was evaluated post implementation by tracking the number of near-misses reported before and after implementation of the enhanced pharmacy dispensing system, Fastrak. The team also compared the time taken to report a near-miss using the manual hardcopy system against the time taken using the electronic system to determine the amount of time-savings. Surveys were conducted to gather staff views on the enhanced system.

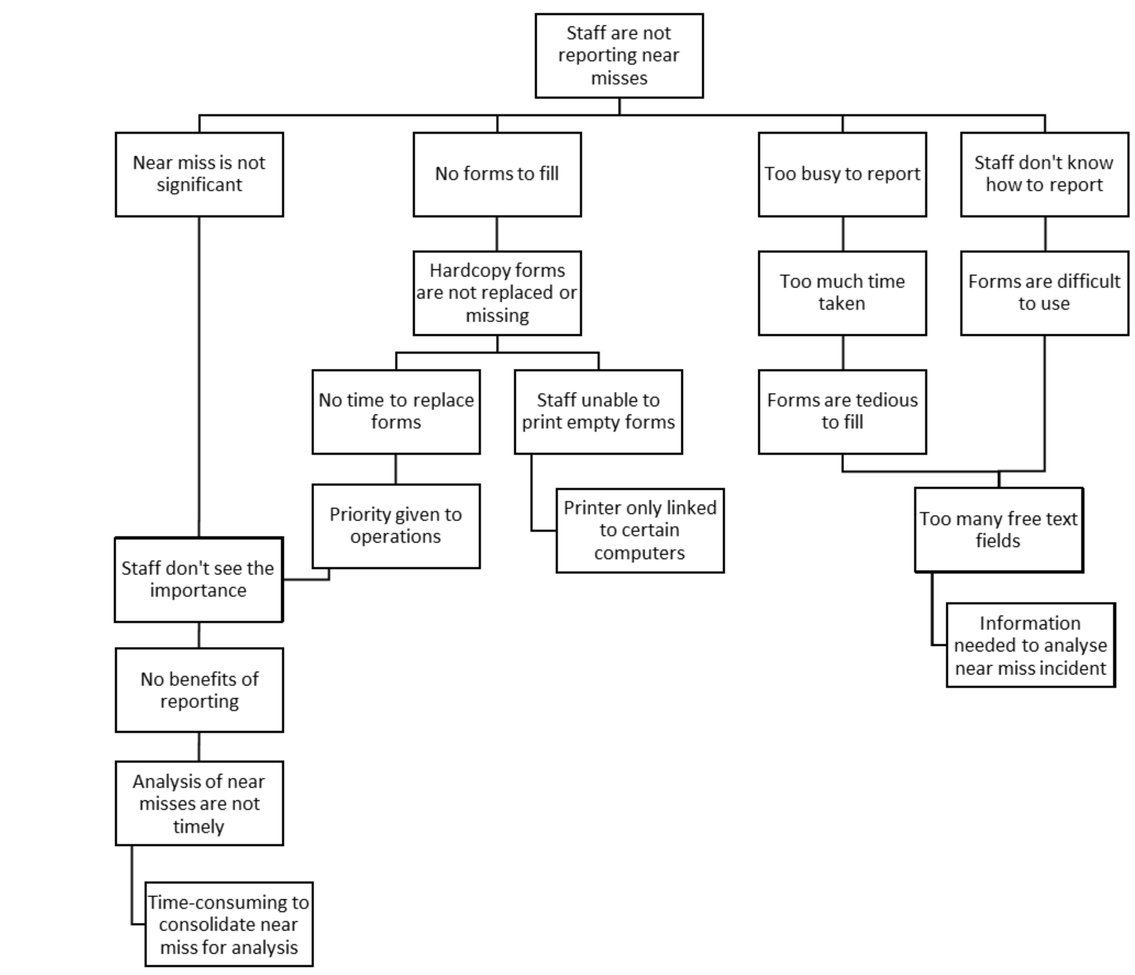

Figure 1. Root cause analysis

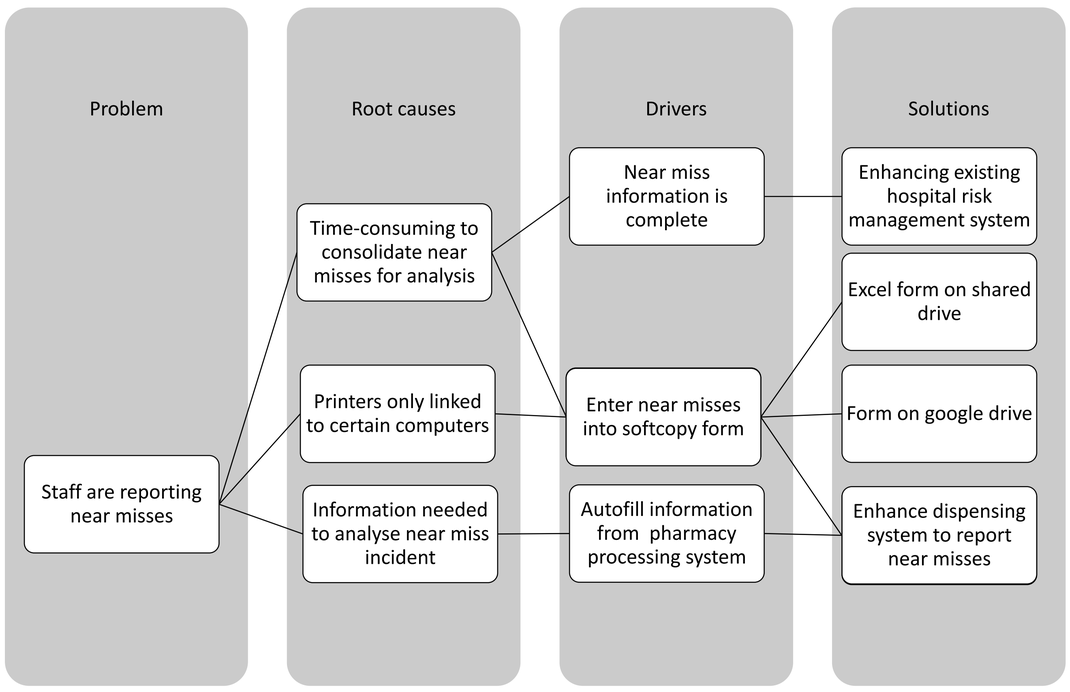

Figure 2. Driver Diagram to brainstorm solutions

INTERVENTION

An electronic system for near-miss reporting was developed on the pharmacy dispensing system and implemented in the outpatient pharmacy in September 2017. Post implementation evaluation was done to assess the usefulness and effectiveness of the system.

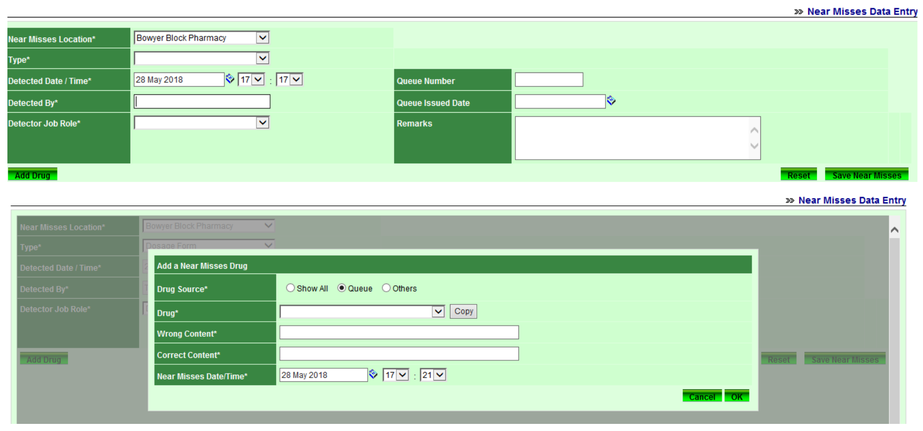

Figure 3. Electronic near miss reporting system

RESULTS

Number of near-misses reported per month increased by 47%, from an average of 207 near misses per month (January 2017 to August 2017) to an average of 304 near misses per month (September 2017 to March 2018) with the electronic system.

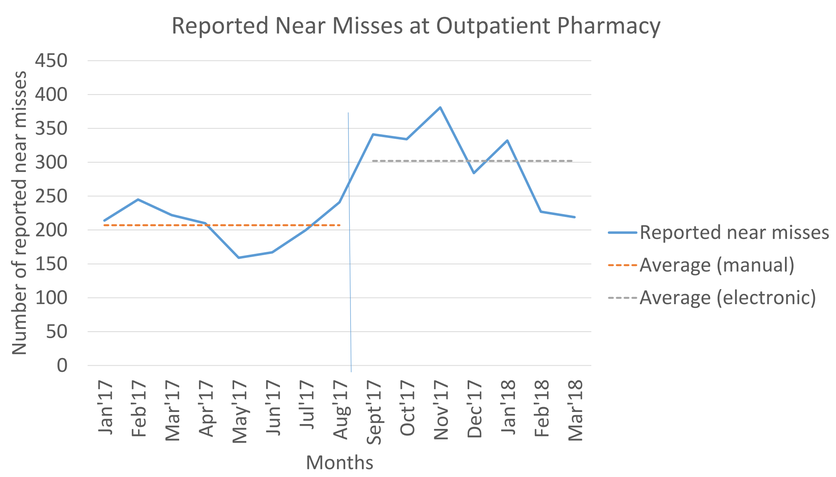

Figure 4. Number of reported near misses

Mean time taken to report and collate near-misses was also measured. An average of 137 seconds was needed to record each near miss using the manual system, while only 47 seconds was needed with the enhanced electronic system. This translates to a time savings of 66%, potentially saving 11 man-days per year. The Wilcoxon Signed-Rank test also showed that the electronic near miss reporting system was more efficient than the manual near miss reporting system ($p<0.05$).

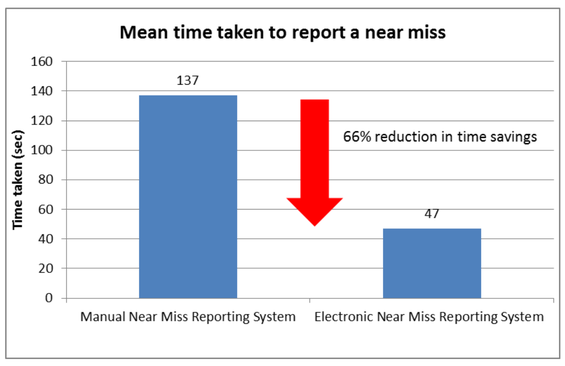

Figure 5. Mean time taken to report a near miss

Staff surveys were administered before and after implementation of the enhanced Fastrak system to understand users' perception of the manual and electronic system. Results of the survey showed that the electronic system was easy to use and non-inferior to the manual reporting method.

Conclusion

The number of near-misses reported has increased using the electronic near-miss reporting system. Time spent on near-miss reporting and data collation was reduced. Time and manpower can be redirected towards error analysis and preventive measures, thus aligning with SGH priorities to provide safest care and improve efficiency through streamlining of processes.