The effectiveness of using Root Cause Analysis (RCA) Framework in reducing medication errors by improving mitigating solution

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INTRODUCTION

Incident reporting is a well accepted method for improving safety. Anderson et al, mentioned that recently, there is a call for a less emphasis on counting incidents but more emphasis on the effective analysis of the incidents and organizational learning. Few studies have examined the effectiveness of incident reporting in improving safety. In KKH, we have created and incorporated the Root Cause Analysis (RCA) framework and reference guide for staff to use in analysing incidents in a more systematic process and produce mitigating solutions that are workable, effective and sustainable.

AIM



To review the effectiveness of the mitigating solutions for medication errors before and after the implementation of KKH-RCA framework for incidents reported in the Risk Management Incident Reporting System from April 2012 to March 2014.

METHODOLOGY

A qualitative review was carried out for all the medication error incidents from April 2012-March 2014 to compare the effectiveness of the control measures applied on each incident pre and post implementation of the KKH Root Cause Analysis (RCA) Framework and Reference Guide. The RCA framework and reference guide has 3 parts: Stages of the process, contributory factors and the types of preventive actions planned. It followed by the framework which the Incident follow-up action and report for the actual data entry of the RCA as shown in figure 1.

Figure 1: RCA Reference Guide



In the pre-implementation phase of the KKH-RCA framework, a total of 14 medication errors belonging to Cat D was identified. Only 3 out of 14 used process mapping to identify the cause of the incident. The mitigating solution from the review belong to the 5th level (Administrative controls) of the hierarchy of controls (i.e. Conduct training, Reinforce adherence to PnP, Be vigilant). No control measures were identified that eliminate or remove the risk. There were no implementation date noted for each of the proposed interventions. An example of an incident report due to wrong dose (Figure 4).

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Figure 4

Type of Medication Error	Underlying Cause	Intervention/ Mitigating Solution	Protective Measure	Classification of Control				
Wrong dose	Independent Check Failure	Conduct independent double check		Administrative control				
	Performance deficit	Highlight the importance of adhering to 5 Rights during administration.	Training and					
		Conduct training	Procedures					
		Reinforce P&P						
		Be vigilant						

However, after the implementation of the KKH-RCA framework, there is a significant change in the format of reporting. There is a more detailed understanding of the root cause of the incident and the recommendations were impactful, workable and implemented accordingly. Thus there is accountability among the involved staff (Figure 5). Figure 5

Type of Med Error	Underlying Cause	Interventions	Protective measure	Classification	Status of Implementa tion
	Staff – interruption & distraction	Wear drug administration apron Speak up and escalate to senior staff	Minimize the hazard	Administrative control	Immediate
	Organisational - Education & Training Roles & Responsibilities - better definition of the role or responsibility.	Training of the practicalities of drug administration in 'mock' codes - this will require the drawing up of scenarios based on drugs commonly implicated in errors especially during resuscitation scenarios.	Simulation - reduces the hazard	Administrative control	Start date: Sep 2013
/rong Dose	Task Design - Multiple steps Display - Lack of existing pre-printed drug labels for intravenous morphine.	All IV drugs drawn to be labelled - through the use of pre-printed drug labels or hand written labels Provision of pre-printed drug labels	Design out	Engineering type of control	Immediate
	Work Environment/ Equipment	Provision of IV trolley in Resuscitation Room Provision of plastic compartment trays	Reduce the hazard	Substitution	Immediate

(Theose reper to the non-investigation galacy		Physical environment related	2	7
DENTIFY THE CONTRIBUTORY FACTORS A	AND COMPONENTS TO THE INCIDENT			
lease tick on the key determinants and answer ac	cordingly		4	8
Patient	Components	Leadership related		
		Administrative/Human Action related		
Stan			Prepared by:	
		Other (Please specify)	 Name:	Date:
] Task				
		RECOMMENDATIONS		
			Approved by:	
Work Environment				2.4
			Name:	Date:
□ Organisational.				
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Education & Training			******	
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Pre-selected all medication errors under Cat D (defined as administered and requires further monitoring) to be the cohort for this study.

Figure 2 Medication Errors under Cat D and above



The mitigating solutions were categorized using the Boyle's hierarchy of control measures from the Health and safety: risk management to determine the effectiveness of the mitigating solution for each of the medication error incidents.

In the post implementation phase, there is a gradual decline in the number of Cat D medication error over time. There was no Cat E medication error reported from Q1 of 2014. These were attributed to the effectiveness of the mitigation solutions that were implemented using the RCA framework and reference guide. Majority of the mitigating solutions belong to the most effective and sustainable control measures (Fig 6).

Figure 6

Elimination

Medication Error Cat D and Above





CONCLUSION

In conclusion, the KKH RCA framework and reference guide has changed the reviewing and reporting framework for medication related incidents. It provided more effective and sustainable mitigating solutions to prevent error in medication administration.

Reference: "Can incident reporting improve safety? Healthcare practitioners' view of the effectiveness of incident reporting", Anderson, et al. International Journal for Quality in Healthcare Vol. 25.No.2 and Boyle, T., "Health and safety: risk management," IOSH Services Ltd, Leicester UK, 2008.