Systematic Review of the Delivery of Mydriacyl to the Inpatient Pediatric Floors at LVHN for an Ophthalmology Consultation.

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Introduction

For a hospital to operate within its budget, it must offer efficient and expedient services. In order to provide quality, yet affordable care, a hospital must be efficient in its practices. It must provide the right treatment, at the right time because there is an associated opportunity costs with diagnosis and treatment errors and delays (failure modalities). Medication delivery is an integral system to a well-functioning hospital—it must be quick and most importantly, correct.

Problem Statement

After detailing the medication delivery process of the ophthalmic drug, Tropicamide, to the Pediatrics Floor at the Lehigh Valley Health Network, this study aims to identify where and how the process might fail and to assess the relative impact of different failures, in order to identify the parts of the process that are most in need of change.

Results

Using the Institute of Healthcare Improvement (IHI) Failure Modalities and Effects Analysis, this cross sectional study interviewed and surveyed teams and individuals to answer three questions: what could go wrong? Why would the failure happen? and What would be the consequences of each failure? Interviewees of representative of pharmacy and pediatric nursing assigned numbers (1-10) for each of the questions asked, and a Risk Priority Number (RPN) was calculated for each failure modality which is used to prioritize the modality that needs to be assessed first, and with the most priority. The results, for the pharmacy and nursing teams are listed below. The higher the RPN, the potentially more serious the failure modality, and should be addressed first.

Failure Modalities and Occurence, Detection, Severity & RPN for Tropicamide Delivery Process per Nursing Team

	Occurrence	Detection	Severity	RPN
Misplaced	5	8	6	240
Delivered to Wrong Pt	2	10	10	200
Wrong Dose	5	3	4	60
Time Delay	6	1	6	36
Wrong Drug	3	1	5	15

Failure Modalities and Occurence, Detection, Severity & RPN for Tropicamide Delivery Process per Pharmacy Team

	Occurrence	Detection	Severity	RPN
Misplaced	2	6	7	84
Time Delay	1	5	5	25
Delivered to Wrong Pt	1	2	9	18
Wrong Drug	1	2	8	16
Wrong Dose	1	2	6	12

Discussion

Of note, both pharmacy and nursing teams made suggestions that the delivery process of tropicamide could be improved by permanently keeping tropicamide stocked in the Pyxis units on the floors, and ultimately creating a stand alone pediatric pharmacy that is separate from the main hospital pharmacy. With regards to Pyxis, both teams felt that there was enough free space in the device that could store the tropicamide drops. They felt that this would ensure a quicker, and more efficient delivery process, by bypassing the pharmacy collection and distribution process. Additionally, both units felt that to minimize any potential errors to the pediatrics floors, a pediatric stand alone pharmacy should be created. This would allow for a reduction of errors and an decrease in transit time because it would be streamlined for pediatric, not adult patient, needs.

Conclusions

THE IHI FMEA tool per nursing and pharmacy teams identified several failure modalities and the RPNs associated with each modality. Misplacing Tropicamide was calculated to have the highest RPN for both sub groups. Upon further questioning, both pharmacy and nursing stated that it is the most likely to occur of all of the modalities and that it is the hardest to detect (ie find the misplaced drops). This in turn can related to delay in delivery of the dilating drops which is a delay in patient care. It also represents an opportunity cost to the consultant. Moroever, this project also provided suggestions on how to improve the process, most notably, consider stocking tropicamide in the Pyxis units on the floors.