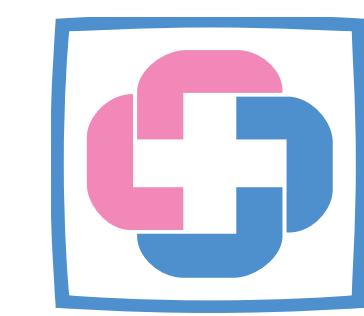




Process Review in Medication Serving to Eliminate Transmission of Highly Infectious Disease

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INTRODUCTION

There is a constant need to decrease risk and increase patient safety in the hospital environment due to the complexity of healthcare system. Patient safety is a pressing health care challenge and reducing the likelihood of clinical risks in hospitals is an important element of improving quality of care. During the accreditation of the institution for Joint Commission International (JCI), it was highlighted that there is a potential breach of infection control practices in serving oral medications in Isolation Rooms. Currently medication administration can potentially cause transmission and cross contamination of infection, error in medication administration and longer process of medication administration. To mitigate the risk, the team used Failure Mode Effect Analysis (FMEA), a prospective method of hazard analysis in healthcare, that can help look through the processes and identify the potential failure modes and come up with measures to reduce the risks proactively

AIM

To reduce the process of medication serving process for patients in the Isolation room and prevent potential source of cross contamination for the safety of patients and staff.

METHODOLOGY

A multidisciplinary team was formed that includes Nurses, Doctors, Pharmacists and representatives from Infection Control Team, Information System Department (ISD) and Facilities Management (FM). The team were selected to plan and propose solutions to mitigate the risks in medication serving process for patients in the isolation room. There were a total of 62 isolation rooms in the institution and the team identified Ward 46 as the pilot site. The steps of the medication serving process were mapped. There were 5 potential failure modes in the process of medication administration identified.

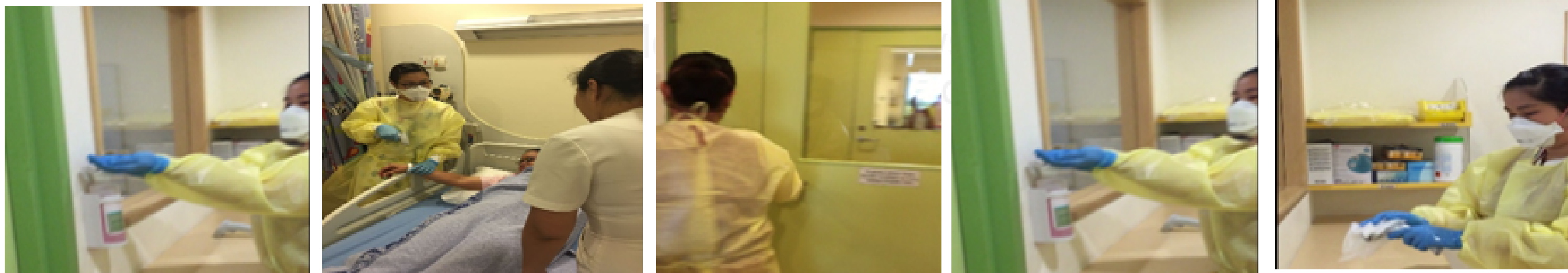
Medication Serving Process

The workflow of Medication Serving Process has 17 steps prior to project initiation and implementation.

- 2 Registered Nurse (RN) are required to push the medication cart and park outside the patient's room.
- Login to Sunrise Clinical Management (SCM) 2 RNs must look at the patient list to select the correct patient. Check that the medication is due, then click to scan patient.
- 1st RN enter ante room with the bar code scanner. Placed the bar code scanner on the table.
- Perform hand rub before donning on Personal Protective Equipment (PPE).
- Enter patient room with the scanner.



- Hand rub before scanning the patient wrist tag. Verifying with caregivers of the child's name with the patient's name slot as well as checking of drug allergy status. Hand rub after touching the patient and exit from the patient's room.
- In the ante room, the nurse removed PPE, wipe down the bar code scanner, perform hand rub and exit the ante room with the scanner



- Pick up the medicine and go inside patients room to serve the medication to the patients
- After serving the medications, the nurse threw away the requisites, perform hand rub and proceed to the ante room to doff PPE.
- Perform hand rub, wipe down the bar code scanner and exit from the room
- Place the scanner back to the med cart.
- Hand washing outside patient's room.
- The 2nd nurse will log off SCM and proceed to the next room until the medication process is over



The team identified and listed all potential failures at each step of the process and determined the severity, probability, and detection on a numerical scale. Team members assigned values from 1 to 10 based on the risk of injury should a failure result (severity, S); the frequency with which failures occur (occurrence, O); and the likelihood that a failure goes undetected before injury results (detection, D). After the ranking, these three scores are multiplied to one critical score or Risk Priority Number (RPN). The higher the RPN score, the greater the risk associated with a failure. In table 1, the score of 320 is given to the potential failure when the medication cart is parked outside the intended patient's room that can potentially lead to wrong medication given to the patient.

TABLE 1

FAILURE MODE AND EFFECT ANALYSIS WORKSHEET (CPOE and MEDICATION ADMINISTRATION IN ISOLATION ROOM)							
Process & Subprocess	Potential Failure Modes	Potential Causes	Potential Effects	Safety	Health	Efficiency	RPN
MEDICATION SERVING PROCESS Preparation of medication outside patient's cubicle for highly infectious cases in the Isolation Room using shared Medication Cart	1. Pull out medication list of the wrong patient	Unable to verify patient identification through the computer system	Wrong medication given to the patient	6	3	4	72
	2. Medication cart not parked outside the intended patient's room	1) Distraction and interruption (i.e. from door bell of the main ward entrance, patient's call bell, caregiver request for assistance from nursing) 2) 12 rooms sharing 1 medication cart	Wrong medication given to the patient	5	8	8	320
		Ineffective wipe down of scanner after use in ISO room due to contact time less than 2 minutes	Transmission of life threatening infection due to transmission of pathogens	10	1	4	40
		Sharing of medication cart and scanner for 12 Isolation rooms	Transmission of life threatening infection due to transmission of pathogens	10	1	4	40
		Failure to adhere to proper donning of PPE	Transmission of life threatening infection due to transmission of pathogens	10	1	4	40
3. Transmission of infection during medication serving process	Non-compliance to hand hygiene and infection control practices	Knowledge deficit and attitude	Transmission of life threatening infection due to transmission of pathogens	7	7	4	196
	Medication are brought to patient's room and taken out after use	Change in air pressure as the staff open the door without waiting for another door to close	Transmission of life threatening infection due to transmission of pathogens	7	7	4	196
4. Longer time taken and additional steps required to serve medication	Time consuming due to multiple steps/complex process of donning on and off PPE		1. Delay in medication serving 2. Staff will miss out certain steps due to complex process 3. Wastage of consumable	4	3	4	48
5. Loss of medication due to unattended medication cart parked outside of the iso room	Two nurses involved during medication serving round		1. Pilferage of medication 2. Ward staff has to go through the tedious process of reporting lost medication	4	3	3	36

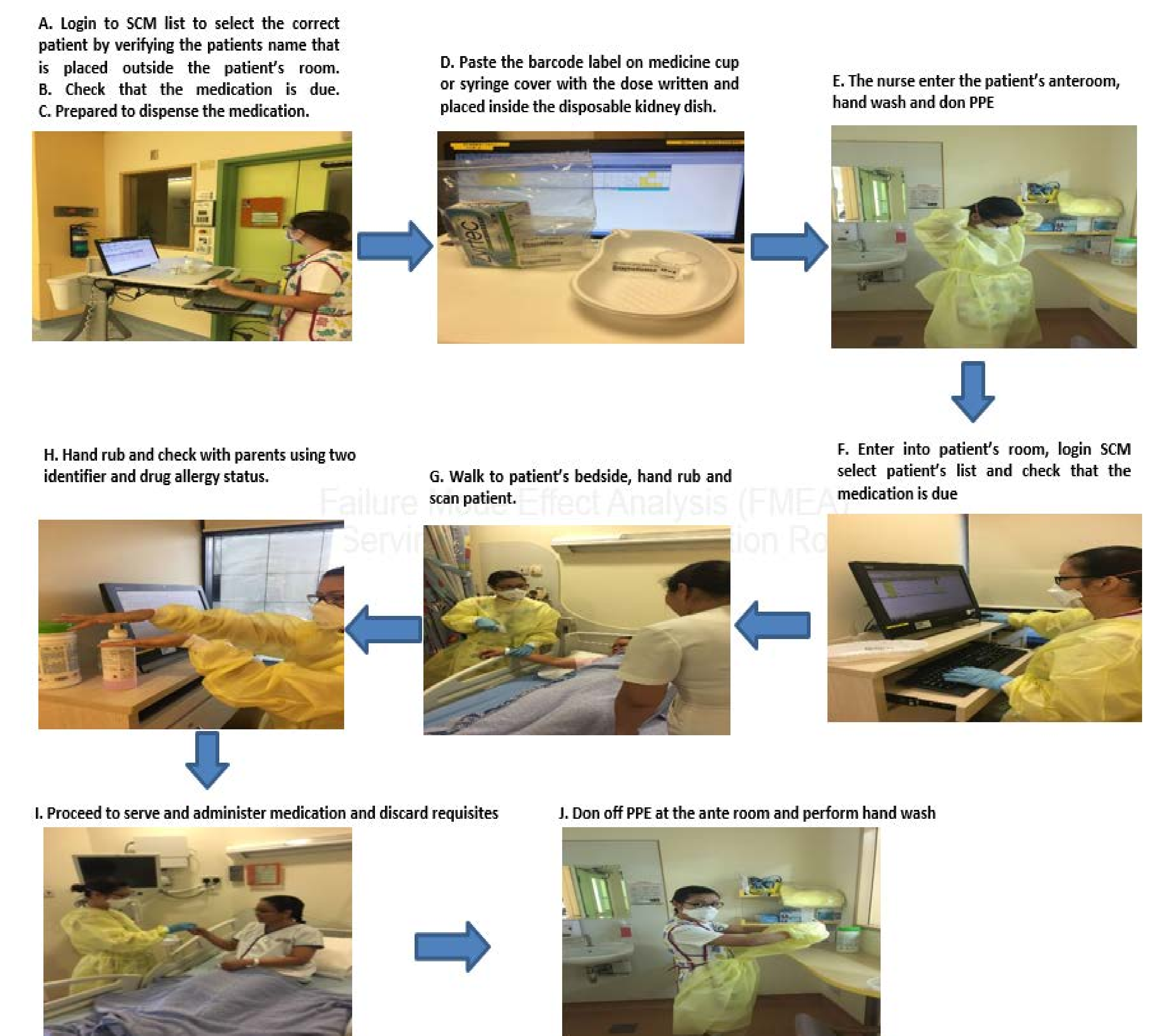
INTERVENTION

There were 3 proposed solutions for the identified risks: 1) Decontaminate scanner after each use using antiseptic wipes, 2) Deploy 1 Computer on Wheels (COW) in each of the Isolation room and 3) Equip each Isolation Room with individualized medication cabinets, computer, scanner and printer and revise the medication administration process. The latter proposed solution was chosen and recognized as the most appropriate solution to the risks identified for medication serving in Isolation Rooms. It was presented and was approved by the Executive Council after it was presented in Feb 2015.



Ward 46 was the first Isolation Ward to be renovated and two Isolation Rooms were blocked at each phase of the renovation that was started on 15 June 2014. For each Isolation Room, FM and ISD carry out the following works: 1) Installation of new table with individualized medication cabinets and power points; 2) Installation of desktop computer with CPOE printer and scanner.

Post Intervention Workflow



After the mock up of Ward 46, further renovations were executed to the rest of the 62 Isolation Rooms in the institution.

RESULTS

The revised process of medication serving has reaped the following benefits:

- Simplified medication serving process from 17 to 10 steps
- Reduction in manpower and time required for medication serving from 2 to 1 nurse
- Reduced staff movement in and out of isolation rooms, reducing risk of infection transmission
- Reduction of usage of Personal Protective Equipment (PPE) caused by multiple entries to the isolation room
- New process is implemented in all Isolation rooms
- Increased job satisfaction and staff morale

CONCLUSION

The team was able to determine the causes of the high-risk failures using FMEA and identified preventive actions for these high risk procedures. The provision of individualized medication cabinet, computer, scanner and printer greatly reduced the risk of cross-contamination. The medication serving process has been simplified and the reduced staff movement in and out of the isolation rooms lead to improved safety for both the patients and the staff.