



# Improve NUH Emergency Medicine Department Inventory Flow



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## BACKGROUND

Due to the high patient load Emergency Medicine Department (EMD) handles per day and limited space for storage of supplies, the inventory in EMD requires constant top-ups and ordering. Existing inventory management system involved transferring of stocks from one area to the next to replenish supplies. Manual stock checking and stocking of supplies were time-consuming and often resulted in inaccurate stocking. Valuable time that could be better spent on patient care was wasted on locating and retrieving items from stores.

## OBJECTIVES

This project aims to improve the management of inventory and flow in EMD through lean transformation, so as to provide more timely care to patients and reduce unwarranted stress for staff.

## METHODOLOGY

### Value Stream Mapping

Used to visualize the process map of topping up of cubicles. This allowed the team to identify waste easily. (Figure 1)



Figure 1: Value Stream Map of Current State

### Spaghetti Diagrams

Current and future staff movement and distances travelled were evaluated. Locations of the stores and ways of topping up are reconsidered to minimise staff movement. (Figure 2)



Figure 2: Spaghetti Diagram



Figure 3: PICK Chart

### PICK Chart

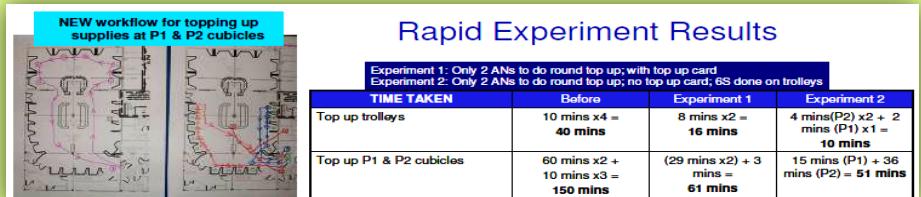
Suggestions were prioritised using a PICK Chart. (Figure 3)

## RESULTS

The implementation has led to several positive outcomes.

### Topping up of inventory with revised route and top up trolleys

The total time needed to top up patients' cubicles is significantly reduced by approximately **68%** from 190mins to 61mins. (Figure 4)



BEFORE AFTER

Figure 4: Revised route and timing of topping up

### 6S of Inventory Stores

Stocks are easier to retrieve, reducing time spent on looking for stocks. Number of stores is reduced from **7** to **5**. (Figure 5)



Figure 5: 6S of Stores

### Error Rate of Ordering Supplies

Number of stocks returned reduced significantly from **8%** to **0%**. (Figure 6)

### Staff Satisfaction

**237 staff** benefited from this project and approximately **90%** of EMD staff are satisfied with the current inventory management. (Figure 7)

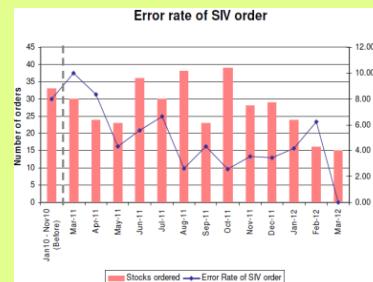


Figure 6: Error rate of orders

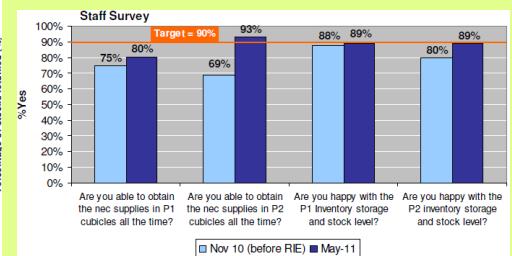


Figure 7: Staff survey

## IMPLEMENTATION

Implementation	Benefits
Re-organise the stores and top-up trolleys by applying 6S	<ul style="list-style-type: none"> <li>Easier monitoring of stock levels</li> <li>Standardization of stock management.</li> <li>Easier retrieval of stock</li> <li>Recipe cards allow better visibility of the workflows.</li> <li>Reduces staff movement</li> </ul>
New workflow of topping up supplies	<ul style="list-style-type: none"> <li>Reduces staff movement and time spent on topping up supplies</li> </ul>
Conversion of stocks to blanket orders and auto top up	<ul style="list-style-type: none"> <li>Minimizes checking and ordering of stocks</li> <li>Reduces storage space needed</li> </ul>

## SUSTAINING THE GAINS & LESSONS LEARNT

### Key Success Factors

- Consistent review of project to enable prompt elimination of negative impact and execution of countermeasures
- Continuous support from Senior Management, other departments and external vendors
- Sharing of the project with other institutions provided further motivation to the team

Besides having a positive impact in EMD itself, the collaborations between EMD and other departments including external parties, have resulted in win-win situations and better teamwork. This project has improved patient care by improving staff morale and strengthening coordination of care among departments.