

## **Project Title**

Evaluation of Initiatives to Improve Process of Daily Medicines Supplies and Inventory Management

## **Project Lead and Members**

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Project members: Timothy Koh Yi Kiet, Lim Dao Jun, Alison Low Ching Yoke

## **Organisation(s) Involved**

Ng Teng Fong General Hospital

## **Aims**

To improve the efficiency of cartfill processing time from 107.4 minutes to 60 minutes, reduce out-of-stock situation from 412 to 370 and reduce overstock situations in ward by 10% over a 3 months period for wards 11 to 14 subsidized.

## **Background**

See poster attached/ below

## **Methods**

See poster attached/ below

## **Results**

See poster attached/ below

## **Lessons Learnt**

Regular adjustments to ward ADC items is required with shifts in prescribing practices and changes to hospital formulary. Each ward needs a customised set of medications to better manage the wards' inventory.

## **Conclusion**

See poster attached/ below

**Project Category**

Care & Process Redesign

**Keywords**

Care & Process Redesign, Productivity, Quality Improvement, Root Cause Analysis, Plan Do Study Act, Inventory Management, Allied Health, Pharmacy, Ng Teng Fong General Hospital, Cartfill process, Automated Dispensing Cabinet, Medication Inventory

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# EVALUATION OF INITIATIVES TO IMPROVE PROCESS OF DAILY MEDICINES SUPPLIES AND INVENTORY MANAGEMENT

MEMBERS: NG STACEY HQ, KOH TIMOTHY YK, LIM DAOJUN, LOW ALISON CY, NG TENG FONG GENERAL HOSPITAL, INPATIENT PHARMACY

- SAFETY
- PRODUCTIVITY
- PATIENT EXPERIENCE
- QUALITY
- VALUE

## Define Problem/Set Aim

### Opportunity for Improvement

Medication supplies to inpatient wards occur daily and require time and effort from pharmacy staff and nurses alike. Scheduled medications required to be served to patients can be retrieved from individual wards' Automated Dispensing Cabinets (ADC) or via scheduled cartfills (set of daily medication supplies for each ward supplied from inpatient pharmacy). Process of medication supply can be seen in Fig 1. below. In a random sampling of 5 days in September 2017, an average of 107.4 minutes (78.6 minutes to pack and 28.8 minutes to check) is required to process one cartfill each day.

At the ward level, out-of-stock situations in ADC cause inconvenience to staff and may delay medication serving to patients. Between Apr to Jun 2017, wards 11 to 14 subsidized have a total of 412 ADC out-of-stock situations.

### Aim

To improve the efficiency of cartfill processing time from 107.4 minutes to 60 minutes, reduce out-of-stock situation from 412 to 370 and reduce overstock situations in ward by 10% over a 3 months period for wards 11 to 14 subsidized.

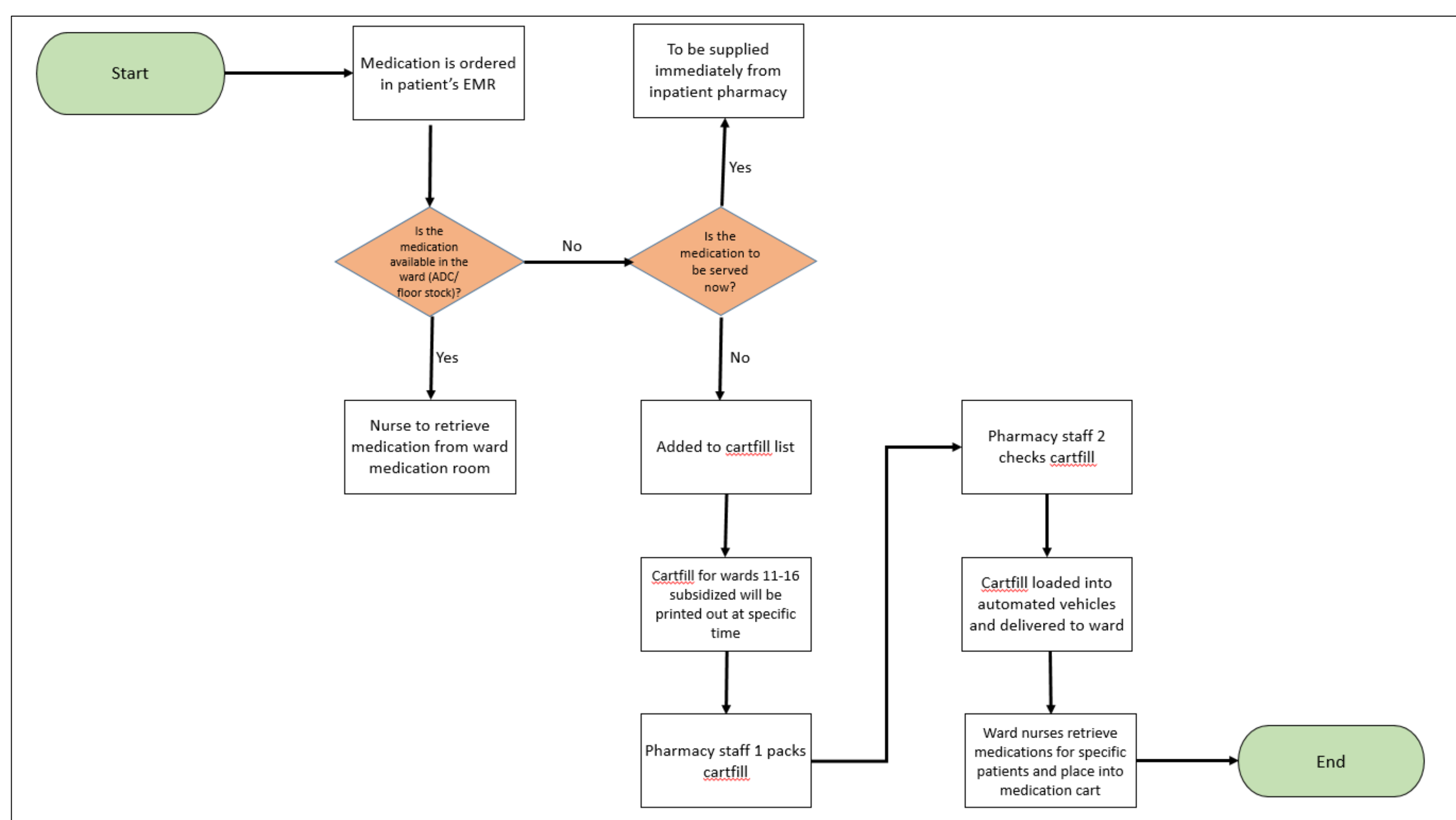
## Establish Measures

### Outcome measures:

1. Time required to process cartfill
2. Amount of cartfill items to process
3. Number of out-of-stock situations
4. Percentage usage of line items in ADC

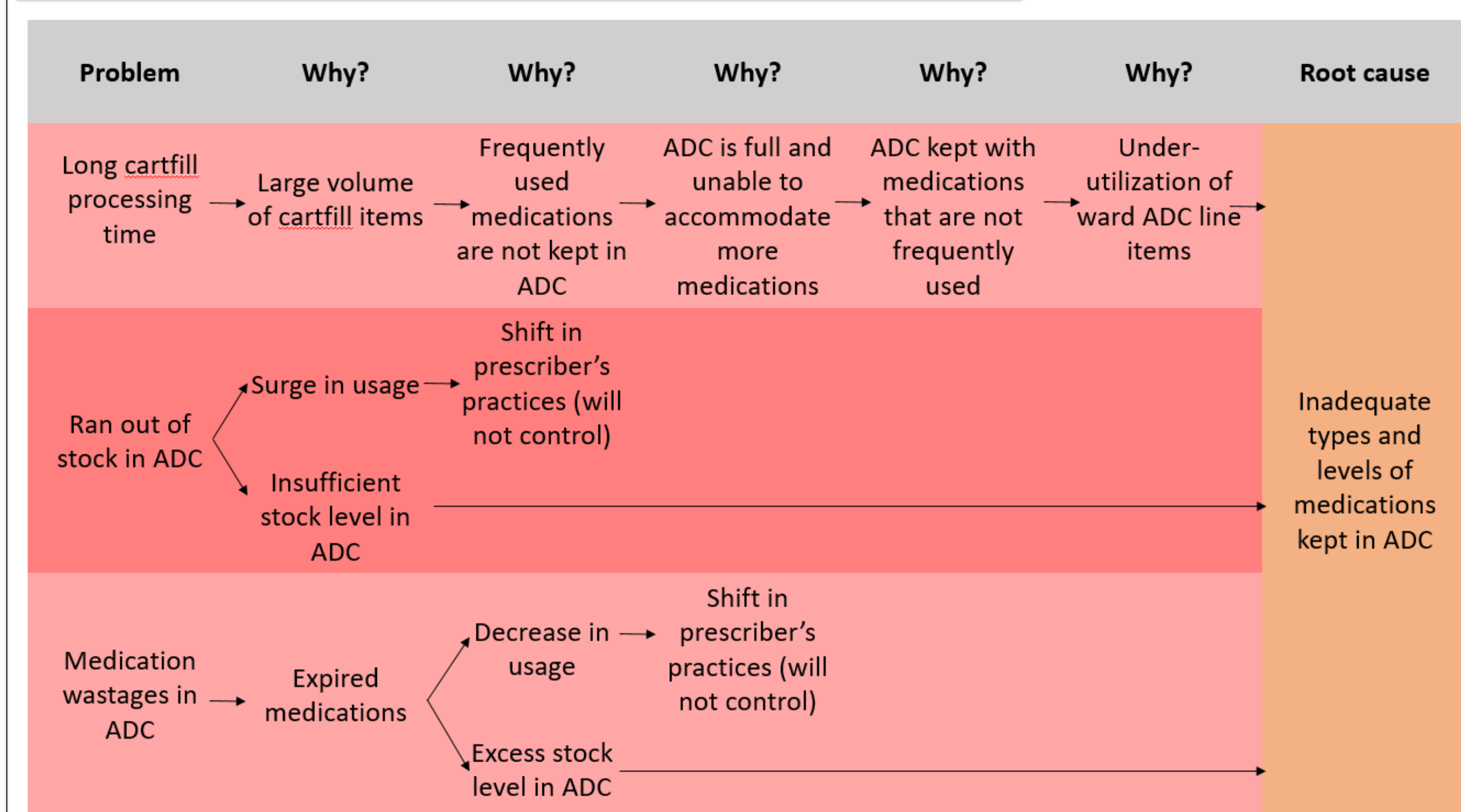
## Analyse Problem

Fig 1. inpatient medication supply process



The most efficient method of medication supply would be for nurses to retrieve the medication from ward's ADC. However, space constraints in the ADC mean that each ward needs to be selective in the type and quantity of medications kept in ADCs. In cases where the medication is not kept in the ward, there would be a longer process of medication supply (via cartfill). Hence, more manpower and time is required for supply, as seen in the above workflow.

### Root cause analysis of inefficiencies in medication supply



## Select Changes

### List of potential solution:

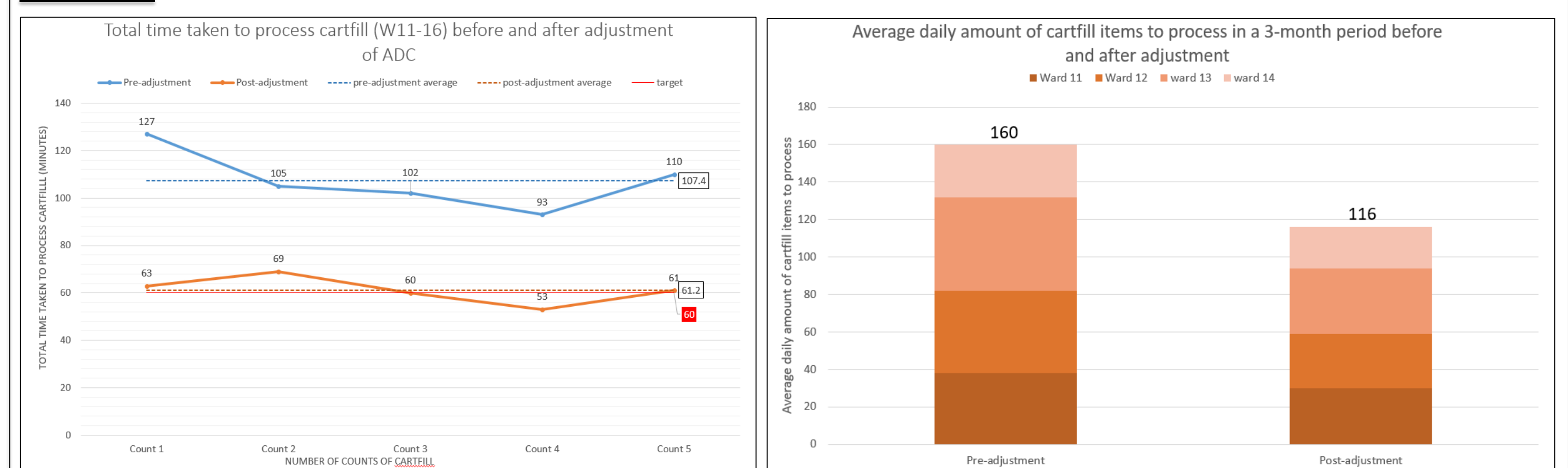
Root Cause	Potential Solutions	
Inadequate types and levels of medications kept in ADC	1 Decrease stock level of or remove medications that are slow or not moving from ADC	✓
	2 Increase the stock level for fast-moving medications in ADC	✓
	3 Add medications that are frequently used in ward but yet not kept in ADC	✓
Shift in prescribers' practices	1 Restrict prescribing choices to influence practice	X

## Test & Implement Changes

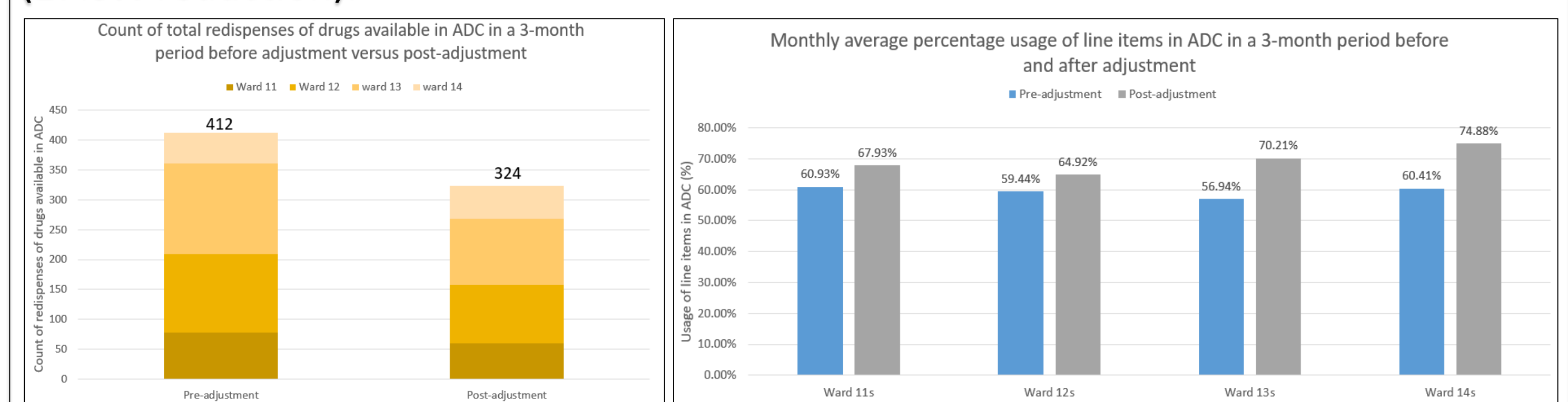
### Plan-Do-Study-Act (PDSA) cycles

CYCLE	PLAN	DO	STUDY	ACT
1	Standardisation of methods to adjust ADC items	1. Remove items that have not moved for at least 1 year. 2. Add items that are used at least once a week (and supplied from places other than the ward's ADC). 3. Adjust remaining medications based on average weekly usage	Guide to standardization is useful to guide team members to decide on the adjustment required.	Propose changes to respective ward sisters.
2	Adjustment of ADC items for wards 11 to 14 subsidised	Each team member to adjust based on standardization. To also discuss changes with ward sister as each ward's usage and specialty differs.	Ward sisters may propose other changes as well. Ward sisters are aware and agreeable with changes.	Implement changes to ward ADCs

### Results



The average total time used to process (pack and check) cartfill was reduced from 107.4 minutes to 61.2 minutes (43% reduction), almost achieving the target of 60 minutes. The average daily cartfill items also reduced from 160 items to 116 items (27.5% reduction).



There is a reduction of total out-of-stock situations from 412 to 324, and a monthly average of 137 to 108 (21% reduction) in the 3 months before and after adjustment. The percentage usage of line items in each ADC also improved 10% from a monthly average of 59.43% to 69.49%.

## Spread Change/Learning Points

### Conclusion

1. The initiative improved the cartfill efficiency to almost the target of 60 minutes, and effectively reduced out-of-stock and overstock situations by more than 10%.

### Strategies to spread and maintain changes

1. Engagement of inpatient ward pharmacists as team members, instead of inventory portfolio members, allows feedback and fine-tuning of the standardization of ward adjustment.
2. Inpatient pharmacists then have the skill of adjusting ward ADC, which allows sustainability when future cycles of adjustment are required.
3. Cooperation with ward sisters creates awareness for the adjustments.

### Key learning

1. Regular adjustment to ward ADC items is required with shifts in prescribing practices and changes to hospital formulary.
2. Each ward requires a customized set of medications (both types and quantities) to better manage the wards' inventory of medications.