LEAN MANAGEMENT OF A HAZARDOUS CHEMICAL IN A MAJOR REPROCESSING UNIT

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Nenny Suzanah Bte Sellamat, SGH, Chua Puay Hoon, SGH, Dr Christopher Khor, SGH, Lek Mui Ngoh, SGH, Mohammad Nabil Fadhil, SGH, Yip Teck Ming, SGH, Kashmir Kaur, SGH, Mariamal A, SGH, Kam Wai Kuen, SGH, Azhar Ahmad, SGH, Raynald Tan, SGH, Chia Peng Han, SGH

INTRODUCTION

Quality management and storage of hazardous chemical is essential in the environmental, health, and safety plan in a healthcare organisation. In a high throughput, high volume, endoscope reprocessing unit, adequate supply of disinfectants are required to ensure smooth and efficient operations and service delivery.

Rapicide PA is high level disinfectant and fast acting sterilant used in Automated Endoscope Reprocessors (AER). This disinfectant comes in 2 bottles of 5 litres each- Rapicide PA Part A (a peracetic acid based disinfectant of 22% Hydrogen Peroxide) and Rapicide PA Part B (the neutralizer).

BACKGROUND

The focus of this project is Rapicide PA Part A. Rapicide PA Part A is also classified as an explosive precursor. Strict stock accounting process is in place for management of supplies.

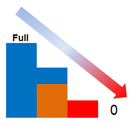
Supplies for 1 AER typically require a consumption of 4L of Rapicide PA Part A per day. With the development of a new reprocessing unit with 10 AERs, the consumption requirement is 40L/day. With a weekly schedule of replenishment, the total quantity storage will be 220L. Apart from space requirements, this caused other operational challenges for the team. In the planning of this new centre, the project team had analysed the issues and sought solutions.

CHALLENGES AND RISKS

Stocking Rapicide PA Part A for 10 AERs presents various challenges. The current practice is not sustainable in the long term. These challenges are:

220L
Stock max. capacity in centre

HAZARD ALERT- HIGH QUANTITIES IN STORAGE
The maximum quantity of Rapicide PA Part A for 1 AER is 22L. The maximum quantity for 10 AERs is 220L.



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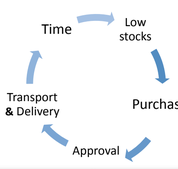
Par Quantity

INCONSISTENT SUPPLY IN STOCK
The current practice of ad-hoc purchase and weekly supply would yield inconsistent supply of Rapicide PA Part A, which is not sustainable for a major reprocessing unit with 10 AERs.



21 DAYS
Order→ Delivery

LONG LEAD TIME FOR INDENTING, SUPPLY & DELIVERY
Total time for indenting process and new supply delivery. Process is repeated 4x monthly.

11,440 MINS
Time spent per year

ADMIN TIME
Staff will spend a total of 11,440 minutes annually on administration of ad-hoc purchases

$ 9,073
Estimated manpower costs

MANPOWER ASSIGNMENT AND RESOURCES
Currently 1 staff handles the orders and delivery in centre. There is heavy dependence on a single resource to complete tasks. The estimated average manpower cost for managing AER Rapicide PA Part A supply is $9,073/ year

2.64 SQM
Storage space

STORAGE & SPACE
Total volume in storage, based on a weekly supply process is 275L. This translates to approximately 2.64 sqm of storage space or 2 cabinets for a 1 week supply.

METHODS

5 Lean Principles

1. Identify Value
2. Map the Value Stream
3. Create flow- Seamless, Lean & Streamlined
4. Establish Pull- with value based activities
5. Seek perfection- through standardisation & scheduling

1. ROOT CAUSE ANALYSIS: CURRENT STATE

A root cause analysis was performed with the use of an Ishikawa diagram. Issues were identified (Fig 1)

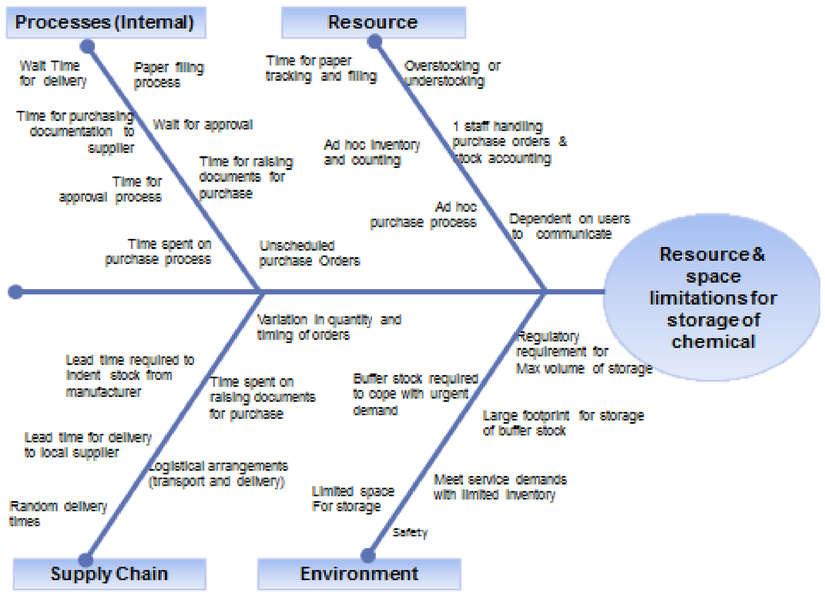


Fig 1: Root cause Analysis of current facility, processes, and practices

2. VALUE CHAIN ANALYSIS & VALUE STREAM MAPPING

The processes and interrelationships in the supply chain were analysed through Value Chain Analysis and Value Stream Mapping (Fig 2).Value creation activities were identified

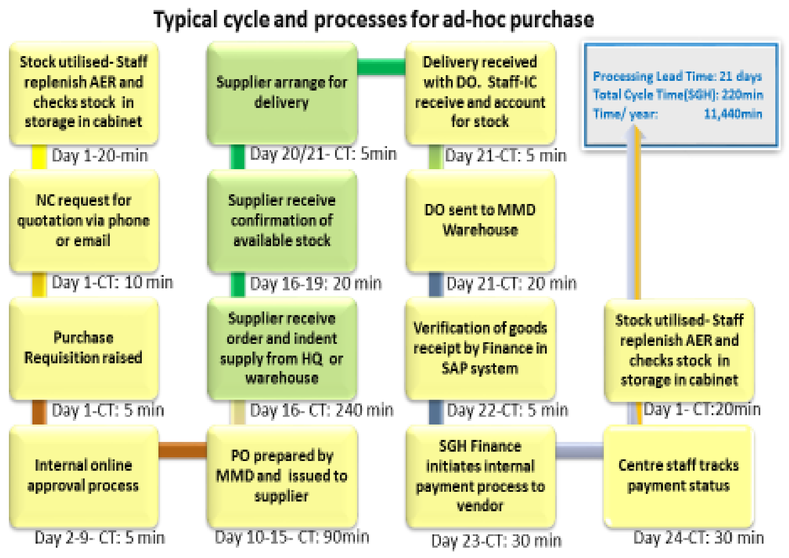


Fig 2: Integrated Value Chain Analysis & Value Stream Map of Typical cycle and processes for ad- hoc purchase

3. PROCESS RE-ENGINEERING WITH LEAN PRINCPLES

Processes were re-engineered and streamlined (Fig 3) . Value- creation activities include contract arrangement for purchase, systematic practices and processes and standardised scheduling for inventory management

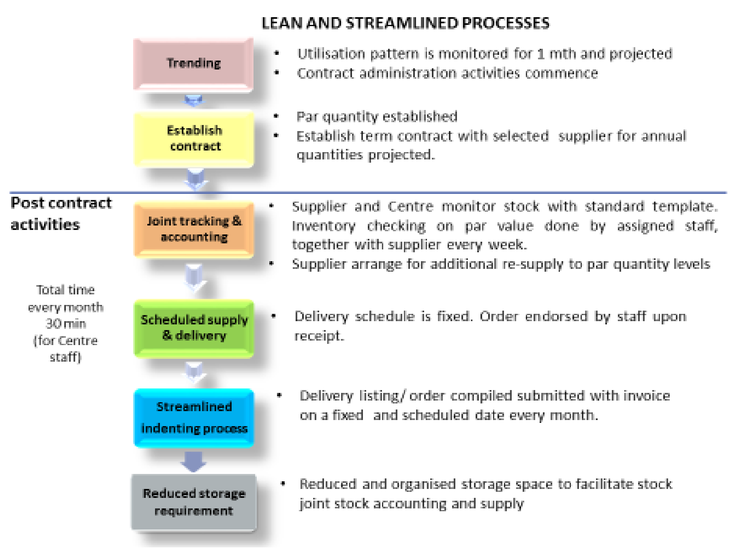


Fig 3: Process re-engineering- of resources, processes, practices and ordering, supply and delivery patterns

RESULTS AND CONCLUSION

80L
Stock max. capacity in centre

ENHANCED SAFETY- LOWER QUANTITY IN STORAGE
Stock is stored in lower quantities in centre

50L
Par Quantity

PAR QUANTITY- 1 DAY SUPPLY
With par quantity available, supply can match demand.

1-2 DAYS
Stock accounting →Delivery

REDUCED LEAD TIME FOR DELIVERY
It just takes 2 days for the stocks to arrive

360 MINS
Time spent Per Year

REDUCED ADMIN TIME
Staff spends less time on purchase processes

$285
Est Manpower cost

$8788
Manpower savings

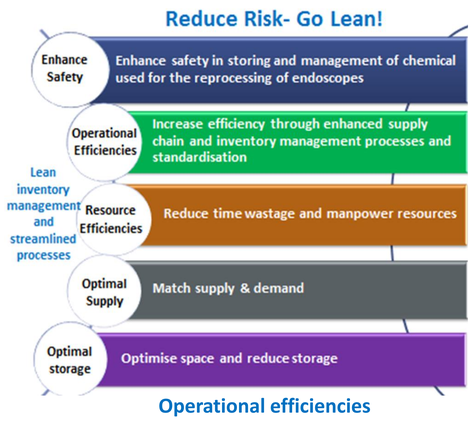
MANPOWER RESOURCES AND FUTURE SAVINGS
With standard processes, staff assignment can be rotated. Total estimated manpower costs is $ 285. This translates to manpower savings of $8788.

1.32 SQM
50% reduction in storage space

SMALLER STORAGE SPACE
Storage requirements are reduced by 50% to facilitate space optimisation

BENEFITS, OUTCOME AND FUTURE APPLICATION

The tools, mechanisms, and strategies in this project are applicable in similar settings in any healthcare facility. There are also many benefits with implementing these strategies With process re-engineering and lean management principles, enterprise risks could be mitigated. Overall, operational efficiencies would be achieved.



Enterprise Risk Mitigation Strategy for:

- Environmental risks
- Patient safety
- Staff safety
- Infection Control
- Manpower resources
- Financial resources
- Operational risk
- Business risk (business continuity)
- Equipment Risk
- Inventory Control