Improving the Process for Linen and Meal Delivery

NTUC Health Co-operative Limited

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Background

The daily operations of our Nursing Home (NH) requires delivery of various materials within the facility, such as linen and meals. Transporting of fully loaded food trolleys and dirty linen trolleys could weigh as much as 160 kg and 80 kg respectively. Carrying of these heavy loads could pose potential health hazards for the staff.

There could be up to **7 trips per day** for transporting these items. Apart from time wasted, this transportation task of linen and meals is manual and strenuous.

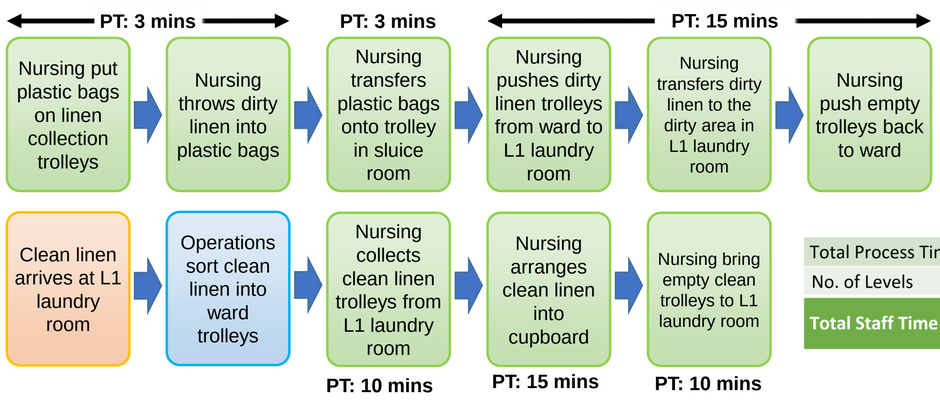
Objectives

1. Reduce 30% or more of the time spent on this task so staff have more time for value-added tasks such as caring for residents.
2. Improve sustainability throughout our processes.
3. Improve job satisfaction and morale by reducing strenuous tasks, and creating a safer working environment.
4. Minimise human cross-interaction (especially during the pandemic).

Problem Analysis

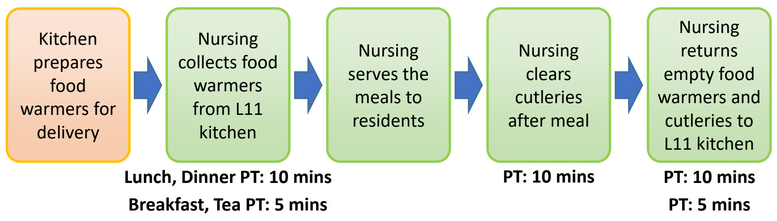
Go and See was conducted to observe the delivery process of linen and meals. The process was also mapped using Value Stream Mapping (VSM). This allows identification of non-value added activities, potential touchpoints and Process Time (PT) which could be optimised to reduce strain on staff and support greater efficiency.

1. Current Linen Process



Total Process Time (Nursing)	56 mins
No. of Levels	7
Total Staff Time (Nursing)	**6.5 hrs per day**

2. Current Meals Delivery Process



Total Process Time (Nursing)	80 mins
No. of Levels	7
Total Staff Time (Nursing)	**9.3 hrs per day**

The observation revealed that staff spent approximately **5,767 hours annually** on such duties. In addition, 8 Wastes were identified during the Go and See.

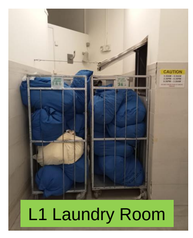
8 Wastes	
Defects	• Dirty linen are spilled on the floor due to torn plastic bags. • An infection control concern with exposed dirty linen during delivery process.
Overproduction	• Ordering of extra one-time use plastic bags for holding dirty linens.
Waiting	• Long waiting time for lifts during peak hours.
Non-Utilised Talent	• Staff performing low-value added delivery tasks instead of nursing care. • Linen chute is not utilised due to misconception of difficulty in maintenance and safety concerns.
Transportation	• Delivery of linen and meals between laundry and kitchen.
Inventory	• Large number of plastic bags take up space in the storeroom.
Motion	• Nurses need to walk to Sluice Room for topping up of plastic bags while changing linen.
Extra Processing	• Placing plastic bag over linen collection trolley

Implementation Plan

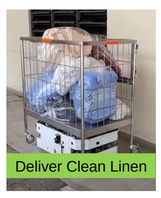
Through technology adoption and maximisation of resources available, an optimised linen and meal delivery process was adopted to minimise human involvement and reduce waste.

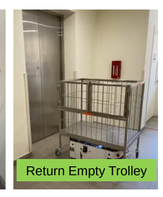
1. Washable laundry bags were customised to fit the linen collection trolley to replace plastic bags.
2. Dirty linens was sent to laundry room at Level 1 using linen chute and the use of an Automated Guided Vehicle (AGV) to deliver clean linen to seven ward levels was implemented.
3. Meals were delivered in custom-made food warmer using AGV from Level 11 kitchen to seven ward levels.

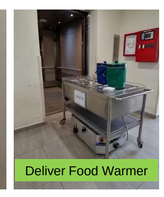
Sending Dirty Linen to Level 1 Laundry Room through Linen Chute



Delivering Clean Linen and Meals with AGV







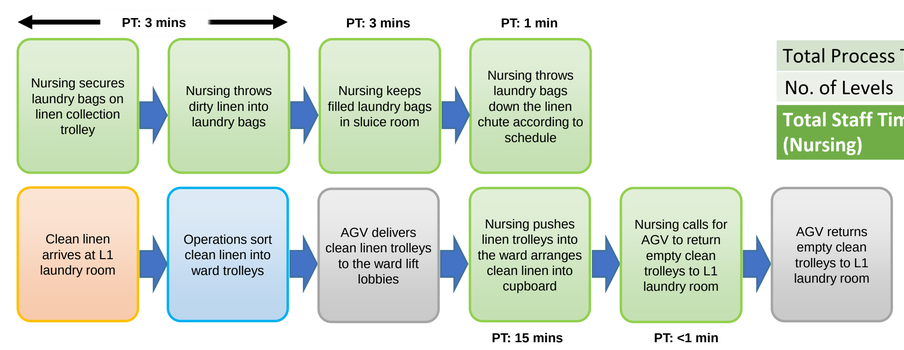
Benefits/Results

The use of washable laundry bags and linen chute had significantly reduced the time spent to transport dirty linen to L1 Laundry Room. The process was further improved with the help of the AGV to deliver clean linen to the wards and saved **3.8 hrs daily**. In addition, washable laundry bags had replaced **20,400 plastic bags annually**, this is a significant contribution to our sustainability efforts.

For meal delivery, the AGV had replaced the time spent by staff to collect and return the food warmer - this is equivalent to **7.4 hrs saved per day**.

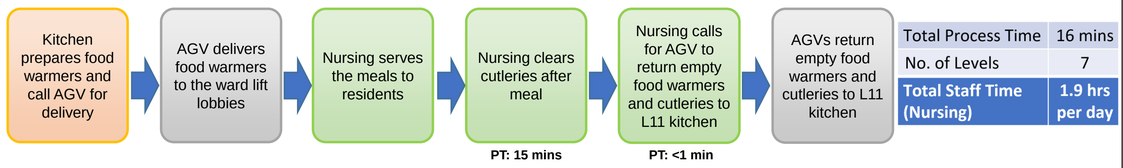
The annual time spent on low-value added tasks was **reduced by 4088 hours** and achieved **71% reduction**. Morale also increased while cross-interaction was also reduced.

1. New Linen Process



Total Process Time	23 mins
No. of Levels	7
Total Staff Time (Nursing)	**2.7 hrs per day**

2. New Meals Delivery Process



Total Process Time	16 mins
No. of Levels	7
Total Staff Time (Nursing)	**1.9 hrs per day**

Sustainability & Reflections

Due to concerns and uncertainties of the change process, the linen chute had not been used previously despite it being provided. In order to improve the delivery workflow, usage of the linen chute was explored. After the trial, the linen chute proved to be very useful with minimal maintenance. With both the linen chute and AGV, low-value added delivery tasks carried out by staff were replaced with automation. The approach is sustainable through staff training as the chute and AGV user interface is simple.

There was improvement in job satisfaction, productivity and significant total savings of man hours. It is vital to keep an open mind and venture into unexplored grounds for process improvement.

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