

# Re-Thinking Sustainable Practices in Endoscopy Reprocessing

## Opportunity showcased:



### Use visual cues for behavioural change

Sometimes, sustainability improvements are obvious and only require the highlighting of specific focus areas.


The use of simple visual cues to draw attention and raise awareness of more sustainable practices can lead to natural changes in habits.

In this project, the NUS team understood the workflow of the endoscopy department, identified the areas of waste, and used visual cues to seamlessly influence staff behaviours.

## Other opportunities shown:

 *Seamless integration into workflow*

 *Tackle systemic waste at its roots*

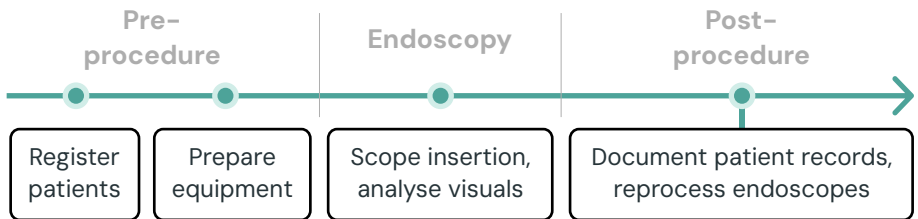
 *Streamline information distribution*

## PROJECT CONTEXT

The tail end of the endoscopy process involves documenting patient records, and washing endoscopes thoroughly to prevent contamination and to prepare them for their next use.

These procedures happen frequently, and high patient turnover compounds the waste generated in the form of water, paper, and time.

### CURRENT ENDOSCOPY TIMELINE/FLOW



#### High volume of waste generated



#### Location:

- Reprocessing room

#### Processes:

- Wash endoscopes
- Leak testing
- Print patient label

#### Stakeholders involved

- Endoscopists
- Healthcare Assistants
- Nurses
- Supply Vendors
- Housekeepers

# Research Approach

EVERYDAY  
ACTION STEPS

ACTIVITIES DONE  
BY TEAM

INSIGHTS  
IDENTIFIED

Take a look  
around

Talk to  
people



Build  
quickly



Brainstorm  
together



Gather  
feedback

Observed  
reprocessing room

Lots of paperwork &  
paper waste involved

Excessive water used  
during scope washing

Crafted rapid  
prototypes

Conducted a workshop  
with endoscopy staff

Rubbish bins  
in department  
frequently cleared  
regardless of fullness

Designed and  
tested solutions

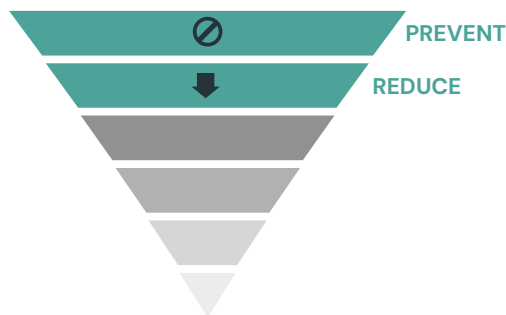
## Design Challenge

How might we reduce waste while adhering to Standard Operating Procedures (SOPs) for safety and efficiency in the endoscope cleaning process?

## Design Solution

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The team developed four design ideas addressing waste generation associated with endoscopy reprocessing procedures.



These design ideas aim to **prevent** paper and plastic waste, and **reduce** the amount of water waste from inconsistent basin fill levels.

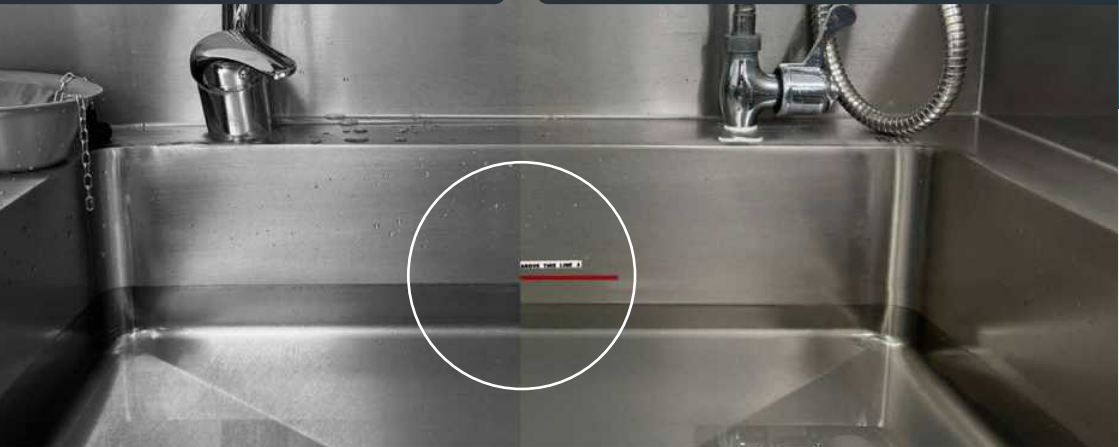
## Design Solution 01

# Basin Visual Marker

Rinsing labels indicating the maximum water level, effectively alerting staff to avoid exceeding this point.

**Before:** Roughly estimate fill level

**After:** Consistent visual cue/limit



## Consider this!

### Can you **Use visual cues for behavioural change?**

Visual cues are important because they draw our attention to areas of concern.

Small additions such as labels/graphics can act as important reminders or reference points for us to practice sustainable behaviour.

This solution utilises a simple label to demarcate an appropriate fill level for the water basin.

## Problem Addressed

With the guesswork removed, nurses can now accurately estimate how much water to use when washing endoscopes.

*"Because we eye-ball water level, I used to overfill as a safety measure."  
> Ms Siti, Scrub Nurse*



## How?

Nurses are encouraged to maintain water levels below the designated mark, successfully mitigating water wastage.




## Design Solution 02

# Document Re-design

A re-designed document form accommodating the details of four patients instead of three.

### PROBLEM ADDRESSED

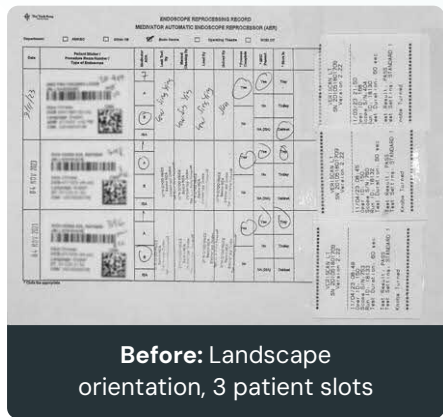
Reduced paper usage compared to the previous format of documenting endoscope patient records.



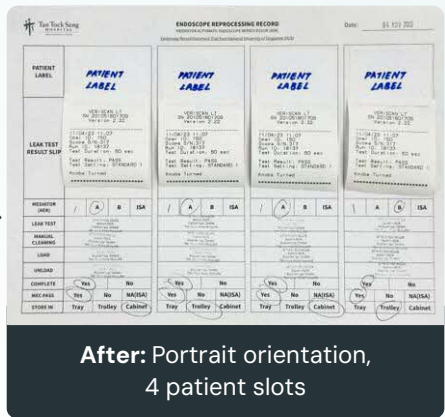
**Consider this!**

Can you **Seamlessly integrate your solution into existing workflows\***?

*\*Refer to pg. 20 to know more.*



**Before:** Landscape orientation, 3 patient slots



**After:** Portrait orientation, 4 patient slots

### OUTCOME

The new document format saves paper used for documenting records as more information can be captured per sheet. It was also found to be more readable, making the documentation process easier for nurses.

*"The new vertical layout is easier to read."*  
 > Mdm Pei Yee, Senior Nurse

## Design Solution 03

# Wastebin Compactor

## Consider this!



Can you **Tackle systemic waste at its roots\***?

*\*Refer to pg. 72 to know more.*

An automatic trash compacting fixture.

### PROBLEM ADDRESSED

Bin liners are now changed only when bins are full, instead of frequent mandated changes in the past regardless of waste volume.

### OUTCOME

Bin liner usage is reduced.



## Design Solution 04

# Roll Call Bulletin

A whiteboard as a physical information bulletin



## Consider this!



Can you **Streamline information distribution\***?

*\*Refer to pg. 46 to know more.*

### PROBLEM ADDRESSED

Staff do not miss important announcements/information.

### OUTCOME

This encourages acknowledgement of information, potentially reducing miscommunication and double work.



# User Testing

## Increased Awareness of Water Usage

### Basin Visual Marker



The markers were pasted on various basins in the reprocessing room to test their effectiveness.

[ 2 week testing period ]

*“The sticker is good, lets me know how much water is considered ‘too much’”*

*> Mdm Goh, Senior Nurse*

Daily endoscope washes: **81**

Yearly endoscope washes: **23,166**

The marker prevents unnecessary overfilling by ensuring consistency, potentially saving a **significant amount of water** across **thousands of washes** annually.

## Decreased Paper Usage

### Document Re-design

The team trialled the new document format with 5 nurses, who all agreed that it did not disrupt their current workflow.

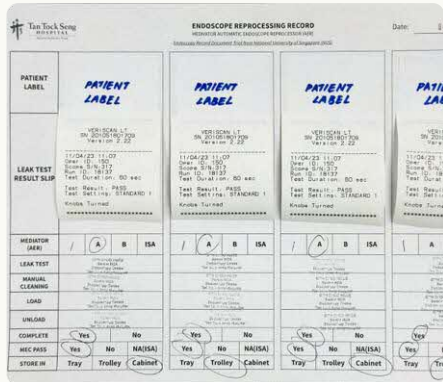
[ 2 week testing period ]

Current use:  
**7,140**

PAPER SAVED  
ANNUALLY

Projected use:  
**5,284**

**25%**



The new template saves 5 pieces of A4 sized paper daily (1,856 saved annually). Beyond paper savings, it helps save time during documentation.

## Decreased Annual Bags Usage

### Wastebin Compactor

The team tested this solution with 5 nurses and 2 housekeepers, and received positive feedback from them.

[ 2 week testing period ]

Current use:

**1,683**

Projected use:

**976**

BAGS SAVED  
ANNUALLY

**42%**



The bin compactor intervention has successfully saved 2 bags a day, and can potentially save 707 bags annually.

## Increased Response, Awareness

### Roll Call Bulletin

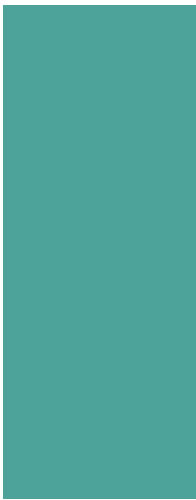


The team tested the bulletin board with 5 nurses, all of whom managed to **acknowledge the messages** written on it.

[ 2 week testing period ]

"Useful because I can see who is updated or not, on the latest announcement"  
> Mdm Goh, Senior Nurse

Senior nurses found it more beneficial compared to younger nurses, as they appreciated a physical medium for information dissemination.



## **RE-THINKING SUSTAINABLE PRACTICES IN ENDOSCOPY REPROCESSING**



**TEAM MEMBERS**

### **MUHAMMAD HAZIQ BIN ROSLAN Y**

An industrial designer whose unique style may be considered niche, yet he consistently discovers innovative ways to transform the seemingly impossible into reality. For him, design is a continual process of reimagining and redefining.

### **LOH YI ZHI**

A passionate industrial designer devoted to human-centered healthcare design, constantly exploring practical solutions to enhance user experiences and streamline processes. He is committed to creating innovative designs that prioritise functionality and user well-being in the healthcare industry.

### **NOR NADIA DIYANA BINTE MOHD NORZAIDI**

Nadia thrives in the iterative journey of experimenting with diverse mediums where her curiosity fuels ambitious ideas, embracing evolution through trial and error. Crafting with intention and purpose resonates deeply, and she is eager to learn, share, and enhance her designs globally, enriching user experiences.