

# Singapore Healthcare Enterprise Risk Management Congress 2022

## ERM 4 - Closing Plenary: Sustainable Safe Sterile Supplies Services

**A/Prof Lim Boon Leng,**

**Director, Medical Affairs, SingHealth**

**Senior Consultant, Department of Anaesthesiology**

**Chief Risk Officer, Singapore General Hospital**

# Timeline of Events & Milestones

## Sterile Supplies Services at SingHealth

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2017

## National Dental Centre Singapore Incident

- 72 packs of instruments did not complete final step of steam sterilisation
- They were used for patient treatment over 2 days

72 packs of dental instruments not sterilised completely used for patient care at National Dental Centre



The National Dental Centre's three-step process for sterilising its dental instruments. Steps 1 (top left) and 2 (bottom left) remove and inactivate organisms. PHOTOS: NDCS

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# Formation of Cross Institution Sterile Processing ERM Review (CISPER) Group

2017

National Dental Centre Singapore Incident

2018

Role

Initiated by SingHealth Senior Leadership to:

- Review the sterile processing procedures & workflow at each institution
- Share best practices
- Propose recommendations

Who are involved?

Sterile Processing, Nursing, and Infection Control representatives from all institutions with sterile processing facilities

Chair: Cl A/Prof Ken Tan, NDCS (Alternate Chair: Dr Chelsia Sim, NDCS)



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## Findings & Recommendations

### People

- Recruit the right fit
- Provide adequate training opportunities
- Structured career pathway
- Equip staff with latest skills

### Process

- Establish harmonised standards and processes
- Procurement to align with sterile processing capabilities
- Traceability of instruments varies with operating systems
- Accountability in sterile processing
- Oversight during vendor servicing

### Speak Up Culture

- Cultivate communicative relationship between staff and management
- Promote psychological safety to eliminate fear of speaking up

### Communication

- Proactive communication between sterile processing units and end users
- Proper channel to disseminate important changes in work processes

2017

National Dental  
Centre Singapore  
Incident

2018

Formation of Cross  
Institution Sterile  
Processing ERM Review  
(CISPER) Group

2019

Formation of SingHealth Sterilised Supplies  
Workgroup (S3W)

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# SingHealth Sterilised Supplies Workgroup (S3W)

**Role:** To plan for and implement operationalisation of the CISPER recommendations

**Chair:** A/Prof Lim Boon Leng, SGH

**Alternate Chair:** Dr Chelsia Sim, NDCS

**Advisor:** Ms Goh Meh Meh, SGH

**Members:** Domain experts from SSU, nursing, infection prevention, human resource



*Supported by 4 Taskforces*

## Dental Sterilised Supplies

- Explore feasibility of substituting commonly used dental instrument sets with disposables
- Explore feasibility of recycling used disposable instruments

## Internal Audit

- Established internal audit framework for cross institution audit of SSUs
- Auditors for Cross Institution Sterilisation Hygiene (CISH) have been trained.

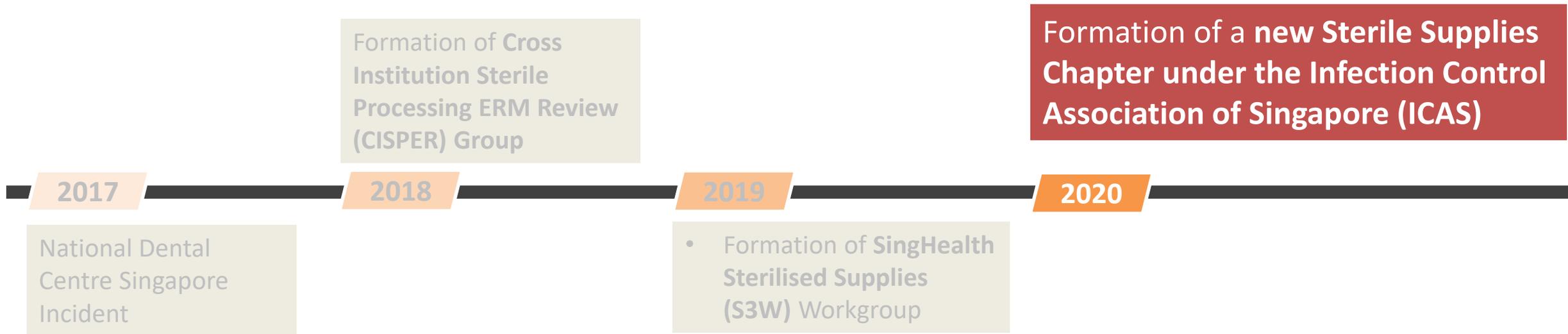
## Career Path Development

- Harmonised career development path for instrument technicians
- Harmonised competency checklists and finalised training curriculum and materials

## Endoscope Reprocessing

- Formalised the Cluster endoscopy reprocessing Policies & Procedures

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# New Sterile Supplies Chapter under the Infection Control Association of Singapore (ICAS)

- Subsumed under the ICAS, the Sterile Supplies Chapter (SSC) was launched on 20 Oct 2020
- Under the guidance of A/Prof Ling Moi Ling, Chair of ICAS, SSC has organized the on-going Bi-monthly webinar series for SSC members that started in Dec 2020.
- Topics of webinars include Instrument traceability & inventory management and Management of flexible endoscope

Infection Control Association of Singapore  
**Sterile Supplies Chapter**

**SOFT LAUNCH AND  
WEBINAR**



CME/CNE points per

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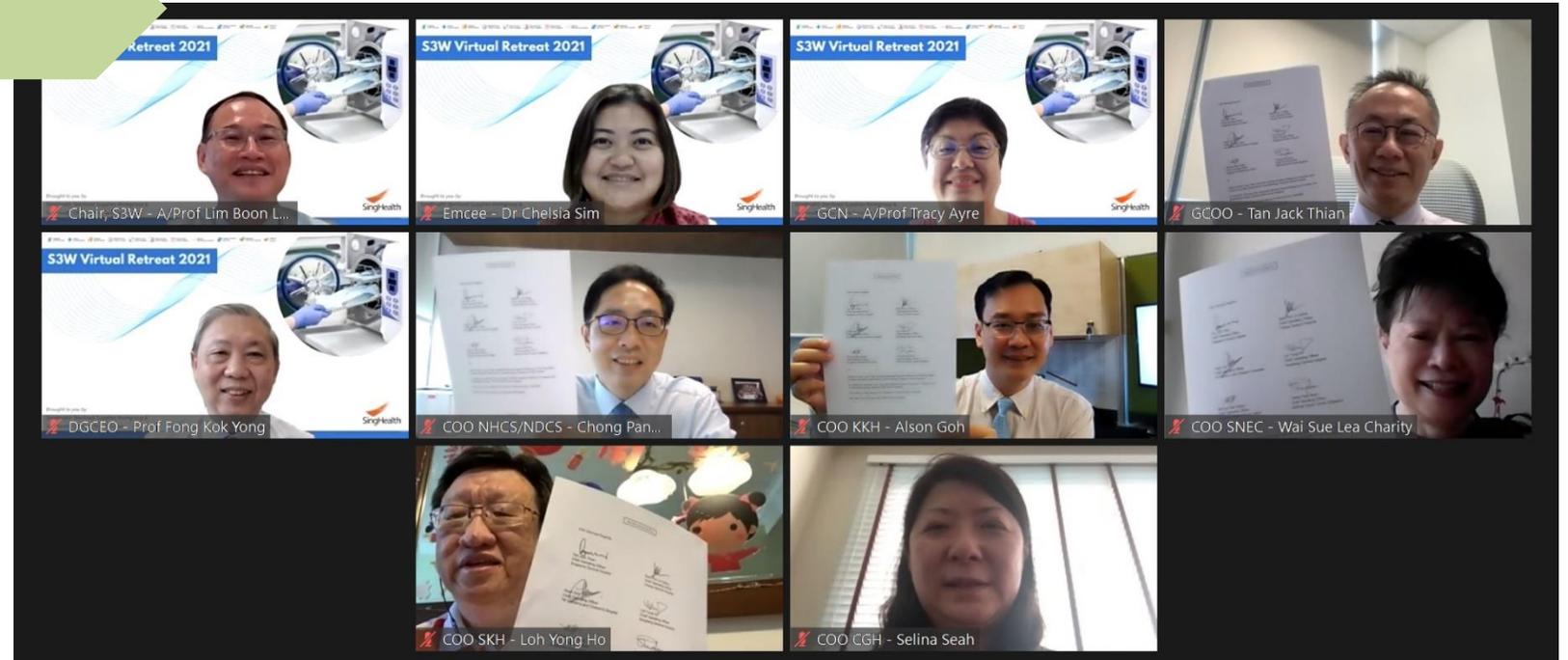
2021

- S3W Virtual Retreat
- Signing of SingHealth Business Continuity Plan (BCP) Agreement for SSUs
- Formation of SingHealth Sterile Supplies Council (S3C)

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A virtual retreat was held by S3W and Office of Risk Services in Feb 2021

Signing ceremony of Cluster Business Continuity Plan (BCP) for SSU



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## Award Ceremony to recognise the exemplary work of the SSUs

### SINGHEALTH STERILISED SUPPLIES WORKGROUP VIRTUAL RETREAT 2021



SINGAPORE  
GENERAL  
HOSPITAL

#### Most Improved Sterile Supplies Unit Award (Hospital Category)



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Defining Tomorrow's Medicine

### S3W Virtual Retreat 2021



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SingHealth Sterilised Supplies Workgroup &  
SingHealth Office of Risk Services  
Emcee - Dr Chelsia Sim



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Defining Tomorrow's Medicine

## Award Ceremony to recognise the exemplary work of the SSUs

**SINGHEALTH STERILISED SUPPLIES WORKGROUP VIRTUAL RETREAT 2021**

**Most Improved Sterile Supplies Unit Award (Specialist Centre Category)**

**NATIONAL DENTAL CENTRE SINGAPORE**



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SingHealth Office of  
Emcee - Dr

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## Award Ceremony to recognise the exemplary work of the SSUs

**SINGHEALTH STERILISED SUPPLIES WORKGROUP VIRTUAL RETREAT 2021**

**Most Improved Endoscopy Reprocessing Award (Hospital Category)**

**SENGKANG GENERAL HOSPITAL**



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**SingHealth**  
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SingHealth Office of Risk Services  
Emcee - Dr Chelsia

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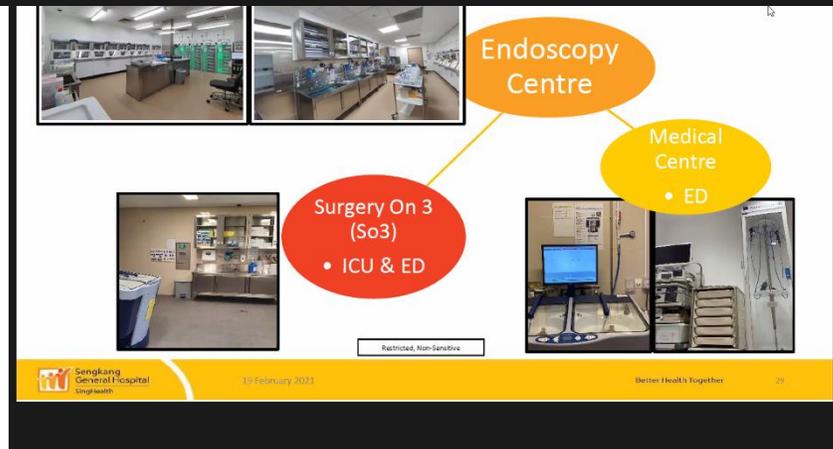
## Team Sharing by the institutions

**EVOLVE**

- Leveraging on IT
  - Digital Staff Competency Assessment
  - Automated Transportation
  - Robotic Assembly of Instruments



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**S3W Virtual Retreat 2021**

Brought to you by:  
SingHealth Sterilised Supplies Workgroup &  
SingHealth Office of Risk Services

SSU SKH - Li Jinliang

SingHealth

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# Formation of SingHealth Sterile Supplies Council (S3C)

## Role

To develop governance framework and organisation structure for sterilisation by leveraging on the works & building blocks of S3W

## Membership

**Chair:** A/Prof Lim Boon Leng, SGH

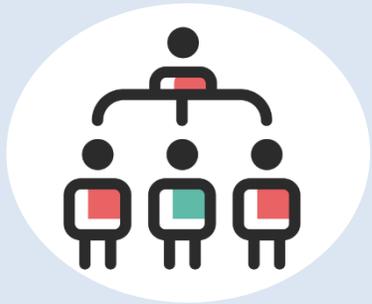
**Alternate Chair:** Dr Chelsia Sim, NDCS

**Advisor:** Ms Goh Meh Meh, SGH

**Members:** Domain experts from SSU, Procurement, nursing, infection prevention, human resource, audit

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# Formation of SingHealth Sterile Supplies Council (S3C)



## Organisation Structure

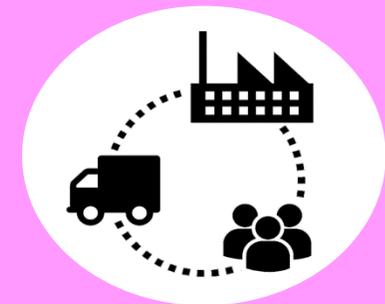
Harmonise the institution SSU Organisation Structures into a Cluster Structure



## Policies & Procedures

Harmonise the institution Policies and Procedures (P&Ps) on sterilisation and disinfection

– 11 cluster sterilisation policy and procedures P&Ps were formalised



## Logistics

Work with ALPS on logistics function including procurement, disposal and recycling programme at cluster level

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**Endoscopy Reprocessing (10)**

Training and Competency for Reprocessing of Endoscopes

Cleaning of Endoscopes

Disinfection of Endoscopes

Sterilisation of Endoscopes

Storage of Endoscopes

Transport of Flexible Endoscopes

Quality Assurance Monitoring of Automated Endoscope Reprocessor (AER), Endoscopes and Water

Maintenance of Endoscopes, Leak Tester, Endoscope Flushing Pump and Automated Endoscope Reprocessor (AER)

Reporting of Adverse Endoscopy Incident

Selection and Procurement of Products and Equipment in an Endoscopy Setting

**Sterilisation & Disinfection (11)**

Design consideration

Personnel in Sterile Supplies Unit

Handling, collection and transport of contaminated items

Cleaning and Decontamination

Preparation and assembly of instruments

Packaging Process

Sterilisation Process

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2021

- S3W Virtual Retreat
- SingHealth Business Continuity Plan (BCP) Agreement for SSUs was signed
- Formation of SingHealth Sterile Supplies Council (S3C)

- **Dissolution of S3W**
- **CSSD Intermediate Course**
- S3C is working on harmonizing the SSU organisation structures to support **Sterile Supplies Shared Service (S4) model vision**

**2022 & Moving Forward**

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INFECTION CONTROL ASSOCIATION (SINGAPORE)  
Singapore  
Sterile Supplies Chapter

# CSSD

## INTERMEDIATE COURSE

15 - 18 November 2022

*(Banner includes a small image of a person in a clinical setting and a calendar icon)*

TO REGISTER

**CLICK HERE**

*or scan QR code*



- 4 day face-to-face course
- Objectives:
  - Provide participant enhanced knowledge and application skills required to handle and manage all types of reusable instruments
  - Sterilisation processes including quality controls used in cleaning and sterilisation processes

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INFECTION CONTROL ASSOCIATION (SINGAPORE)  
Sterile Supplies Chapter

## CSSD INTERMEDIATE COURSE

15 - 18 November 2022

**TO REGISTER**

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or scan QR code



### PREREQUISITE

The participants are assumed to have basic knowledge and skills on the activities and practices at the Sterile Processing Department (SPD), attended a basic CSSD course previously, AND currently working in operating theatre or SPD facility for at least two (2) years on reprocessing of instruments.

### COURSE FEE

Registration fee (Incl. of 7% Goods and Service Tax)	Early Bird (till 15 September 2022)	Regular (from 16 September 2022)
ICA(S) Member*	\$1,000	\$1,200
Non ICA(S) Member	\$1,200	\$1,500
Group registration discount From 5 pax and above	10% discount	

*\* To enjoy member rate, member must be with the society for at least 6 months at time of registration.*

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# CSSD

## INTERMEDIATE COURSE



15 - 18 November  
2022

**TO REGISTER**

**CLICK HERE**

or scan QR code



Time	Tuesday 15 November 2022	Wednesday 16 November 2022	Thursday 17 November 2022	Friday 18 November 2022	
0800	Registration				
0845	Welcome address				
0900	Design Layout Physical & Environmental Infection Prevention & Control Practices Workflow in CSSD	Sterilisation High temperature	Continuous Quality Improvement	0900 to 1100 Written Examination	
1000	Tea Break				
1030	Workplace Health and Safety, Regulation and Guidelines	Sterilisation Low Temperature	Tracking Systems and Recall Process		
1130	Review of Cleaning and Disinfection	Flexible Endoscopes Cleaning and Processing	Communication	Lunch Break	
1200	Lunch Break				
1330	Cleaning Equipment Quality Test	Flexible Endoscopes Storage and Monitoring	Teamwork Human Factors	1330 to 1430 Site Visit	
1430	Surgical Instruments Complex Instruments	Inventory Management	Discussion and Revision		
1530	Tea Break				Day Ends
1600	Surgical Instruments Loaner & Consignment Sets	Documentation & Record Keeping	Discussion and Revision		
1700	Day Ends				

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# Long Term Sustainability

- Environmental - Recycling of Disposable instruments
- Infrastructure - Hub & Spoke
- Human Resource - Automation

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Ms Goh Meh Meh, Deputy Director, Nursing, SGH approached the Environmental Services department to partner an external recycling company after noticing large amounts of biohazardous waste resulting from the disposable surgical instruments.

**(SGH recycles surgical instruments in a bid to reduce biohazardous waste. Source: Zao Bao Online, 11 Jul 2022)**

减少生物危险垃圾 中央医院回收手术工具  
每年重量料等于10辆轻型车

订户

来自 / 联合早报

文 / 王懿婷

发布 / 2022年7月11日 5:00 AM

Used products from OT, procedure room and ward areas were collected and sent to SSU for decontamination before they are collected by external contractor for recycling.

Since August 2020, the hospital has been encouraging clinical staff to recycle their disposable surgical instruments, and has recycled **600kg** of steel in March 2022.



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# Recycling of Disposable Instruments

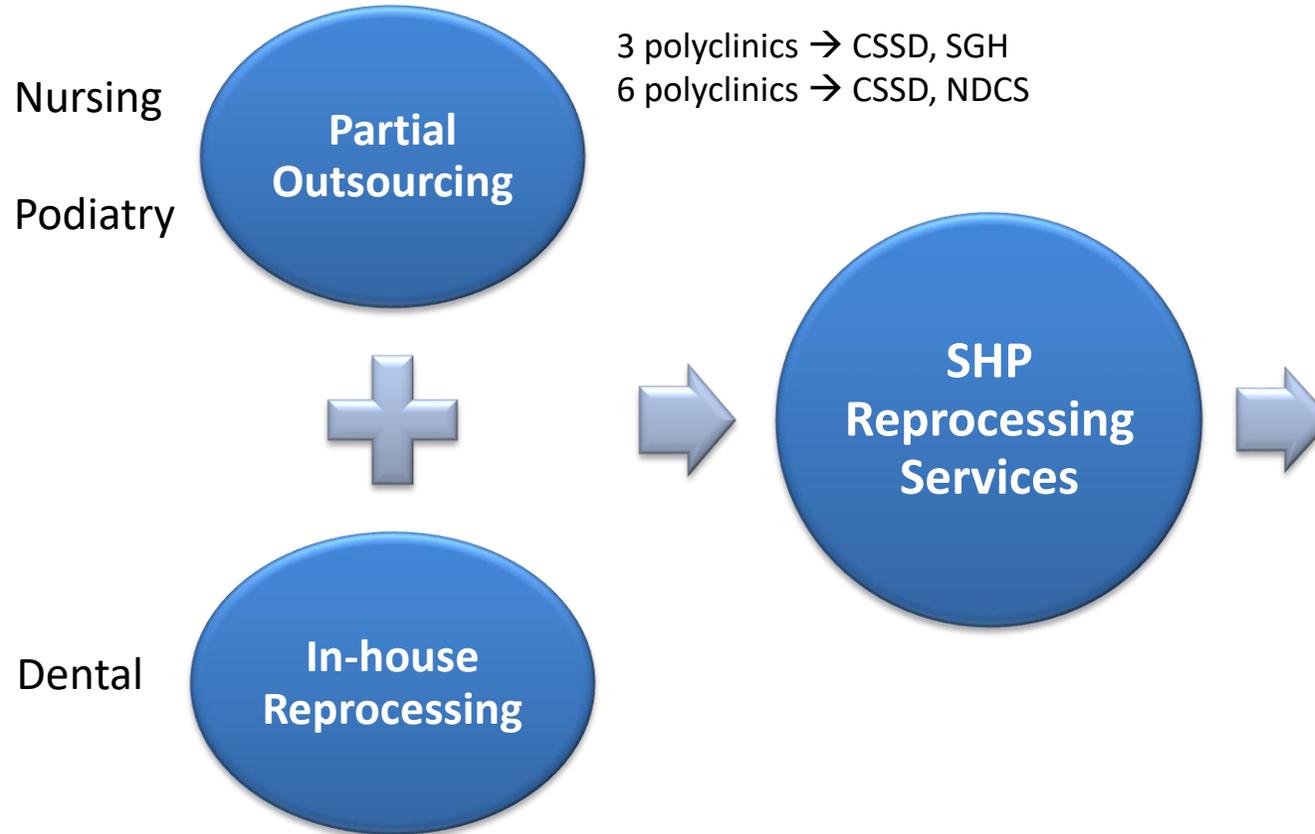


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# SHP Outsourcing Reprocessing Services (OReS) Taskforce

One of OReS' objectives is to develop a framework for the **centralization of SHP's reusable instruments reprocessing services.**

## Current Stage:

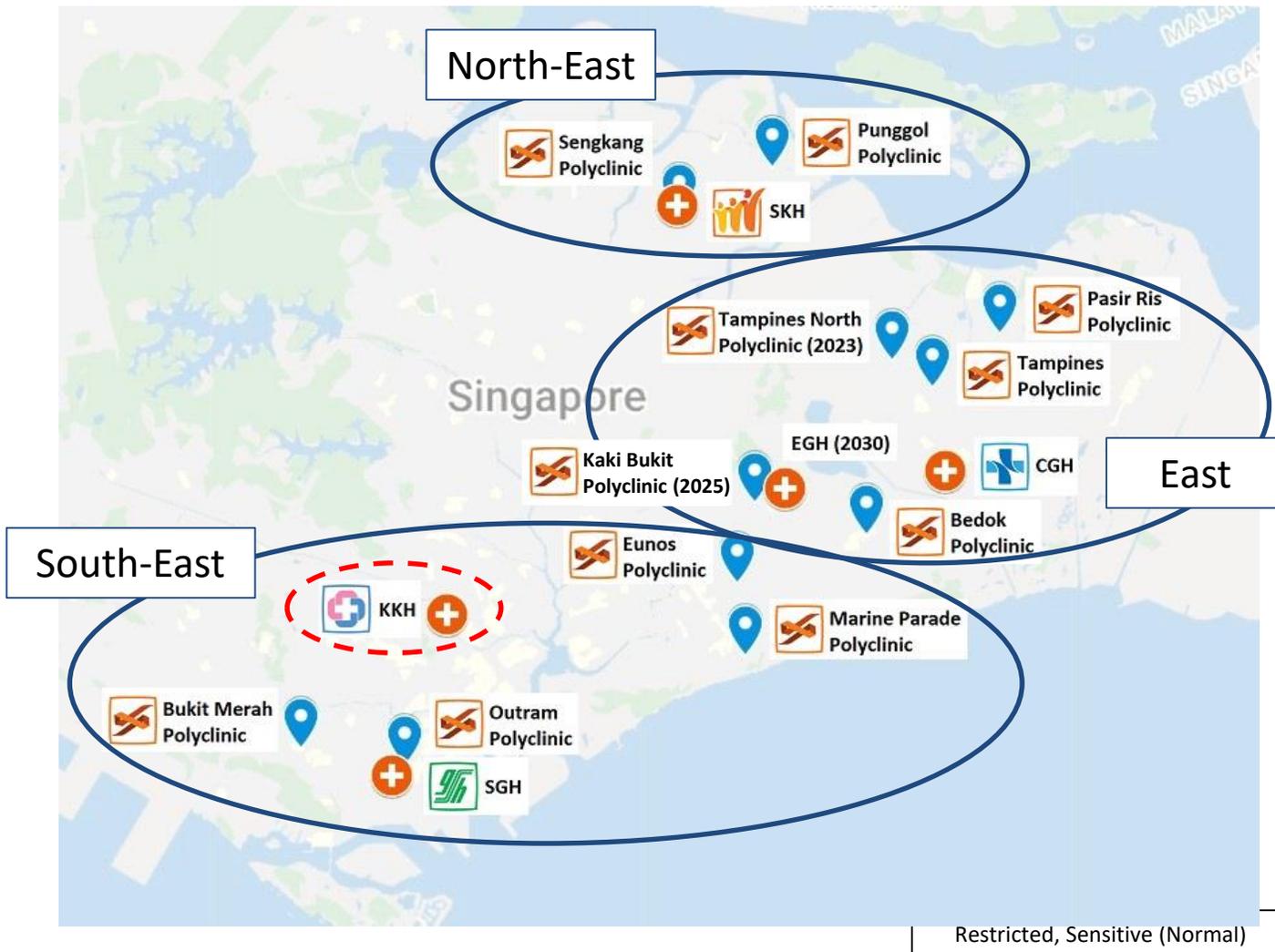


## Future Goal

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## Explorative Plan 1: Following SingHealth's long term vision to move towards S4 Model

To send out SHP reusable instruments to **different SH reprocessing sites based on physical proximity** (i.e. adopt Hub and Spoke Model)



## Explorative Plan 2: Standardised Cluster Contract

With a centralized cluster approach – to tap on a **cluster contract:**

- ✓ Standardization of costing of reusable instruments reprocessing (set & loose piece)
- ✓ Standardization of charging mechanism
- ✓ Standardization of Service Level Agreement

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# Veterans Affairs (VA) medical facilities across United States

**Improvements (Automation) was initiated due to sterilisation issues** which results in serious patient safety violations. E.g potential risk for infectious diseases like the human immunodeficiency virus (HIV) and hepatitis.

- The sterilisation issues were mainly attributed to **ineffective sterilisation of reusable medical equipment** (e.g. ear, nose, and throat endoscopes)
- **Causes for these lapses include:**
  - Inadequately trained staff; failure to develop device-specific training requirements.
  - Trained staff with potential lapses in performance.
  - Number of devices and brand types currently used across the different facilities.
  - Lack of quality control
  - Lack of effective oversight

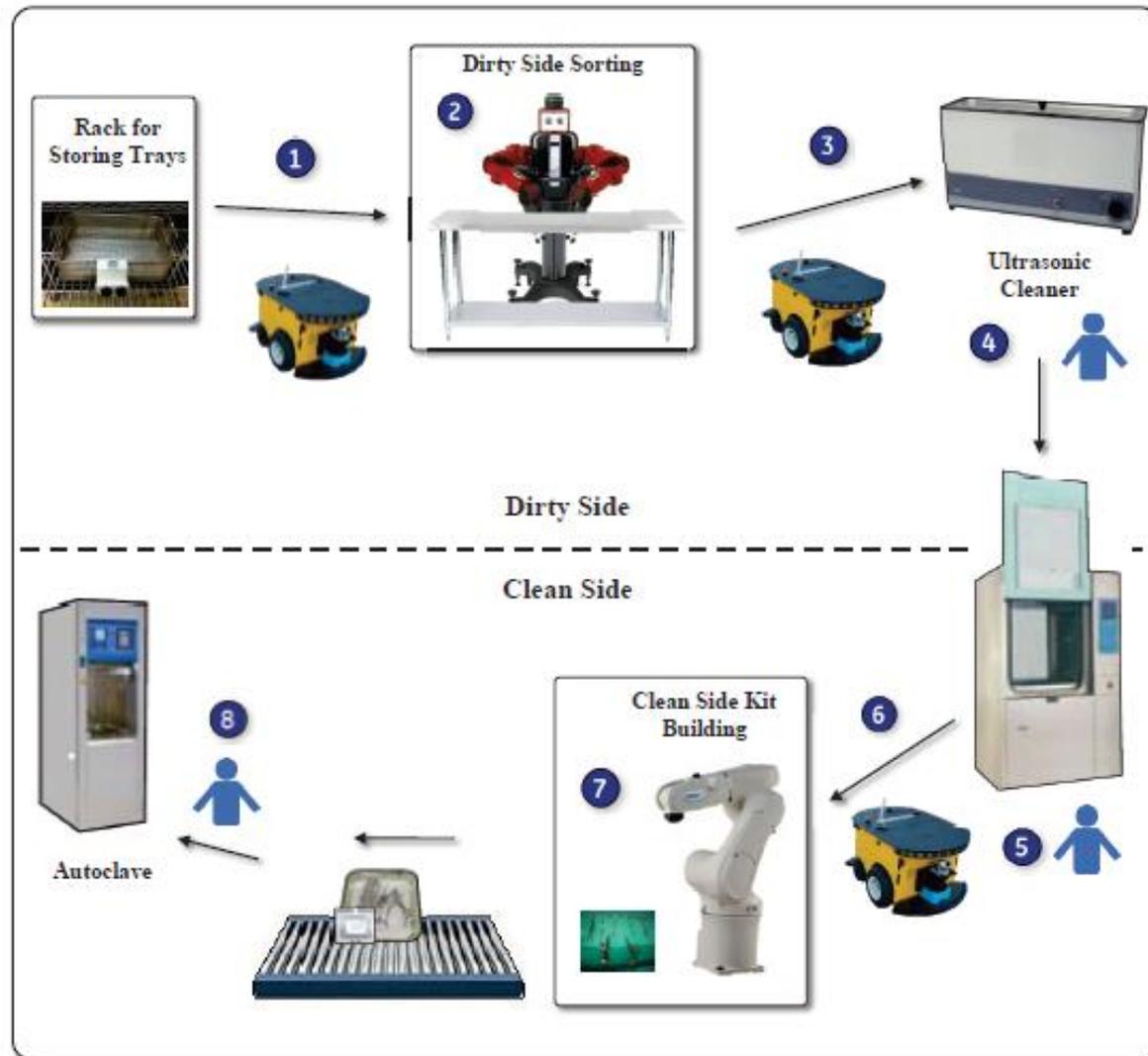
**Automating the sterilisation process will reduce the extent of human involvement in the process, reducing potential safety risks.**

*Reference: Computer Vision and Robotics in Perioperative Process Downloaded from [www.worldscientific.com](http://www.worldscientific.com) under Chapter 1 of Automating the Perioperative Process*

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# Veterans Affairs (VA) medical facilities across United States

Automated, integrated sterilisation and delivery process in VA medical facilities



Reference: *Computer Vision and Robotics in Perioperative Process*  
Downloaded from [www.worldscientific.com](http://www.worldscientific.com) under Chapter 1 of *Automating the Perioperative Process*

# Automation in Sterile Supplies Department

## Automated Loading and Unloading of Instrument Carts for Washing



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## Packaging Robot for Automated Wrapping of instrument set



# Automation in Sterile Supplies Department

## Automated Storage and Retrieval of Instrument Sets



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## Gold Finger:

Creation of a prototype to manage the identification, inspection and assembly of GES Basic Set



Sorting, inspecting, and packing of clean surgical instruments in Sterile Supplies Unit to free up nursing and instrument technician manpower for higher productivity tasks

*The prototype was completed in May 2022*

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# Completion of Gold Finger Phase 1: Big Box

## Entire Process

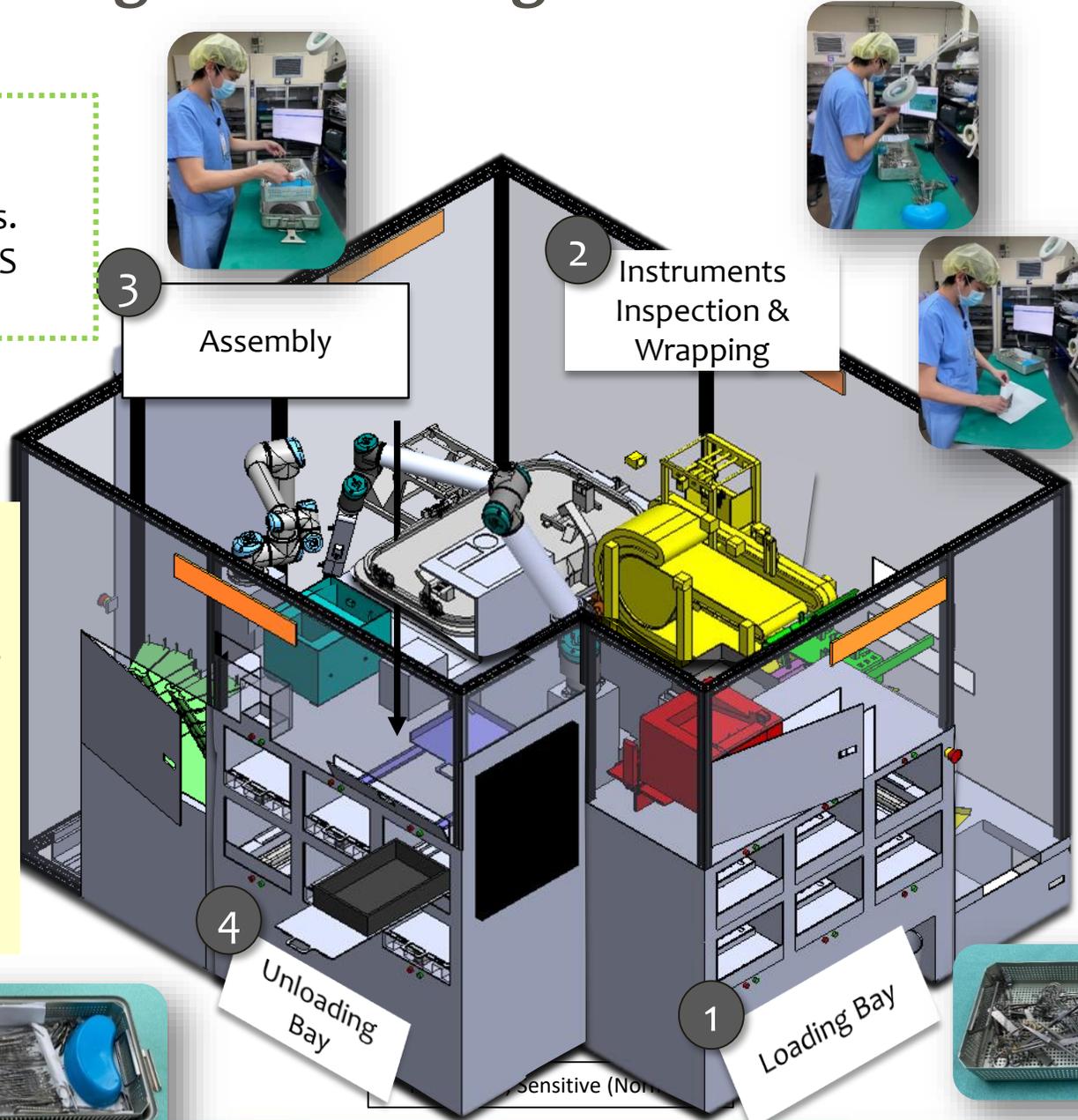
### Deliverables

- To be completed within 15mins.
- 41.5% productivity gains for GES BSS sets

## Assembly and Unloading

### Deliverables

- Full assembly of 2 wrapped packages, 2 brackets, kidney dish, gallipot, other loose instruments, printed list and indicator to the agreed format
- Auto drop of lid on the outer counter
- Auto ejection of completed tray to user side



## Instrument Inspection & Wrapping

### Deliverables

- Differentiating between ringed and non-ringed instruments
- Inspecting for surface and structure defects
- Replacing faulty instruments
- Wrapping small instruments into packages

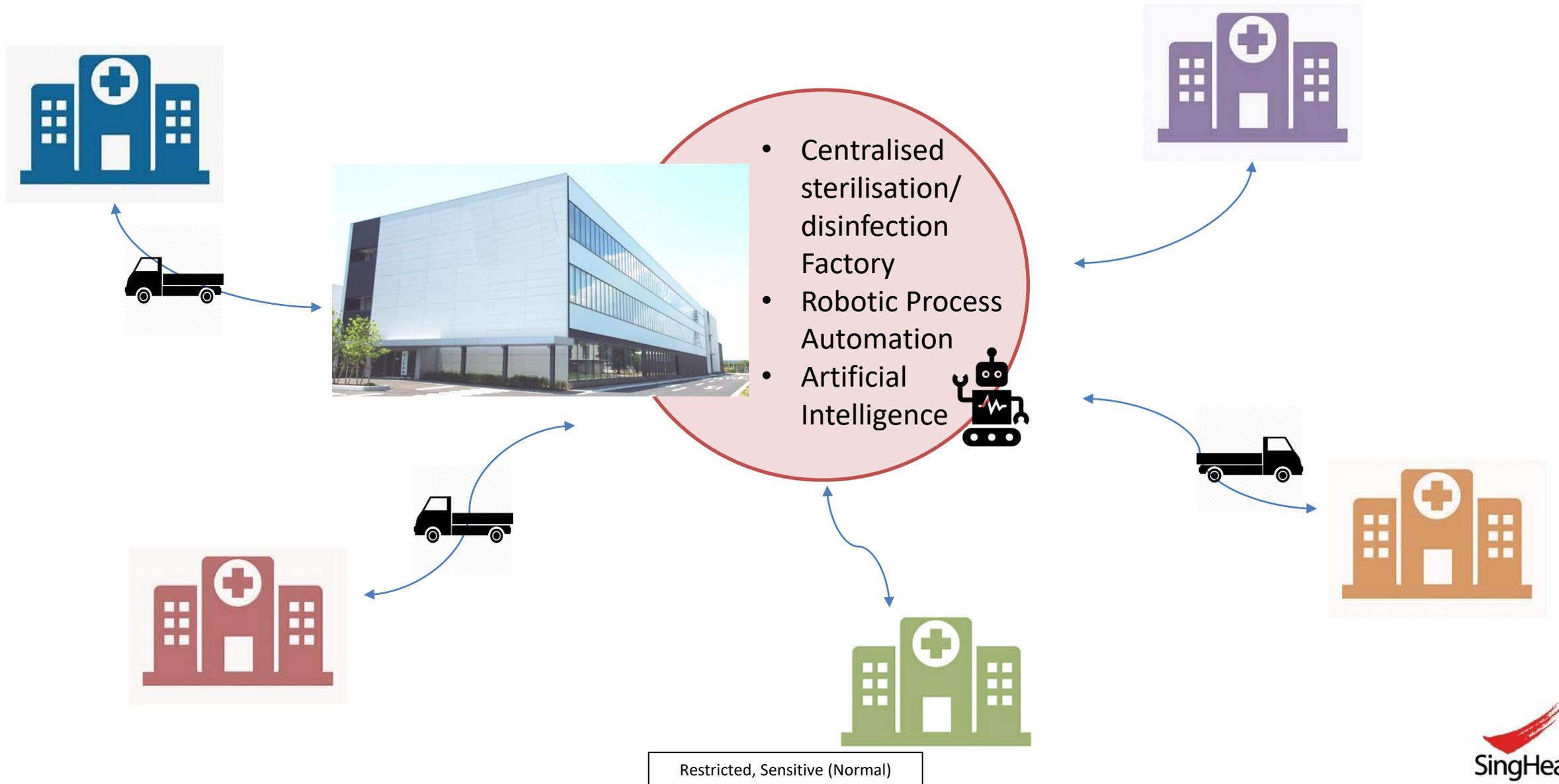
## Loading Bay

### Deliverables

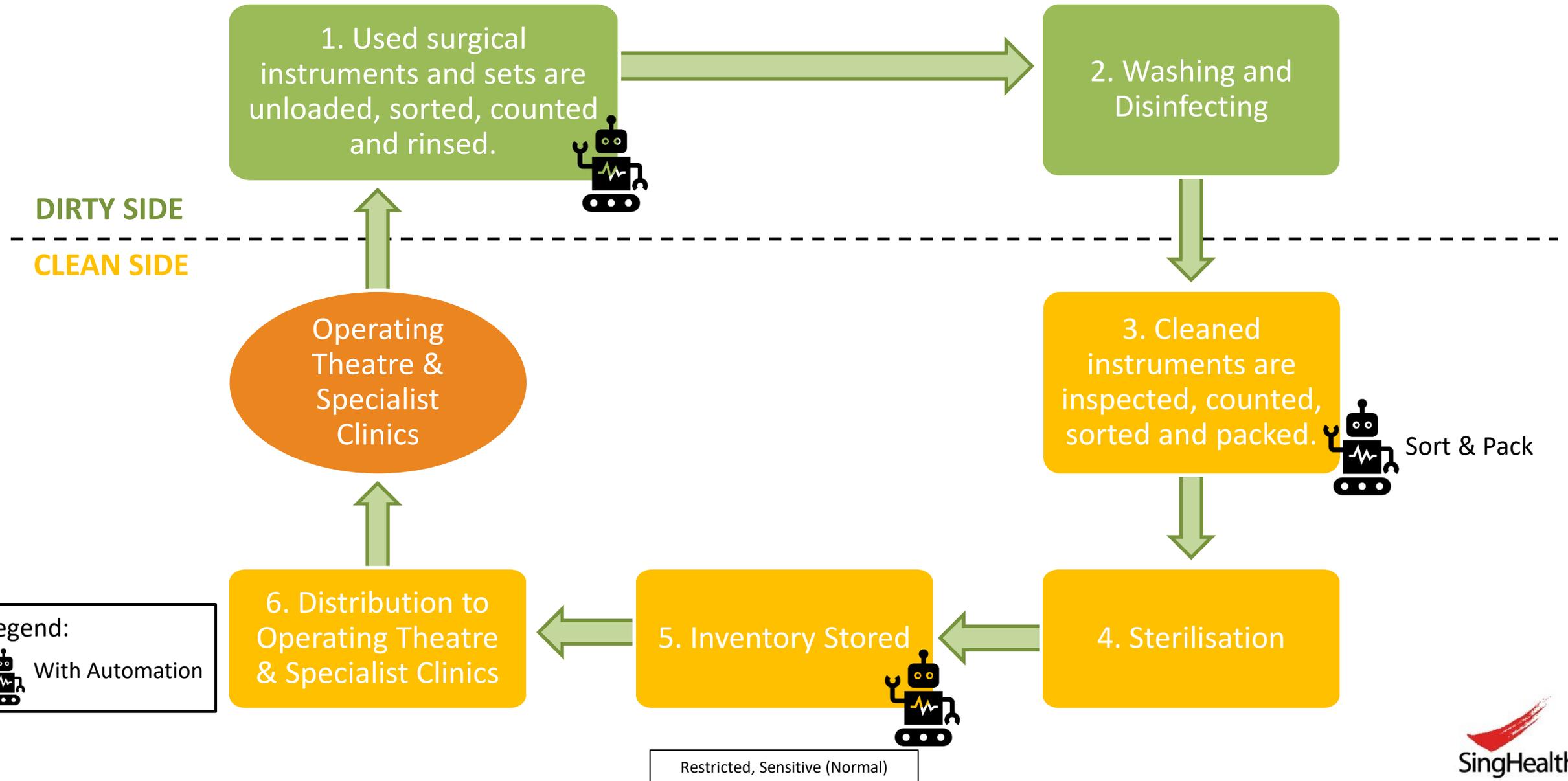
- Sensor recognition for loaded bays
- Auto ejection of tray within big box



# Long Term Vision – Towards a Sterilisation Shared Services Model



# Future Goal – Towards a Sterilisation Shared Services Model (With Automation)



# Conclusion

- Balance between patient safety and sustainability – In midst of converting reusable to disposable for sterilisation safety, we can look at effective ways to recycle medical wastes and disposables instruments
- With modernisation and changes in SSU landscape -> The need for reorganisation and harmonisation and to work towards a centralised/national based sterilisation system
- Important to develop and implement a holistic and sustainable programme in mitigating risks and improving health and safety to deliver continual improvement.

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*THANK YOU*

# Q&A