Project Title

Implementation of Post Discharge Decontamination Process Using Germicidal Ultraviolet – C (UVC) Light

Project Lead and Members

Project lead: Samantha Lai Yu Shan

Project members:

- Dr Ling Moi Lin, Director, Infection Prevention and Epidemiology, SGH
- Lam Keung Hung David, Assistant Director, Biological Safety, SGH
- Tan Kwee Yuen, Senior Nurse Clinician, Infection Prevention and Epidemiology, SGH
- Samantha Lai Yu Shan, Senior Operations Executive, Environmental Services, SGH
- Celine Lim, Operations Executive, Environmental Services, SGH
- Yamin Yuper Zin, Senior Assistant Manager, ISS
- Sally Poh, Assistant Contract Manager, ISS

Organisation(s) Involved

Singapore General Hospital; ISS Facility Services Pte Ltd

Aims

To make use of Germicidal Ultraviolet-C (UVC) as a secondary disinfection to enhance the environmental hygiene..

Background

See attached

Methods

See attached

Results

See attached

Lessons Learnt

As UVC disinfection process is a newly implemented cleaning operations procedure, below are problems encountered and resolved during trial period:

- Familiarization of operating the machine. Staff underwent training to learn the standard operating procedure. Competency test and practical assessment will be given to ensure trained staff adhere according to protocol.
- Proper handling of machine. UVC light lamp is fragile and may easily crack, therefore, staff operating the machine must be cautious when transporting machines from one area to another. Staff are briefed to check for defects and send the machine for servicing according to schedule.

Conclusion

See attached

Additional Information

Every healthcare professionals throughout the world are challenged to implement effective infection prevention programs. Environmental surfaces play an important role in transmission as the most common way of getting infected is by touching things in public. Manual post discharged cleaning may less be effective. Therefore, we must look out for ways to reduce acquiring risk of HAIs which poses threat to patient's safety and recovery.

Project Category

Automation, IT & Robotics, Safe Care

Keywords

Automation, IT & Robotics, Automation, IT & Robotics, Safe Care, Infection Control, Healthcare Associated Infections, Environmental Hygiene, Improvement Tool, Lean Six Sigma, Singapore General Hospital, ISS Facility Services Pte Ltd, Germicidal Ultra Violet-C, UVC Exposure, Photovoltaics Sticker Test, Touch Points, Bioburden

Name and Email of Project Contact Person(s)

Name: Samantha Lai Yu Shan

Email: samantha.lai.y.s@sgh.com.sg

Implementation of Post Discharge Decontamination Process Using Germicidal Ultraviolet – C (UVC) Light

Dr Ling Moi Lin, Tan Kwee Yuen, Infection Prevention & Control Department
Lam Keung Hung David, Safety Network Department,
Samantha Lai, Celine Lim Environmental Services Department ,
Yamin Yuper Zin, Sally Poh, ISS Facility Services Pte Ltd,

Singapore General Hospital
SingHealth

INTRODUCTION

Healthcare Associated Infections (HAIs) is a major challenge to healthcare professionals. Protocols with appropriate cleaning chemicals and technology still poses limitations such as:

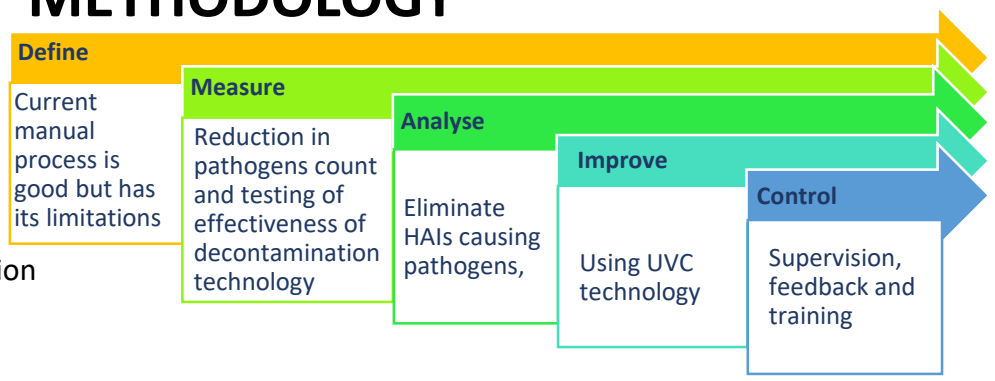
- Limitation of surface disinfectants due to long chemical contact time
- Numerous cleaning steps might result in areas missed out during cleaning

Therefore, Germicidal Ultra Violet-C (UVC) is used to improve disinfection of environmental surfaces and enhance environmental hygiene.

AIM

- Enhance environmental hygiene standard to provide a safer and clean environment for patient and healthcare workers
- To decrease the risk of acquiring Healthcare Associated Infections (HAIs)
- To improve patient's safety and recovery

METHODOLOGY



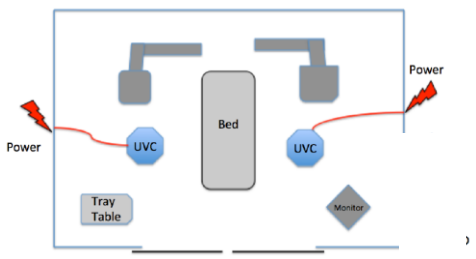
CHARACTERISTICS OF UVC

- Fast and relative short exposure time required to achieve 4-log disinfection
- Green technology , uses no chemicals

UV-C PROCESS

1. Perform general cleaning
- Performed by housekeeper

2. Stage the room
- Remove linens
- Open all drawers and interior doors
- Prop up mattress and bins



3. Placement of UVC machines
- Position the UVC machines in the room

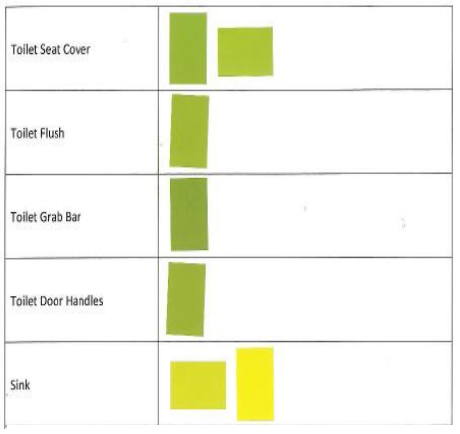
4. Exit the room and start decontamination process
- Position portable screen at glass doors
- Turn on UVC machines using remote control

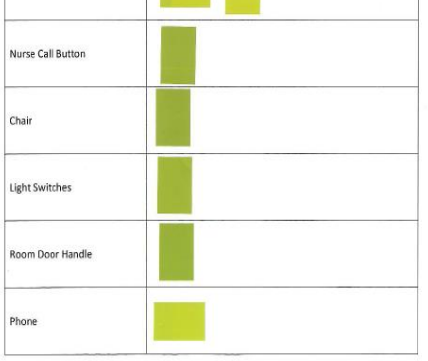
5. UVC meter
- Ensure UVC rays do not penetrate through the glass room doors

6. Decontamination completes
- Push out UVC machines
- Restore back to original state

RESULTS

Photovoltaics stickers test was place on 14 high touch points to test the effectiveness of UVC exposure

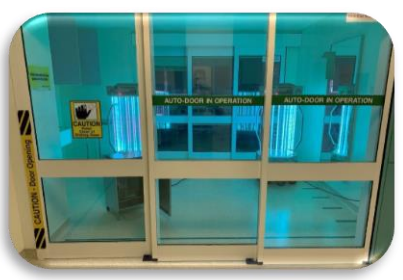




Colour of the stickers had change from yellow to green for 13 of the high touch points. This indicated that the UVC can achieve up to log 4 reduction in bioburden. With the exception of the photovoltaic sticker placed behind the sink where UV light could not penetrate through. This was due to the limitation where light wave are blocked by objects, areas can't be reached by the light was observed to have a reduction in UV exposure.

CONCLUSION

We had learnt that to optimize the efficacy of the UVC machine strategic placement of the Machine is important



The UVC Machine have proven to be effective in reducing bioburden up to log 4 from the photovoltaics stickers testing. This in turns translate to an increase in environmental hygiene which helps to improve patient's safety. Current study can be improved and further verified in future studies with the use of swab and cultures test to determine if there are a reduction of pathogens post UVC treatment.