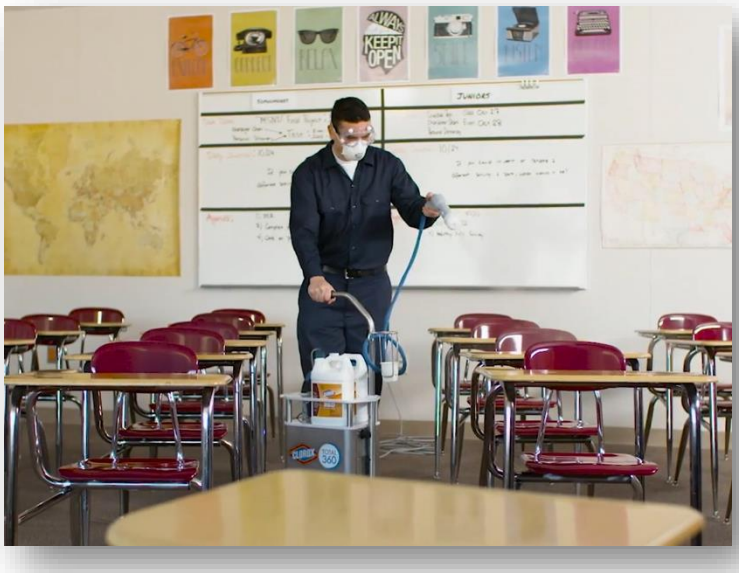
Clorox Total 360® System

Disinfecting Solution for All Sectors



March 2021

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EXECUTIVE SUMMARY

Now more than ever, disinfecting surfaces has become a Global priority and focus. With the recent COVID 19 Pandemic moving throughout the world at a rapid pace. Our facilities are complex environments where people work, learn, live and receive medical care contamination of surfaces with harmful microorganisms. Traditional manual cleaning and disinfecting methods and tools face challenges with surface design, time and financial restraints. As viruses and diseases adapt and change rapidly, Environmental Services needs to look at new technologies to help support infection control.

BACKGROUND

Current State Challenges

- Current practice uses traditional methods to manually clean and disinfect surfaces, often a two-step procedure
- Requirement to supplement staffing levels to meet increased service
- EVS resources are being stretched with increased demand in service
- Enhanced cleaning increases chemicals, PPE and cleaning equipment cost
- Higher level of disinfection being required at our non health care facilities
- Non health care facilities have large footprint of space to clean and disinfect with less resources

Desired Outcome

- Technology and chemistry that will support our EVS teams perform disinfecting procedures efficiently, effectively and with a high level of infection control
- Integrate a system that disinfects surfaces into regular routines without adding extra FTE
- Mitigate an increase in chemical cost and disposal of chemical in to drainage system
- Achieve a higher level of surface coverage on items being disinfected

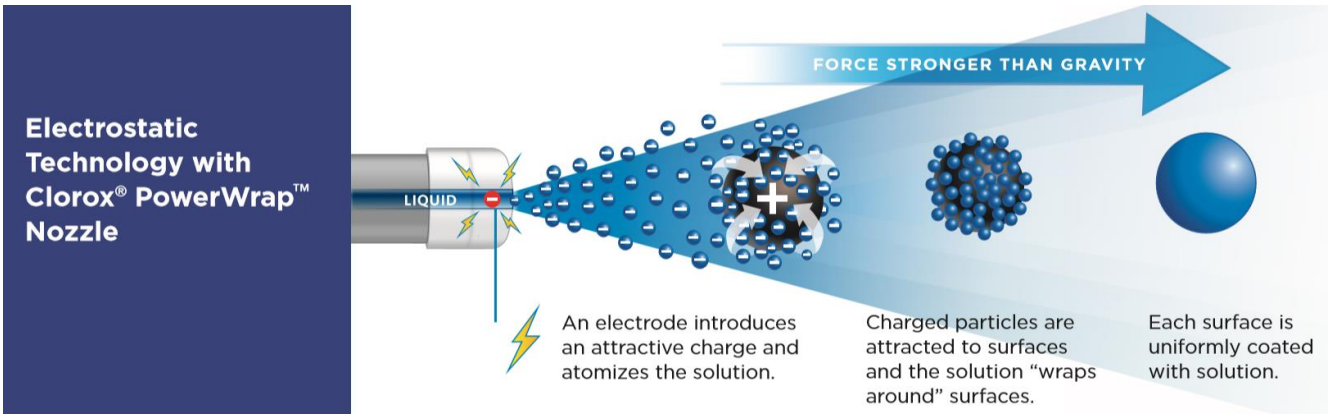
Resources Required

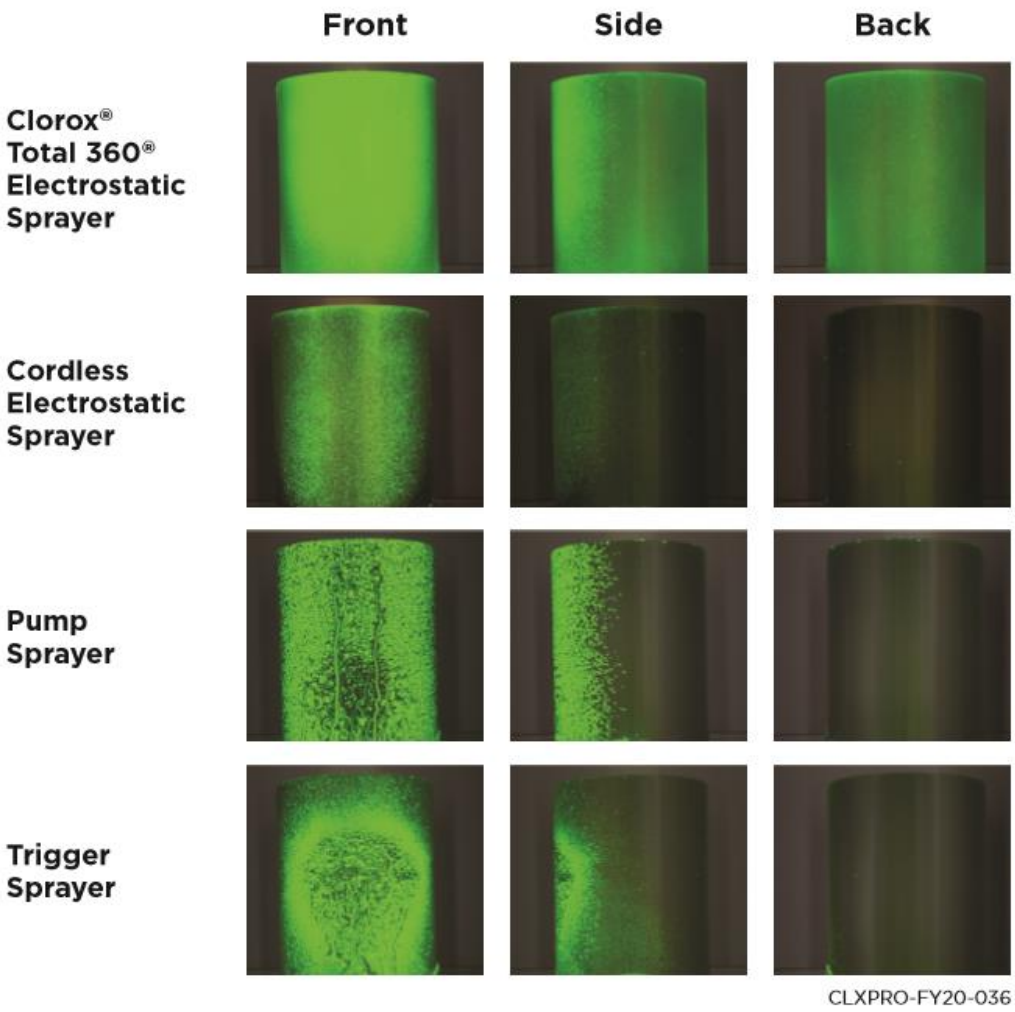
1) Purchase of a Clorox Total 360 (T360) system and chemistry
2) Trainer to train associated to operate the system
3) COE Standards, SOP and Training

The Technology and Chemistry

The Clorox® Total 360® System pairs an electrostatic sprayer with Clorox Healthcare® Spore Defense™ Cleaner Disinfectant that kills C. difficile in 5 minutes in addition to 42 other microorganisms in just 1 minute to ensure all surfaces — even those hard-to-reach, difficult-to-clean areas — are properly treated. The superior coverage helps keep facilities healthier, while also saving time and money.

https://www.youtube.com/watch?v=v8XruARQVko
https://www.youtube.com/watch?v=9CYbULSlzws
https://www.youtube.com/watch?v=5uK56pZnkiI





Clorox Total 360® system uses a patented PowerWrap™ nozzle providing wraparound technology delivers uniform disinfecting to all sides.

The dynamic air compressor enables fast, efficient delivery of charged particles to targeted surfaces. Disinfect up to 18 000 sq.ft. / Per hour.

The corded system ensures safe grounding and consistent electrostatic output. No variance in performance due to operator handling or battery life.

Clorox Healthcare® Spore Defense™ launched in April 2020. This addition to the Clorox 360® program now provides use of the system in hospital facilities that do not use Quaternary Disinfectants.

Clorox Healthcare® combined a very low-level of bleach with an optimized mix of ingredients to create Spore Defense™. The new sporicidal chemistry has been designed with low-bleach levels to enable safe and effective use in spraying application with the Clorox® Total 360® Electrostatic Sprayer. Minimal bleach level also reduces odor and increases compatibility.

	Other Bleach Disinfectants	Clorox Healthcare® Spore Defense™
Bleach levels	High	Low 0.25% sodium hypochlorite
Other ingredients	Required to for odour and compatibility	Minimal – simple and safe formula
Results: Efficacy	Often kills *C. diff* and other pathogens	Kills *C. diff* and other pathogens
Compatibility	Varies	Very good
Odour	High; fragrances vary	Very low
Safety	Varies – PPE often required	Safe to use through Clorox Total 360 System without PPE

PILOT AND 3RD PARTY TESTING

Desired outcome of pilot:

- Determine if the Clorox Total 360® (T360) system could be incorporated into our daily routines
- Time in Motion study – mechanical vs manual application of disinfectant
- Accuracy of application and coverage of disinfectant
- Awareness of potential cost saving or reallocation of resources and chemistry

Pilot methodology:

- 2 Clorox Total 360® systems per facility, piloted at:
  - Acute Care - St Paul's Hospital
  - Long Term Care – Holy Family Hospital
- Systems were incorporated into existing routines, no additional FTE's were added
- The T360 system did not nor was intended to replace the daily manual cleaning process and was used as an additional application of disinfection
- Daily reporting of usage of systems
- Data was tracked and analyzed
- Health Authority communication to stakeholders
- Onsite training for Crothall Management Team and Associates
- KPI testing performed by pilot partners
- Scheduled weekly check in meeting
- Final report and presentation after pilot conclusion

Procedure and policy:

- Communication strategy to stakeholders
- Use current staffing model without the addition of FTE's
- All Management Team and associates operating the system:
  - participate in training sessions
  - documented training using the Clorox Total 360® Training Checklist
- Follow standard operating procedures for the Clorox Total 360® system and chemistry
- Follow donning and doffing PPE as per system/chemistry and facility requirements
- Utilize in/on, but not limited to proposed areas

Proposed area(s) of usage:

T360 usage in an Acute Care setting		
Areas	High-Risk Utilization	Low-Risk Utilization
Patient Equipment: wheelchairs, commodes, shared equipment, etc.	After patient use	Daily
Public Spaces: bathrooms, elevators, waiting rooms, corridors, stairwells	Daily	Daily/Bi-weekly
Physical Therapy Areas: Ambulatory, Rehab	Daily	Bi-weekly/weekly
Patient Care Areas: DI, Endoscopy, Cardiology, Units in outbreak, OR (potential add-on)	After patient use	Daily
Patient Rooms: Discharge Cleans, c.diff, Non-isolation rooms*	Daily/Upon Discharge	Daily
Misc: Office Spaces, Auditoriums, Meeting rooms, WOWs	Daily	Daily/Bi-weekly/Weekly

T360 usage in a Long Term Care setting		
Areas	High-Risk Utilization	Low-Risk Utilization
Equipment: Wheelchairs, Commodes, Physical Therapy Equipment, etc.	After patient use	Daily/Bi-weekly
Resident Areas: Bathrooms, Shower Rooms, Physical Therapy Spaces	Daily	Daily/Bi-weekly
Misc: Corridors, Elevators, Outbreak	After patient use	Daily/Bi-Weekly
Resident Rooms: Resident room upon request*, c.diff or discharge	Dependent	Dependent

Scope change during pilot:

- Holy Family and St Paul's Hospitals both had units that were placed on Covid 19 outbreak right before the pilot start date
- As per Health Authority the T360 pilot was not to be utilized on any of these outbreak units
- On January 21, 2021 we received formal notification the T360 pilot could proceed on Covid 19 outbreak units expanding the usage of the system at both facilities

Pilot timeline:

- Start of Trial: January 11, 2021
- End of Trial: February 5, 2021

Key Performance Indicators (KPI):

1. Efficacy: Spore Defense tested by Health Canada, peer reviewed in CJIC & AJIC, RODAC sampling study completed at St Paul's Hospital

2. Chemicals:
    a. Reduction in chemical use
    b. Reduction of unused chemical solution discarded down drain

3. Technical KPI's to be evaluated during pilot:
    a. Application Time: T360 compared to current application process.
    b. Surface Coverage: T360 Demo Glow Solution vs manual disinfection
    c. Disinfection Time: Spore Defense compared to Current Disinfection Time

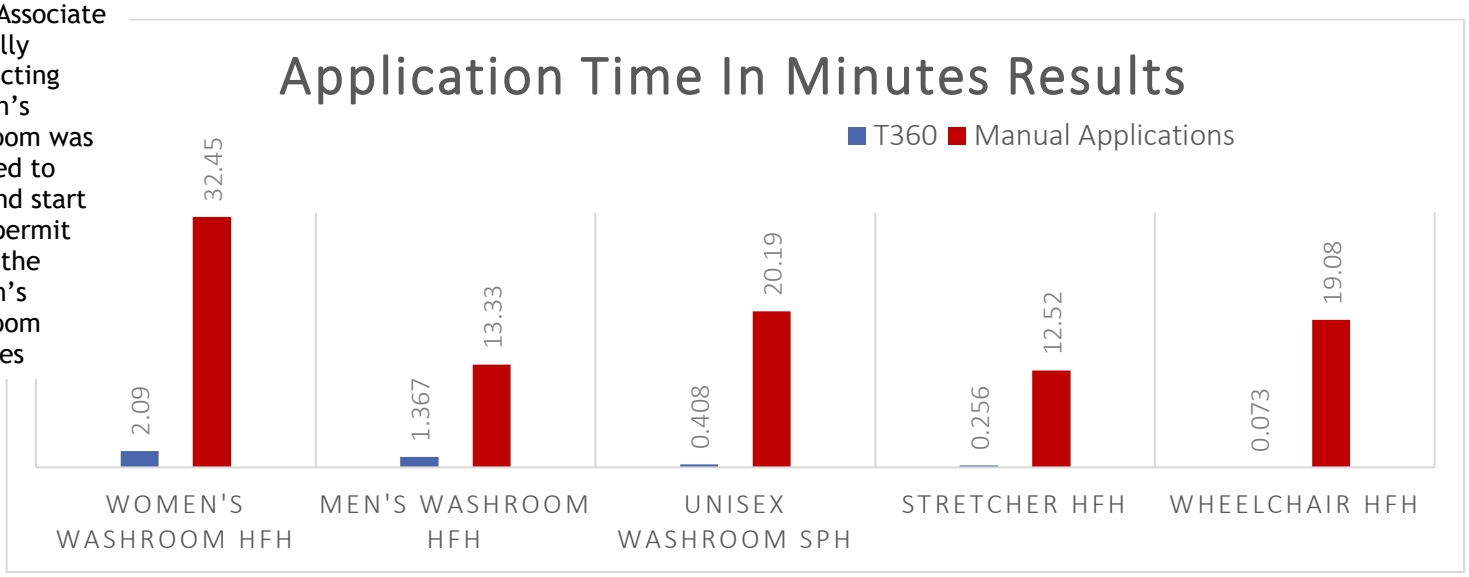
Technical KPI Methodology – Application Time:

T360 compared to current manual application process

- T360 system was used to apply a UV solution to a:
    - Stretcher
    - Wheelchair
    - Washrooms – 3 washrooms in total
- The application was timed and documented
- The process was completed using the same methodology for a wheelchair and washrooms
- Crothall associate(s) were requested to disinfect the same stretcher, wheelchair and washrooms
- The associate had no prior knowledge nor were they provided information why they were performing the requested task
- Participants in the KPI testing were not present as the associate performed the task to keep the testing blind
- The associate was timed from start to finish for each item/room

Application Time in Minutes

Note: Associate manually disinfecting Women's washroom was required to stop and start 4X to permit use of the women's washroom facilities

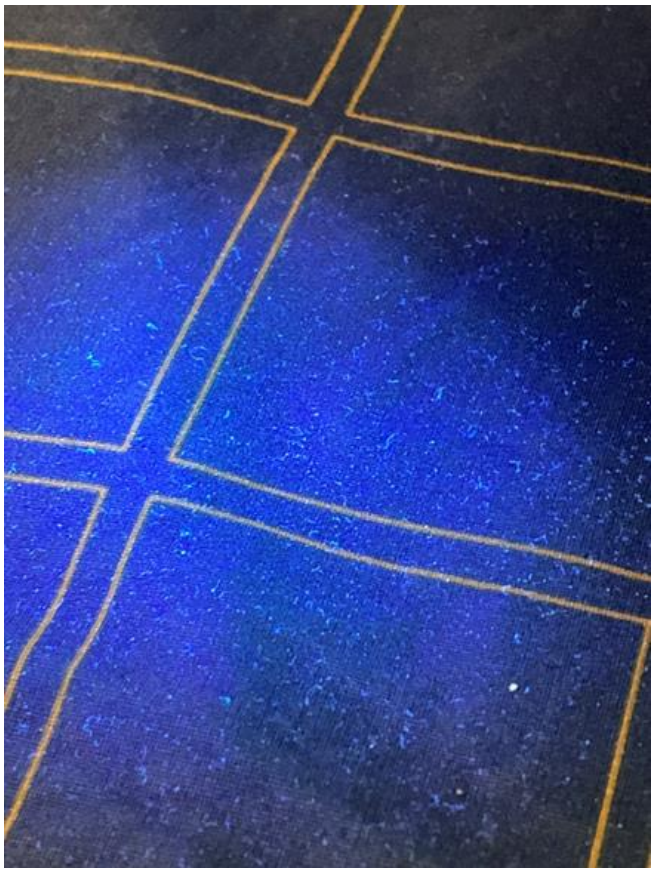


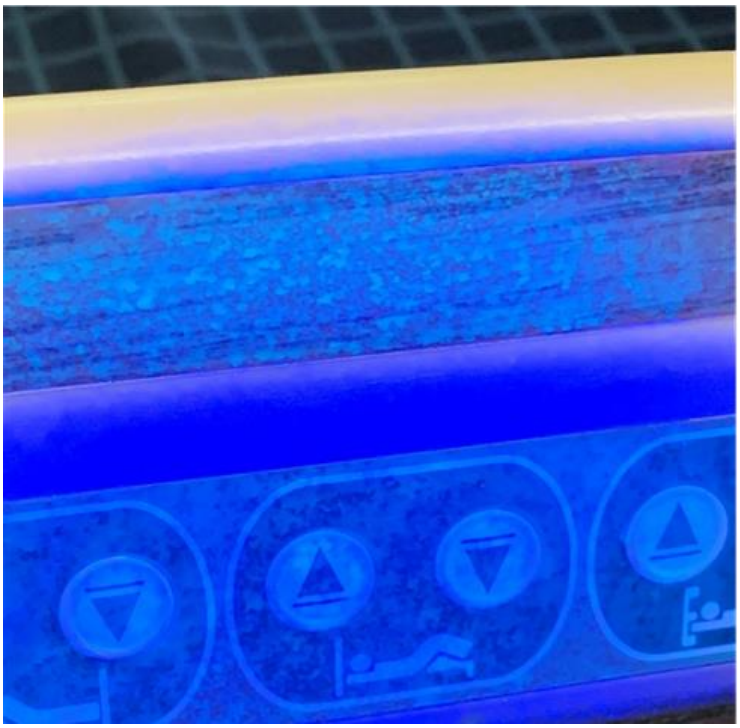
Technical KPI Methodology – Surface Coverage:

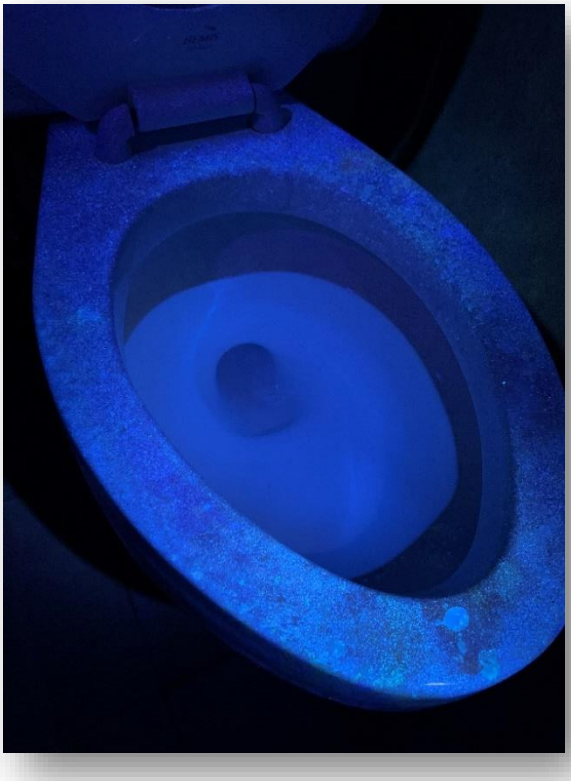
T360 compared to current manual application process
Note: Surface Coverage KPI performed at the same time as the Application time KPI test

1. T360 system was used to apply a UV solution to a:
    a. Stretcher
    b. Wheelchair
    c. Washrooms – 3 washrooms in total
2. The process was completed using the same methodology for a wheelchair and washrooms
3. Using a black light, verification of coverage was confirmed and documented
4. Crothall associate(s) was requested to disinfect the same stretcher, wheelchair and washrooms after the UV solution was applied
5. The associate had no prior knowledge nor were they provided information why they were performing the requested task
6. Participants in the KPI testing were not present as the associate performed the task to keep the testing blind
7. After associate completed the request, a black light was used to verify the removal of the UV solution indicating where the associate used a cloth to wipe the element simulating the disinfecting process, for example all contact points
8. Note: while disinfecting a washroom the associate had to stop 4 times to permit someone to use the facilities

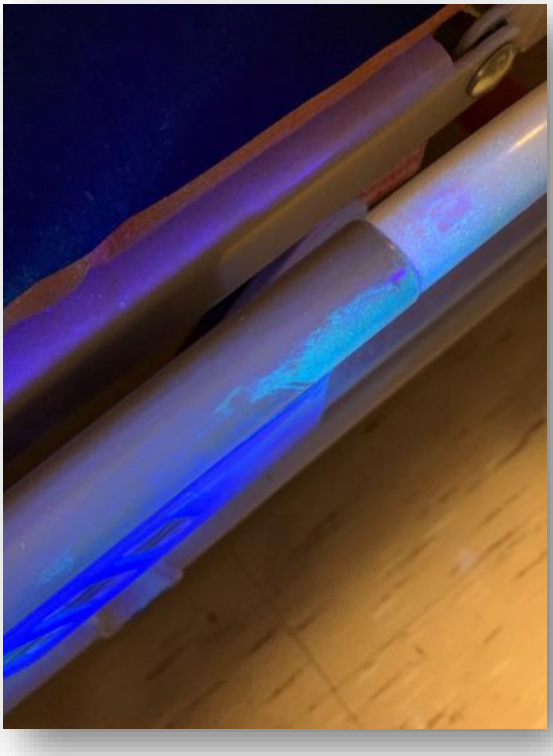
Photos showing surface coverage of disinfectant using T360 (disinfection is shown by the presence of the UV solution on the surface)

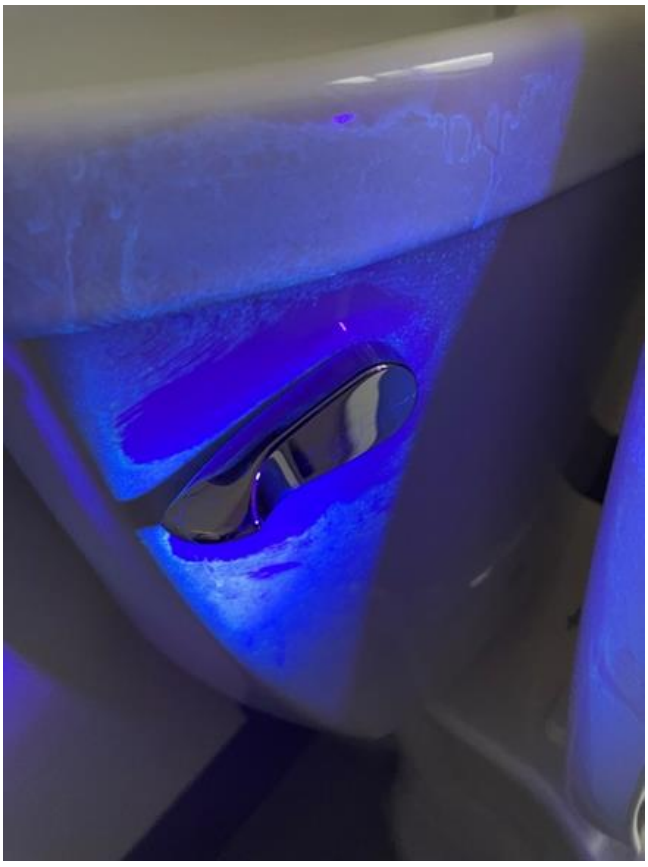




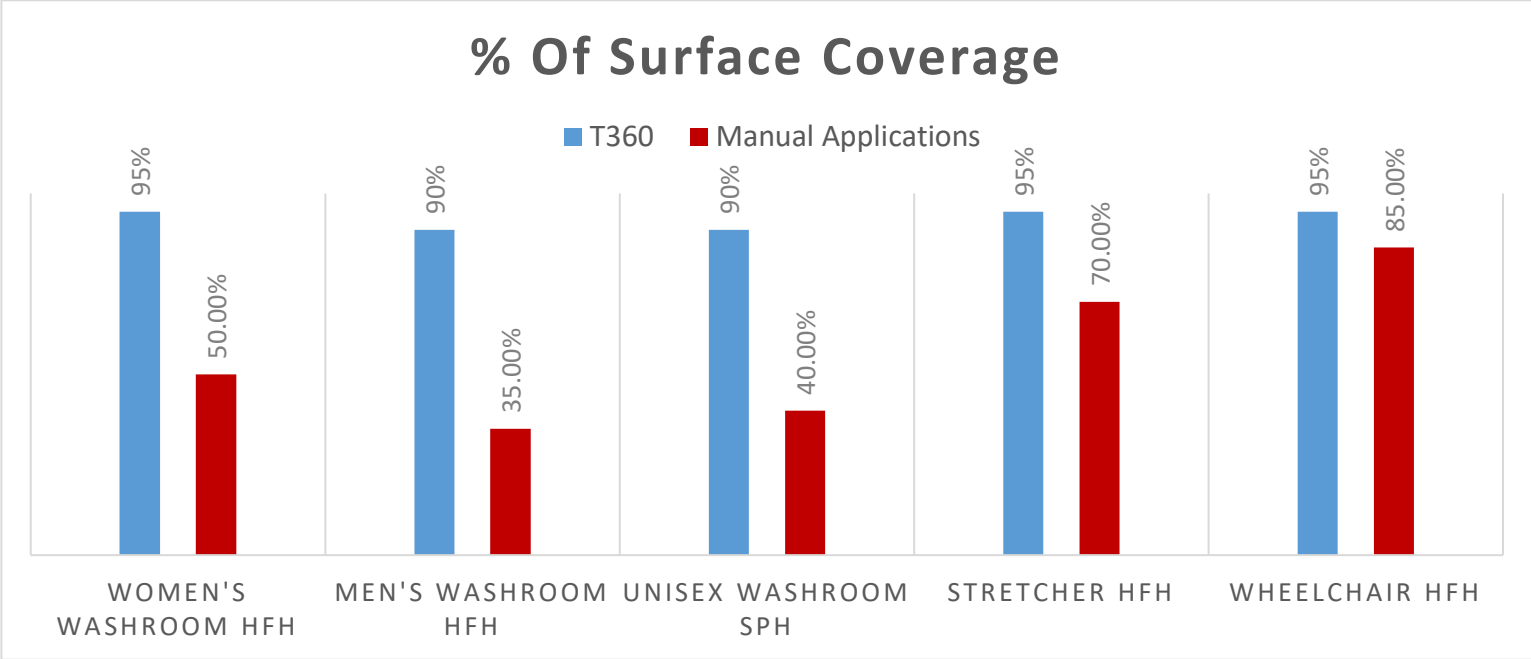


Photos showing manual disinfection (disinfection shown by the removal of the UV solution on the surface)



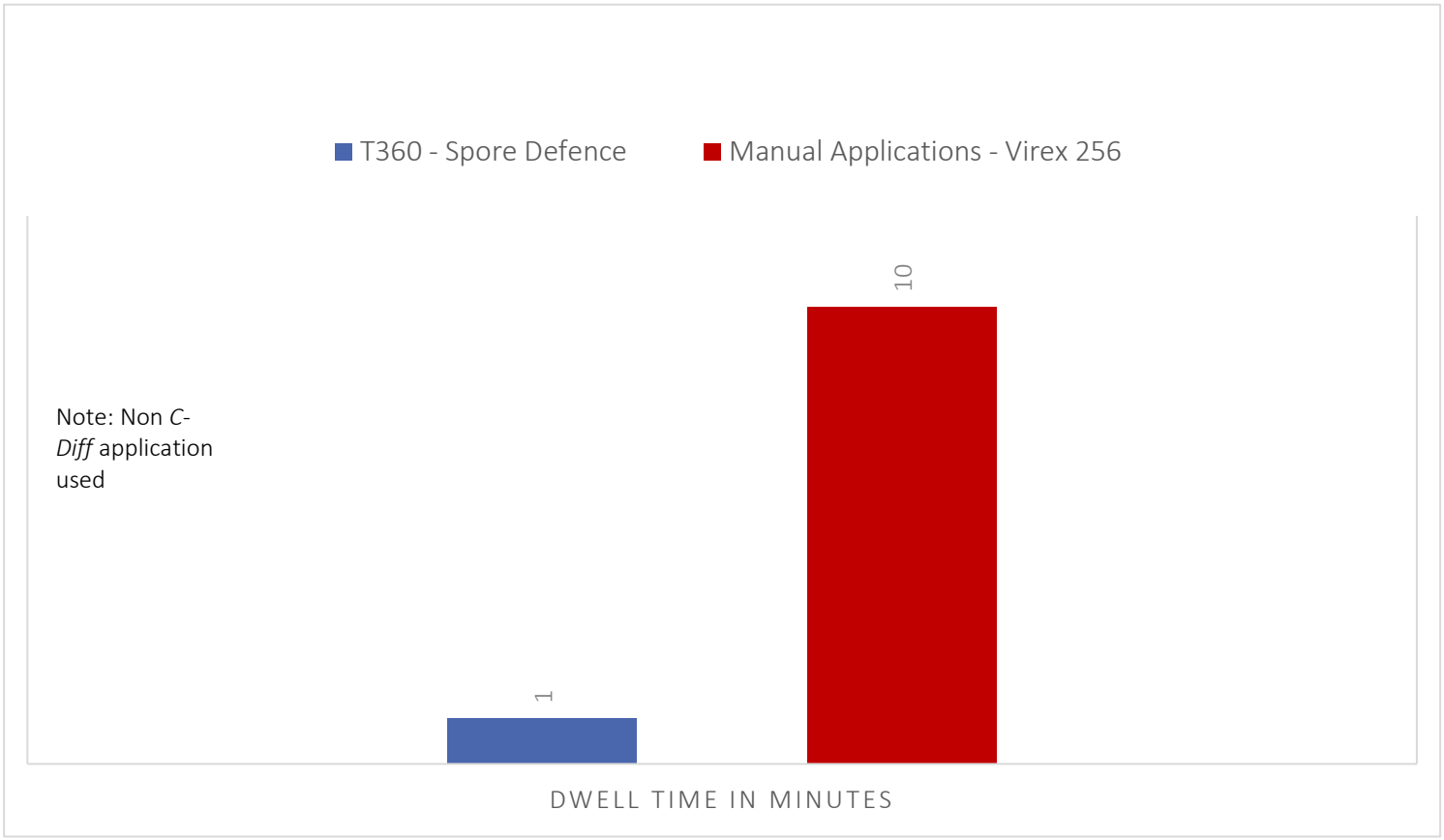


Percentage of Surface Coverage

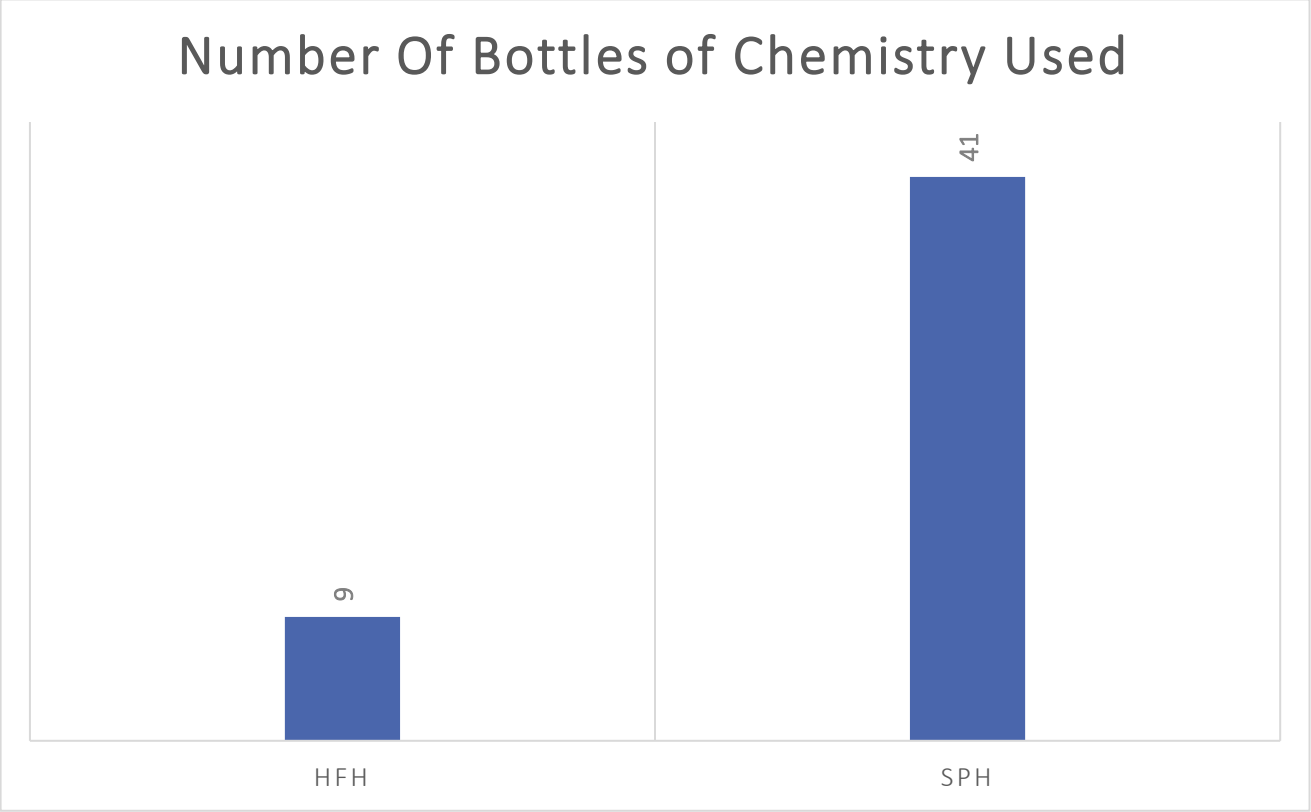


Technical KPI Methodology – Dwell Time:

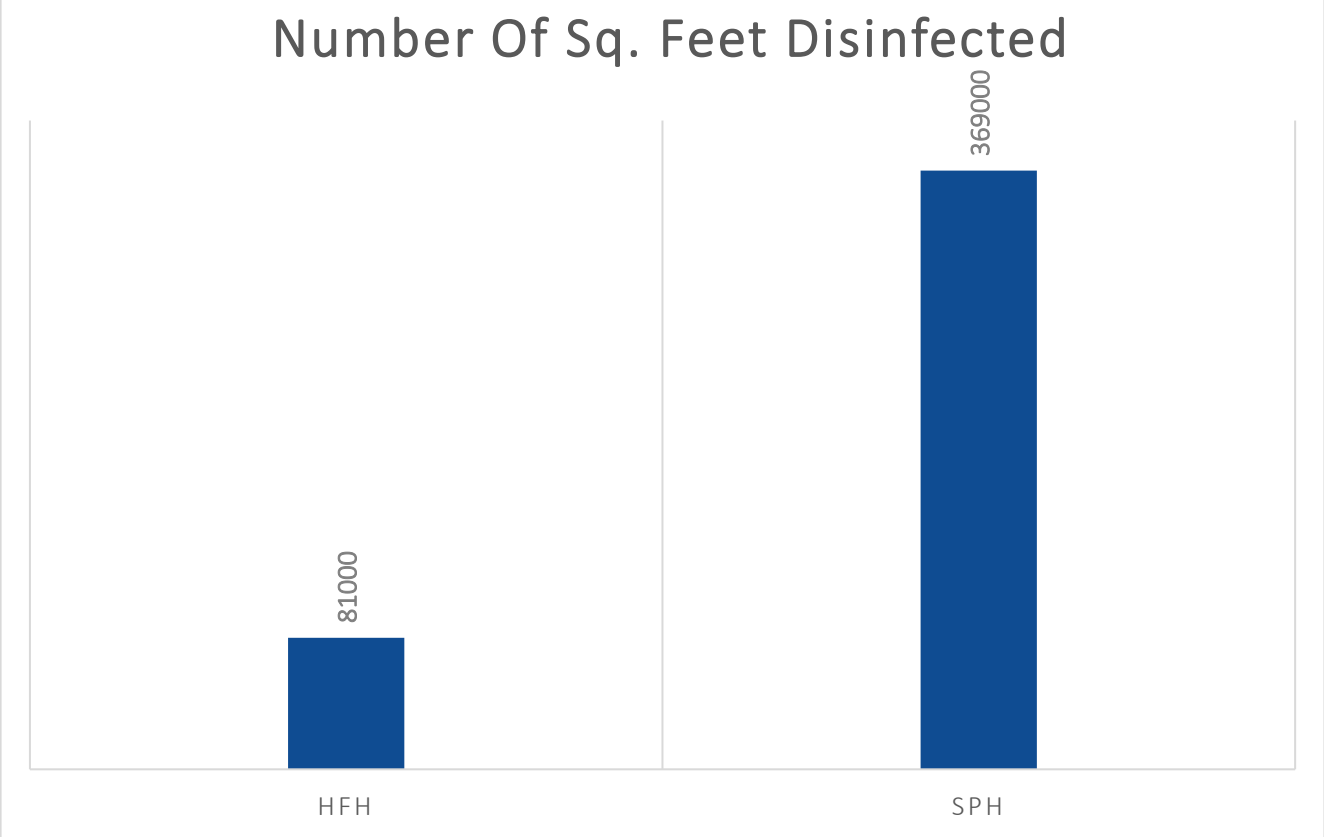
Dwell time was observed and documented for both T360 application and Manual disinfection



Volume of Chemistry Used and total Square Feet Disinfected with T360



Number of Square Feet Disinfected



Chemistry

- During the pilot there was zero Spore Defense chemistry wastage
    - Ready to use out of bottle eliminating pre mixing of chemistry and wastage of unused chemistry
    - Zero Spore Defense chemistry discarded in the drainage system

- It was determined that exact chemistry cost saving could not be calculated during the pilot

- Other factors that may lead to reduce cost related to chemistry are:
    - Microfiber cloths were not required for disinfection
    - Possible reduced laundry cost
    - Possible reduced cost replacing cloths
    - Potential to reduce the quantity of RTU wipes when using the T360 system
    - Possible reduction in the quantity of RTU wipes discarded in landfill
    - Effective use of productive time – reduce time refilling buckets

T360 Utilization during Pilot

Holy Family Hospital

•Resident rooms

•Resident, staff and public washrooms

•Conference Room

•Patient equipment (Solarium)

•Wheelchairs

•Large Staff Lounge (3rd Floor – tables, chairs and contact points)

•Tub/shower rooms

•Soiled utility rooms

•Clean utility rooms

•Cafeteria seating

•Nurses station

•Elevators

•Staff locker rooms

•Resident dining room

•Contact points hallways

•Physio rooms and equipment

St Paul's Hospital

•Patient Rooms floors 3-10

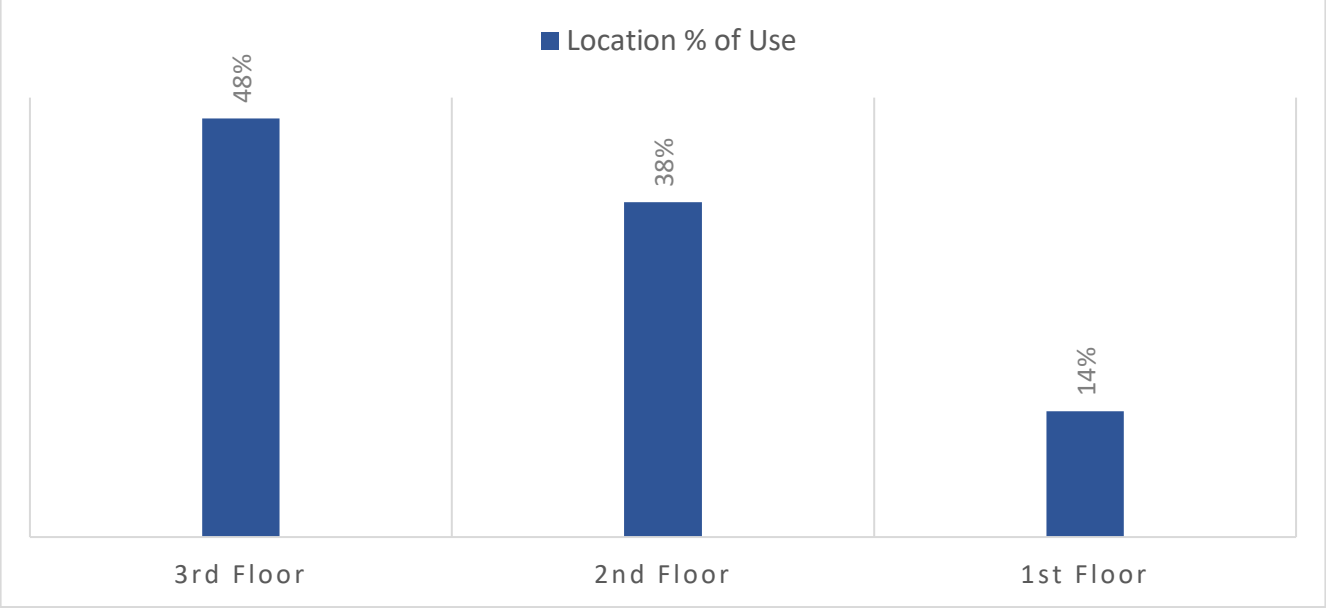
•Elevators and area around elevators including equipment and stretches – all buildings

•Procedure and exam rooms throughout Providence and Burrard

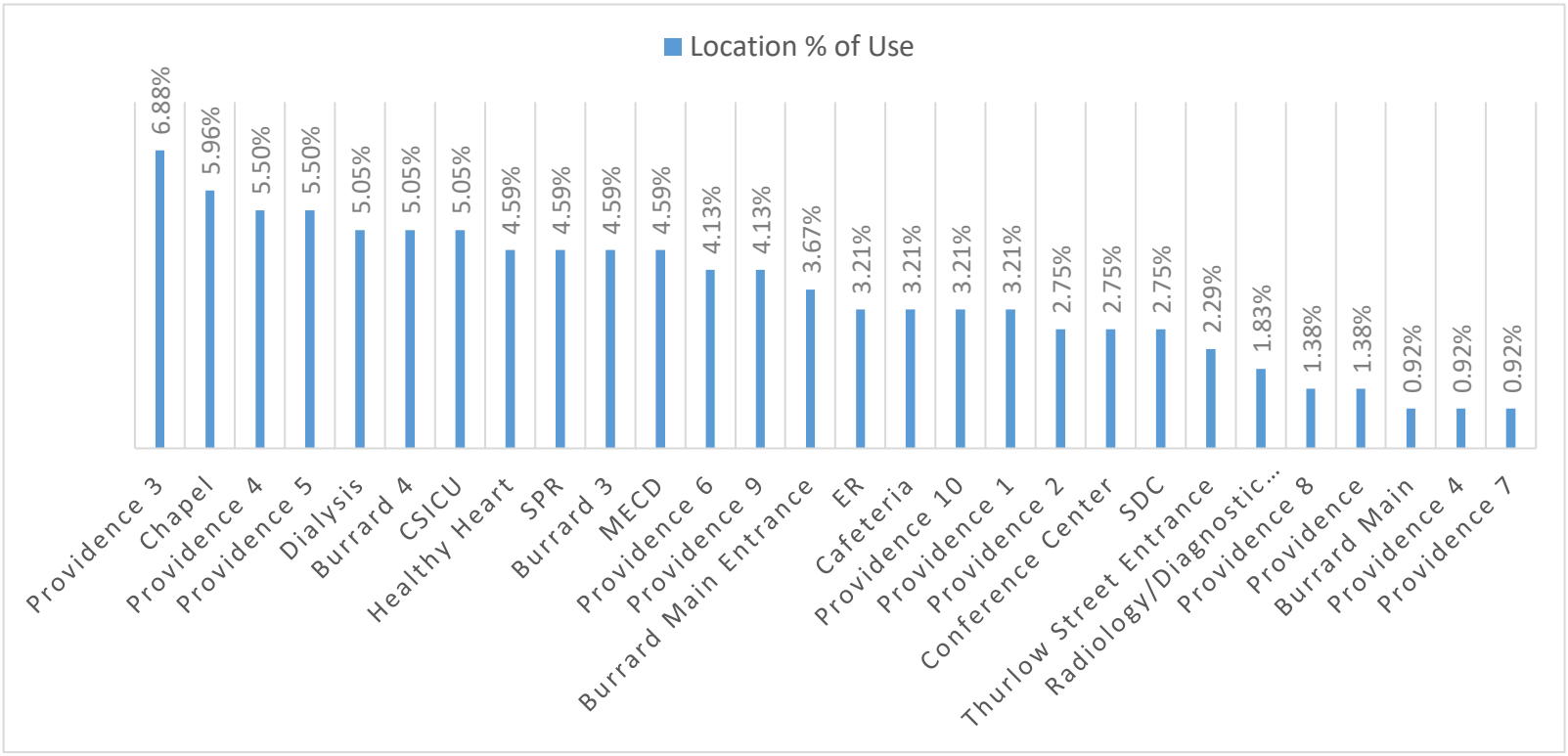
•Offices - Providence and Burrard

•Conference rooms, auditorium and meeting rooms
•Chapel
•Contact point hallways
•Staff Locker Rooms/washrooms
•Healthy Heart
•Patient, staff and public washrooms
•ER – washrooms and waiting room
•SPR – washrooms and public spaces
•SPR – washrooms and public spaces
•Radiology – washrooms and exam/procedure rooms
•Dialysis – washrooms and waiting/public spaces
•Waiting rooms – Providence and Burrard
•MECD and other patient equipment
•Entrances – all buildings
•Stairways
•Cafeteria
•Café
•Seating areas in hallways
•Clean Utility rooms
•Soiled Utility rooms
•Shower rooms
•Nurses station

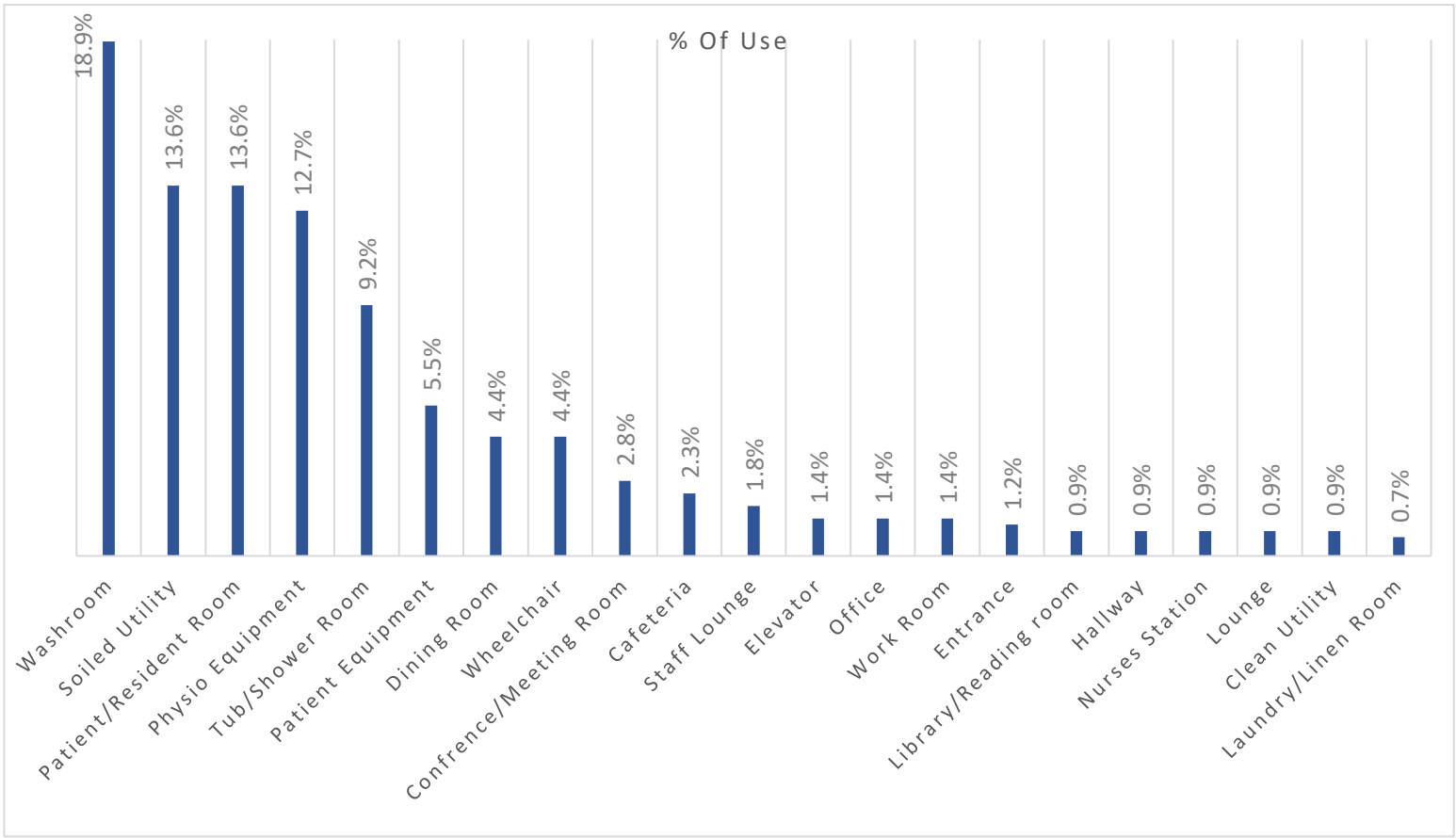
Percentage of Floor/Area Usage 4 Week Pilot Holy Family Hospital



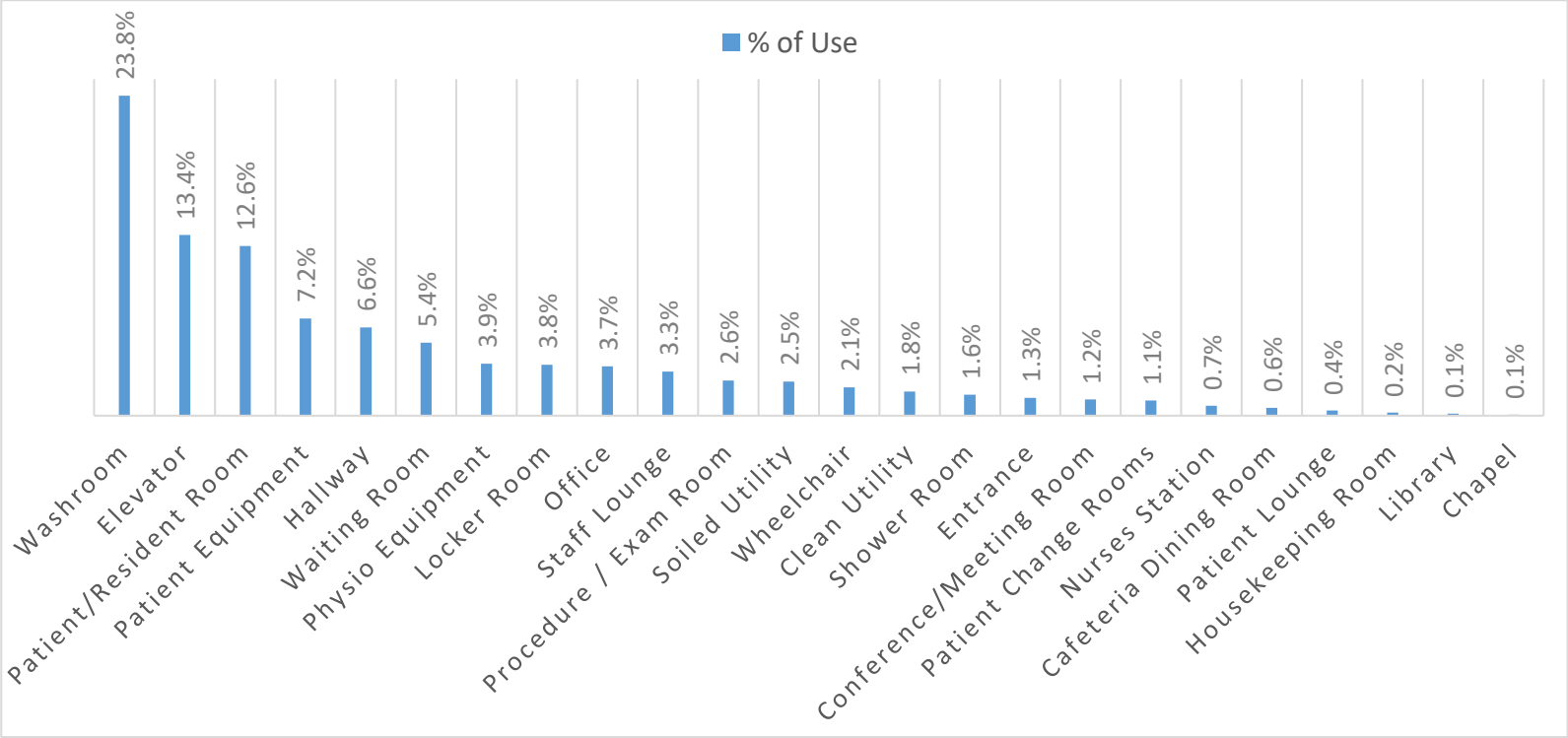
Percentage of Floor/Area Usage 4 Week Pilot St Paul's Hospital



Percentage of Room/Space Usage 4 Week Pilot Holy Family Hospital



Percentage of Room/Space Usage 4 Week Pilot St Paul's Hospital



Feedback during Pilot

- Both facilities reported minimal number of concerns regarding the odor
- As the pilot progressed, both facilities reported that the request to use the system increased as stakeholders understood or became more aware of what the system does
- Both facilities were able to utilize the system with existing FTE's and routines
- January 22, 2021 - 2 additional systems were requested and delivered to St Paul's Hospital to increase site usage based on site activity with Covid 19
- St Paul's did not run at capacity during the trial, access to patient rooms may not be as accessible in the future, this challenge is not anticipated at Holy Family
- Associates at both facilities demonstrated the system was easy to use and transport around the facilities

ASSESSMENT OF DESIRED OUTCOMES

Desired Outcome	Benefit	Assessment If Desired Outcome Achieved
Technology and chemistry that will support our EVS teams perform disinfecting procedure more efficiently, effectively and with a high level of infection control	Diverse nature of the system and chemistry lends for use across all sectors and facilities New chemistry being released for kitchen (food prep) New chemistry being developed for bed bugs	Associates achieved a higher surface coverage using the T360 system than manual disinfecting. The time and motion KPI testing results confirmed the T360 system was more effective and disinfected surfaces at a higher rate of speed and accuracy.
Maximize associates output	Capability of disinfecting 18 000 square feet per hour 75% faster than disinfecting with a cloth	During the pilot, our associates were able to incorporate the T360 system into their regular routine without the addition of additional FTE's. They were able to disinfect many locations several times per day that would not have been possible using only manual method. It is important to note, that a cleaning step still must be performed once per day and any visible bioburden removed before using the T360 system. The system does not replace manual cleaning.
Mitigate an increase in chemical, PPE and supply costs	65% less chemical used Chemistry is RTU (ready to use)	There was no disposal of chemistry in the drainage system or wastage of chemistry during the pilot. The chemistry is RTU and did not take away productive time to mix. The system can cover a larger footprint of area and is hands of surfaces resulting in less risk of associates contaminating themselves and requiring less frequent PPE changes.
Achieve a higher level of surface coverage on items being disinfected	Electrostatic charged droplets adhere to surfaces vertically and horizontally Delivers uniform wrap around coverage	KPI testing confirmed the T360 system achieved greater surface coverage resulting in a higher percentage of disinfection. The surface coverage was consistent and reach areas our associates did not or could not. Manual disinfecting was not consistent and highlighted training gaps.

OTHER CONSIDERATIONS

Independent testing completed for and air quality and surface sampling on September 21 and 22, 2020 at St Paul's Hospital by Pinchin

- Surface Sampling for Total Bacteria on a surface: Determined the cleanliness of select surface areas by evaluating the total bacteria on the surface five minutes before and five minutes after the application of a surface cleaning/disinfecting product. Sample locations:
    - Nursing Skills Lab
    - OPS (Overdoes Prevention Site) Trailer
        - 2 testing locations - Inside and outside of trailer
    - Conference Center
    - Conference Center Washroom

- Heat Treatment Room in the basement

The analysis for bacteria was performed at the Pinchin Environmental Microbiology Laboratory, Mississauga. The Pinchin laboratory is independently accredited to ISO/IEC 17025:2005 for mould and bacteria analysis, by the American Industrial Hygiene Association Laboratory Accreditation Program LLC (AIHA LAP LLC) (Lab ID 158835)1 and the Quebec government (Lab ID 495).

Air Sampling: The objectives of the survey was be to measure airborne chlorine levels and evaluate the results of testing against regulated exposure limits and guidelines (e.g. WorkSafe BC Occupational Health and Safety Regulation).

Conclusion of the air quality testing: all areas passed.

Reference Documents:

- Occupational Hygiene Survey of Chlorine Clorox Professional Products Company 1081 Burrard Street, Vancouver, BC
- Bacteria Surface Sampling Report St. Paul's Hospital 1081 Burrard Street, Vancouver, British Columbia

Outcome of Bacteria Testing:

- Product #B Virex® II 256 Disinfectant had the highest percent of removal of bacteria at 97.6%

- Product #A Stride® Fragrance Free SC Neutral Cleaner had the 2nd highest percent of removal of bacteria at 95.5%

- Product #C Clorox® Total 360™ Disinfectant had the 3rd highest percent of removal of bacteria at 89.4%

Special Note:

- EVS Associate was wiping within a 4X4 inch square for testing which may have created an unrealistic scenario. In reality an associate would not spend the same amount of time cleaning one specific area on an item unless it was heavily soiled

SUMMARY AND RECOMMENDATIONS

- The results of the testing concluded that the Clorox 360 system was effective at reducing the bioburden load on a surface

- The system does not replace daily cleaning that would require the rub and scrub method with a cloth to esure surface is cleaned of bioburden prior to disinfecting

- The Clorox 360 system would not replace the daily cleaning/dinifecting process and cost saving for this initial clean would not be realized

- The system cannot be used in an area where other humans or animals are in the same room or in close proximity. The following recommendation for use are, but not limited to:

- **Healthcare and Senior Living Facilities**
  - Discharge and terminal cleans (for reasons other than discharge)
  - Staxi chairs
  - Wheelchairs
  - Mattresses/beds/stretchers in a storage or holding area
  - Patient equipment
  - Public washrooms that can be closed while system is being operated
  - Resident and patient communal washrooms, tub and shower rooms not located directly in an ocuppied patiet and resident room
  - Hallways (during evening shift when traffic is minimal)
  - Waiting rooms and sitting areas – end of day or when unoccupied
  - Elevators – with the ability to lock down when the system is being oporated
  - Stairwells
  - offices
  - Contact points in public spaces
  - Resident dining rooms (tables and chairs) inbetween meals
  - Terminal clean of a unit or facility that has an outbreak
  - Tents or temporary structures supporting a site in outbreak
  - End of day terminal cleaning/disinfecting in OR's, Cardiac Cath Labs, Endoscopy Suites and other high risk procedure rooms
  - Offices
  - Staff locker rooms and lounges

- **Non Healthcare Facilities**
  - Classrooms
  - Meeting and confrence rooms
  - Lecture theaters
  - Dining halls
  - Non food production areas
  - Public washrooms
  - Staff locker rooms and lounges
  - Offices
  - Waiting rooms
  - Reception areas
  - Fitness areas

- Implementing the use of the T360 system in other sectors

- Potential productivity saving using as the 2nd disinfecting step in *C-diff* discharge rooms and enhanced cleaning

- Use the system prior to cleaning and disinfecting high risk exposed or isolation areas as additional precautions to EVS associates

- Once a facility has purchased the Clorox Total 360® system they have purchased the technology

- As Clorox releases new chemistries the possibilities for use expands

- CloroxPro® Clorox® Anywhere™ Daily Sanitizer & Disinfectant will be released this spring
- For use in
    - Food preparation and eating areas
    - Daycares or areas with toys
    - Currently exploring future use as a training system, utilizing the UV demo system to enable visual verification where an associate has cleaned and disinfected