



EVS PROTECTS

Report Date: 16-September-2019

Customer Name: Process Cleaning Solutions
Contact: Michael Rochon
Description: ACC Analysis of 146 samples
C. difficile analysis of 72 post-cleaning samples
Job Number: PCS081919
Project Number: PCS081919-EV001
PO:

Thank you for working with EVS Protects.

Please contact Christine Greene, MPH, PhD if you have any questions or concerns pertaining to this report.

Report Authorization: Christine Greene, MPH, PhD
September 16, 2019

Experimental Summary

Summary of Procedures

Sample Collection

- A total of 146 swab samples were collected from a hospital in Quebec, Canada as follows:

Date	Number of samples collected	
	Before Cleaning	After Cleaning
8/26/2019	19	17
8/27/2019	19	19
9/3/2019	18	18
9/4/2019	18	18
Total	74	72

- 74 samples were collected over the course of 2 days using the hospital's current disinfection process.
 - Efficacy for daily cleaning was observed only (discharge cleaning was not considered).
 - Dry time data was not collected
 - All cleaning was performed by trained staff.
 - Of the 74 samples collected, 36 post-cleaning samples were assessed for the presence/absence of *C. difficile*.
- 72 samples were collected over the course of 2 days using PCS' cleaning process.
 - The PCS cleaning process involved spraying on the surface with PCS sprayer (250-ppm hypochlorite solution with a neutral pH of 8.5-9.5) and immediately wiping dry with the PCS microfiber cloth.
 - Of the 72 samples collected, 36 post-cleaning samples were assessed for the presence/absence of *C. difficile*.
- For both product types, rooms were sampled prior to cleaning and again immediately after cleaning.
- Rooms were chosen randomly based on availability for cleaning as determined by the environmental services staff.
- Surfaces sampled were high-touch surfaces, randomly chosen by the sampling collection staff.
- All samples were transported in cold conditions to the microbiology lab.

Methodology

- All samples were analyzed for total aerobic colony counts (ACC) and post-cleaning samples were assessed for the presence/absence of *C. difficile*.
- Samples arrived cold to the microbiology test laboratory.
- Upon receipt, each swab was vortexed and plated (dilution factor = 10 for all samples).
- Samples were plated by spread plate method. Triplicate plating of neat only was performed.
- Samples were incubated at 37°C for 48 hours. After 48 hours, colonies were counted, and CFU/sample reported.
- The upper limit of detection is >300 CFU/sample or >30 CFU/cm². The lower limit of detection is <10 CFU/sample or <0.10 CFU/cm². Therefore, the upper limit of 30 and lower limit of 0.1 were used in calculations where the limit was detected.

Results

Table 1: Results for samples collected on August 26, 2019 before and after application of hospital's disinfectant reported in average CFU/cm².

Current Disinfection Product/Protocol						
			Before	After		
Sample Day	Sample Discription	Location	Average CFU/cm ²	Average CFU/cm ²	% Reduction	<i>C. difficile</i> Detection
8/26/2019	Paper towel disp.	Hallway	1.97		N/A	
	Blood Pressure machine	J2-330	0.17	<0.10	40.00%	absent
	Counter	J2-330	7.40	0.10	98.65%	absent
	Fridge	J2-336	0.33	0.13	60.00%	absent
	Sink	J2-336	>30.0	4.33	85.56%	absent
	Table	J2-336	1.67	0.40	76.00%	absent
	Sink	J2-344	>30.0	4.30	85.67%	absent
	Table	J2-344	0.37	0.13	63.64%	absent
	Toilet Seat	J2-344	20.7	>30.0	0.00%	absent
	Bed rail	J2-352	0.37	14.2	0.00%	absent
	Table	J2-352	0.63	0.10	84.21%	absent
	Toilet seat	J2-352	1.93	0.10	94.83%	absent
	Bed rail	J2-353	2.90	1.30	55.17%	absent
	Table	J2-353	<0.10	0.10	0.00%	absent
	Toilet seat	J2-353	8.00	<0.10	98.75%	absent
	Door plate	J4-316	0.13	2.70	0.00%	absent
	Keyboard	J4-329	11.3	9.70	14.41%	absent
	Phone	J4-329	1.00	0.47	53.33%	absent
	Patient file	J4-329	1.27		N/A	

Table 2: Results for samples collected on August 27, 2019 before and after application of hospital's disinfectant reported in average CFU/cm².

Current Disinfection Product/Protocol						
			Before	After		
Sample Day	Sample Discription	Location	Average CFU/cm ²	Average CFU/cm ²	% Reduction	<i>C. difficile</i> Detection
8/27/2019	Paper towel disp.	Hallway	1.97	/	N/A	/
	Counter	J2-330	7.40	>30.0	0.00%	absent
	Blood Pressure machine	J2-330	0.17	<0.10	40.00%	absent
	Microwave	J2-336	/	0.27	N/A	absent
	Table	J2-336	1.67	0.17	90.00%	absent
	Bed rail	J2-344	/	0.10	N/A	absent
	Fridge	J2-336	0.33	/	N/A	/
	Sink	J2-336	>30.0	/	N/A	/
	Table	J2-344	0.37	0.27	27.27%	absent
	Toilet Seat	J2-344	20.67	0.17	99.19%	absent
	Sink	J2-344	>30.0	/	N/A	/
	Bed rail	J2-348	/	10.3	N/A	absent
	Table	J2-348	/	0.20	N/A	absent
	Toilet seat	J2-348	/	0.23	N/A	absent
	Bed rail	J2-352	0.37	0.17	54.55%	absent
	Table	J2-352	0.63	0.10	84.21%	absent
	Toilet seat	J2-352	1.93	<0.10	94.83%	absent
	Bed rail	J2-353	2.90	0.13	95.40%	absent
	Table	J2-353	<0.10	0.10	0.00%	absent
	Chair	J2-353	/	<0.10	N/A	absent
	Toilet seat	J2-353	8.00	/	N/A	/
	Door plate	J4-316	0.13	0.10	25.00%	absent
	Counter	J4-329	/	1.73	N/A	absent
	Keyboard	J4-329	11.3	/	N/A	/
	Patient file	J4-329	1.27	/	N/A	/
	Phone	J4-329	1.00	0.20	80.00%	absent

Table 3: Results for samples collected on September 3, 2019 before and after application of PCS disinfectant reported in average CFU/cm².

PCS Disinfection Product/Protocol						
			Before	After		
Sample Day	Sample Discription	Location	Average CFU/cm ²	Average CFU/cm ²	% Reduction	<i>C. difficile</i> Detection
9/3/2019	Counter	J2-330	0.13	<0.10	25.00%	absent
	Med Cart	# 2	1.40	<0.10	92.86%	absent
	Fridge	J2-336	>30.0	<0.10	99.67%	absent
	Table	J2-336	0.53	<0.10	81.25%	absent
	Bed rail	J2-341	0.57	0.10	82.35%	absent
	Table	J2-341	0.17	0.13	20.00%	absent
	Comode chair	J2-341	6.00	0.10	98.33%	absent
	Bed rail	J2-344	4.33	0.50	88.46%	absent
	Table	J2-344	0.77	<0.10	86.96%	absent
	Toilet seat	J2-344	0.17	0.10	40.00%	absent
	Bed rail	J2-348	0.17	<0.10	40.00%	absent
	Table	J2-348	0.90	<0.10	88.89%	absent
	Toilet seat	J2-348	16.5	<0.10	99.39%	absent
	Bed rail	J2-352	0.47	<0.10	78.57%	absent
	Table	J2-352	0.10	<0.10	0.00%	absent
	Toilet Seat	J2-352	4.20	0.10	97.62%	absent
	Door plate	J4-316	0.10	<0.10	0.00%	absent
	Counter	J4-329	0.33	<0.10	70.00%	absent

Table 4: Results for samples collected on September 4, 2019 before and after application of PCS disinfectant reported in average CFU/cm².

PCS Disinfection Product/Protocol							
			Before	After			
Sample Day	Sample Description	Location	Average CFU/cm ²	Average CFU/cm ²	% Reduction	<i>C. difficile</i> Detection	
9/4/2019	Counter	J2-330	0.47	17.7	0.00%	absent	
	Bed rail	J2-305	0.13	<0.10	25.00%	absent	
	Table	J2-305	1.50	<0.10	93.33%	absent	
	Toilet seat	J2-305	0.40	<0.10	75.00%	absent	
	Door Plate	J2-316	0.10	<0.10	0.00%	absent	
	Counter	J2-329	1.33	<0.10	92.50%	absent	
	Ice Machine	J2-330	11.9	<0.10	99.16%	absent	
	Fridge	J2-336	4.23	<0.10	97.64%	absent	
	Table	J2-336	1.43	0.13	90.70%	absent	
	Bed rail	J2-344	5.20	0.10	98.08%	absent	
	Table	J2-344	0.10	<0.10	0.00%	absent	
	Toilet seat	J2-344	1.17	0.10	91.43%	absent	
	Bed rail	J2-352	2.60	0.10	96.15%	absent	
	Table	J2-352	0.23	<0.10	57.14%	absent	
	Toilet seat	J2-352-1	7.13	0.10	98.60%	absent	
	Toilet seat (replicate sample)	J2-352-2		0.10	N/A	absent	
	BP Machine	J2-353		<0.10	N/A		
	Bed rail	J2-353		>30.0	<0.10	99.67%	absent
	Table	J2-353		5.80	<0.10	98.28%	absent

Table 5: Summary table of average CFU/cm² recovered and % Reduction for each day after each cleaning process.

Date	Description	Before	After	% Reduction	
		Average CFU/cm ²	Average CFU/cm ²	Average Per Day	Total Average Per Process
8/26/2019	Current Product/Process	6.33	4.01	36.65%	49.84%
8/27/2019		6.33	2.34	63.03%	
	Total Average	6.33	3.18		
9/3/2019	PCS Product/Process	3.71	0.12	96.77%	84.64%
9/4/2019		4.10	1.08	73.66%	
	Total Average	3.91	0.60		

Table 6: Summary table of *C. difficile* presence/absence results for each day after each cleaning process.

Date	<i>C. difficile</i> Presence/Absence	Number of Samples Collected	Total number positive for <i>C. difficile</i>	Total number negative for <i>C. difficile</i>
8/26/2019	Current	17	0	17
8/27/2019	Product/Process	19	0	19
9/3/2019	PCS	18	0	18
9/4/2019	Product/Process	18	0	18

Figure 1: Total average CFU/cm² recovered after each cleaning process. Graph displays the mean values.

