

**ASSESSMENT OF A  
DECONTAMINATION PROCEDURE  
FOR THE 'MEDIWASH'\*  
HANDWASHING UNIT**

**TEAL PATENTS LTD**

***\*'STOP'N WASH' IS THE PROTOTYPE NAME FOR THE 'MEDIWASH'***

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**JUNE 2013**

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**EQUIPMENT TESTED** Stop n Wash Hand Wash Unit  
TSN W230

## **OBJECTIVE**

**To evaluate a disinfection procedure for the Stop n Wash Hand Wash Unit.**

## **INTRODUCTION**

The Stop n Wash Hand Wash Unit consists of a waist high portable hand-washing unit that is connected to a power supply. The unit supplies heated water for up to 75 washes per 10 litres of water used. The tank which holds both fresh and waste water is located underneath the wash basin and is connected to the unit via a connector. A separate plastic bag is located in the tank which accommodates fresh water. A waste pipe is positioned between the wash basin and the container which collects the waste external to the plastic bag. Fresh water is pumped through the heater when the sensor on the water outlet is activated. The heater raises the water to approx 35°C. A sensor on the tap operates the water flow and a screen prompts the user in the procedure for hand washing. After the initial wetting of the hands the flow of water stops until the hand wash procedure is complete and then water flows to rinse the hands. The work station has space for a soap/antiseptic dispenser and a paper towel dispenser.

When the fresh water has been depleted, the unit is disconnected from the power supply. The container is removed from the unit, and the wastewater, and any residual fresh water, is discarded. The fresh water bag is then filled with fresh tap water, the container is reconnected to the unit, and the unit is reconnected to the power supply.

If water is left for periods of time then contamination, particularly with *Pseudomonas* spp can occur. These tests were designed to assess the levels of contamination and a simple method for maintaining the unit in a bacteria free state.

## **TEST METHODS**

To establish the base level of contamination, water samples were taken from the Stop n Wash Hand Wash Units on the day they were installed. The water samples were collected from the nozzles of the machines and from the fresh water bag of the container. Sodium thiosulphate (0.5%) was added to the water sample to neutralize any residual chlorine in the water. This is common practice when sampling water. The water samples were plated out onto Tryptone Soy Agar (TSA) and incubated at 37°C for approximately 48 hours. Thereafter, water from the nozzles and tanks were sampled at about 9.00am and at 3.00pm. When a disinfection procedure was carried out a sample was collected immediately after the procedure.

The disinfection routine tested on the Stop n Wash Hand Wash Units was as follows:

1. Disconnect the unit from the power supply.
2. Disconnect the container from the unit.
3. Discard wastewater and any remaining fresh water.
4. Replenish the fresh water bag with approximately 10 litres of tap water.
5. Add sodium dichloroisocyanurate (a chlorine releasing agent) tablets to the water, giving a final concentration 500 ppm av. Cl.
6. Allow tablets to dissolve.
7. Reconnect the container to the unit, and the unit to the power supply.
8. Run the 'purge function' for 5 minutes.
9. Repeat steps 1-4.
10. Thoroughly rinse the fresh water bag with tap water.
11. Replenish the fresh water bag with approximately 10 litres of tap water.
12. Reconnect the container to the unit, and the unit to the power supply.
13. Run the 'purge function' for 30 seconds.

The testing was conducted over 87 days. At the beginning of this study the machines were regularly activated to replicate expected operational conditions. However, towards the end of the study the machines were not used apart from the sampling times, to replicate worst case conditions of stagnant water.

## RESULTS

During the 87 days duration of this study, samples were collected on 56 of these days. After installation, when freshly drawn tap water from the test laboratory was used to fill the container, it took 16 days before contamination started to occur. No contamination was detected on the day of installation. On the vast majority of occasions, when contamination was detected, it was the nozzle that showed microbial counts before the tank. Counts with natural contamination were very slow to develop so the tanks were artificially contaminated on 6 occasions with a test strain of *Pseudomonas aeruginosa* (NCTC 6749).

Table 1 displays the total viable counts/ml of water (TVC) obtained from the water samples before and after disinfection with a 500ppm av. Cl solution of sodium dichloroisocyanurate. Disinfection was successfully carried out 10 times during this study with no naturally occurring contamination or the *Ps. aeruginosa* used to artificially contaminate the system detected post disinfection.

**Table 1**

	Mean number of cfu/ml (mean of 10)			
	Machine 1		Machine 2	
	Tank	Nozzle	Tank	Nozzle
Pre disinfection	$1.2 \times 10^7$	$1.9 \times 10^7$	$2.2 \times 10^7$	$2.35 \times 10^6$
Post disinfection	0	0	0	0

A summary of the results obtained from contaminated samples is shown in Table 2. More contamination was detected from the nozzle rather than the tank for both machines. Counts increased to as much as  $10^8$  cfu/ml in the period between disinfection. Towards the end of the study, contamination occurred more rapidly ie 2 – 3 days post disinfection, presumably due to the formation of a biofilm within the nozzle and pipe work.

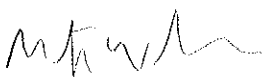
**Table 2**

	Number of cfu/ml			
	Machine 1		Machine 2	
	Tank	Nozzle	Tank	Nozzle
Mean of contaminated samples	$1.63 \times 10^7$	$6.4 \times 10^6$	$1.3 \times 10^7$	$7.3 \times 10^6$
Median of contaminated samples	$5.7 \times 10^6$	$2.4 \times 10^4$	$7.5 \times 10^2$	$1.4 \times 10^4$
Minimum count	1	7	2	1
Maximum count	$1.0 \times 10^8$	$1.5 \times 10^8$	$1.8 \times 10^8$	$1.0 \times 10^8$
Number of contaminated samples	10	40	19	28

## SUMMARY

The results of these tests suggest that for routine disinfection, 500ppm chlorine with a 5 minute contact time at least every other day is sufficient to maintain a negligible level of contamination. If the unit is not used for an extended period of time, it may be necessary to perform daily disinfection for the first few days of its reuse.

*Testing by the Hospital Infection Research Laboratory does not imply approval or endorsement.*



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