

New Washable SPILLSEAL Keyboards 'How they can reduce MRSA in your hospital'



The Evaluation of Disinfection Procedures for **SPILLSEAL**
Keyboards Contaminated with *Staphylococcus Aureus*

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1.0 INTRODUCTION

The bacteria *Staphylococcus Aureus* is commonly found on human skin. This bacteria alone does not cause major health problems. However, if it invades inside the body, for instance the lungs, it can cause infections such as pneumonia. Individuals who carry this organism are usually totally healthy and are considered simply to be carriers.

Methicillin resistant *Staphylococcus Aureus* (MRSA) is used to describe strains of this organism that are resistant to commonly used antibiotics. If MRSA is passed on to someone who is already ill an infection may occur. This can be very serious since the infection often cannot be treated using traditional antibiotic therapy. MRSA is currently of great concern within the UK, particularly in hospital environments such as the National Health Service (NHS).

Individuals can become unknowing carriers of MRSA in the same way that they can for ordinary *Staphylococcus Aureus*. If the organism is on the skin it can be passed to other individuals simply by physical contact.

Computer keyboards are widely used in UK hospitals and are therefore a likely means by which MRSA can be spread from person to person.

This project was designed to evaluate disinfection procedures for SpillSeal keyboards contaminated with *Staphylococcus Aureus*. The *Staphylococcus Aureus* bacteria was inoculated under various keys identified as the areas most difficult to disinfect.



2.0 METHODOLOGY

2.1 Development of a Standardised Inoculation Procedure

It was considered important to ensure keyboards were contaminated in a way that replicated the "worst case scenario" likely to be encountered within the NHS and allowed for the different sanitisation procedures to be compared. Each keyboard was therefore contaminated with high levels of *Staphylococcus Aureus* in areas difficult to disinfect. This was performed using the following procedure:

1. A culture of *Staphylococcus Aureus* was grown under standard conditions in a media containing solids to mimic soiling.
2. Using clean keyboards the 10 pre-selected keys (C, 5/%, U, F12, 9/pgUp, arrow down key, Delete, Esc, far left small shift, @) were removed. 0.1mls of the *Staphylococcus Aureus* culture was inoculated into each key recess and the keys replaced.
3. The keyboards were left at ambient room temperature for one hour.
4. After the one hour storage the 10 keys were removed and the numbers of remaining *Staphylococcus Aureus* were determined by swabbing.

The levels of Staphylococcus aureus acted as the control values against which the effectiveness of each sanitisation procedure was calculated as a percentage kill.

2.2 Evaluation of Sanitisation Treatments

1. Seven clean keyboards were inoculated with staphylococcus aureus as per point 3 above.
 2. After one-hour storage the keyboards were treated for 30 seconds with one of the treatments as listed in Appendix 1.
 3. Treatment was carried out by preparing 10 litres of a cleaning solution; washing by immersing and agitating the keyboard (by moving about and pressing the keys) and standing without rinsing or drying for 2 minutes.
 4. Treatment in 10 litres of sterile water was also carried out as a control and to differentiate between removal of the bacteria by chemical disinfection and removal by physical washing.
 5. The levels of remaining *Staphylococcus Aureus* were determined as per point 4 above.
 6. The percentage kill for each treatment was calculated using the baseline levels of *Staphylococcus Aureus* as determined under stage 1.
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3.0 RESULTS

The average *Staphylococcus Aureus* inoculum per key was 596,000 organisms expressed as colony forming units per key.

Results obtained after sanitising the keyboards are shown in the table in Appendix 1.

The keyboards were tested after the sanitisation procedure. They were found to function satisfactorily.

4.0 CONCLUSIONS

1. All the treatments significantly reduced the levels of *Staphylococcus Aureus* inoculated under the keyboards. The antibacterial washing up liquid gave the lowest reductions averaging 98.32% per keyboard. Presept at 1000ppm (the recommended level) gave the best results with 100% kill of *Staphylococcus Aureus* being achieved for all inoculated keyboards.
2. Washing in water reduced the levels of *Staphylococcus Aureus* by 86.29%. This showed that physical washing removed most of the bacteria but that a chemical disinfectant was essential to ensure optimum sanitisation.
3. These results suggest that the use and regular disinfection of SpillSeal keyboards within hospital environments such as the NHS could assist in reducing the spread of MRSA.



APPENDIX 1 – RESULTS

	KEYS										
	C	5/%	U	F12	9/ Pg Up	Arrow Down	Delete	Esc	Far Left	@	Average
TREATMENT	PERCENTAGE <i>STAPHYLOCOCCUS AUREUS</i> KILLED										
Antibacterial Washing up Liquid (10%)	99.16%	99.21%	97.23%	99.35%	98.26%	98.21%	99.15%	97.80%	96.09%	98.73%	98.32%
1% NaOCL as Milton	99.84%	99.87%	99.54%	99.98%	99.57%	99.90%	99.99%	99.89%	99.79%	99.92%	99.83%
2% NaOCL as Milton	99.89%	99.91%	99.68%	100.00%	99.96%	99.94%	100.00%	99.99%	100.00%	99.99%	99.94%
5% NaOCL as Milton	100.00%	99.99%	99.86%	100.00%	99.97%	99.97%	100.00%	100.00%	100.00%	100.00%	99.98%
Tristel	99.60%	99.67%	99.15%	99.66%	99.48%	99.17%	99.65%	99.03%	99.43%	99.73%	99.46%
Presept 1000ppm	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Water alone	95.57%	87.50%	73.07%	89.05%	95.92%	94.07%	93.33%	68.00%	82.61%	83.78%	86.29%

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