

Smart Solutions for HCAI



EVALUATION REPORT: AirManager

Introduction

Smart Solutions for Healthcare Associated Infections (HCAI) is a national programme that aims to bring forward new technologies with the potential to reduce HCAI rates within the NHS. The programme was run by *TrusTECH*®, The North West of England NHS Innovations Hub, on behalf of the Department of Health's HCAI Technology Innovation Programme, and supported by the NHS National Innovation Centre.

Following a national call for innovative products and technologies from a range of diverse industries, nine products were selected for further evaluation within an NHS setting. The aim of the evaluation was to assess the potential of the product to contribute to the reduction of HCAs in a scientifically robust manner.

AirManager, manufactured by Quest International (UK) Ltd, was one of the products selected for evaluation. AirManager uses close coupled field technology (CCFT) to destroy particles in air including microbes and volatile organic compounds (VOCs). The manufacturer claims that it also reduces airborne odours.

It was one of three portable air decontamination products evaluated at the Royal Free Hospital, London (Royal Free and Hampstead NHS Trust).

Objectives

- To assess the effect on environmental microbial load of deploying air decontamination devices in a general ward environment.
- To compare the efficacy of these devices during the test period.
- To assess ease of use and acceptability of air decontamination devices in a general ward environment.

Methodology

Four-bedded bays and single rooms of general medical/elderly care wards were used for the study. Each device was trialled over a 16-week period divided into five periods as follows:

| | | | |
|----------|---------|-------------|----------------------------|
| Period 1 | 2 weeks | Devices off | (baseline data collection) |
| Period 2 | 5 weeks | Devices on | |
| Period 3 | 2 weeks | Devices off | |
| Period 4 | 5 weeks | Devices on | |
| Period 5 | 2 weeks | Devices off | |

Devices were placed in three bays/rooms and a fourth bay/room acted as a control. The exact location and number of floor areas used for the study was dependent on

the bed use at the time. The standard cleaning regimen for the wards was not to be modified in any way during the duration of the study.

Wherever possible during the study period, the sampling protocol was adhered to with the same personnel performing the sampling. The presence of any patients colonised with alert organisms was recorded. Results of hand hygiene audits were used to ensure that hand hygiene compliance had been comparable throughout.

A total of 21 standardised sites for surface sampling were identified in the four-bed bays, consisting of 12 high surfaces and nine low surfaces. Each was sampled five times per week, alternating between morning pre-cleaning and afternoon post-cleaning.

Up to 17 standardised sites were identified in the side rooms for surface sampling (nine high surfaces and eight low surfaces). Each was sampled five times per week, alternating between morning pre-cleaning and afternoon post-cleaning. Up to six air samples were taken per day, four times weekly in each bay and room.

Evaluation

- Surface sampling was by contact agar plates for determining total viable count (TVC) and meticillin-resistant *Staphylococcus aureus* (MRSA). *Clostridium difficile* and Enterobacteriaceae were measured if positive patients had been identified in the locations used in the study.
- Air samples were collected for TVC, fungi (Sabouraud dextrose agar, SAB) and MRSA. Air sampling was performed using AirTrace slit-to-agar microbial air sampler. A total of 200 L of air was sampled per plate. *C. difficile* and Enterobacteriaceae were measured if positive patients were identified.
- A standardised questionnaire was used to obtain feedback from staff.

Results

- The evaluation suggests that the effect of AirManager was mainly observed as a reduction in surface contamination. Little effect was observed on airborne pathogens (environmental air TVC, air MRSA or airborne fungi).
- The findings indicated that AirManager reduced environmental TVCs on low and high surfaces in single rooms, but only on high surfaces in four-bedded bays. It is noted that these findings were statistically significant for the comparison of the device with the internal control but not with the external controls.
- It is considered that the inconsistencies in the differences between the device and the external control could have been due to underlying differences between the locations. Additionally, the relationship with cleaning status (whether a sample had been taken pre- or post-cleaning, although this was alternated) may have had a bearing on the results. The internal comparison of the device on versus off provided an alternative confirmatory method of analysis. However, further investigations, particularly with regard to controls, are required in order to fully establish the effect on external pathogens.
- Feedback from a small number of ward staff showed that generally AirManager was acceptable. Overall six of the seven respondents (five nurses, one pathway coordinator and one healthcare assistant) indicated that the device did not increase the level of noise; however only one of the respondents thought that AirManager improved cleanliness and one thought AirManager reduced odour.

Conclusions

AirManager was most effective at reducing environmental surface contamination in patient four-bedded bays and single rooms. It appeared to be less effective at reducing airborne organisms.

AirManager was considered by ward staff to be generally acceptable and easy to use. Further investigations are required to establish the effect on air decontamination within hospital ward settings.

Further information:

Smart Solutions for HCAI is run by TrusTECH®, the North West Innovations Hub.

www.smartsolutionsforhcai.co.uk

www.trustech.org.uk

www.clean-safe-care.nhs.uk

www.airmanager.com