

Deployment of RBDS in UK hospitals

BIOQUELL's Room Bio-Decontamination Service (RBDS) uses Hydrogen Peroxide Vapour (HPV) to eradicate potentially harmful micro-organisms from hospital environments. These include methicillin-resistant *Staphylococcus aureus* (MRSA), Vancomycin-resistant enterococci (VRE), *Clostridium difficile*, *Acinetobacter* spp., and *Klebsiella* spp. RBDS is a rapid, residue-free method for making any sized room microbiologically "sterile" (based on the bio-deactivation of 6-log *Geobacillus stearothermophilus* spores; the same challenge used for steam sterilisers). Examples of RBDS hospital application include outbreak control, medical equipment fumigation and regular decontamination of high-risk areas in the hospital.

ROYAL HALLAMSHIRE HOSPITAL, SHEFFIELD

Infectious diseases unit (IDU)

- RBDS was deployed in a single side room on the IDU in July 2004.
- In addition to BIOQUELL's standard 6-log, Tyvek pouched *Geobacillus stearothermophilus* biological indicators, the Royal Hallamshire Microbiology Department supplied additional microbiological challenges in the form of *Staphylococcus aureus*, *Escherichia coli* and an aerobic spore-forming bacillus (ASB) inoculated onto glass slides and sterile gauze.
- All hard surface biological indicators in the room were completely deactivated (all porous biological indicators for *E.coli* and *S.aureus* were completely bio-deactivated and a significant reduction was demonstrated for the ASB porous biological indicators).

Neonatal intensive care unit

- Based on the success of the RBDS deployment on the IDU, BIOQUELL were contracted to deploy RBDS in the NICU to eradicate *Serratia* sp. environmental contamination during an outbreak in August 2004.
- The contract involved the fumigation of two ward areas including a large volume of sensitive medical equipment in situ, with a total value of some £1m which was contaminated and therefore out of use.
- Following extensive testing after RBDS, the equipment and ward areas are now in use. The hospital intends to publish their experience.

NORTH MIDDLESEX HOSPITAL, LONDON

Following a spillage of faecally contaminated water in an isotope injection suite within the medical physics department, BIOQUELL was contracted in July 2004 to deploy RBDS and ensure that any potentially hazardous micro-organisms were removed before the suite was returned to normal operation.

GREAT ORMOND STREET HOSPITAL, LONDON

Paediatric Intensive Care Unit

- A patient who was colonised with a multiply drug-resistant (MDR) *Acinetobacter* sp. was discharged from the GOS hospital paediatric intensive care unit (PICU).
- Given the documented propensity of *Acinetobacter* sp. to contaminate the patient environment and persist after terminal cleaning, surface swabbing was conducted and the MDR-*Acinetobacter* sp. was discovered after terminal cleaning in the room.
- Consequently, BIOQUELL was invited to deploy RBDS on a research basis in July 2004. No *Acinetobacter* sp. was discovered following extensive surface swabbing conducted by the GOS microbiology department after RBDS.
- The room was then released and prepared for the next patient.

ST. THOMAS' HOSPITAL, LONDON

Pilot RBDS study, surgical ward

Given the ever-increasing rates of methicillin-resistant *Staphylococcus aureus* (MRSA) infection, colonisation and bacteraemia in the UK, BIOQUELL collaborated with St. Thomas' Hospital Department of Microbiology and King's College London to investigate the level of MRSA environmental contamination at St Thomas'. In response to the high level of MRSA contamination discovered, the effect of conventional cleaning and fumigation with BIOQUELL's RBDS was compared. RBDS was deployed in four side rooms and three bathrooms on a surgical ward between May and July 2003. The results of this pilot study were published in the Journal of Hospital Infection.¹

Key findings:

- Overall, 74% of 359 swabs positive for MRSA before intervention.
- MRSA found at high levels in non-MRSA areas (e.g. 43% of the bed frames of one ward).
- After conventional cleaning, 66% of 124 swabs positive for MRSA.
- MRSA cultured from high-risk sites before and after cleaning, which could act as fomites for MRSA transmission such as bed frames, TV remotes and door handles.
- After BIOQUELL's RBDS, only 1% of swabs were found to have a low level of MRSA contamination (only detectable by enrichment culture).

¹ French GL, Otter JA, Shannon KP, Adams NMT, Parks MJ, Watling D. Tackling contamination of the hospital environment by methicillin-resistant *Staphylococcus aureus* (MRSA): a comparison between conventional terminal cleaning and hydrogen peroxide vapour decontamination. J Hosp Infect 2004; 57: 31-37.

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