



Effective sterilisation of reusable surgical instruments between operations is essential to prevent cross infection

Instrumental in clean practices

Centralisation of decontamination services for UK hospitals has been controversial but – in hygiene terms – the facilities are a radical improvement.

Susan Birks visited a new centre built by cfes

The effective cleaning and sterilisation of reusable surgical instruments between operations is essential in reducing the risk of cross infection. In any one year approximately 6.5m¹ surgical procedures take place and this figure is growing. However, recent estimates suggest that almost three times as many people die from hospital infections as are killed on the roads each year.

Reused surgical instruments from such procedures have been implicated in transmitting infection. In September 1999, following concerns surrounding the theoretical transmission of vCJD, the UK

Department of Health (DoH) commissioned a survey of the decontamination of surgical instruments in a number of National Health Service (NHS) hospitals, as well as private and voluntary organisations and general medical practices in England. The survey found instances where decontamination processes fell short of current standards and where practice was poor. Many hospitals were not segregating clean and dirty items that could lead to recontamination of sterile equipment. Also, many facilities were not up to standard.

The survey identified that substantial improvements could be achieved by

ensuring effective management of decontamination services. However, many of the buildings and equipment used in Sterile Services Departments (SSDs) needed refurbishment or replacement. Since then significant investment has been allocated for upgrading decontamination facilities and for purchasing additional surgical instruments and tracking systems to facilitate centralisation of instrument processing from clinical areas to SSDs.

A *National Decontamination Strategy for Modernising the Provision of Decontamination Services* was also launched back in 2001 to enable continuous improvement. The programme was aimed at improving the quality of surgical instrument reprocessing across the healthcare sectors in England. It was felt that centralised decontamination services (CDS) for many hospitals would bring huge benefits for patients and staff. These centralised ►



◀ facilities would be completely responsible for cleaning and sterilising all the re-usable instruments and equipment used in the operating department and wards, and would be located off the hospital site.

To undertake decontamination effectively the centralised decontamination centres need to be strategically located within easy reach of many hospitals so that equipment can be sanitised and returned in the shortest amount of time. Additionally, the quantity of the stock of devices requiring processing must be factored in, to ensure that no hospitals were without equipment.

Nuffield Hospital, the largest network of charitable, independent hospitals in the UK, has started strategically placing CDSs around the UK within a key radius of its hospitals. Nuffield implemented a surgical instrument tracking and management system and revised design guidance for upgrading and building new centralised decontamination facilities.

Such specialist decontamination



A flush wall to floor finish reduces the opportunity for bacteria to take hold and grow

construction work called for experts within the industry. After a tendering process, turnkey medical construction contractor cfes became the preferred supplier and was awarded the contract.

So far, cfes has project managed the build of five sites in Stoke, Warwick, Cambridge, Tiverton and Wetherby, and is currently completing work on a further site in Eastleigh, near Southampton.

The company has managed to transform even the most complex of sites, including the oldest site, Warwick – a former engineering industrial shed – into a state of the art 18,000ft² decontamination centre that will sterilise millions of used instruments each year. By July 2009, all six of the sites will be MHRA accredited by the UK Department of Health.

Cfes has provided a complete turnkey package, carrying out the design, installation and co-ordination, while project managing a bespoke structural build that was replicated for each site. The company developed a construction strategy, working from planned structural layouts and comprehensive designs to ensure a seamless build. With the aid of expert project managers, this ensured the highest standards of cleanliness and build quality were integrated throughout all six sites.

In Eastleigh, as in all the sites, the key ingredient to the sterilisation and decontamination process is water; therefore the provision of adequate drainage was fundamental for the efficient running of the site. The contractor supplied a 30,000 litre water tank to supply and feed the plant equipment including the washer disinfectors and the sterilisers. To maintain

A 30,000 litre water tank to supply and feed the washing and disinfection equipment

reliability and a long life for the washing and sterilisation equipment, a Triple Red softened process water supply system was also installed.

Once the drainage system had been prepared, a mezzanine floor was constructed to ensure efficient use of space. This houses the HVAC system and electrical control panel as well as offices and shower rooms, to ensure that the personnel operating the site could maintain the highest standards of personal cleanliness.

As part of the build cfes provided air conditioning plant, associated filtration and ductwork to create a controlled internal environment, restricting the ability for bacteria to thrive. In particular, positive airflow is provided in the two main high care areas through ducts and fans in the ceiling. The chiller plant serves coils located in the



Transfer hatch from one room to the next

the air handling plant to provide cool and dehumidified fresh air inside the building, thus reducing bacteria growth, which provides a high care internal atmosphere.

A steam boiler plant was installed for the raising of process steam to serve washer disinfectors, sterilisers, space heating and domestic hot water requirements.

Maximising plant efficiencies was a key focus during the design, build and commissioning phases of the project. Due to the critical nature of the project, it was crucial to fit an LV Switchboard, providing the vital link to all the power within the facility, accompanied by a standby generator. Should normal electrical power be lost, the generator and LV Switchboard

will provide automatic electrical changeover onto standby power, enabling the site to continue its operation.

Segregation and separate storage holding areas are imperative for contaminated and sterilised items. Within the decontamination area, cfes ensured a clear one-way flow of equipment, from the entry of dirty items into the area to the removal of the clean equipment following decontamination. This provides complete confidence that contaminated and decontaminated equipment is effectively kept apart.

At Eastleigh, the contaminated equipment is dropped off on trolleys at the entrance and stored in the general waste area until it can be taken into the next area for prewashing.

The heavily soiled instruments are initially washed in deep stainless steel sinks and then placed onto sterilisation trays, which are inserted into large washers, where they are disinfected. There is also a large trolley washing machine that functions in a similar way to a car wash, but is completely enclosed.

The trays are removed from the washing cycle on the other side of the room partition and through a back opening in the washers. In this area they are packed, loaded and sent through to the sterilisation plant to undergo the decontamination process. In the case of the Eastleigh project, this comprises six BMM Weston steam-operated sterilisers. Once sterilised, the trays are moved to a cooling area ready for dispatch.

A sterile indoor environment is crucial for a clean and efficiently working facility and must be reinforced from ceiling to floor. Cfes has installed hygienic vinyl flooring that acts as an easy to clean area, allowing no bacteria



or dirt to settle. The flooring is secured by a finish flush with the wall so that the junction between the skirting and wall does not provide a suitable ledge for bacteria to grow.

Staff must enter the facility via the gowning and washroom, where they don the required protective clothing and shoes. The doors to the high care areas work on a "traffic-light" system ensuring that one has to be shut before the next can open to prevent unwanted flow of contamination.

Nuffield Health wanted to build and provide a modern facility with stringent infection control and decontamination processes that meet existing international standards and regulations. Both cfes and Nuffield recognised the importance of the health and economic impact if surgical instruments are not sterilised to the highest quality standards. With these centralised decontamination services in place, any risk

The steam boiler plant for the washer disinfectors, sterilisers, hot water and heating

of HCAs (healthcare associated infections) should be reduced and incidents such as blood-borne virus transmission should not occur as a result of inadequately decontaminated or stored medical equipment.

Duncan Roper, general manager for Nuffield Health says: "Our aim at Nuffield Hospitals is to be one step ahead of the game when it comes to the sterilisation and decontamination of surgical instruments.... We believe this can be successfully achieved through strategically located centralised decontamination centres (CDS), which will in turn provide our patients with unrivalled levels of customer care and safety."

Rob Doubtfire, contracts director of cfes believes that upgrading facilities, be they CDS or refurbishment of existing sites, is the way forward to ensure patient safety, and Nuffield's new centralised decontamination centres will ensure that surgical equipment is cleaned and sterilised to the highest standards possible to protect patients from cross infection. ■

Reference

1. The Operating Theatre Journal, Nov, 2001.



Triple Red softened process water supply systems ensure the water systems run reliably

CONTACT

cfes Ltd
Head Office, Unit 3,
Bentley Park, Blacknest,
Alton, Hampshire, GU34 4PX
UK
T +44 1420 22622
F +44 1420 22612
general@cfes.co.uk
www.cfes.co.uk