



Cold calling

The experiences of an infection control team in disinfection and sterilisation procedures have helped influence one manufacturer's product development in endoscope sterilisation.

At King's College Hospital, London, Tristel sterilants have recently replaced glutaraldehyde as the method of choice for sterilising heat-labile surgical instruments, such as flexible endoscopes. The change came about under the guidance of the hospital's infection control team, led by senior infection control officer Bill Houston, whose experiences with Tristel products in the late 1990s helped pave the way for the development of the current product range.

In 1996, Houston conducted a review of procedures for the disinfection and sterilisation of instruments at Medway Maritime Hospital, where he was an infection control officer. The review highlighted the variety of approaches being used for cold sterilisation of flexible endoscopes. While all procedures used glutaraldehyde, not all were operated within contained areas.

While the method of choice at the time was the widely used 2% glutaraldehyde managed in a sealed environment such as an automatic washer/disinfector, disinfection in satellite and more remote areas was often carried out in open troughs, where ventilation might be poor and rigorous control more difficult. The large surface areas meant increased vaporisation, with the potential to expose operators to the hazards posed by this respiratory irritant (Cowan, RE, Manning, AP, Ayliffe, GAJ et al, *Aldehyde disinfectants and health in endoscopy units* GUT 1993; 34: 1641-5). As the potential health risks became more widely appreciated swift action was taken.

The health and safety of the staff was a major decision-making force in the move away from glutaraldehyde, but there was the added concern that while glutaraldehyde offered high-level disinfection, it is not a sterilant. There were also issues of lengthy exposure times when dealing with endoscopes used on ▶

A variety of approaches are used for cold sterilisation of flexible endoscopes in most NHS trusts.





Tristel technology

Chlorine dioxide has long been established as a highly effective sterilant, penetrating microbiological structures and acting as an oxidising agent to disrupt metabolic processes. The Tristel system generates chlorine dioxide rapidly and reliably and the incorporation of a patented buffering and inhibition system stabilises the pH close to neutral and protects sensitive materials.

On activation of the Tristel sterilant, chlorous acid is produced in solution (HClO_2) with the release of chlorine dioxide on contact with the surface of micro-organisms. Unlike other chlorine based products, no free chlorine (a hazardous substance) is produced.

Tristel points to an extensive microbiological testing programme conducted at independent laboratories, which was used to establish the minimum level of chlorine dioxide required for sporicidal, tuberculocidal and fungicidal activity. In vitro studies have been further validated by in-use testing of the Medivator/Tristel Generator system at the Royal Oldham Hospital.

Toxicology data from a range of studies conducted for the US Food and Drug and Administration demonstrate that Tristel solutions are non-hazardous and non-sensitising. Furthermore, its complete biodegradability is an additional advantage since it can be disposed of to normal drainage and any spills can be managed without the need for special precautions.

1997, the switch from glutaraldehyde was completed at the first attempt.

The move to the new product presented some challenges and addressing them required close co-operation between Tristel, the hospital and the manufacturers of the endoscope washer/disinfectors and the scopes themselves. It had been foreseen that the Tristel product would affect brass, but it had not been anticipated that some of the older rigid endoscopes were made from a chromium-coated brass alloy. This is no longer a problem, as modern scopes are manufactured from stainless steel, but damage to the brass parts in washer/disinfectors resulted in breakdowns. Also, the pungent odour from the activated solution was not well received, and resulted in staff leaving the activated solution for several hours to allow the concentrated vapour to disperse.

A far-reaching consequence of the investigations at this stage was the introduction in 2001 of a new, improved range of Tristel sterilants in which the chlorine dioxide concentration on initial activation is significantly lower than in the original products.

Tristel sterilisation technology has been refined to suit the needs of different trusts and departments.



patients with, or suspected of having, tuberculosis. Here the normal 20 minutes disinfection time had to be increased to one hour, delaying the next use of that scope and occasionally raising questions about the effectiveness of the disinfectant.

Time to decide

Following the review, the team at Medway decided to investigate all other sterilants. The choices were fewer than they are today, but three were selected for further evaluation. These were: A super-oxidised water system that required a production unit and had to be piped to the washer/disinfectors; peracetic acid; and Tristel, which uses chlorine dioxide technology. At that time the Tristel product was only available in one format — Tristel 1100 — which was activated by and used very high chlorine dioxide concentrations, some four to five times greater than the concentrations that are used in the current product range.

Ultimately the Tristel product was selected for routine use at Medway, as it presented no health risks and microbiology data from the Public Health Laboratory Service (PHLS) indicated its effectiveness. Its adoption was initially intended to be a holding procedure pending the completion of new theatres, which would include the installation of a super-oxidised water system. When the decision was made in

Learning from experience

Moving to King's College Hospital in 2000 as senior infection control officer, Houston undertook a similar review of instrument disinfection and sterilisation procedures. The withdrawal in 2002 of a leading glutaraldehyde product provided the final incentive to move to a cold sterilant and as stocks of glutaraldehyde were depleted, the Tristel range — now offering a variety of formats to suit the needs of individual departments — was introduced throughout the trust. The changeover proved to be straightforward and Houston is now looking to expand the use of Tristel into non-endoscopy areas. These may include the sterilisation of instruments used in the diabetic foot clinic.

The move away from glutaraldehyde has gathered pace in the last 12 months. Starting with a sound technology, the Tristel range has been refined to suit the needs of different trusts and departments. This process has benefited greatly from the input and co-operation of infection control professionals, endoscope users and others within the healthcare environment, and emphasises the need for close collaboration between all parties involved in the development, supply and use of vital medical products. ■