

# Comprehensive overview of current topics

## Infection Control, Sterilization & Decontamination in Healthcare, London, 21 – 22 March 2017

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The 2<sup>nd</sup> annual Infection Control, Sterilization & Decontamination in Healthcare Congress was held on 21 and 22 March in London with some 150 delegates in attendance.

Graham Stanton spoke about the new English HTM guidance. He said the CFPP document title was causing confusion and needed changing. When discussing protein detection, he said that traditional methods of detection were not sensitive enough. Referring to the TSE guidance and in particular Part 4, he stated that para's C3 and C4 were the driver for change. He also stated that the protein level should not be seen as absolute and that continuous improvement is required.

### I Endoscope reprocessing

In his lecture John Mills (Steris) spoke about endoscopy. He pointed out that endoscopic, like minimally invasive surgery, procedures were being used increasingly, with ever smaller more complex instruments containing increasingly more electronic components. One wondered whether high level disinfection was still adequate since the boundaries were increasingly more blurred between diagnostic and interventional, and as such also between non-critical and invasive, procedures. Mills continued by stating that while the Spaulding classification system was effective, modern surgical techniques were yet to be developed at the time of its formulation. The basic trend pointed towards endoscope sterilization, using a range of low-temperature sterilization processes. H<sub>2</sub>O<sub>2</sub> sterilizers with and without plasma had become established, largely thanks to their shorter cycle times compared with ethylene oxide or formaldehyde and the fact that they did not present a risk of toxicity to users or the environment.

Gary Clarke (IHSS), too, spoke about endoscopy. Outsourcing of endoscope reprocessing (decontamination) to specialist establishments was one alternative to traditional organizational practices and also increased patient safety thanks to more specialized personnel. Besides, obtaining certification was a particular challenge for small reprocessing departments.

Another benefit was the investment savings made and the space-saving advantages to the hospital. But one problem could be keeping the endoscopes sufficiently moist, especially with long transport routes, and reprocessing them as prescribed within three hours.

Paul Caesar from the Netherlands suggested there was an increasing problem of HAI's associated with endoscopy and that removing debris (cleaning) was the most important step in reducing the bioburden on an endoscope. One of the problems was deciding how clean do they needed to be. He highlighted several publications which offered evidence that endoscope cleaning is inconsistent at best and ineffective at worst. He stated that biofilms are also a problem and effective cleaning of duodenoscopes may not be possible. He described it as a kind of Russian roulette for patients. There is a definite need for surveillance of endoscope cleaning but biological culturing of endoscopes was still rare. An easy to use, rapid system was therefore required. Caesar then explained the mechanism of ATP and proposed it as a mechanism of monitoring endoscope cleanliness. The benchmark used in his trial was < 15 Relative Light Units (RLU) was efficiently clean, 15 – 30 was moderately clean and more than 30 not clean. His findings revealed that 26.5% of duodenoscopes showed a failed result after reprocessing and needed a second round of processing.

He concluded by saying that rapid cleaning indicators such as ATP, haemoglobin and carbohydrate were needed to create a safe endoscope for patients and that control alone of the AER and manual process was not enough. But setting an acceptable limit that corresponded to microbiological sampling was difficult and different levels may be required for different types of endoscopes depending upon their use.

Mariette Jungblut discussed the issues surrounding processing of endoscopes and focused on the manual wash requirements. She described issues with biofilms in water supply pipework and that this was a common problem. She asked if there was a conflict of interest if the person using the endoscope also decontaminated it.

The time pressures and amount of work that had to be completed make it difficult for technicians and all clinicians need to understand this.

### I Tracing

Anthony Heard, Associate Sterile Services Manager, talked about this history of the bar code and its origins in food industry and supermarkets. It was worrying that Never Events (events in a hospital that should not happen) included leaving of instruments and medical devices in patients despite use of the WHO checklist and instrument counts. He said the use of proper codes and data management could help prevent these.

Heard argued that the current situation in many hospitals is that trays can be traced using a bar code however this does not apply to single instruments which are not often tracked individually. This leads to problems with instruments migrating between trays. A universal bar code system would help facilitate this. It would also be useful for loan trays which are a particu-

lar problem as loan suppliers all use different systems. He concluded by saying if we can trace food from the grower to the consumer, we should be able to trace medical devices through the use and supply chain.

### **I Reprocessing in Norway**

June Aksnes, Sterile services Manager, Norway outlined the Norwegian health infrastructure and stated that large changes would be made in the management structure and some hospitals may have to close as a result.

Decontamination and sterilisation were not centralised and most theatres and departments had the own equipment. Whilst Norway is a relatively wealthy country, money for capital equipment was hard to come by as there is no fixed capital replacement programme to automatically fund new washers and sterilizers.

There is now a national strategy for decontamination which required decontamination leads in a hospital, structured procedures, an education programme, national documentation and specifications for buildings and technical infrastructure. Norwegian hospitals needed to share more and avoid duplication of work. Therefore there was a need to review the way they work, adapt to use new skills and implement better technology. This may also require increasing use of single use devices and centralisation.

### **I Low temperature sterilization**

Bob Jobbins, Authorising Engineers, discussed what methods of low temperature sterilization are available and why we need to use low temperature methods.

He outlined the various methods of sterilization that existed by breaking them down into physical, chemical and mechanical means such as filtration. He then focused on low temperature methods using oxidising agents and in particular hydrogen peroxide. He stated that hydrogen peroxide had relatively poor penetration characteristics, had issues with cellulose materials and devices could not have residual moisture on them before processing but overall he felt it was widely adopted because it offered less disadvantages than other common methods such as ethylene oxide. He warned about interchangeability between devices and sterilizers due to a lack

of a standard process. This is not the same as steam where a device can be processed in many different makes of steam sterilizer he stated.

He offered welcome news that a draft European standard for the equipment was being developed and that a process standard was also being considered. He explained that the mechanism of action was still not fully understood.

### **I Preventing infections in dentistry**

Christine Young from Scotland described the different approaches taken to improve infection prevention and control in dentistry in Scotland. Often, dentists had little understanding of the need for such measures; after all, the oral cavity was home to several bacteria and dental instruments were therefore essentially just like cutlery. It was not easy to provide evidence that someone had become infected while being treated by a dentist. However, in the meantime there were a number of cases where dentists had been prosecuted e.g. because of using non-reprocessed endodontic files or transmission of hepatitis. There were numerous challenges to be faced in dentistry: blood, saliva and aerosols presented a risk of infection; some of the instruments were very intricate and difficult to reprocess.

Often, only disinfectant wipes were used to clean contact surfaces between individual patients, but choosing the right disinfectant wipes and using them properly was a problem. And single-use devices continued to be often reused, e.g. endodontic files as demonstrated by a survey conducted in 2012/13 in Scotland.

The guidelines used in the United Kingdom were not uniform; the provisions of the Scottish National Health Service (NHS Scotland) differed from those of Health Technical Memorandum 01-05 valid in England.

Citing by way of example a washer-disinfector (WD), Young explained how a guideline had been amended: a previous version of the guideline had specified that a WD had to be available but now the current version stated that a WD had to be used – often the available WDs were not used to save time.

It was important to assure training for the entire team. An action plan was needed for

each dental practice and its implementation should be supervised.

### **I Building a new department**

Moya Alexander Decontamination lead, Imperial Hospitals, began her presentation with a description of the situation at the hospital she worked at in 2010 and how the endoscopy reprocessing was spread out in multiple locations and needed improvement.

They realised that investment was required in new units using a centralised model. They took the decision to build the new units to a sterile services environment standard. They undertook a facility and staff modelling process. When they went through a procurement process in order to evaluate the potential suppliers, they quickly realised they needed whole life costs that included maintenance, validation and consumable costs to make a valid judgement. They had limited space at some hospitals and compromises had to be made. They made use of a vacuum wrapping system to reduce the number of controlled environment endoscope storage cabinets required. They have since implemented a quality system within the departments.

Paul Jenkins Assistant General Manager, North Bristol, discussed the lessons learnt when building and designing new decontamination facility. The task he was set was to provide a facility with a 30 year life and at a low cost. It needed natural lighting, increased staff safety with controlled access and good staff facilities. Good light levels were important and Paul was surprised how much the light level dropped once the stainless steel surfaces were installed. The key was to measure levels once the equipment was installed.

Paul then showed plans of the new unit and explained the layout adopted. It was designed to accommodate both surgical instrument and flexible endoscope reprocessing albeit the two processes were separated in different rooms. Equipment levels were set to include redundancy and this include duplex water treatment systems and in some cases even a second spare component (such as with water pumps). The extensive use of rigid sterilization containers had increased the need for wash capacity. Paul stated that every consecutive department he has designed has end-

ed up increasing the size of transfer rooms and hatches. Having a transfer room allows larger amounts of raw materials to be held for the days production and reduce the wasted walking time. Paul listed some innovations they had adopted such as automated guided vehicle systems for delivery, acrovyn wall finishes, anti-fatigue mats and touch screen computer interfaces. Paul confessed that one of the most difficult aspects was bringing two teams together from the two old separate departments. Uncertainties around moving dates, new processes and working with different colleagues made change management important.

Rodney Wood, Sterile Service Manager, Cambridge, stated that we should aim for appropriate handling of instruments which was safe, kept instruments in the right condition and maintained their cleanliness. There are challenges around the environment, staff management and managing the expectations of clients. He reiterated that good communication between theatres and SSD was essential. Effective staff selection when recruiting was important especially their ability to follow processes. New staff only work on a restricted range of instrument sets and were reviewed at 1 and 3 month intervals. They had to take a practical assessment at the end of their probationary period.

Standardised tray lists with standardised checklists had been adopted. Use of pictures aided the tray assembly instructions. They now had of 3000 pictures stored within the tracking system to aid staff with further information if it is needed. Other solutions to meeting the challenges include avoiding overcrowding of sets, use of purpose designed trays with silicone holders, in-house trained instrument workshop and routine performance checks on some instruments.

In his closing thoughts he stated that staff will always make mistakes but we can take steps to reduce those mistakes and that vigilance is vital. Finally he said we must remember to say thank you – staff appreciate being valued.

### **I Copper against resistant bacteria**

Bill Keevil from the University of Southampton reported on the antimicrobial properties of copper. His lecture began

with a look at history – already during the antiquity copper was regarded as having health benefits.

Keevil presented the results of studies undertaken at Southampton University that simulated both moist and dry contact of a variety of organisms with copper surfaces. His work demonstrated that copper surfaces performed much better than stainless steel surfaces or even silver. *E. coli* cells exposed to copper surfaces showed destruction of DNA components over time. He then explained how antibiotic resistance could potentially be transferred by natural conjugation on surfaces. He proposed that copper surfaces could help prevent horizontal gene transfer.

He concluded that contact surfaces are a reservoir for rapid HGT and emergence of super bugs but copper alloys kill rapidly and can help reduce the spread of resistant bacteria.

He then discussed ongoing work using a laboratory simulation of a hospital ward and how infection can be transferred. This led to a discussion of trials around the world where copper alloys were being tested. One trial reported 58% reduction in HCAI's and while this seemed very high and unlikely, others had found 15% reductions.

Keevil finished by pointing out that copper surfaces were not more expensive than their stainless steel counterparts and that savings could even be made through a reduction in infection rates.

### **I The water system as a source of infection**

Daniel Imoh, Deputy Decontamination Manager, gave a presentation about maintaining standards of water quality during the decontamination process. It discussed why we need to control water and its contaminants. Corrosion due to poor quality water was an issue and it could lead to patient incidents when an instruments break due to corrosion. It could also lead to poor performance of washer-disinfectors. He concluded with a discussion of available methods of water treatment.

Mike Weinbren reported on waterborne infections. He described the problems associated with biofilm formation and explained what constituted an ideal water circulation system to control legionella. But things were unfortunately more dif-

ficult in reality. Weinbren stressed that water safety was not just a matter for the hospital's or institution's engineering department. Citing by way of example patient washbasins, he explained when microbial counts were especially high. The bigger the washbasin and the later the time of day, the lower the microbial count. Infirm, bedridden patients were at higher risk of legionella infection since the water system, e.g. the shower, was used less frequently. Once patients were able to get up and shower they faced a risk of contracting infection on showering.

Photos of water taps and washbasins helped to demonstrate just how extensive were the maintenance measures needed and that fatal errors were often made at the time of installation and cleaning.

Therefore, hand washbasins were being dispensed with in the meantime, especially in particularly vulnerable areas – hands were washed before entering such areas and then only disinfected.

Antibiotics, too, were expelled in urine and could contribute to the development of antibiotic resistance in the waste water system.

Already back in the 1960s Joachim Kohn had demonstrated that infections could have their source in washbasins but that possibility was initially discounted.

There have been reports in the meantime of outbreaks of SARS and salmonellae following transmission via the waste water system. Weinbren clearly demonstrated how toilets and washbasins were interconnected with the waste water system and this could give rise to backing up of contaminated water and microbial transmission, in particular when blockages occurred. And blockages were very common, e.g. if disinfectant wipes were disposed of in the toilet.

The Infection Control, Sterilization & Decontamination in Healthcare Congress, which offered a comprehensive overview of current topics, will be held again in the spring of 2018. ■