

## What Did We Learn In 2016? Emerging Trends and Technologies In Decontamination Sciences

In 2016 the fight against Healthcare-Associated Infections continued. The plight of cleaning, disinfection and sterilization of surgical devices gained much attention. Main stream media (like the *Chicago Times*) published articles relating to outbreaks of superbugs.

Even in South Africa we saw headlines like "New superbug danger stalks SA hospitals" in the *Sunday Times*.



These headlines have resulted in renewed focus on the importance of adhering to the manufacturers' instruction for decontamination. The spread of Carbapenem-resistant *Enterobacteriaceae* (CRE) from patient to patient via contaminated duodenoscopes during Endoscopic Cholangiogram (ERCP) procedures has added fuel to the fire.

Regulatory and accrediting bodies in the USA are "persistently and rigorously assessing both in-patient and out-patient procedures in all areas where medical and surgical instrumentation or equipment is used or reprocessed" (2016). Some outbreaks of CRE associated with duodenoscopes have occurred despite the hospital following the decontamination instructions to the letter.

### Emerging Pathogens

Antibiotic resistant bacteria like *Clostridium difficile*, *Enterobacteriaceae* and *Staphylococcus aureus* occur commonly in hospitals all over the world.

#### *Enterobacteriaceae* (CRE)

According to Dr Brink, the co-chair of the South African Antibiotic Stewardship Programme: "The exponential rise of CRE in South Africa has the potential to become a national crisis." In 2012, in South Africa only 64 patients tested positive for CRE at Ampath laboratories. In 2015, 587 patients tested positive. One wonders how many will test positive in 2017?

According to the *Sunday Times* article: "... one in five patients admitted to selected state hospitals are at risk of contracting a hospital-acquired infection".

#### *Candida auris*

The latest kid on the block to emerge is *Candida auris*. *Candida auris* is a fungus that can cause invasive infections that are often resistant to multiple anti-fungal drugs. *C. auris* was first described in 2009 and has caused infections in the ear and in wounds. It has a high crude mortality rate of between 33% to 72%. It has emerged worldwide and has been seen in Colombia, India, Israel, Kenya, Kuwait, Pakistan, South Africa, South Korea, Venezuela, and the United Kingdom.

Over 1 000 patients have had *C. auris* cultured from diagnostic specimens at public and private laboratories in South Africa. The majority of cases have been seen in hospitals in Johannesburg and Pretoria. Patients usually develop this infection after hospitalisation and the chances of developing this infection are increased if the patient has diabetes, has had recent surgery, or has had a urinary catheter or a central venous catheter inserted while in hospital. It is thought that this fungus is spread via the hands of healthcare workers or on fomites.

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### *Mycobacterium chimaera*

The transmission of this non-tuberculous *Mycobacterium* has been associated with heater-cooler units used in open heart surgery. Published research states *M chimera* aerosols are transmitted via the airborne route into the open surgical field (the chest cavity) even in operating rooms with ultraclean ventilation systems. The FDA has since provided updated recommendations relating to the use of a particular heater-cooler unit.

### **Surgical Instruments**

A number of reprocessing steps are required to decontaminate reusable surgical instruments. The Association of Operating Room Nurses (AORN) reminds us that the first steps begin in the operating room. It is critical that scrub persons keep instruments free of gross debris throughout the surgical procedure. The instructions provided by the AORN state that: "After the procedure, scrub personnel should use a spray or gel instrument pre-cleaner." (2016). These steps are important as they prevent a build-up of bioburden from drying on the surgical instruments. Pre-cleaning softens and loosens gross soil which makes the rest of the decontamination steps performed in the CSSD so much easier. In the USA, if a hospital does not perform the pre-cleaning steps in the operating room the hospital can be cited by an accreditation body as being in violation.

### **Complex Medical Instruments**

More and more surgical procedures are performed using minimally-invasive surgical (MIS) techniques. New complex surgical instruments are being designed to perform these surgeries. It is estimated that more than 60% of the surgical procedures performed in the USA are performed using MIS. According to the AORN, surgical instrumentation innovation includes illuminated retractors (spinal surgery) and cannulated reduction forceps used in orthopaedics.

### **Environmental Cleaning and Disinfection**

Florence Nightingale taught us about the environmental theory in the 1850s, in other words, the impact a patient's environment can have on their well being. Nightingale was particularly concerned with sanitation, and ensuring that the patient's environment was clean. The cleanliness of the surgical instruments used on the patient and the cleanliness of the operating room are of vital importance. Not to mention the importance of hand hygiene throughout the hospital. Superbug outbreaks have forced us to improve our environmental cleaning and disinfection. Operating rooms are often disinfected post cleaning using non-touch vaporised hydrogen peroxide technology or UV pulsing.

The challenges and trends in 2016 have indeed taught us valuable lessons.

### **References:**

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## 2017 Sterile Processing: State of the Industry Report

An on-line survey was conducted by Infection Control Today, looking at latest trends and patient safety issues relating to sterile processing. The findings of the survey were summarised in a report. The report is "designed to offer a snapshot of the key issues and challenges" faced in CSSDs in 2017.

The focus areas were as follows:

- Resources
- Education, training and certification
- Sterile processing performance and patient safety issues

### **Resources**

According to the survey it seems that 51% of the respondents had undergone budget or staffing cuts in the last year, and 84% said that their CSSD provided all the equipment and tools they needed to perform their jobs correctly.

## Education, Training and Certification

The respondents in the survey stated that the personnel in their departments had varying levels of educational background with 27% having a high school diploma and 26% having a trade school diploma. It was great to note that 89% of the respondents had a CSSD qualification like a Certified Registered Central Service Technician qualification from IAHCSSM.

## Sterile Processing Performance and Patient Safety Issues

In this report it was noted that experts at the AAMI forum 2016 identified the following types of challenges:

- Inadequate designs of the CSSD
- Issues with steam and water quality
- Aged or outdated facilities
- Inadequate resources and training for staff
- Inadequate point of use pre-cleaning
- Insufficient maintenance and repair of equipment and devices
- Failure to consider reprocessing requirements/instructions when purchasing equipment

The intention of the Association for the Advancement of Medical Instrumentation (AMMI) forum was to “examine the causes of healthcare-associated infections associated with medical devices and healthcare equipment”. The forum looked at how people, places and things contributed to HCAI. The forum stated that the contributing factors identified included: insufficient equipment (like automated washers for example); insufficiently trained staff; and poorly-designed facilities.

**In the latest UK CSSD Guidelines (HTM 2016) emphasis is placed on the importance of maximising protein removal by using a suitably-optimised washer disinfectant.**

Thankfully in South Africa we were notified in the Government Notice no 33790 that the Minister of Health has published standards relating to planning and design of CSSD and operating theatres in terms of the National Health Act.

**If all facilities going forward are designed and built within the framework of this standard, we can look forward to well-designed and structured CSSDs that will prevent - or will not contribute to - healthcare-associated infections.**

## References:

Government Notice, 30 June 2014. No 3379. *Publication of Health Infrastructure Norms and Guidelines*

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## Courses in Decontamination and Sterilization

These courses are run at various venues throughout South Africa and sponsored by SafMed. The courses are not product related and are run by Qualified Nursing lecturers who are experts in the field of Theatre and CSSD.

**The two courses are known as:** *Foundation Course in Sterilization and Decontamination (One day)*  
*The Advanced Course in Decontamination and Quality Management (One day)*  
In order to attend these courses an application form must be submitted.

**For course dates and application forms please contact:**

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