

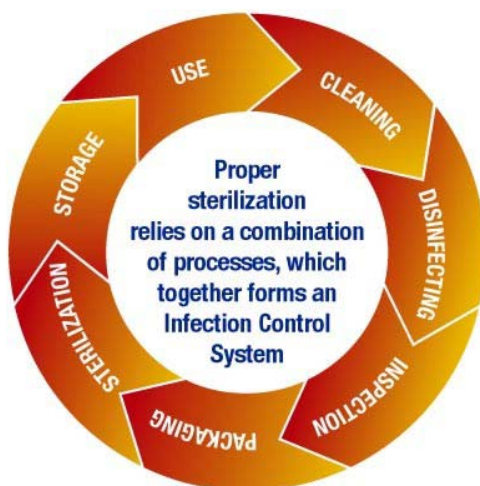
The Decontamination Cycle

Today's healthcare environment demands all instruments used on patients are safe for use. In order to achieve this, surgical instruments and other similar items require appropriate reprocessing between patients. This should take the form of a clearly defined process of decontamination.

The Decontamination Cycle

"Decontamination is a combination of processes, including cleaning, disinfection and/or sterilization, used to make reusable surgical instruments safe for further use. The effective decontamination of reusable medical devices is essential in reducing the risk of transmission of infectious agents".⁽¹⁾

The following diagram identifies all elements of the decontamination cycle.⁽²⁾



1. Cleaning

Cleaning can be achieved either by manual or mechanical means. The mechanical method is considered preferable as it is more effective than manual cleaning and can be validated. Not only does it provide higher standards of cleanliness, it reduces the risk of infection for staff involved. Whichever method is chosen effective cleaning is vital to the overall efficiency of the disinfection and sterilization stages of the decontamination process. If an item is not clean it cannot achieve sterility when autoclaved.

"Washer disinfectors are more efficient at pre-sterilization cleaning than ultrasonic cleaners and hand cleaning must not be used as a substitute for sterilization procedures". British Dental Association (BDA) Advice Sheet 12 'Infection Control in Dentistry'. February 2003

2. Disinfection

Disinfection is a process which uses chemical substances and/or heat to reduce the number of micro-organisms present, but may not inactivate some viruses and bacterial spores. Again mechanical disinfection is preferable as it is consistent and reduces the risk of injury from contact with hazardous chemicals used in manual disinfection. Disinfection should not be used as a substitute for sterilization.

3. Inspection

Inspection should be performed before sterilization in order to ensure that appropriate safety levels are being maintained. These items should be examined to ensure they are clean with no sign of debris remaining and there is no evidence of damage. Sub-standard instruments should be removed from the cycle immediately. If dirty, they should then be re-cleaned. If damaged, they should be sterilized before repair work is carried out. Alternatively, they should be destroyed if repair is not an option.

4. Packaging

Packaging is required for items which are to be stored for later use. Packed items should only be processed in a vacuum autoclave. (Please see advice sheet 3).

5. Sterilization

Sterilization is a process to render an object free from viable micro-organisms, including bacterial spores and viruses. Sterility, can be described theoretically as, "not more than one living micro-organism present in 1×10^6 (1 in 1 million) sterilized units of the final product"⁽³⁾. Items are required to attain this standard in order to achieve the term "sterile".

Sterilization of instruments can be achieved in a number of ways, including hot air, gas, irradiation and steam. Some of these methods are not suited to hospitals or clinics as they can be both lengthy and hazardous processes requiring specialised handling and equipment.

In contrast steam sterilization (autoclaving) is both quick and effective, offering a simple yet reliable method.

Steam sterilization is the most practicable method for sterilizing reusable medical devices in healthcare premises because it has high lethality, it is rapid and it is non toxic. Ref: Medicines & Healthcare products Regulatory Agency (Formerly Medical Devices Agency (MDA) DB 2002 (06)).

6. Storage

The storage of instruments should be suited to their subsequent use (see **levels of risk** below). In all cases storage areas should be clean and dust free.

7. Use - Levels of Risk

Whether an instrument needs to be sterile at the point of use will depend on the procedure to be carried out and the associated risk of infection to the patient. Methods of processing and storage will also be affected by the level of risk associated with the procedure to be performed, (i.e. if the instrument is required to be sterile at point of use.)

Risk levels are categorised as low, medium or high.

Low Risk Procedures are those where items only come into contact with intact skin, such as stethoscopes, skin thermometers and blood pressure cuffs. It is not necessary to sterilize these items but they should be cleaned in accordance with manufacturers' instructions.

Medium Risk Procedures are those where instruments will be in contact with intact mucous membranes or body fluids, such as mouth, vagina or rectum. Examples will include cervical screening, oral or rectal examination. These instruments must be cleaned and sterilized after use but do not need to be sterile at the point of use. They can therefore, be stored after autoclaving in a clean environment.

High Risk Procedures are those where instruments come into contact with breaks in the skin or mucous membranes, or when they will enter a sterile body cavity, such as insertion of Intra Uterine Contraceptive Devices (IUCDs), dental implantology and surgical procedures. In this instance the instruments must be sterile at point of use, either being used immediately after autoclaving or taken from sterile storage.

Alternative options for instrument supply

The use of Central Sterile Services Departments is often promoted, however, this is not always the most practical solution.

The turn around of instruments using this facility can affect the number of instruments purchased and may well influence the flexibility of service offered to patients. Delays in the service may also result in cancelled appointments due to the lack of sufficient sterilized instruments.

Another option is to use single use devices. This can be costly and there may be occasions when the required instrument is not available which may result in cancelled appointments.

For the majority of clinics and private practices the most suitable choice is that of a benchtop autoclave. This choice provides users with a rapid turnaround of their own instruments.

1. Source. Department of Health (DOH) Health Service Circular (HSC) 2000 (032)
2. Adapted from Sterilization, Disinfection and Cleaning of Medical Equipment, Medical Devices Agency 1996 (Now known as the Medicines and Healthcare products Regulatory Agency (MHRA).
3. 'Sterilization of Medical Supplies by Steam' Volume 1 General Theory. Jan Huys. Heart.

SES Little Sister Benchtop Autoclave Advice Sheets

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- No 2 Pre-sterilization Cleaning & Disinfection
- No 3 Selecting A New Autoclave
- No 4 Best Practice in Use of Benchtop Autoclaves
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