SOP
Cleaning of Surgical Instruments

Ministry of Health and Wellness
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Approval Form

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STANDARD OPERATING PROCEDURE FOR THE CLEANING OF SURGICAL INSTRUMENTS			
	NAME	**SIGNATURE**	**DATE**
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Standard Operating Procedure for the cleaning of surgical instruments and other medical devices

Challenges faced

During visits in the middle of 2024 to different areas such as outpatient departments, surgical and orthopedic wards and intensive care units (ICUs) in the five regional hospitals and two Mediclinics, it was noted that healthcare workers (HCWs) do not clean used surgical instruments adequately before sterilization or disinfection. Disinfectants (e.g. sodium hypochlorite [Javel]) and antiseptic solutions such as chlorhexidine gluconate and Savlon are used inappropriately to wash instruments. Often surgical instruments are soaked in disinfectants such as alcohol 70% or glutaraldehyde 2% without being adequately cleaned. There are no dedicated areas for the cleaning of instruments in the wards and often handwash basins in the treatment rooms are used for the cleaning of surgical instruments and other medical devices.

Central Sterile Services departments (CSSD) are mostly used for the packing and steam sterilization of surgical instruments cleaned by the wards and some theatres as well as the packing and sterilization of gauze, cotton wool and linen. No cleaning and very little inspection of instruments is done in the CSSD. This is the standard practice in most hospitals, despite having automated washers/disinfectors in the CSSDs in a number of hospitals. Instruments should preferably be cleaned in a centralized area with the appropriate equipment (automated washer/disinfectors are preferred), infrastructure, correct chemicals and trained staff to ensure adequately decontaminated surgical instruments that is safe to be processed further (e.g. sterilized) to ensure the safety of patients.[1,2]

Purpose

All healthcare workers involved in the decontamination of re-usable medical devices in the public sector must adhere to the Standard Operating Procedure (SOP) to ensure that dirty/used surgical instruments and other medical devices are clean and free of dirt and organic material to prepare them for further disinfection or sterilization. Disinfection and sterilization cannot be achieved if the bioburden and soil have not been removed.

Key points

1. Cleaning is the most complex and important step in the processing of medical devices. If a device is not clean it cannot be disinfected or sterilized.
2. Inadequately cleaned surgical instruments can carry residues of blood and body fluids with a risk of blood-borne virus transmission (e.g. HIV, hepatitis B & C) as well as highly infectious viral diseases, such as viral hemorrhagic fevers.
3. Inadequate cleaning does not remove biofilms. Biofilm formation in the lumens, thread of screws, hinges and difficult to reach areas prevent penetration of disinfectants and steam. Biofilm protects bacteria by covering them with an impenetrable layer of mucous and deposits (e.g. *Pseudomonas aeruginosa*).[3]
4. Surgical instruments and other medical devices cannot be disinfected or sterilized in the presence of dirt and organic matter as poor penetration of steam and chemicals occurs.
5. Some disinfectants (e.g. hypochlorite) are inactivated by organic matter.
6. **NEVER** soak dirty surgical instruments or other medical devices in a disinfectant e.g. Savlon, sodium hypochlorite (Javel), chlorhexidine or alcohol.
7. **Surgical instruments used on patients with multidrug-resistant organisms do not have to be soaked in disinfectants before or after cleaning. Effective decontamination processes are able**

to destroy most micro-organisms, except prions.

8. Used surgical instruments must be pre-cleaned at the point of use to remove gross contamination. It can be wiped or rinsed and kept moist until being re-processed further.[1,2]
9. Pre-cleaning does not replace the cleaning process.[2]
10. The life of the instruments is prolonged if soil and debris are removed regularly.
11. Use appropriate medical grade detergents for the cleaning of instruments (e.g. enzymatic detergents). **Never use the following: home or laundry detergents, liquid hand wash soap, disinfectants such as sodium hypochlorite or antiseptic solutions such as Chlorhexidine or Savlon**.
12. Ensure that detergents are diluted according to the manufacturers instruction to ensure optimal efficacy.[1]
13. Always follow the recommendations for decontamination of the manufacturer.
14. Surgical instruments should be cleaned in an automated washer/disinfector if available. Manual cleaning must not be used where formal, mechanical methods are available.[4]
15. Manual cleaning of medical devices is not generally recommended unless the device manufacturer's instructions state that the device cannot be safely cleaned in any other way, or that manual cleaning must be performed prior to automated cleaning.
16. Medical devices should be cleaned in a dedicated area and never in hand wash basins in clinical areas.
17. Never wash under running water to prevent splashes and aerosol production.
18. Manual cleaning cannot be validated, which makes record-keeping problematic.
19. Manual cleaning efficacy may be affected by staff competency and training, water quality and temperature range, detergent concentration level, nature of soil to be removed, method of soil removal, and accessibility of solution to item being processed.[1,2]
20. There are two principal methods of manual cleaning:
    - Cleaning by immersion.
    - Non-immersion method for devices which cannot be immersed in aqueous solutions, such as electrical and electronic equipment.[1]

Steps to be followed

Manual Cleaning

Immersion method

1. This method is used for medical devices that can tolerate water such e.g. surgical instruments, kidney dishes and other bowls.
2. Don the appropriate personal protective equipment (PPE) such as a long sleeve gown, utility gloves, goggles/face shield and closed shoes.
3. Fill the sink or any other appropriate basin with sufficient clean warm water (27°C to 42°C) for complete immersion of the device. Water should not be too hot because hot water coagulates protein

and makes it harder to remover.[1] Follow the instructions for water temperature of the manufacturer of the detergent.

4. Good quality potable water must be used for cleaning. Water with a high mineral content is not suitable for rinsing as the instruments can be damaged by the mineral deposits.
5. Ensure the detergent is prepared at the correct concentration and temperature and used for the recommended contact time as recommended by the manufacturer.
6. Use compatible enzymatic cleaners / detergents according to manufacturer's instructions. NEVER use a disinfectant or antiseptic solution (e.g. Savlon, Javal or chlorhexidine) to clean used surgical instruments.
7. The instrument must be dismantled or opened as necessary to ensure all parts are adequately cleaned. Special attention should be paid to joints, crevices and small lumens.
8. All devices being manually cleaned must be fully immersed in the solution and not under running water while being washed to reduce the production of aerosols and subsequent contamination of the environment.[6]
9. Use appropriate brushes to properly clean box locks, lumens and other hard-to-clean areas.
    - Use soft (nylon) bristle brushes so that the surface of the instrument is not damaged.
    - Brushes used to clean lumens must be the same diameter as the instrument to ensure that all internal surfaces can be reached.
    - Brushes must be long enough to exit the distal end of the instrument.
10. In another sink or basin, completely immerse the device in clean purified water and rinse the device thoroughly to remove loosened soil and residual detergent.
11. As soon as the wash and rinse water are visibly soiled, it must be replaced.
12. Dry the clean instruments in a drying cabinet or air or hand dry using a disposable clean lint free cloth.
13. Drying is an important step that prevents the growth of micro-organisms and dilution of chemical disinfectants, which may become ineffective.
14. Chemical disinfection prior to cleaning is unnecessary, ineffective and of little value in the presence of organic matter.[1,2,5]

Non-immersion method

1. This method should only be used for medical devices such as electronic and electrical devices that cannot be submerged in water.
2. If it is an electrical item, ensure it is disconnected from the main electricity supply before commencing the cleaning procedure.
3. Use a damp cleaning cloth that has been submerged in water and detergent solution.
4. Commencing with the upper surface of the item, wipe thoroughly, ensuring that the detergent solution does not enter electrical components.
5. Rinse the cloth in clean water every few minutes before re-immersing in detergent solution and wringing before continuing to wipe the item.

6. Surfaces should be hand-dried using a clean lint free cloth.[2]

After cleaning, all devices must be visually inspected for soil, damage, and functionality. Clean items should be stored and transported in such a manner that cross contamination is avoided.[1,2,5]

Mechanical cleaning

Mechanical cleaning of surgical instruments in a washer-disinfector is preferred. Washer-disinfectors are a very effective method for cleaning and heat disinfecting of surgical instruments because of the detergents, pressure and thermal action used.[4] Multiple steps are included in the cycle including pre-rinse, enzymatic wash, detergent wash, and lubrication. A final rinse at a temperature that thermally disinfects using de-ionized water will help to prevent mineral deposits and spotting and improve drying. Mechanical cleaning provides a controlled and uniformly reliable results if the equipment is well maintained. The cleaning process can further be validated to ensure adequately cleaned surgical instruments. It reduces the potential risk to staff of handling contaminated medical devices.[1,2,4]

Steps to be followed

1. Use mechanical washers-disinfectors in accordance with the manufacturer's instructions.
2. All used instruments should be pre-cleaned at the point of use to remove gross soil and organic material to prevent drying and coagulation of blood and body fluids.
3. Ensure that the device to be cleaned is compatible with the mechanical cleaning equipment, cycle parameters and cleaning solutions that are being used.
4. Open all hinged instruments to ensure that all surfaces are exposed.
5. Disassemble all multi part instruments.
6. Keep sets of items being processed together where possible.
7. Load items to be decontaminated in the correct position in the baskets to ensure maximum exposure of all surfaces of the instrument to the decontamination process.
8. Connect all tubes to the appropriate connector on the basket union and position the tray into the chamber.
9. Place heavier items at the bottom making sure that all surfaces can be reached by the spray jets.
10. Do not pack too densely or over-pack trays. All surfaces must be reached by the spray jets.
11. Use chemicals according to manufacturers' instructions.
12. A full-automated process should be used including pre-rinsing, washing, rinsing, and drying. Always follow the instructions of the device manufacturer.
13. Ensure that all daily tests are completed satisfactorily, and results recorded in appropriate logbooks.
14. Reporting any abnormal performance of the cleaning equipment promptly to the CSSD Supervisor.
15. All staff working in this area must be qualified and have received training from the manufacturers to operate the equipment. [1,2,5]

Validation and verification of cleaning

1. Validation of decontamination processes is important to ensure that it is carried out consistently in a systematic way.
2. Manual cleaning cannot be validated or verified.
3. Verification of the cleaning process can only be done through visual inspection during the inspection and packing of instruments.
4. All washer-disinfectors must be serviced regularly according to a planned maintenance programme. It is important that the parameters of the washer-disinfector cycles are monitored and recorded.
5. The washer-washer disinfector process can be verified with a commercially-manufactured product that mimics dried blood. Failure of this quality check can indicate that the washing equipment is not functioning properly or that cleaning chemicals are not feeding in properly. A passing check does however not prove that instruments are clean.[1]
6. Visual inspection of cleaned instruments is important.

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