## **GUIDELINES ON CLEANING AND DISINFECTION**

Introduction:

The Spaulding Classification classifies endoscopes under the category of *Semi-critical Disinfection* (a device that comes into contact with intact mucous membranes and does not ordinarily penetrate sterile tissue). Under this classification, these devices should receive at least *high level disinfection*, defined as the destruction of all vegetative microorganisms, mycobacteria, small or nonlipid viruses, medium or lipid viruses, fungal spores, and some but not all bacterial spores.

Most guidelines for endoscope reprocessing prescribe the following 6 steps:

Cleaning->Rinsing->Disinfection->Drying->Storage

The WGO-OMGE/OMED Practice Guidelines for endoscope disinfection lists a hierarchy of standards, namely: optimal, normal and minimal. The following steps are enumerated for minimal standards.<sup>2</sup>

- I. ENDOSCOPE REPROCESSING: MINIMAL STANDARDS
  - A. Pre-cleaning
    - 1. Clear gross debris by sucking water through the working channel (250 ml/min)
    - 2. Expel any blood, mucus or other debris
    - 3. Flush the air/water channel and wipe down insertion shaft
    - 4. Check for bite marks or other surface irregularities
    - 5. Detach endoscope from light source/video processor
    - 6. Transport in a closed container to the reprocessing room

## B. Cleaning

- 1. Conduct leak testing and block testing
- 2. Immerse endoscope in detergent or soap solution
- 3. Clean all surfaces, brush channels and valves with a clean dedicated brush and a clean swab or tissue
  - i. \*(use disposable brush and disposable swab or tissue)
  - ii. \*(renew detergent solution for each new procedure)
  - iii. \*(clean and rinse container before next procedure)
- 4. Follow the same procedures for all accessories as for endoscope processing

## C. Rinsing

- 1. Rinse the endoscope and valves under running tap water (drinking-water quality)
- 2. Immerse endoscope and irrigate all channels
- 3. Discard rinse water after each use to avoid concentration of the detergent and the risk of reduced efficacy of the disinfectant solution
- 4. Clean and rinse the container before the next procedure
- 5. Disinfection
- 6. Immerse the endoscope and valves in a disinfectant solution of proven efficacy (Glutaraldehyde, Paracetic acid, Orthoptaldehyde, etc.)
- 7. Follow manufacturer's recommendation for dilution
- 8. Irrigate all channels with a syringe until air is eliminated to avoid dead spaces.
- 9. Contact time with the solution should be according to the manufacturer's recommendation
- 10. Disinfection solution should be removed by flushing air before rinsing
- 11. The disinfectant solution should be tested at least every day for efficacy using the manufacturer's test strip
- D. Final Rinsing
  - 1. Rinse the endoscope and valves in drinking-quality or boiled water by immersing the endoscope and irrigating all channels

- 2. Discard the rinse water after each use to avoid concentration of the disinfectant and thus damages to mucosa
- E. Drying
  - 1. Ensure correct final drying before storage
  - 2. Dry with compressed air or if not available inject air with a clean syringe
  - 3. (dry with compressed air or 70% alcohol flush)
  - 4. Drying should be performed after each processing cycle and not just before storage
- F. Storage
  - 1. Disassemble the endoscope
  - 2. Store in a well-ventilated storage cupboard
  - 3. Ensure the valves are dry and lubricate if necessary
  - 4. Store separately or store the endoscope in a clean closed box with the valves

Most guidelines recommend the use of non-foaming enzymatic detergents for cleaning <sup>1/2</sup>, following the manufacturer's recommendation for dilution in cleaning endoscopes which may vary with the recommended dilution for cleaning accessories.

The ESGE/ESGENA outlines the following steps in the reprocessing of endoscopic accessories.

#### ESGE Guidelines on Reprocessing Accessories Cleaning

- Disconnect & dismantle accessories as far as possible
- Immerse accessories in enzymatic detergent solution immediately after usage
- Clean the single components of the devices externally by using soft cloth, sponge and brushes
- Perform brushing/cleaning under the water surface in order to avoid sprinkling of contaminated liquids
- Inject detergent solution into all accessible channels and lumen to remove secretion and debris (at least 1-0-20 ml solution in each channel)
- Ensure that all lumen are flushed completely to avoid air blockage
- Remove the instruments from the detergent solution Ultrasonic Cleaning (if available)
- Use a medical grade ultrasonic cleaner with a frequency range over 30kHz (38-47 kHz) and a max. operation temperature of 45°C, following manufacturer's instructions
- Use the same solution for the ultrasonic cleaner as for cleaning step
- Ensure that the detergent used is a non-foaming solution, compatible for manual cleaning as well as for ultrasonic cleaning
- Renew the cleaning solution at least daily or sooner if the solution is contaminated
- Ensure that the tray is large and deep enough to allow for complete immersion of the devices
- Load the basket/tray of the ultrasonic cleaner with the dismantled and pre-cleaned accessories (maximum 10 devices/cycle and tray)
- Avoid any ultrasound "shadows"/dead spaces where ultrasound waves cannot act, therefore, do not overload tray
- The instrument should be coiled with a diameter of not less than 15-20 cm, in accordance to the manufacturer's instructions
- Flush again all channels and lumen completely with at least 10 ml detergent solution to avoid air blockage

- Follow the instructions of both the ultrasonic cleaner manufacturer and the devices manufacturer
- Cover the ultrasonic cleaner with a lid
- Leave the accessories in the ultrasonic cleaner and complete the recommended contact time for ultrasonic cleaning, following the manufacturer's instructions for devices, ultrasonic cleaner and detergents (recommended ultrasonic cleaning: 30 min.)
- Remove the accessories from the ultrasonic cleaner
- Flush all channels with air to displace excess fluid

#### Rinsing

- Transfer the cleaned accessories to a bowl or tray, containing drinking quality water without contamination and renew it after each rinsing cycle
- Flush all channels completely and thoroughly in the water to remove detergent residuals, flush the channels with at least 20 ml water
- Rinse external surfaces thoroughly using drinking-quality water to remove chemical residues
- Remove the devices from the water
- Drain or aspirate all channels with air to express residual rinse water

### Drying

- Dry the external surfaces with a non-shedding cloth and compressed medical air
- Dry each channel completely with compressed air
- Dry all coiled accessories in a hang position to support the drying procedure
- Compose the accessories and check the correct functioning

#### Sterilization

- Put the instruments into sterile packaging for special instruments
- Select the adequate sterilization procedure for the thermal-stable and thermal-labile instruments in accordance with the manufacturer's instructions (pre-vacuum, 134°C, 5 min. or equivalent cycles)
- After completion of the sterilization cycle, ensure all cycle stages and parameters have been achieved
- Check the sterile packaging for any damage and the sterilization indicators

#### Storage

• Store the sterilized instruments in the sterile packaging in a closed cupboard, protected from dust, humidity and temperature fluctuations

## Microbiologic Surveillance Testing

The following sampling methods for testing the quality of reprocessing of endoscopes is recommended  $^{\rm 6}$ 

Test area/material	Test Method	Standard
Each endoscope channel	Flushing or rinsing of: - Suction/biopsy channel - Water channel - Air channel - Additional rinsing channels - Elevator channel on duodeno- scopes	<ul> <li>Fill a sterile syringe with 20 ml sterile saline</li> <li>Connect the syringe to the entry port of each channel</li> <li>Ensure that the connection permits complete flushing of the whole channel</li> <li>Adequate connectors should be used in order to guarantee correct rinsing</li> <li>Collect the fluid in a sterile container</li> </ul>
Outer surfaces	Swabs from e.g.: - Distal end - Valve ports - Bridge elevator	<ul> <li>Use sterile swabs, moistened with sterile saline with or without appropriate neutralizer</li> <li>Take swabs from each separate part of the endoscope</li> <li>Put each swab separately in a suitable medium and container (e.g. Tryptic Soy Broth, containing neutralizer</li> </ul>
Water bottle	Liquid sample	Water bottle ready for use should be tested     Sample volume: 2 x 100 ml     Adequate connectors should be used in order to take liquid samples from the water bottle via the connection tube of the water bottle     Use the appropriate and adequate connector and a sterile syringe to collect liquid samples from the water bottle
Final rinse water	Water sample	- Use a sterile syringe     - Collect the water in a sterile     container     - Sample volume: 2 x 100 ml

Frequency of surveillance varies from country to country. The ESGE-ESGENA guideline committee recommends routine testing at intervals no longer than 3 months.

Depending on the number of endoscopes in use, it may be impractical to test each endoscope at each occasion. The recommendation is to test a sample of each types/series at each sampling session in rotation, making sure that at the end of the year each endoscope has been sampled at least once.

#### **Personnel Protective Equipment**

- Long-sleeved waterproof gowns which are changed between patients
- Gloves long enough to cover the forearms
- Goggles to prevent conjunctival irritation and protect from splashes

- Disposable charcoal-impregnated masks to reduce inhalation of vapor
- An approved vapor respirator available for spillage or other emergencies

# **Reprocessing Room**

- Well-ventilated room with adequate exhaust
- Water of drinking quality or filtered water supply or sterile water supply
- Compressed air (optional)