ENDOSCOPE DECONTAMINATION

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INFECTION CONTROL OBJECTIVE

To prevent potentially pathogenic micro-organisms from reaching a susceptible site on a patient in sufficient numbers to cause infection

ENDOSCOPE DECONTAMINATION WHY?

- To prevent infection
- To protect the quality of diagnostic samples
- To prolong the life of the equipment

STERILIZATION

The complete destruction or removal of all micro-organisms including bacterial spores

DISINFECTION

The destruction of micro-organisms but not usually bacterial spores. The process does not necessarily kill all micro-organisms but reduces them to a level which is not harmful to health
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CATEGORIES OF INFECTION RISK TO PATIENTS TREATMENT OF EQUIPMENT

HIGH RISK
Items in close contact with break in the skin or mucous membranes or introduced into a sterile body cavity
STERILIZATION REQUIRED

INTERMEDIATE RISK
Items in contact with intact mucous membranes
DISINFECTION (OR STERILIZATION) REQUIRED

ENDOSCOPE DECONTAMINATION PROBLEMS(1)
- Instruments and accessories are expensive
- Damaged by heat and pressure
- Complex, difficult to clean and dry
- Penetration of channel uncertain
- Disinfectants often toxic, damaging or ineffective

ENDOSCOPE DECONTAMINATION PROBLEMS(2)
- Short periods only available for decontamination
- Automated systems and environmental controls expensive
- Rapidly advancing technology

MEDICAL DEVICES DIRECTIVE
Manufacturers are obliged to provide full details on how to decontaminate the reusable devices they supply. This should include compatibility with heat pressure, moisture, processing chemicals (e.g. detergents, disinfectants) and ultrasonics.

ENDOSCOPE PROCESSING EVALUATION CRITERIA
- Patient safe
- Staff safe
- Equipment safe
- Cost effective
- Practical

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ENDOSCOPE PROCESSING
- Specialized procedure
- Trained staff
- Dedicated room fully equipped

GOOD CLEANING IS ESSENTIAL
It removes:
- Potentially infectious micro-organisms
- The organic material on which micro-organisms thrive
- Soil which protects micro-organisms during sterilization and disinfection
- Soil which may inactivate disinfectants

CLEANING OF ENDOSCOPES
Important to ensure
- Access to all channels whether they have been used or not e.g. forceps raiser channel, auxiliary water channel
- Irrigation of all channels that cannot be brushed

MANUAL CLEANING
Brushing
Appropriate size brush

Flushing
All channels
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ENDOSCOPE ACCESSORIES
Single use v reusable

- Cleaning
- Traceability
- Cost
- Turnaround time
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**ENDOSCOPE PROCESSING**

- Patient safe  
- Staff safe  
- Equipment safe  
- Cost effective  
- Practical

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**GLUTARALDEHYDE**  
(Cidex, Asep, Totacide)

- Wide range of antimicrobial activity  
- (including *Mycobacterium tuberculosis*)  
- Sporicidal (slow)  
- Inexpensive  
- Not readily inactivated by organic material  
- Does not damage instrument or processor components

- Irritant and sensitising  
- Fixative  
- Relatively unstable

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**GLUTARALDEHYDE**  
UK MAXIMUM EXPOSURE LIMIT (MEL)

0.05 ppm (0.2 mgm⁻³)

Short term exposure (15 mins)  
Long term exposure (8 hour TWA)

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**SELECTION OF DISINFECTANT FOR HEAT SENSITIVE EQUIPMENT**

**Efficacy**

- Destroy pathogenic spores, mycobacteria, non spring bacteria, viruses and fungi

**Compatibility**

- Non damaging to instruments and processors

**Safety**

- Non irritant to patients and staff. Environmentally friendly

**Cost**

- Consider use concentration, stability and associated costs e.g. processors, personal protective equipment

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**PERACETIC ACID**  
(NuCidex, Steris, Perasafe, Perascope)

- Wide range of antimicrobial activity (including *Mycobacterium tuberculosis*)  
- Rapidly sporicidal  
- Less irritant than glutaraldehyde  
- Active in presence of organic material

- Damaging to some instrument and processor components  
- Unstable  
- Unpleasant odour
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**CHLORINE DIOXIDE (Tristel)**
- Wide range of antimicrobial activity (including *Mycobacterium tuberculosis*)
- Rapidly sporicidal
- ? Less irritant than glutaraldehyde
- Inactivated by organic material
- Damaging to some instrument and processor components
- Unstable
- Unpleasant odour

**SUPEROXIDISED WATER**  
**Sterilox**
- ORP 950mV, pH 5.5-6.5, Current 9 Amps
- Wide range of antimicrobial activity (including *Mycobacterium tuberculosis*)
- Rapidly sporicidal
- Non irritant
- Generated at point of use
- Unstable (use within 24 hours)
- Inactivated by organic material
- Damaging to some instrument components
- Generator expensive

**CIDEX OPA**  
0.55% ortho-phthalaldehyde
- Wide range of antimicrobial activity (including *Mycobacterium tuberculosis*)
- No activation required
- Not readily inactivated by organic material
- Does not damage instrument components
- Low vapour properties
- Poor sporicidal properties
- Irritant and sensitising

**ALCOHOL**
- Rapid in action
- Good bactericidal/fungicidal/virucidal activity
- Evaporates leaving surfaces dry
- Non corrosive
- Non sporicidal
- Flammable
- Fixative, does not penetrate organic material
- Prolonged immersion may damage lens cements

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**CHANGING YOUR INSTRUMENT DISINFECTANT**
- Inform Infection Control Team
- Notify the instrument and processor manufacturers
- Cost change, bearing in mind use life of the disinfectant and any associated equipment
- Ensure manufacturers recommendations are followed
- Establish what PPE is required

**ADVANTAGES OF ENDOSCOPE WASHER DISINFECTORS**
- Reproducible cycle with process controls
- Reduces splashing and skin contact with the disinfectant
- More user friendly and convenient process
ENDOSCOPE WASHER DISINFECTORS

Effective  Cleans and disinfects all internal and external surfaces
Safe    Removes toxic residues and vapour
Versatile  Accommodates various types/ manufacturers endoscopes
Convenient Rapid, non damaging, simple to use, inexpensive

ENDOSCOPE WASHER DISINFECTORS CONSIDERATIONS (1)

- Programmed cycles for cleaning, disinfection and rinsing
- Number of endoscopes processed
- Cycle counter for disinfectant replacement and machine maintenance
- Fault indicator
- Quality of rinse water

ENDOSCOPE WASHER DISINFECTORS CONSIDERATIONS (2)

- Machine self disinfect cycle
- Toxic/irritant fume extraction/containment
- Tracking system for instrument, patient and procedure
- Availability of test reports substantiating claims
- Processor handbook and staff training

MACHINE CONTAMINATION

Due to:
- Inadequate cleaning, disinfection and maintenance of machine
- Static water remaining in tanks and pipework
- Poor quality water supply
- Biofilm within the machine

BACTERIA FREE RINSE WATER

- Filtration
- UV Treatment
- Heat treatment
- Reverse osmosis
- Addition of biocides
HTM 2030
MICROBIOLOGICAL QUALITY OF WATER
Total viable count - weekly
Environmental mycobacteria - yearly
Bacterial endotoxins - yearly

IDENTIFICATION AND TRACING OF ENDOSCOPES
Endoscopes are expensive and if they have to be quarantined as a result of possible exposure to vCJD, and are then subsequently destroyed, there is a large cost attached. If the instrument is not identifiable it may be necessary to destroy the entire endoscopy pool. All endoscopes should have a unique identifier and use on patients and processing details should be recorded.

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SELECTION OF ENDOSCOPE WASHER DISINFECTORS FOR ENDOSCOPES
Ensure that the processor
- Thoroughly cleans all instrument surfaces and lumens
- Disinfects instruments with an effective, non damaging disinfectant at use concentration and temperature
- Removes irritant disinfectant residues with sterile or bacteria free water
- Has a self disinfect facility
- Contains or removes all toxic vapour emissions
- Produces a print out for cycle validation and instrument traceability

VALIDATION OF DECONTAMINATION
Numerous tests are described but at the minimum, the user must ensure :-
- All channel irrigation occurs
- Disinfectant is within minimum effective concentration
- Quality of water is adequate

ENDOSCOPE DECONTAMINATION FAILURES
Due to :
- Inadequate cleaning
- Unsuitable disinfectant
- Damaged instrument
- Contaminated rinse water
- Contaminated washer disinfector
SUMMARY

Effective cleaning and disinfection/sterilization using a properly validated washer disinfector will

- Protect patients and staff from infection
- Prolong the life of the equipment
- Ensure the quality of the diagnostic/therapeutic procedure

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