

**Christina Bradley**  
**Endoscope Decontamination**  
**A Webber Training Teleclass**

**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

#### SOURCES OF INFECTION DURING ENDOSCOPY

- Previous patient, inadequate decontamination of endoscope before reuse
- Endogenous skin, mucosal or bowel flora
- Contaminated lubricants, dyes, irrigation fluids, rinse water
- Inadequate decontamination of processing equipment
- Air, hands or gloves of staff

#### 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

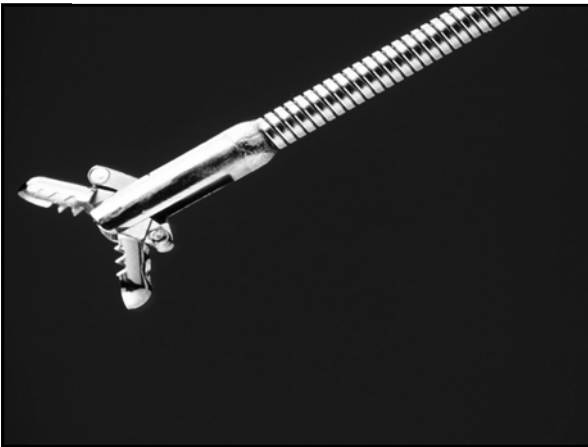
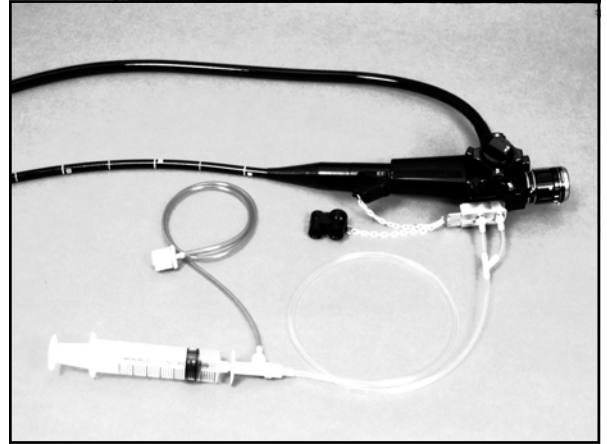
All channels



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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

## 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

GLUTARALDEHYDE SENSITIZATION



## GLUTARALDEHYDE UK MAXIMUM EXPOSURE LIMIT (MEL)

0.05 ppm (0.2 mgm<sup>-3</sup>)

Short term exposure ( 15 mins)

Long term exposure (8 hour TWA)

## 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

## 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 5-6.5, 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

**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

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#### ENDOSCOPE WASHER DISINFECTORS

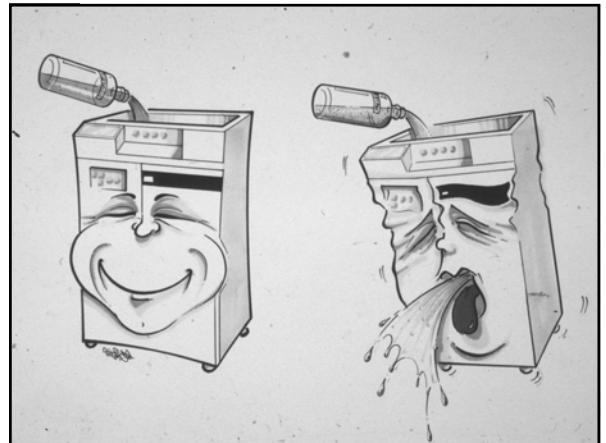
- Effective** Cleans and disinfects all internal and external surfaces
- Safe** Removes toxic residues and vapour
- Versatile** Accommodates various types/ manufacturers endoscopes
- Convenient** Rapid, non damaging, simple to use, inexpensive

#### 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

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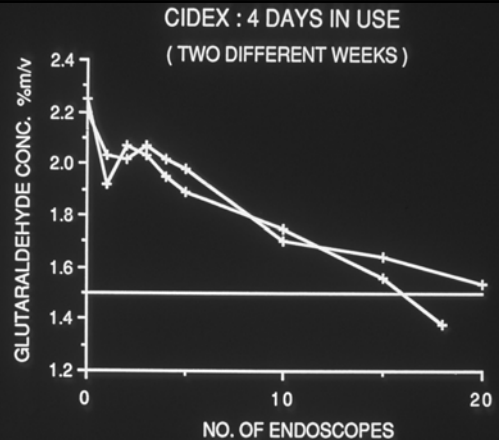
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#### HTM 2030

#### 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.

*HSC 1999/179*

#### 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 disinfectant



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## SUMMARY

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

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

## THANK YOU FOR LISTENING



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