# DECONTAMINATION OF FIBRE-OPTIC ENDOSCOPES

## *KEY POINTS*

Infections such as hepatitis B virus and tuberculosis have been shown to be transmitted on endoscopes
All precautions will be taken to reduce this risk
The mainstay of decontamination is cleaning
This should be done in an automated washer
Glutaraldehyde has been phased out (DoH and HSE recommendations)
High level disinfection is possible with a number of other products
These may be efficient disinfectants but they may also be more damaging to endoscopes and their accessories
Final rinsing should be done with sterile pyrogen-free water
Patient-endoscope and endoscope accessory tracking should be instituted
Single patient-use disposable accessories should be used where possible

## INTRODUCTION

A wide variety of fibre-optic endoscopes is used, ranging from naso-pharyngoscopes of relatively simple design, to ultrasound endoscopes of complicated design, some with video imaging. Fibre-optic endoscopes are made from heat sensitive materials and their design incorporates long narrow channels. Both these factors make them very difficult to decontaminate. Endoscopes have been associated with the transmission of infection from one patient to another so it is essential that the recommended procedures are followed when disinfecting or sterilizing these instruments. This policy contains recommendations concerning decontamination of various fibre-optic endoscopes

## GENERAL POINTS

HIGH RISK PATIENTS

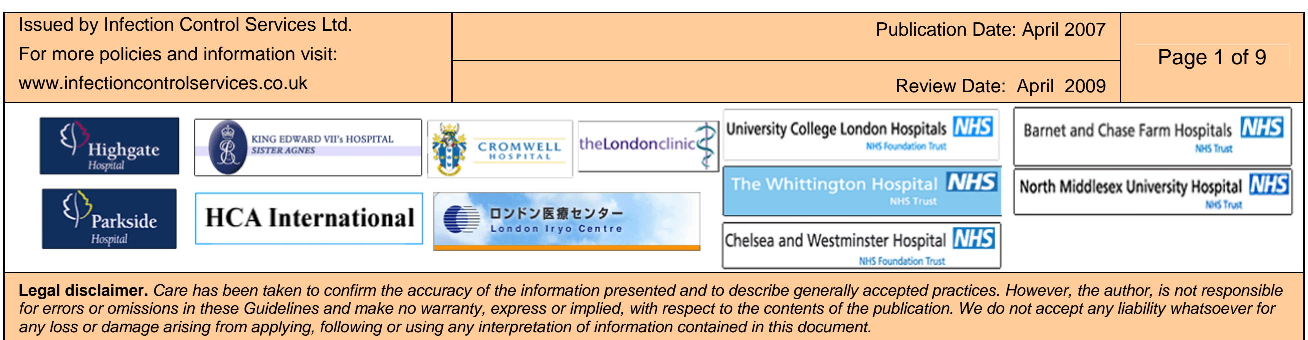
It is impracticable to identify all high-risk individuals. Thus an adequate antimicrobial decontamination process must be used for all endoscopes at all times, rather than adopting a two-tier approach, depending upon the perceived risk that any particular patient presents. A dedicated "AIDS" endoscope is therefore not necessary.

vCJD

However, a dedicated endoscope will be used for performing upper GI endoscopy procedures on patients known to have variant CJD (see policy ). The commonest indication for such use is insertion of a percutaneous feeding line. A designated gastroscope is available at UCLH for local and National use. All ancillary items must be disposed of.

TRACEABILITY/TRACKING

A system must be in place so that it will be possible to trace all patients who have a procedure with a particular endoscopes and their reusable accessories. These data should be recorded in the patient's notes.





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## DECONTAMINATION PRINCIPLES

Decontamination of fibre-optic endoscopic and ancillary equipment is a specialised procedure and should be carried out only by staff who have been properly trained. Mechanical cleaning with a detergent is an essential prerequisite to any disinfection or sterilisation process, as it physically removes the mucus containing the majority of pathogenic micro-organisms, so allowing subsequent decontamination to be carried out with optimum efficiency. It is the most important part of the decontamination procedure.

Decontamination of the endoscope should take place in a specified area, properly ventilated, near to where the procedure is being performed. The person who is decontaminating the endoscopes should wear a plastic apron, rubber gloves, mask and/or face visor. If a mask is worn, the eyes should be protected with goggles.

The endoscope should be decontaminated before the endoscopy list begins, between patients and at the end of the list.

Brushes and other ancillary equipment must themselves be disinfected or sterilised after each use. (See Policy for Disinfection).

Automated methods of disinfection using an endoscope washer are preferred to manual disinfection because there is more consistency in the process; automated methods are microbiologically more efficient and endoscope washers will minimise staff contact with these chemicals. However, the use of an automated method of disinfection does not remove the need to thoroughly clean the endoscope prior to disinfection.

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**GASTROSCOPES, DUODENOSCOPES,**

**COLONOSCOPES AND SIGMOIDOSCOPES**

**MECHANICAL CLEANING**

- As soon as the endoscope is removed from the patient, wipe off excess mucus, etc from the insertion tube. The endoscope should not be placed on any other work surface.
- Place distal end of insertion tube in a sink of detergent and water and aspirate through suction channel for at least 30 seconds.
- Turn off air pump and remove air/water valve. Place valve in bowl of detergent solution. Insert air/water channel cleaning adaptor.
- Perform a leak test.
- Turn air pump back on and operate air/water channel cleaning adaptor to feed air and water alternately for approximately 10 seconds each.
- Disconnect endoscope from light source and immerse whole instrument in sink full of cleaning solution (Check that AC-10s adaptor is not still attached to endoscope).
- Wash outside of the instrument with gauze swabs, and clean the distal tip thoroughly with a toothbrush.
- Remove the air/water cleaning adaptor, suction valve, biopsy valve (and distal hood and $CO_2$ valve on colonoscopes), and place them in a small bowl of detergent solution.
- Insert special OES cleaning brush through biopsy channel opening and brush through the tip of the endoscope. Clean brush and repeat at least three times.
- Pass the cleaning brush through the suction valve hole into the instrument channel to the tip of the endoscope. Clean the bristles carefully before withdrawing the brush. Repeat until the channel is clean.
- Pass the cleaning brush down the universal cord suction channel, again cleaning the brush before withdrawal.
- After brushing all the channels, they must be flushed with detergent.
- For side-viewing endoscopes, clean the forceps raiser mechanism carefully with a denture brush. Attach the forceps raiser channel cleaning tube and flush thoroughly with detergent solution.

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## DISINFECTION

- Using an endoscope washer-disinfector (EWD)
- Connect the all-channel irrigator to the endoscope and immerse the entire instrument in an EWD. (For side viewing endoscopes, attach the forceps raiser channel cleaning tube and fill the channel with the disinfectant prior to immersion in the EWD.) Leave the endoscope immersed in the disinfectant for the recommended time.
- At the end of the list, clean the suction and air/water valves in the ultrasonic cleaner for 10 minutes, then disinfect them as above. Dry and lubricate with Silicone Oil before replacing them. Send water container to CSSD for autoclaving at the end of the list.
- A leak test must be performed

## BRONCHOSCOPES

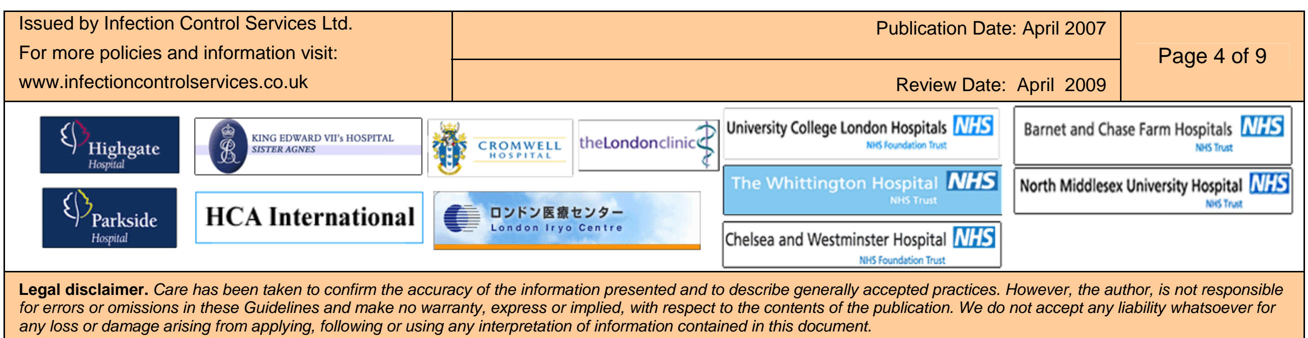
## MECHANICAL CLEANING

- After removal from the patient, the bronchoscope should be taken straight to a sink containing a detergent solution. Wipe the insertion tube with a gauze.
- Perform a leak test
- Connect a syringe to the biopsy part and placing the tip of the bronchoscope in the detergent solution, aspirate up and down the channel several times.
- Remove the syringe and insert a cleaning brush all the way down the channel, cleaning it as it emerges from the distal tip. Brush the channel several times.
- Immerse the bronchoscope in the detergent and clean the outside with gauze, brushing the channel repeatedly and cleaning the brush as it emerges from the tip.
- Biopsy brushes should be cleaned ultrasonically if possible

## DISINFECTION

- Connect the bronchoscope to the EWD.
- Allow the bronchoscope to soak in the disinfectant for the recommended time.
- Remove the bronchoscope. Dry the insertion tube and control box with a gauze and suck air through the channel until dry.



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## CYSTOSCOPES

### MECHANICAL CLEANING

- After removal from the patient, the cystoscope should be taken straight to the washing sink, which should be filled with a detergent solution. Perform a leak test. The insertion tube (sheath) should be wiped with gauze.
- Connect a syringe to the biopsy channel part and placing the tip of the cystoscope in the detergent solution aspirate up and down several times.
- Remove the syringe and insert a cleaning brush all the way down the channel, cleaning it as it emerges from the distal tip. Brush the channel at least 3 times or until clean.
- Biopsy brushes should be cleaned ultrasonically if possible.

### DISINFECTION

- Connect the cystoscope to the EWD and soak for a minimum of 10 minutes.
- Remove the cystoscope from the disinfectant. Dry the insertion tube and body of the cystoscope, sucking air through the channel until dry.

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## NASO PHARYNGOSCOPES

### MECHANICAL CLEANING

- After removal from the patient, wipe the insertion tube.

### DISINFECTION

- Totally immerse it in approved disinfectant and leave for the recommended time. Use an automatic processor if available.

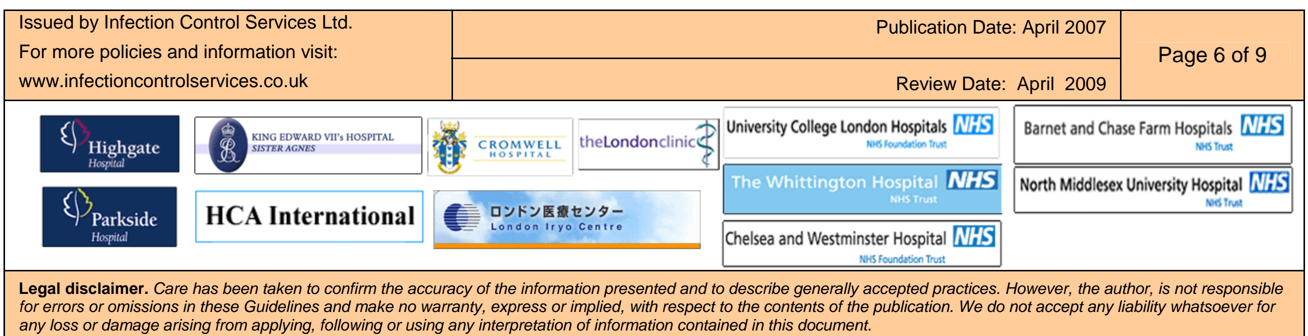
## DECONTAMINATION OF REUSABLE ENDOSCOPE ACCESSORIES

### MECHANICAL CLEANING

- Wash immediately in fresh detergent solution, dismantling as far as possible. Brush away adherent matter with a toothbrush.
- Flush detergent solution through all channels.
- Transfer to an ultrasonic cleaning bath containing ultrasonic cleaning agent. Ensure that all lumina are filled with liquid before cleaning.
- Rinse thoroughly with water, flushing out lumina.

### DISINFECTION/STERILISATION

Either sterilize by autoclaving or where the accessories are heat sensitive (eg some endoscope brushes), use Sterrad Gas plasma (or ethylene oxide, which is not now generally available), or immerse in approved disinfectant for the recommended time. If the accessories have been used in situations where the presence of *M. tuberculosis* is likely, eg bronchoscopy, the time of immersion is doubled.



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## DECONTAMINATION OF RIGID ENDOSCOPES: FETOSCOPES, HYSTEROSCOPES, LAPAROSCOPES AND ARTHROSCOPES

These instruments should be sterile prior to use. Decontamination using liquid disinfectants is not ideal although in practice infection is very unlikely from equipment processed properly in this way. If possible, sterilize by autoclaving, or using the Sterad gas plasma system (or ethylene oxide). (Some subsidiary equipment in current use eg.intrauterine catheters and fibre optic leads do not withstand autoclaving. These should be sterilised using Sterad gas plasma (or ethylene oxide)).

## RIGID BRONCHOSCOPES, OESOPHAGOSCOPES AND TELESCOPES

These instruments should normally be autoclaved. In a few cases, rigid bronchoscopes contain fibre-optic leads and are not suitable for autoclaving. Heat sensitive equipment should ideally be sterilised using ethylene oxide or the Sterrad gas plasma system. Alternatively, immerse the clean instrument in approved disinfectant for 10 minutes. ensuring that all air channels are flushed through. Remove the instrument, rinse with sterile water and dry with sterile towels.

Before doing an endoscopy on an immunocompromised patient, the endoscope should be disinfected. Patients known to have infection with *M. tuberculosis*, HIV or HBV should be scheduled for the end of the list and the endoscope cleaned then immersed in disinfectant for 20 minutes. If atypical mycobacterial infection is suspected the period of immersion should be 1 hour.

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## NEW DISINFECTANTS

Although glutaraldehyde is probably the best choice of disinfectant for endoscopes, it is now no longer recommended because of the stringent precautions laid down to reduce risk of exposure. Glutaraldehyde is relatively non-damaging to endoscopes and is cheap but contact times to ensure kill of mycobacteria are long.

New agents include superoxidised water, hydrogen peroxide, chlorine dioxide, improved quaternary ammonium compounds, peroxygen and peracetic acid compounds. Most of them have potential disadvantages of insufficient spectrum of activity, corrosiveness and irritant activity and cost. Of these new agents, peracetic acid formulations appear to be the best but, if used, ventilation and health screening are advocated (as for the use of glutaraldehyde). Commercial formulations include “Steris” and “NuCidex”. The former is a dedicated endoscopy system with a long cycle time, the latter can be used in any suitably modified endoscope washer/disinfector. The products are less stable and more expensive than glutaraldehyde.

Various guidelines have been published. Those given by different groups are given in MDA DB 9607 Nov 96: Decontamination of endoscopes. These tables given for different preparations and recommended minimal disinfection times are given below but do not include recommendations for newer disinfectants. Individual policies in different units should conform to these minimum requirements.

The recommended ***minimum*** exposure times (minutes) are controversial and are a balance between adequate decontamination, damage to the instrument and the required interval between procedures.

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## REFERENCES

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