

Cleaning and Disinfection of Endoscopes Policy

Effective: August 2009

Review: March 2012

1. Introduction

This document covers basic principles of cleaning and disinfection of endoscopic equipment followed by specific sections for:

- Flexible gastrointestinal endoscopes (sections 6-7)
- Bronchoscopes (section 8)
- Rigid sigmoidoscopes and proctoscopes (section 9)
- Endoscopes inserted into sterile body sites (section 10)

This paper has been drawn up to comply with the guidelines produced by the British Society for Gastroenterology¹ and the British Thoracic Society.²

2. General principles

2.1 Any patient undergoing endoscopy may be infected with potentially transmissible infections such as HIV, hepatitis B, hepatitis C, *Salmonella* or mycobacteria. In addition immunocompromised patients may be at risk from organisms that would not pose a threat to patients with normal immune systems. The purpose of cleaning and disinfection therefore is to prevent the exposure of all individuals to potential pathogens. It is the responsibility of the senior nurse to ensure that this policy is followed.

2.2 **It cannot be emphasised too strongly that thorough manual cleaning of an endoscope prior to disinfection is the most important means of removing potential pathogens.** Satisfactory cleaning will remove the vast majority of microorganisms, plus organic matter that would otherwise protect bacteria and viruses against the action of a disinfectant. In addition blood, mucus and other organic material is “fixed” in place by disinfectants, which makes future cleaning more difficult. The broad principles to be followed in cleaning any type of flexible endoscope are detailed in Appendix 1. Manufacturers’ instructions must be adhered to.

It is often supposed that disinfectants can sterilise an endoscope (that is, remove all micro-organisms, including bacterial spores). In fact, with the immersion times normally used only viruses and vegetative bacteria are killed and the instrument is not left sterile. For many types of endoscopy this does not matter but some endoscopes are inserted into sterile areas of the body and should in turn be sterile themselves. Peracetic acid is said to be sporicidal but where an instrument is required to be sterile, autoclaving is the preferred method wherever possible. **It is not possible to autoclave flexible endoscopes.**

It follows therefore that regular training of staff in the manual cleaning and disinfection of endoscopes is vital. This staff training programme and competency must be conducted at induction and at least annually thereafter and written training records maintained. This competency named 'Reprocessing and storage of Flexible Endoscopes and associated equipment' has been adapted from the Skills for Health Workforce Endoscopy Competency END21 and covers the awareness of channel configuration of all endoscopes, cleaning, reprocessing in automated washer disinfectors and storage of endoscopy equipment applicable to staff in all areas dealing with all types of flexible endoscopes before, during and after patient use.

- 2.3 Automated washer disinfectors are recommended for routine disinfection of endoscopy equipment. These machines must be regularly maintained and the disinfection process validated according to NHS Estates **HTM 2030³. There must be documented evidence of a testing and validation regime, this will normally be done by the Estates Department or by an outside contractor.

The use of these machines is not a substitute for effective manual cleaning prior to disinfection.

- 2.4 Valves including flushing valves and removable parts **must** be kept with the endoscope to form a unique set of equipment
- 2.5 Patient traceability – tracking of the decontamination cycle, personnel and patient association of each endoscope must be undertaken using manual or electronic methods
- 2.6 All endoscopes must be transported in approved Cleanascope trolleys
- 2.7 Endoscopes used out of hours must be decontaminated in accordance with this policy
- 2.8 The use of manual disinfection **must** be reviewed at every possible opportunity during service development to allow compliance with NHS Estates **HTM 2030
- 2.9 All units must move away from aldehyde based disinfectants and mutlishot use of all disinfectants. Single use disinfectants **must** be used in any new automated washer disinfectors purchased by the Trust.

3. Disinfectants and manual cleaning agents

- 3.1 Manual Cleaning agent: a neutral detergent or enzymatic cleaner in warm water.

- 3.2 Disinfectants:

- i) Chlorine dioxide e.g. Tristel

Chlorine dioxide (Tristel) can be more damaging to instruments and processing equipment therefore external surfaces of flexible endoscopes and equipment must be examined daily prior to use. This must be recorded and problems reported to the senior nurse.

- ii) Peracetic acid. Peracetic acid achieves high level disinfection. It has a role to play where autoclaving is not possible (e.g. flexible Cystoscopes, Hysteroscopes etc) in the processing of flexible endoscopes which are required to be 'sterile' before use.
- iii) Gigasept 10% - the use of aldehyde disinfectants **must** be reviewed at every possible opportunity during service development to allow compliance with NHS Estates **HTM 2030 which encourages a move away from aldehyde based disinfectants
- iv) Isopropyl Alcohol 70% may be used for the external disinfection of the hand controls and eyepieces of non-immersible instruments.
- v) It is important to ensure that the endoscope manufacturer has approved the chosen disinfectant for use in decontaminating their product, and that the disinfectant is also compatible with the automatic endoscope reprocessor in which it is being used.

3.3 Changing disinfectants:

- i) For manual disinfection, disinfectants must be changed according to manufacturers' instructions or sooner if there is visible contamination with organic matter. The use of manual disinfection **must** be reviewed at every possible opportunity during service redevelopment to allow compliance with NHS Estates **HTM 2030
- ii) All disinfectants should be used at the correct temperature and concentration in accordance with the manufacturers' instructions. Some manufacturers provide test strips and/or kits, the use of which they recommend in ensuring optimal activity of their product
- iii) If an automatic washer/disinfector is used the disinfectant must be changed at regular intervals as determined by the manufacturer's instructions. Single use disinfectants are now widely used within endoscope washer disinfectors and should be encouraged at every possible opportunity during service redevelopment to allow compliance with NHS Estates **HTM 2030

3.4 Water for rinsing:

- i) Automatic washer-disinfectors use reverse osmosis (RO) water systems or tap water filtered through a bacteria retaining filter, which is an alternative to the use of sterile water. These systems should be regularly maintained and weekly water resting performed as per Standard Operating Procedure.

- ii) After disinfection in troughs, but before use on a patient, the disinfectant must be rinsed out of the instrument with water. Tap water may be contaminated with environmental organisms or mycobacteria, and therefore sterile water should be used for rinsing and renewed between each patient. The use of manual disinfection in troughs **must** be reviewed at every possible opportunity during service redevelopment to allow compliance with NHS Estates **HTM 2030.

4. Health and safety aspects

- 4.1 The infectious status of patients undergoing endoscopy may be unknown at the time of the procedure, and therefore standard precautions against the acquisition of infection should be applied. Personal Protective Equipment (PPE) must be worn when coming into contact with contaminated endoscopic equipment and patient secretions, blood, urine or faeces. The use of aprons, gloves, masks, and eye protection is required when cleaning and performing procedures involving splashing or more extensive contact with blood or potentially infectious body fluids. In the case of a patient with pulmonary tuberculosis a FFP3 mask must be used.
- 4.2 Disinfectants are potentially toxic chemicals and may cause sensitivity reactions in staff that use them. Such reactions include skin rashes, conjunctivitis, nasal irritation, sinusitis and asthma. Staff should report any such reactions to their supervisor and should be referred to Occupational Health. Staff should also complete an annual health questionnaire provided by the Occupational Health Department. To avoid toxic reactions, staff should:
 - Avoid skin, eye or mucous membrane contact with the disinfectant;
 - Wear protective gloves (note: ordinary latex rubber gloves are not adequate use nitrile rubber gloves); eye protection should be worn where splashing might occur and masks to prevent inhalation of fumes if a spillage occurs e.g. during the mixing of fresh solutions.
- 4.3 Departments using troughs should be equipped with exhaust extraction at bench level and facilities such as hoods or cabinets. The use of automated washer disinfectors provides the best protection by reducing exposure to disinfectant. There is a legal obligation under COSHH⁴ to attain this level of control. The use of manual disinfection in troughs **must** be reviewed at every possible opportunity during service redevelopment to allow compliance with NHS Estates **HTM 2030.
- 4.3 To avoid needlestick injuries during cleaning, disposable endoscopic accessories must be used where possible.

5. Record keeping

- 5.1 Every department must keep a record of procedures performed. This record should identify the patient, the nature of the procedure, the code number of the

instrument used, the immersion time in disinfectant (where appropriate), the machine used and the operator's name and the name of the person responsible for cleaning and disinfection of the instrument. This also applies to instruments sent out to other departments, as these are sometimes returned having been inadequately cleaned.

- 5.2 Such a record is kept so that if it is thought that an endoscopy related infection may have occurred it will be possible to check the adequacy of disinfection and to trace any other patients who might have been exposed to the same risk.

6. Use of accessory equipment

- 6.1 Whenever possible disposable endoscopic accessories should be used. Reusable accessories should be washed in fresh detergent/enzymatic cleaner and where appropriate reprocessed in SSD.
- 6.2 Equipment that breaches the mucosa, and other equipment used for manipulation within the bile duct and pancreas should be disposable where possible. If reusable, it should be sterilised after cleaning by autoclaving or ethylene oxide sterilisation, and be kept sterile until next used.

Flexible Gastrointestinal Endoscopes

7. Introduction

This category includes gastroscopes colonoscopes, sigmoidoscopes, duodenoscopes, endoscopic ultrasound scopes, bronchoscopes and pharyngoscopes.

- 7.1 These endoscopes should be cleaned and disinfected at the start and end of a list and between patients.
- 7.2 Endoscopes that have been stored in Ultra Violet (UV) Cabinets for less than 72hours can be used directly from the UV cabinets without further pre procedure disinfection. The contents of each cabinet, the date and time the endoscope was put in and the expiry date and time is clearly marked on the front of each cabinet.
- 7.3 Following manual cleaning, the use of an automatic washer disinfector provides the most consistent and reliable means of cleaning and disinfecting an instrument and the installation of these machines is recommended in those units which do not currently have them. The use of manual disinfection in troughs **must** be reviewed at every possible opportunity during service redevelopment to allow compliance with NHS Estates **HTM 2030.

8. Cleaning and Disinfection

8.1 After manual cleaning, an automated washer disinfectant must be used where possible. If an automated washer disinfectant is not available, the instrument should be immersed in a disinfectant solution ensuring that all the channels are irrigated and filled with disinfectant and rinsed accordingly and all traceability documented manually or electronically.

All new Automated Washer Disinfectors have pre set immersion times. However, if not follow the chart below:

Protocol for Recommended Immersion Times for Flexible Gastrointestinal Endoscopes

**Standard Endoscopic Procedures
plus endoscopes used for patients with hepatitis, MRSA, Clostridium difficile**

	Aldehyde e.g. Gigasept	Peracetic Acid e.g. Steris PA	Chlorine Dioxide e.g. Tristel
Pre-list	10 minutes	5 minutes	5 minutes
Between patients	10 minutes	5 minutes	5 minutes
Post-list	20 minutes	5 minutes	5 minutes

Duodenoscopes and all endoscopes used for immunocompromised, suspected TB or HIV / AIDS patients

	Aldehyde e.g. Gigasept	Peracetic Acid e.g. Steris PA	Chlorine Dioxide e.g. Tristel
Pre-list	20 minutes	5 minutes	5 minutes
Between patients	20 minutes	5 minutes	5 minutes
Post-list	20 minutes	5 minutes	5 minutes

After a patient with known M. Avium Intracellulare or other highly resistant mycobacteria

	Aldehyde e.g. Gigasept	Peracetic Acid e.g. Steris PA	Chlorine Dioxide e.g. Tristel
Post-list	60 minutes	5 minutes	5 minutes

Notes

- Immunocompromised patients: thorough cleaning to the highest standard is essential before use on an immunocompromised patient, and in addition the instrument should be rinsed with sterile water (filtered or RO water in an automatic washer-disinfector is a suitable alternative in some machines), because tap water is not sterile and may contain mycobacteria and other organisms. Once this is done, the instrument should be processed according to the Protocol for Immersion Times for Flexible Endoscopes (see P.4). If in doubt whether or not a particular patient should be regarded as immunocompromised, contact the Infection Prevention and Control Team for advice.
- Units serving “at risk” groups (such as haemophilia centres) should avoid using aldehydes as their primary disinfectant. Single use disinfectants should be employed in these units. All units must move away from aldehyde based disinfectants and multishot use of all disinfectants. Single use disinfectants **must** be used in any new automated washer disinfectors purchased by the Trust.
- Patients known to be infected with HIV or who have symptomatic AIDS should be treated as immunocompromised patients.
- Known or suspected tuberculosis and other mycobacterial infections (excluding *M Avium-intracellulare* – see above): these organisms are relatively resistant to the action of disinfectants and endoscopes should be processed according to the Protocol for Immersion Times for Flexible Endoscopes (see P.4). It is recommended that such patients are placed at the end of a list.
- Current methods of endoscope disinfection are not capable of eradication of prions and therefore therapeutic endoscopy should be avoided wherever possible in patients with known/ suspected or at risk of transmissible spongiform encephalopathy (eg CJD, vCJD or UK Plasma recipients). If therapeutic endoscopy is essential, please contact the Infection Prevention and Control Team and Endoscopy Services Manager.
- Important: If no Automatic Washer Disinfector is available then in all cases the length of manual immersion must be timed with a clock timer and the immersion time recorded in the logbook.

Flexible Bronchoscopes

Ideally, all bronchoscopy should be carried out in rooms equipped with negative pressure ventilation to avoid the release of aerosols containing mycobacteria into the hospital environment. We recommend that any new bronchoscopy suites planned in the Newcastle hospitals should incorporate this facility.

Important: due to the advent of multiple drug resistant tuberculosis (MDR-TB) and the potential exposure to aerosols during bronchoscopy, it is recommended that operators should wear a high efficiency bacterial mask when performing bronchoscopy on patients with known or suspected tuberculosis, or those with HIV infection (due to the risk of MDR-TB infection in such patients).

9. Cleaning and disinfection of bronchoscopes

9.1 The cleaning and disinfection of bronchoscopes is very similar to the procedures used for gastrointestinal endoscopes. The cleaning procedure should be in accordance with the manufacturer's instructions; general principles are listed in section 1.2 of this document.

9.2 Routine Bronchoscopy cases

	Aldehyde e.g. Gigasept	Peracetic Acid e.g. Steris PA	Chlorine Dioxide e.g. Tristel
Pre-list	20 minutes	5 minutes	5 minutes
Between patients	20 minutes	5 minutes	5 minutes
Post-list	20 minutes	5 minutes	5 minutes

After a patient with known M. Avium Intracellulare, symptomatic AIDS or other highly resistant mycobacteria

	<u>Aldehyde</u> e.g. Gigasept	<u>Peracetic Acid</u> e.g. Steris PA	<u>Chlorine Dioxide</u> e.g. Tristel
Post-list	60 minutes	5 minutes	5 minutes

Sigmoidoscopes and Proctoscopes

10. Cleaning and disinfection

- 10.1 Disposable sigmoidoscopes/proctoscopes must be used where possible. The reusable light source should be cleaned with a cloth impregnated with soap solution and disinfected by wiping with 70% isopropyl alcohol.
- 10.2 If disposable sigmoidoscopes / proctoscopes are not available, reusable sigmoidoscopes / proctoscopes must be autoclaved in SSD following thorough manual cleaning with hot water and detergent.
- 10.3 Accessories such as biopsy forceps and swab holders should be manually cleaned with hot water and detergent then autoclaved in SSD.

11. Disinfection and sterilisation

There are many different types of such instrument, which have the common feature that they are inserted into sterile areas of the body. They include:

- 11.1 Rigid Arthroscopes and Rigid Laparoscopes:
These instruments must be sterile and **MUST** be autoclaved.
- 11.2 Rigid Hysteroscopes:
These instruments must be sterile and **MUST** be autoclaved.
- 11.3 Flexible Hysteroscopes:
These instruments will not withstand autoclaving. After thorough manual cleaning, they should be processing in a suitable automated washer-disinfector or immersed in the appropriate disinfectant for the recommended time.
- 11.4 Flexible Choledochoscopes:
These instruments will not withstand autoclaving. After thorough manual cleaning, they should be process by sending away for ethylene oxide sterilisation.
- 11.5 Mediastinoscopes:
These instruments must be sterile and **MUST** be autoclaved.
- 11.6 Rigid Cystoscopes:
These instruments must be sterile and **MUST** be autoclaved.
- 11.7 Flexible Cystoscopes:
These instruments will not withstand autoclaving. After thorough manual cleaning, they should be processing in a suitable automated washer-disinfector or immersed in the appropriate disinfectant for the recommended time. The use of manual disinfection in troughs **must** be reviewed at every possible opportunity during service development to allow compliance with NHS Estates **HTM 2030

12. Monitoring

Compliance with this policy is monitored within each department that cleans uses, reprocesses and or stores endoscopes. Staff competency must be completed following induction and thereafter on a yearly basis. A record of the competency must be kept in the relevant department as well as by the individual in KSF Portfolio

This competency named 'Reprocessing and storage of Flexible Endoscopes and associated equipment' has been adapted from the Skills for Health Workforce Endoscopy Competency END21 and covers the reprocessing of endoscopy equipment applicable to staff in all areas dealing with all types of flexible endoscopes before, during and after patient use.

Training is offered in relation to the competency by the staff of the Endoscopy Units at both Freeman and RVI.

Appendix 1

Protocol for the Cleaning & Disinfection of Flexible Endoscopes

Cleaning & disinfection of endoscopic equipment correctly is essential and a process you must be familiar with and strictly adhere to. Adhering to set guidelines reduces the risk of cross infection to both patients and staff.

Standard Precautions must be adhered to at all times and Personal Protective Equipment including gloves, apron, goggles / face protection must be worn. During manual cleaning phase, forearms should be protected.

Where Ultraviolet Hepa Filter (UV) Cabinets are available -

Flexible endoscopes which have been in the UV cabinets less than 72hours may be used for procedures directly from the cabinet without further processing. The contents of each cabinet, the date and time the endoscope was put in and the expiry date and time is clearly marked on the front of each cabinet.

All other endoscopes, not taken from a UV cabinet, **must** be cleaned & disinfected prior to use.

If, in an emergency situation, an endoscope is required, and not taken from a UV cabinet and without being processed, the endoscopist must be informed prior to the procedure. This must be documented and an incident form completed.

Channels may vary slightly on bronchoscopes – follow unit policy.

Immediately after removal from the patient whilst still connected to light source:

- Wipe down insertion tube with gauze swab in warm water & detergent
- For GI endoscopes, remove air/water (blue) valve and replace with flushing valve, depress for 10-15 seconds to eject any refluxed debris. If blockage noted, use appropriate blockage removal device immediately.
- If endoscope has a suction channel, depress suction valve for 10-15 seconds, with insertion end of endoscope under level of water to remove debris from suction/biopsy channel.
- Disconnect from light source
- If video endoscope attach video cap – **very important do not forget**
- Transport dirty endoscope to cleaning room in the appropriate covered tray

In Cleaning Room:

- Fill sink to marked level with warm water and detergent or enzymatic cleaner as per instructions – this may vary in departments depending which detergent / enzymatic cleaner is used

- If video endoscope, check you have attached the water resistant video cap, as the videoscope must not be put in water without the water resistant video cap attached
- Attach leak tester, switch on
- Immerse endoscope in sink of warm water and perform leak test
- If endoscope shows a leak (bubbles in the water) – dry, wipe down with alcohol wipe, do not proceed any further. Do not place in Washer Disinfector or trough. Endoscope needs to be sent for repair
- If no leak apparent – proceed with cleaning process

External Cleaning Process:

- Remove all valves and throw away disposable biopsy cap
- Clean air/water and suction valve with the **disposable** cleaning brush – these must be kept as a unique set with the particular endoscope
- Use 5ml syringe & connector to flush auxiliary channels (if applicable)
Wash outside of endoscope thoroughly
- Brush distal tip paying particular attention to the air/water nozzle
- Brush each port at least 3 times or until brush emerges clean
- If endoscope has no internal channels - Wash outside of endoscope thoroughly and brush distal tip

Internal Cleaning Process:

- A **disposable** cleaning brush must be used - fully immerse the endoscope, brush through each of the following three channels at least three times or until brush emerges clean. Remember to clean the end of the brush each time it emerges from the end before pulling it back through the channel.
 1. from **biopsy port** through insertion tube emerging at **distal end**
 2. from **suction port** through insertion tube emerging at **distal end**
 3. from **suction port** through umbilicus emerging from **suction connector**

Flushing the Internal Channels:

- Gastrointestinal endoscope channels should be flushed using an all channel irrigator. Attach irrigator to endoscope and flush, check water is seen to emerge from the air/water nozzle at the end of the insertion tube and out of the water and suction connectors on the light guide
- All other endoscopes should have any channels flushed with a syringe
- After the channels have been thoroughly brushed & flushed place the endoscope and the unique set of valves into the automatic washer disinfectant / trough to complete cleaning and disinfection
- If using a trough*, ensure that the channels are flushed adequately with disinfectant and thoroughly flushed with sterile water following the correct immersion time
- Endoscopes should be hung in UV cabinet or endoscope cupboard

*** the use of manual disinfection must be reviewed at every possible opportunity during service development to allow compliance with NHS Estates **HTM 2030**

References

1. BSG Guidelines for Decontamination of Equipment for Gastrointestinal Endoscopy 1998 + 2003 (updated 2005) + 2007. www.bsg.org.uk
2. British Thoracic Society Guidelines on Diagnostic Flexible Bronchoscopy. Thorax 2001; 56 (Suppl1) i1-i21. www.brit-thoracic.org.uk
3. NHS Estates (1997) Health Technical Memorandum. **HTM 2030 Washer Disinfectors. London HMSO.
4. Control of Substances Hazardous to Health (COSHH) Regulations 1994/2002. London. HMSO.

**** NB: NHS Estates **HTM 2030 is currently being revised and is still in draft form but the new document for Automated Washer Disinfectors will be in section HTM 01- 06**

THE NEWCASTLE UPON TYNE HOSPITALS NHS FOUNDATION TRUST
IMPACT ASSESSMENT – SCREENING FORM A

This form must be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval.

Policy Title:	Cleaning and Disinfection of Endoscopes Policy	Policy Author:	Linda Hodgson
		Yes/No?	You must provide evidence to support your response:
1.	Does the policy/guidance affect one group less or more favourably than another on the basis of:		
	• Race	no	See comments box
	• Ethnic origins (including gypsies and travellers)	no	See comments box
	• Nationality	no	See comments box
	• Gender	no	See comments box
	• Culture	no	See comments box
	• Religion or belief	no	See comments box
	• Sexual orientation including lesbian, gay and bisexual people	no	See comments box
	• Age	no	See comments box
	• Disability – learning difficulties, physical disability, sensory impairment and mental health problems.	no	See comments box
2.	Is there any evidence that some groups are affected differently?	no	See comments box
3.	If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?	no	See comments box
4(a).	Is the impact of the policy/guidance likely to be negative? (If “yes”, please answer sections 4(b) to 4(d)).	no	See comments box
4(b).	If so can the impact be avoided?		
4(c).	What alternatives are there to achieving the policy/guidance without the impact?		
4(d)	Can we reduce the impact by taking different action?		

Comments: Endoscopes from all patients are cleaned and disinfected to the same standards	Action Plan due (or Not Applicable): n/a
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Name and Designation of Person responsible for completion of this form: Linda Hodgson, Endoscopy Services Manager

Date: 20.8.09.....

Names & Designations of those involved in the impact assessment screening process:

Linda Hodgson Endoscopy Services Manager & Sharon Gordon, Lead Nurse Infection Prevention and Control Team

(If any reader of this procedural document identifies a potential discriminatory impact that has not been identified on this form, please refer to the Policy Author identified above, together with any suggestions for the actions required to avoid/reduce this impact.)

For advice on answering the above questions please contact Helen Lamont, Director of Nursing, or, Christine Holland, Senior HR Manager. On completion this form must be forwarded electronically to Steven Stoker, Clinical Effectiveness Manager, (Ext. 24963) steven.stoker@nuth.nhs.uk together with the procedural document. If you have identified a potential discriminatory impact of this procedural document, please ensure that you arrange for a full consultation, with relevant stakeholders, to complete a Full Impact Assessment (Form B) and to develop an Action Plan to avoid/reduce this impact; both Form B and the Action Plan should also be sent electronically to Steven Stoker within six weeks of the completion of this form.