The Journal of Laryngology and Otology
March 2000, Vol. **114,** pp. 202–204

A national survey of disinfection techniques for flexible nasendoscopes in UK ENT out-patient departments

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Abstract

Flexible fibre-optic nasendoscopes have become a ubiquitous ENT out-patient tool for the inspection of the nasopharynx, larynx and hypopharynx. Disinfection of the instrument between patient use is important to prevent potential spread of infection but the methods used vary considerably. We designed a questionnaire which was piloted and then sent to 115 UK ENT out-patient departments to establish current UK practice. Most units (67 per cent) use a chemical soak system but the type of chemical disinfectant, the method of delivery and the duration of soak varied considerably. A few hospitals use a disposable plastic sheath system and others simply wipe the instrument with an alcohol swab in between patient use. The protocols for disinfection after high risk patients e.g. human immunodeficiency virus (HIV), hepatitis B varied from hospital to hospital.

The results demonstrate a lack of standard practice that is wasteful of financial resources and may expose patients to unnecessary risk. There is a need for an authoritative ENT body to publish national guidelines as may be found in other specialities and other countries.

Key words: Endoscope; Disinfection

Introduction

Fibre-optic flexible nasendoscopes allow quick and accurate assessment of the upper aero-digestive tract in the out-patient setting. Indirect laryngoscopy with traditional mirrors and spirit lamp cannot offer the same degree of diagnostic accuracy and therefore nasendoscopes are to be found in almost all ENT out-patient departments. However the problem of appropriate disinfection of the instrument in between patient use to prevent cross infection is a difficult one. Autoclaves are used to sterilize many hospital instruments and are therefore widely available but fibre-optic instruments are to delicate for this process. In any case flexible nasendoscopes are not intended to cross mucosal barriers and full sterility of the instrument is not considered necessary. Appropriate disinfection is all that is required.

The traditional method is immersion of the instrument in a strong chemical such as glutaraldehyde. This is accepted to provide adequate disinfection. For many years nasendoscopes have been soaked in curved plastic tubes containing glutaraldehyde held on a stand. This pratice is still to be found in some out-patient departments and is cheap and reliable. However glutaraldehyde is a toxic chemical and is hazardous to the user, usually a member of the nursing staff. Automated machines overcome these problems and are used in other specialities such as gastroenterology but are costly. To avoid glutaraldehyde-like substances all together some hospitals recommend simply wiping down the nasendoscope with an alcohol-soaked steret. Others have experimented with plastic sheaths.

Other specialities that make use of flexible endoscopes such as gastroenterology have clear protocols for cleaning instruments[1] and the re-use of endoscopic accessories.[2] In contrast there are no national UK otolaryngology guidelines and no published data relating to current practice.

Methods

A postal questionnaire was designed to establish the methods used for disinfection of flexible nasendoscopes within ENT out-patient departments. The questionnaire was piloted at St George's Hospital and subsequently sent to the Sister in Charge of 115 ENT out-patient departments within the UK. The targeted hospitals were based on a list held at the Royal College of Surgeons by the British Association of Otolaryngologists, Head and Neck Surgeons and included teaching hospitals, district general hospitals and private hospitals. Those hospitals that failed to reply to the questionnaire were followed up by a telephone enquiry.

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Accepted for publication: 1 December 1999.

TABLE I
DISINFECTION TECHNIQUES FOR CLEANING FLEXIBLE NASENDOSCOPES

Technique	Number of hospitals
Glutaraldehyde-based soak	43
Alcohol wipe	19
Disposable plastic sheath	8
Non-glutaraldehyde-based chemical soak	12

Results

Seventy-four (64 per cent) questionnaires were returned satisfactorily completed. A further eight replies were obtained by telephone giving an overall response rate of 71 per cent. All the departments questioned used flexible nasendoscopes and most (62 per cent) were also equipped with a rigid nasendoscope.

Most departments (74 per cent) claimed to have written protocols for the cleaning of flexible nasendoscopes but only half (51 per cent) had a nurse 'trained' in the procedure.

Precleaning

Precleaning with an enzyme detergent e.g. general purpose detergent in the sink was performed in 27 (33 per cent) hospital departments.

Chemical disinfection techniques

A chemical soak system was the most common technique for disinfection and was used in 55 hospitals (67 per cent) (Table I). Most of these used glutaraldehyde-based products but 12 hospitals used other chemical substances (Table II). The duration of soak varied from five minutes to 30 minutes with a mean of 14 minutes. Some hospitals used an automated machine in the out-patient department to deliver the chemical disinfectant, others used a simple trough or coiled plastic pipe. A few departments arranged for disinfection within the hospital sterile services department at the end of the clinic.

Non-chemical based techniques

An alcohol wipe using a cloth saturated with 70 per cent isopropyl alcohol was used to disinfect nasendoscopes in 19 hospitals (23 per cent). The eight remaining hospitals used a disposable plastic sheath system to cover the nasendoscope during patient use (10 per cent).

TABLE II
NON-GLUTARALDEHYDE-BASED CHEMICAL SOAK

Chemical	Number
Industrial methylated spirits	3
Chlorhexidine gluconate	2
Peracetic acid	2
Succindialdehyde	1
Povidone iodine	1
Chlorine dioxide	1
Alcohol (strength unspecified)	1
Unspecified detergent	1

High-risk groups

After use with high-risk patients e.g. HIV-positive protocols for disinfection varied considerably. Twenty-seven of the 82 (33 per cent) hospital departments used a different protocol often increasing the duration of soak in a glutaraldehyde-based product to up to an hour. However the majority of departments, 46 (56 per cent) used no additional disinfection. Several departments, nine (11 per cent) omitted to answer this question.

Discussion

Flexible fibre-optic nasendoscopy has superseded indirect laryngoscopy as a means of thorough examination of the nasopharynx, larynx and hypopharynx within the ENT out-patient setting. Almost all patients can be successfully examined in this way unlike with the use of the traditional head mirror and light and the view is generally superior. This is underlined by the ubiquitous use of the flexible nasendoscope within ENT out-patient departments as demonstrated by our study.

However, nasendoscopy carries the potential to transmit infectious disease ranging from minor upper respiratory tract infections and influenza to tuberculosis, hepatitis A/B and HIV from one patient to another. This risk is more hazardous still when the same nasendoscope is used on an occasional basis to examine patients with epistaxis. The importance of disinfection of the nasendoscope in between patient use is well recognized but our study demonstrates a wide variety of techniques within UK hospitals, some perhaps more effective than others.

Initial mechanical cleaning of the nasendoscope, usually in the sink, is a necessary first step to remove gross soiling before disinfection. The use of an enzyme detergent at mechanical cleaning makes this process more effective but only a minority of departments use a detergent cleaner.

From our study it is apparent that several different chemical soaks are used for disinfection and glutaraldehyde-based products are the most popular. However, the duration of soak varies widely from hospital to hospital and there is no conformity regarding cleaning after use with high risk patients.

Glutaraldehyde has been used for many years in the NHS and is acknowledged to provide rapid, cheap and effective disinfection. However, inhalation of volatile vapours released by glutaraldehyde will irritate the respiratory tract, and splashes to the skin or eyes will cause local burns. Exposure therefore has potential cost implications in terms of staff health and sick leave, litigation and workforce compensation. In response to these concerns glutaraldehyde is subject to the Control of Substances Hazardous to Health Regulations (COSHH) issued by the Department of Health.[3] For many years it has been the practice within ENT out-patient departments to disinfect nasendoscopes in glutaraldehyde stored either in a simple trough or coiled plastic tube supported by a stand. Some departments still use this technique today. However, these techniques are now recognized to fall short of COSHH guidelines.

https://doi.org/10.1258/0022215001905337 Published online by Cambridge University Press

These problems can be readily overcome using glutaraldehyde stored in automatic machines fitted with extraction fume cupboards and activated charcoal filters. These machines meet COSHH regulations and with built-in timers also overcome any temptation to remove the nasendoscope from the disinfection process early at busy times. However, such machines are expensive and this will discourage some departments or hospitals.

To avoid glutaraldehyde-like substances all together many departments (23 per cent) use alcohol wipes or sterets to clean nasendoscopes. Sterets are wipes saturated with 70 per cent isopropyl alcohol and are widely available for skin cleaning prior to intravenous cannulation. This technique is cheap and quick but is not regulated in terms of duration and effectiveness. There must be considerable concern that, in a busy clinic, cleaning may be at best cursory and on occasion omitted altogether. There are no national guidelines to suggest this technique provides effective disinfection.

Sheaths are used in a few departments to protect the nasendoscope from contamination. The equipment is again relatively expensive and our survey did reveal two anecdotal cases of damage to the nasendoscope during removal from the sheath but it is possible that this technique has some validity.

Our study demonstrates a clear lack of uniformity amongst UK hospitals' solutions to the problem of cleaning of nasendoscopes in between patient use and similar results have been demonstrated abroad.[4] There is little in the ENT literature to offer guidance. Other specialities, in particular gastroenterology, have well-developed guidelines for disinfection of flexible fibre-optic instruments such as gastroscopes and colonoscopes.[5] These guidelines recommend thorough mechanical cleaning using an enzyme detergent in between patients in order to remove secretions, blood and organic material. This is followed by total immersion of the instrument, preferably in an automated machine, in an effective disinfectant. The recommendations stress that every patient should be safeguarded by consistently high standards as infected individuals cannot be readily identified. In addition, cleaning and disinfection is considered a specialized procedure that should only be carried out by staff who are properly trained. These recommendations meet with broad agreement in the American literature.[6]

Conclusion

In conclusion our study demonstrates that the techniques used to disinfect flexible nasendoscopes within ENT out-patient departments vary considerably. Although glutaraldehyde soak is the most common technique other chemicals may be used and there is no consensus regarding immersion time or changes to protocols with high risk patients. The use of enzyme pre-washing to remove gross soiling is sporadic. To avoid the use of toxic chemicals and perhaps also the costs of automatic machines a significant number of hospitals use simple alcohol wipes to clean nasendoscopes which may not provide adequate disinfection. The use of plastic sheaths is uncommon but may have validity.

In our opinion the best solution is glutaraldehyde soak in an automatic machine. Glutaraldehyde is proven to provide effective disinfection and the use of a dedicated machine protects the nursing staff from hazardous exposure and discourages premature removal of the nasendoscope from the cleaning solution.

The publication of national guidelines by an authoritative body within otolaryngology would allow standardization of services and protect patients and staff from unnecessary risk.

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