These guidelines were prepared by the Working Group facilitators with the help of Christine McDougal and advice from Ty Pitt and Peter Hoffman.
# TABLE OF CONTENTS

## INTRODUCTION

1

## WORKING GROUP MEMBERS

3

## GUIDELINES FOR HANDWASHING

5
- Target audience
- Background
- Guideline statements — handwashing
  - A. Indications for handwashing
  - B. Type of cleansing agent
  - C. Handwashing technique
  - D. Promoting handwashing
- Bibliography

9

## GUIDELINES FOR ROUTINE BLOOD AND BODY SUBSTANCES PRECAUTIONS

11
- Target audience
- Background
- Guideline statements — routine blood and body substances precautions
  - A. General principles
  - B. Use of protective clothing
  - C. Handwashing
  - D. Cuts and abrasions
  - E. Management of sharp instruments
  - F. Spillage of body substances
  - G. Disposal of waste material
  - H. Decontamination of equipment
  - I. Staff training
- Bibliography

16

## GUIDELINES FOR THE PREVENTION OF INFECTION ASSOCIATED WITH CENTRAL INTRAVASCULAR DEVICES

19
- Target audience
- Background
- Guideline statements — intravascular devices
  - A. Insertion of intravascular catheter
  - B. Maintenance of intravascular catheter
  - C. Removal of intravascular catheter
  - D. Staff training
- Bibliography

23
GUIDELINES FOR THE PREVENTION OF INFECTION ASSOCIATED WITH SHORT-TERM INDWELLING URETHRAL CATHETERS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target audience</td>
<td>25</td>
</tr>
<tr>
<td>Background</td>
<td>25</td>
</tr>
<tr>
<td>Guideline statements — indwelling urethral catheters</td>
<td>27</td>
</tr>
<tr>
<td>A. General principles</td>
<td>27</td>
</tr>
<tr>
<td>B. Insertion of a urethral catheter</td>
<td>27</td>
</tr>
<tr>
<td>C. Maintenance of the drainage system</td>
<td>28</td>
</tr>
<tr>
<td>Bibliography</td>
<td>29</td>
</tr>
</tbody>
</table>

GUIDELINES FOR THE PREVENTION OF INFECTION ASSOCIATED WITH TRACHEAL SUCTION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target audience</td>
<td>31</td>
</tr>
<tr>
<td>Background</td>
<td>31</td>
</tr>
<tr>
<td>Guideline statements — tracheal suction</td>
<td>33</td>
</tr>
<tr>
<td>A. General principles</td>
<td>33</td>
</tr>
<tr>
<td>B. Suctioning of respiratory secretions</td>
<td>33</td>
</tr>
<tr>
<td>Bibliography</td>
<td>35</td>
</tr>
</tbody>
</table>

GUIDELINES FOR THE PREVENTION OF INFECTION ASSOCIATED WITH NASOGASTRIC TUBES

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target audience</td>
<td>37</td>
</tr>
<tr>
<td>Background</td>
<td>37</td>
</tr>
<tr>
<td>Guideline statements — nasogastric tubes</td>
<td>38</td>
</tr>
<tr>
<td>A. General principles</td>
<td>38</td>
</tr>
<tr>
<td>B. Insertion of nasogastric tubes</td>
<td>38</td>
</tr>
<tr>
<td>C. Feeding via nasogastric tubes</td>
<td>39</td>
</tr>
<tr>
<td>Bibliography</td>
<td>41</td>
</tr>
</tbody>
</table>
INTRODUCTION

These guidelines follow on from the recent PHLS report Hospital-Acquired Infection: Surveillance, Policies and Practice. The report is based on an audit project which examined hospital activities designed to control hospital-acquired infections (HAIs). It contains a detailed survey of the incidence of certain types of HAI in 19 hospitals over a 12-month period, an analysis of hospital policies dealing with control of HAI and an observational audit to assess the extent to which such policies were complied with in practice. It discusses the results and recommends changes in current methods of surveillance. In particular, it recommends that collection of data for surveillance should be made easier by greater use of data already collected for other purposes. This would require significant improvements in medical and nursing notes, and in patient administration systems.

During the course of the project, it became apparent that there was a need for some generally accepted guidelines on the prevention of HAI. The results of the policy analysis and the observational audit strengthened this view. Policies varied both in design and content. Some included infection control measures to which even the infection control teams attached little importance. Compliance with policies was found to be imperfect, which may have been because they were considered to be out of date, or because staff tended to adhere to the policies of their previous hospital or earlier training. In at least half of the observational audits, the staff observed claimed to be unaware that a policy for the procedure existed.

There was no time for the full process of guideline production, beginning with a review of the literature and followed by an iterative process of guideline development, dissemination, implementation, evaluation and review. However, the project team felt it was worthwhile preparing some preliminary guidelines in order to benefit from the recent practical experience of all those taking part in the audit. As well as being of immediate practical use, these could form the basis of a more complete set of guidelines in the future.

Working groups of volunteers from the audit project hospitals were set up, each consisting of one ward nurse, one ward doctor, two infection control nurses, two audit project nurses, one or two medical microbiologists and a member of the project team, who acted as facilitator. Their job was to develop guidelines for the prevention of the three HAIs studied in the project (urinary tract, respiratory tract and bloodstream infections), focusing on one or two key clinical procedures considered to be associated with them. For example, the group dealing with urinary tract infection considered how to prevent infections associated with indwelling urethral catheters. In addition, another group focused on aspects of infection control common to all, namely handwashing and dealing with blood and body substances.

The members of each working group were sent key papers on the subjects they were to deal with, the analyses of the appropriate policies made as part of the main audit project, general articles on guidelines and some guidelines on how to draw up guidelines. They were asked to study these, and then send a brief summary of their views and suggestions to the facilitator, who collated the responses and prepared a discussion paper based on all the papers listed and the results of the policy analysis and observational audit.

A one-day meeting was held for each working group, at which these papers were discussed and the major points of each guideline hammered out. These were put into formal shape by the facilitators and returned to the working group members for correction and comment. The facilitators took these into account in revising the draft guidelines, which were returned to the working group members for approval and any further comment. The facilitator then drew up the final guidelines for review by the audit project team.
These final guidelines are presented in this supplement in the belief that they describe good current practice in an important, if limited, field. They make no claims to perfection, but are practical in a variety of settings. They should be applied with common sense and adapted where necessary to meet local needs. They could be improved and extended by wider consultation, but only at the risk of considerable delay. This would lose much of the benefit of the working parties’ recent experience, as views and practices are changing all the time.

Public Health Laboratory Service
July 1997
## WORKING GROUP MEMBERS

### Blood and body substances precautions/handwashing
Group facilitator: Jennie Wilson

<table>
<thead>
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<th>Position</th>
<th>Site</th>
</tr>
</thead>
<tbody>
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<tr>
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<td>Basildon</td>
</tr>
<tr>
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<td>Whipps Cross</td>
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<tr>
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<td>Carmarthen</td>
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<td>Edgware</td>
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<tr>
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<td>Stoke Mandeville</td>
</tr>
<tr>
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<td>Stoke-on-Trent</td>
</tr>
</tbody>
</table>

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Group facilitator: Valerie Ward

<table>
<thead>
<tr>
<th>Member</th>
<th>Position</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Julie Hayhurst</td>
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<td>Gloucester</td>
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<td>Gwynedd</td>
</tr>
<tr>
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<td>Ward Nurse</td>
<td>Bradford</td>
</tr>
</tbody>
</table>

### Indwelling urethral catheters
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<table>
<thead>
<tr>
<th>Member</th>
<th>Position</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gillian Brown</td>
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<td>Ipswich</td>
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<tr>
<td>Julie Bulman</td>
<td>Ward Nurse</td>
<td>Gwynedd</td>
</tr>
<tr>
<td>Harg Charger</td>
<td>Ward Doctor</td>
<td>Coventry</td>
</tr>
<tr>
<td>Kitty Lee</td>
<td>Infection Control Nurse</td>
<td>Carmarthen</td>
</tr>
<tr>
<td>Sarah Van-Tam</td>
<td>Audit Project Nurse</td>
<td>Leicester</td>
</tr>
<tr>
<td>Maureen Wilson</td>
<td>Infection Control Nurse</td>
<td>Preston</td>
</tr>
<tr>
<td>Peter Wright</td>
<td>Medical Microbiologist</td>
<td>Preston</td>
</tr>
</tbody>
</table>

### Tracheal suction/nasogastric tubes
Group facilitator: Barry Cookson

<table>
<thead>
<tr>
<th>Member</th>
<th>Position</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heather Chaytor</td>
<td>Ward Nurse</td>
<td>Torbay</td>
</tr>
<tr>
<td>Charlotte Doherty</td>
<td>Ward Doctor</td>
<td>Manchester</td>
</tr>
<tr>
<td>Philip Jones</td>
<td>Medical Microbiologist</td>
<td>Ipswich</td>
</tr>
<tr>
<td>Margaret McCarville</td>
<td>Infection Control Nurse</td>
<td>Whipps Cross</td>
</tr>
<tr>
<td>Sallie McClarty</td>
<td>Audit Project Nurse</td>
<td>Stoke Mandeville</td>
</tr>
<tr>
<td>Alan McDonald</td>
<td>Medical Microbiologist</td>
<td>Whipps Cross</td>
</tr>
<tr>
<td>Janet Roberts</td>
<td>Infection Control Nurse</td>
<td>Wirral</td>
</tr>
<tr>
<td>Pauline Webb</td>
<td>Audit Project Nurse</td>
<td>Liverpool</td>
</tr>
</tbody>
</table>
GUIDELINES FOR HANDWASHING

TARGET AUDIENCE

All staff involved in clinical health care.

BACKGROUND

Skin is not sterile. However, most of the micro-organisms found on it (the resident microbial flora) rarely cause disease and are of minor significance in routine clinical situations. The removal of resident flora is considered desirable before procedures where a breach in the patient’s natural defences against infection could enable such microbes to establish infection, e.g. surgery.

Transient micro-organisms are those acquired by touch from the animate and inanimate environment. They are located superficially on the skin and are readily transmitted to the next thing touched. They are also easily removed by washing with soap or destroyed by other treatments, e.g. alcohol handrubs.

Hands are thought to be responsible for much of the transmission of infection between patients. Handwashing has been shown to reduce the spread of infection.

There are three types of agent which can be used to remove micro-organisms from hands: soap, alcohol handrubs and surgical scrubs.

Washing with soap removes transient micro-organisms mechanically, but has little effect on the resident population. However, in most situations handwashing with soap is all that is necessary to prevent cross-infection and protect patients and staff from acquiring infection. Soap should be supplied in a form which minimises the risk of microbial contamination, e.g. liquid soap supplied in containers which cannot be topped up.

Alcohol-based handrubs have a rapid microbicidal action and can be applied quickly and without access to water. However, they will not penetrate organic material and are therefore only fully effective on visibly clean hands. Alcohol handrubs appear to prevent regrowth of resident microflora for several hours after application and may therefore be of value as a pre-surgical hand cleanser.

Surgical scrubs contain a microbicide. They are designed to remove both transient and resident skin micro-organisms, and to prevent the regrowth of resident flora. Chlorhexidine solutions may be slightly more effective than iodine-based ones, but there is little evidence that the type of microbicide has a significant effect in practice. If used frequently they may cause skin damage in some individuals, with co-incidental increased levels of bacteria on the skin.

Although many studies have attempted to assess the technique of handwashing, there is little evidence to indicate whether the technique or duration of the wash makes a difference in preventing cross infection. However, the handwash procedure should aim to cover all parts of the hands. If hands are not rinsed and dried properly there is the potential for skin damage to occur. The evidence about the relative merits of hot-air drying and towels, and the significance of drying in the removal of micro-organisms, is inconclusive.
The timeliness of hand washing is probably more important than the technique. Although there is disagreement about which activities should be preceded or followed by a handwash, it is generally accepted that staff do not wash their hands as frequently as they should. Some groups of staff appear to wash their hands less frequently than others.

Handwashing appears to occur less frequently when the workload of staff is high or handwashing facilities are inadequate.

An emerging problem is the significance of antibiotic resistance in resident flora and the implications of these micro-organisms to the transmission of infection, particularly in relation to surgical procedures.
GUIDELINE STATEMENTS — HANDWASHING

A. Indications for handwashing

1. The decision to wash hands should be based on an assessment of the risk that microbes have been acquired or may be transmitted.

2. Handwashing is essential in the following situations:
   • before contact with susceptible sites, e.g. wounds, burns, intravascular insertion sites
   • before performing invasive procedures, i.e. where natural defences against infection are breached
   • before contact with particularly susceptible patients, e.g. immunocompromised, newborns
   • before handling food or medicines
   • after hands have been contaminated, e.g. contact with body substances, soiled linen or equipment
   • after gloves have been removed, as holes frequently develop while in use, and hands may be contaminated on removal
   • after contact with a patient in isolation, or one colonised with micro-organisms of special clinical significance, e.g. multi-resistant bacteria
   • after using the toilet or toileting others.

3. Handwashing may also be desirable at other times, and indications for hand washing may be varied by local policy or advice from the infection control team, e.g. during outbreaks of infection.

B. Type of cleansing agent

1. Soap and water should be used for handwashing in most situations, most of the time. In clinical areas, soap should preferably be supplied as liquid soap in sealed units where the dispensing nozzle is integral with the reservoir and thus changed when the reservoir is empty.

2. Alcohol handrubs can be used in place of soap and water, except where hands are visibly dirty. They are especially useful in situations where handwashing and drying facilities are inadequate, or where there is a frequent need for hands to be washed.

3. Surgical scrubs may be used in situations where a reduction in the resident microbial flora is considered desirable, such as in operating theatres or similar departments, and before performing an invasive procedure, especially the placement of indwelling medical devices.

C. Handwashing technique

A brief wash will remove the majority of transient micro-organisms, but the technique should aim to cover all surfaces of the hands. Where soap or a surgical scrub has been used, hands should be rinsed in running water and then dried. If towels are used for drying, then single-use ones are preferred. The soap and hand towels should be of a quality acceptable to users so as not to deter handwashing. The skin should be maintained in good condition to discourage the accumulation of bacteria. This may require the regular application of handcreams, which should be hygienically presented and contain an effective preservative.

D. Promoting handwashing

1. Adequate facilities must be provided to encourage staff to wash their hands regularly and appropriately. This includes accessible handwash basins, soap and/or alcohol handrubs, and disposable paper towels.
2. Surgical scrubs and alcohol handrubs should be available in operating departments and other clinical areas where invasive procedures are performed.

3. Training on the importance of handwashing should be included in the induction programmes of all staff, and policies describing when and with what agent hands must be washed should be made available.
BIBLIOGRAPHY


GUIDELINES FOR ROUTINE BLOOD AND BODY SUBSTANCES PRECAUTIONS

TARGET AUDIENCE

All staff who work in clinical health care or whose work brings them into contact with body substances.

BACKGROUND

The emergence of the blood-borne human immunodeficiency virus (HIV) and the associated acquired immune deficiency syndrome (AIDS) pandemic has highlighted the risks to health-care workers of acquiring blood-borne viruses through contact with blood and other body substances. It has been acknowledged that, because individuals infected with blood-borne viruses cannot be reliably identified, precautions recommended to minimise the risk of transmission should be used in the care of all patients. The concept became known as 'universal blood and body fluid precautions'. The recommendations were first published by the Centers for Disease Control, USA, in 1987, and the UK Health Departments issued similar advice in 1990.

The principles of routine blood and body substance precautions are underpinned by the Health and Safety at Work etc. Act (1974), which requires all employers to ensure their staff are appropriately trained in procedures necessary to work safely. This is reinforced by the Control of Substances Hazardous to Health (COSHH) Regulations (1994), which require employers to assess the risks associated with the handling of hazardous substances, including pathogenic micro-organisms.

Health-care workers are known to be at risk of acquiring blood-borne pathogens through exposure to infected blood/body fluid. Worldwide, at least 64 health-care workers have definitely acquired HIV through exposure at work, many have acquired hepatitis B virus and there is evidence of hepatitis C transmission. The greatest risk of transmission is from inoculation injuries, but it is also known to have occurred following splashing of blood onto mucous membranes or damaged skin.

Individuals infected with blood-borne pathogens cannot be reliably detected and, although some activities are known to increase the risk of acquiring blood-borne pathogens, e.g. sharing of intravenous drug-users' equipment or unprotected sexual intercourse, clinical staff are frequently not aware of high-risk behaviour practised by their patients. In addition, seroconversion for HIV may take up to 3 months, during which time the individual is infectious but may not test positive by the majority of serological tests.

The risk of acquiring blood-borne pathogens can be minimised by treating blood and other body substances from all patients as potentially infectious and taking precautions to minimise the risk of inoculation injury or exposure of non-intact skin or mucous membranes to blood and body substances.

Sharps injuries occur frequently among health-care workers and are often not reported. At least 40% of the injuries could be prevented by the adoption of safer sharps handling practice. Recapping of used needles causes approximately one-third of injuries, sharps not discarded after use one-quarter of injuries, and a further 10% are associated with overfilled sharps bins.
In the original recommendations, universal blood and body fluid precautions were to be applied to all body fluids. This advice was subsequently amended to relate to those body substances known to be associated with the transmission of blood-borne pathogens, i.e. blood, blood-stained body fluids, semen, vaginal secretions and cerebrospinal, synovial, peritoneal, pleural, pericardial and amniotic fluids. However, it has also been recognised that other body substances, such as urine, faeces, sputum and vomitus, frequently contain other pathogens and are a major source of infection. The precautions recommended for preventing the transmission of blood-borne pathogens could therefore be used to minimise the spread of other infections if applied to the management of all body substances. This approach has been described as body substance isolation (BSI). Some studies have shown a reduction in occurrence of hospital-acquired colonisation and infections when blood and body fluid precautions were employed.

In 1996, the Centers for Disease Control (CDC), Atlanta, USA, replaced universal precautions with standard infection control precautions. These continue the key elements of universal precautions and body substance isolation, and are designed to protect patients and health-care workers from infection risks associated with all body fluids.

The recommendations in these guidelines are based on the same principle as the standard precautions recommended by CDC. Body substance precautions should be used to prevent the transmission of blood-borne pathogens and to minimise the spread of other pathogens. The key to using the precautions is risk assessment, both of the likely exposure to body substances and of the risk of the substance containing pathogenic micro-organisms.
GUIDELINE STATEMENTS — ROUTINE BLOOD AND BODY SUBSTANCES PRECAUTIONS

A. General principles

1. The precautions aim to prevent the transmission of blood-borne viruses and to minimise the transmission of other pathogens.

2. The general principles of the precautions are to:
   • prevent blood/body substance contact with non-intact skin and mucous membranes
   • minimise blood/body substance contact with intact skin
   • prevent sharps injuries
   • immunise staff against hepatitis B
   • prevent contaminated items being used between patients.

B. Use of protective clothing

1. Protective clothing should be used to prevent exposure of skin and mucous membranes when contact with blood or other body fluids is anticipated. Before performing a procedure, the risk of exposure to blood or body substances should be assessed and protective clothing selected accordingly.

   Gloves should be worn for touching body substances, mucous membranes, e.g. vaginal or dental examinations, and non-intact skin, e.g. wounds. Gloves should be changed after contact with each patient and at the end of each procedure. Hands should be washed after gloves have been removed. Washing gloves between patients is not recommended as the gloves may be damaged by the soap and, if unknowingly punctured, could allow body substances to remain in contact with the skin for prolonged periods. Gloves should be clean, disposable, of good quality, and well-fitting. They should comply with the relevant supplies specification.

   Plastic aprons should be worn if contamination of clothing with body substances is anticipated. They should be used for one procedure and then discarded.

   Water-repellent gowns should be worn during procedures likely to cause extensive splashing of body substances onto the body, e.g. major surgical and obstetrical procedures and endoscopy.

   Masks and eye protection (or face visors) should be worn during procedures likely to cause splashing of body substances into the eyes, mouth or nose, e.g. major surgical procedures, maternal delivery, and scrubbing instruments. They should be available during procedures where splashing is possible, but unlikely, e.g. intra-arterial punctures.

   Additional protective clothing, such as boots and head gear, may be necessary for major surgical procedures.

2. The risk of acquiring infection during mouth-to-mouth resuscitation where there is no blood in the mouth is extremely low. However, mouth pieces, resuscitation bags or other ventilation devices should be available in all clinical areas where respiratory resuscitation is likely to occur regularly.

C. Handwashing

   Hands should be washed immediately and thoroughly with soap and water if contaminated with blood/body fluid, and after gloves have been removed.
D. Cuts and abrasions

Cuts and abrasions in any area of exposed skin should be covered with a waterproof dressing. Health-care workers with exudative lesions/weeping dermatitis should seek advice from the occupational health department and avoid all direct patient care, food handling or handling of patient-care equipment until the condition resolves.

E. Management of sharp instruments

1. Extreme care must be exercised during the use and disposal of sharp instruments.

2. The following principles must be adhered to:
   - the use of sharps should be avoided where possible
   - used sharps must be discarded into a sharps container at the point of use by the person who has used them
   - used needles must not be bent, broken or recapped by hand
   - syringes and needles should be discarded as one unit. In exceptional circumstances, where the needle has to be removed, e.g. blood gas specimens, a needle-removing device should be used
   - sharps containers should be placed as close as possible to the area of use
   - sharps containers must be correctly assembled and securely closed when three-quarters full
   - full containers must be stored in a safe disposal area, handled carefully, i.e. not thrown or dropped, and should not be placed inside yellow bags
   - sharps containers should conform to British Standard 7320
   - sharps containers must not be autoclaved, but must be destroyed by incineration.

3. Local guidelines on management of sharps injuries and exposure of mucous membrane or non-intact skin to body substances must be available, and all exposure managed by an occupational health department. This is necessary to ensure appropriate management of the injury and accurate data collection for use in developing risk prevention strategies.

4. All staff who may have direct contact with body substances should be immunised against hepatitis B, and the process managed by an occupational health department.

F. Spillage of body substances

1. Spillages of body substances should be dealt with immediately by covering with disposable paper towels to soak up the excess; the spillage cleared up with gloved hands; the debris treated as clinical waste; and the area washed with detergent and water.

2. Where the surface will withstand such treatment, it is preferable to treat blood spills with chlorine-releasing agents, such as hypochlorite, bleach or dichloroisocyanurate granules, which will inactivate viruses. High levels of available chlorine are recommended (10,000 parts per million) because the microbicidal activity is markedly reduced in the presence of organic material.

G. Disposal of waste material

Waste material contaminated with blood or body substances should be discarded into yellow clinical waste bags and disposed of by incineration. Excreta can be safely discarded into the sewerage system. Linen should be washed with detergent at a temperature of at least 71°C maintained for 3 minutes. If soiled with body substances, it should be placed in leak-proof bags for transportation to the laundry.
H. Decontamination of equipment

1. Any equipment used for procedures involving potential contact with blood or body substances must be appropriately decontaminated.

2. Equipment should be divided into categories according to the risk that it may transmit infection. High-risk items are those which penetrate skin, enter normally sterile body areas or come into contact with severely ulcerated mucous membranes, e.g. surgical instruments. Medium-risk items are those which have contact with mucous membranes, e.g. anaesthetic equipment. Low-risk items are those only used on intact skin, e.g. mattresses. Instruments used in high-risk procedures must be sterilised, preferably by autoclave or hot air oven. Equipment used in medium-risk procedures should preferably be sterilised, but may be disinfected, depending on the type of equipment and local policy. Low-risk items usually only require cleaning with detergent and water.

3. Before decontamination, all equipment must be thoroughly cleaned with detergent and water. Appropriate protective clothing should be worn. Cleaning is essential to remove body substances, which may otherwise adhere to the surface, and to enable microorganisms to survive the decontamination process.

I. Staff training

All hospitals and other health-care facilities should have clear policies on routine blood and body substance precautions, and local policies should be available for specialist departments, e.g. laboratories, mortuaries, operating theatres, and maternity departments. All staff likely to have contact with body substances should receive regular training on the use of routine body substance precautions, and suitable equipment, e.g. protective clothing and sharps containers, must be made available.
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GUIDELINES FOR THE PREVENTION OF INFECTION ASSOCIATED WITH CENTRAL INTRAVASCULAR DEVICES

TARGET AUDIENCE

Medical and nursing staff involved in the insertion and maintenance of intravascular catheters.

BACKGROUND

Central vascular catheters (CVC) are now an accepted part of the management of patients with critical and chronic illnesses, and are used for central vascular pressure monitoring, drug administration and total parenteral nutrition (TPN). However, catheter-related infection is recognised as a significant clinical problem. The reported incidence ranges from 4 to 18%; this wide variation may be due to a number of factors, including differences in the clinical and laboratory criteria used to diagnose infections.

The organisms most commonly associated with CVC infections are coagulase-negative staphylococci, *Staphylococcus aureus* and candida species. Clinical data and microbiological studies indicate that the majority of infections are caused by skin micro-organisms which invade the transcutaneous wound either at the time the catheter is inserted or in the days following insertion. Another possible source of organisms is the catheter hub.

The symptoms of CVC infections may be systemic, or localised to the insertion site or track of a tunnelled device. It may be difficult to distinguish device-related bloodstream infections from those arising from other sites of infections, e.g. surgical wounds. The same micro-organism isolated from blood cultures taken peripherally and via the catheter will support a clinical diagnosis. Unless there are clinical indications, routine microbiological culture of the skin or CVC components, such as hubs or catheter tips after removal, is probably of little value.

There is evidence to suggest that the design and function of CVCs influence infection rates. Triple lumen catheters are associated with a higher risk than those with a single lumen. However, they do allow the infusion of different solutions to critically ill patients and perhaps carry less risk than a single lumen line with multiple connections. Catheters incorporating a subcutaneous cuff, such as Hickman lines, have been shown to have a considerably lower risk of CVC-related infections; cuffed tunnelled lines are preferred when a CVC is required long term. Studies have also shown that there are marked differences in the capacity of micro-organisms to adhere to various catheter materials, with smooth surfaces such as silicone discouraging colonisation, although the clinical significance is unclear.

The site of insertion may influence the likelihood of subsequent infection. The possible access routes are internal/external jugular, subclavian, supraclavicular and antecubital fossa veins. Subclavian lines are less likely to become infected than those inserted in the internal jugular vein, but there is a higher risk of surgical complications. Femoral vein cannulation has been associated with a high rate of infection and therefore should be avoided.
The method of insertion may also have implications for infection risk. The introduction of the catheter may be carried out using a locator needle. Although some guidelines discourage this practice in view of needle trauma acting as a focus for infection, the use of a fine bore needle may reduce the need for repeat cannulation attempts, thereby decreasing tissue trauma. The majority of catheters are inserted using Seldinger's technique, which involves the use of a guidewire. A percutaneous approach will cause less tissue trauma than an open surgical approach, and there is less likelihood of subsequent infection. The development of imaging guidance techniques simplifies insertion of CVCs and reduces the risk of misplaced catheters. Replacement of a CVC using guidewire line exchange technique increases the risk of bloodstream infection and should only be used as a last resort.

The place of insertion may be an additional risk factor. While the operating theatre may be preferable, this option is not always available or practical. However, it has been shown that the use of a clean area is sufficient, providing there is strict adherence to aseptic techniques.

The risk of infection is reduced by the adoption of strict aseptic techniques for insertion of CVCs. Although it is generally accepted that sterile gloves and large drapes are mandatory, recent research has shown that maximal sterile barrier precautions, which include sterile gowns and possibly a surgical mask and cap, significantly reduce CVC-related infections.

There is conflicting evidence regarding the most effective type of dressing for the insertion site and how frequently it should be changed. Gauze dressings do not protect the site from moisture or allow it to be easily inspected. However, an increase in bacteria under transparent film dressings has been reported, although not all studies have demonstrated an associated increase in device-related infections. This may be due to variations in the permeability to moisture vapour of dressings made by different manufacturers.

It has been proposed that prophylactic antibiotics given at the time of insertion may reduce CVC infection rates. Topical antiseptic or antibiotic/antimicrobial ointments may be of more value. However, the widespread use of agents such as mupirocin may encourage the development of resistant staphylococci. Antimicrobial sleeves, antimicrobial-impregnated catheters, electronically charged catheters and silver-impregnated cuffs are recent developments that may reduce infection rates. At present, there is insufficient evidence for any of these methods to be recommended.

The incidence of infection increases with the duration of catheterisation. Tunnelled lines, such as Hickman or Broviac, can be left in for long periods of time with a relatively low risk of infection. This does not generally apply to non-tunnelled lines. While some practitioners resite CVCs at regular intervals, the majority only change them if a CVC-related infection is diagnosed. In this event, the decision to remove a line must be a clinical one, based on the condition of the patient, the function of the line and the virulence of the infecting organism.

The recommendation to replace administration sets routinely dates from the Clothier report issued by Department of Health in 1972. Recent studies have suggested that administration sets can be changed every 72 hours without decreasing the risk of infection.

Studies have shown that where IV therapy teams are responsible for the insertion and maintenance of intravascular devices there is a substantially lower rate of CVC infections. Other researchers have shown that educational programmes also significantly improve catheter care.

In view of the controversy surrounding many of the issues relating to the insertion and maintenance of central vascular lines, and the paucity of evidence to support many of the suggestions for reducing infection rates, in most instances these guidelines can only make recommendations based on clinical judgement.
GUIDELINE STATEMENTS — INTRAVASCULAR DEVICES

A. Insertion of intravascular catheter

1. It is strongly recommended that CVCs should be inserted in designated clean areas, e.g. central treatment rooms, intensive care units, operating theatres.

2. Hands should be thoroughly washed, using a technique which aims to cover all surfaces of the hands. The use of a surgical scrub is recommended. Hands should be rinsed in running water before and after applying the cleansing agent, and dried well with a sterile towel. Alternatively, an alcohol hand rub can be used on clean hands.

3. Sterile gloves, gowns and large drapes are the minimum barrier precautions required.

4. If not already visibly clean, the skin site should be cleaned with soap and water or gauze swabs with sterile saline or cetrimide. Before inserting the catheter, the skin should be prepared with either chlorhexidine or povidone iodine, with an alcohol base of at least 70% alcohol (ethanol, industrial methylated spirit or isopropanol) applied with gauze rather than cotton wool. The area must then be allowed to dry before starting the procedure, thus enabling sufficient time for the antiseptic to act.

5. Effective skin preparation will remove bacteria from both hair and skin, avoiding the need for shaving, which can result in microscopic damage and thus microbial colonisation. If hair removal is considered necessary, clipping is the preferred option.

6. The insertion technique will be the decision of the practitioner, but should aim to minimise the amount of tissue trauma.

7. Non-cuffed catheters should be firmly anchored to prevent movement, which may carry micro-organisms from the skin into the wound. If the device is not sutured, the tape in direct contact with the insertion site must be sterile. In the case of cuffed, tunnelled lines, a minimum of 10 days should be sufficient to allow tissue growth to secure the dacron cuff. Any exit suture can then be removed.

8. The insertion site must be covered with a sterile dressing which allows ready inspection. Sterile gauze or transparent film may be used. The latter allows continuous inspection, greater protection against wetting and exogenous contamination, and more secure anchorage. There is some evidence that Opsite 3000 may be more suitable for prolonged catheter use.

9. Where it is necessary to administer TPN through a triple lumen catheter, one of the lumens must be strictly dedicated and clearly identified for that purpose.

10. In order to facilitate patient care and audit, the procedure must be documented in the nursing and medical records, stating the name of the person inserting the CVC, the date of insertion, site, catheter size, and reason for insertion.

B. Maintenance of intravascular catheter

1. Wherever possible, the insertion site should be inspected daily for signs of infection. However, the frequency of inspection will depend on the type of dressing and local policy.

2. Dressings should be changed when no longer intact, or when moisture collects at the site. It is suggested that Opsite 3000 be changed every 7 days, transparent dressing every 3–7 days, depending on the type and specification of the film, and sterile gauze every 2–3 days. On removal of a Hickman line suture, the site can be left without a dressing, depending on the condition of the exit site.
3. Hands should be washed and dried as described in section A prior to changing a dressing; alternatively, an alcohol rub can be used on clean hands.

4. A sterile dressing pack must be used when changing a dressing. The skin at the site must be cleaned with aqueous antiseptic from a single-use sachet. The site must be allowed to dry before applying a new dressing.

5. A sterile field must be maintained when disconnecting or manipulating any part of the system.

6. Administration sets should be changed at least every 72 hours, although lines used for parenteral feeding or with an infusion pump, or which are accessed frequently for such purposes as drug administration and haemodynamic monitoring, should be changed daily. In this case, intravenous filters may be cost-effective where there is no contraindication to their use.

C. **Removal of intravascular catheter**

1. The patient should be placed in the Trendelenburg position, lying flat or slightly head down, before removing the CVC. If the patient is breathless, place in a recumbent position.

2. Clean the skin with a disinfectant such as aqueous chlorhexidine or povidone iodine solution, and allow to dry prior to removing the device. Avoid accidental contamination of the tip, if culture is clinically indicated. In this case, cut off 5cm of the distal catheter tip with sterile scissors and place in a sterile container.

3. Apply a sterile dressing to the site.

4. The patient should be placed in an upright position to minimise blood loss for 10 minutes after catheter removal, unless there are any medical contraindications.

5. The date of catheter removal should be documented in the nursing and medical records.

D. **Staff training**

It is recommended that multidisciplinary CVC training teams should be established to ensure that guidelines for the prevention of infection are adhered to, and to develop appropriate educational programmes for all health-care staff involved in the introduction and management of intravascular devices.
BIBLIOGRAPHY


GUIDELINES FOR THE PREVENTION OF INFECTION ASSOCIATED WITH SHORT-TERM INDWELLING URETHRAL CATHETERS

TARGET AUDIENCE

Medical and nursing staff involved in the insertion and maintenance of urinary catheters.

BACKGROUND

The use of indwelling urinary catheters is an essential component of medical care. Approximately 10% of patients are catheterised during hospital admission, with a mean duration of 4 days.

Infections of the urinary tract account for about 40% of hospital-acquired infection (HAI) and are commonly associated with catheterisation. Between 10 and 20% of catheterised patients develop bacteruria and 2-6% develop symptoms of urinary tract infection (UTI). The risk of acquiring bacteruria is approximately 5% for each day of catheterisation. Other major risk factors are absence of systemic antibiotics, catheter care violations, advanced age and debilitation. Women are more at risk than men.

These incidence figures contrast with the proportion of UTIs (23% of all HAI) reported in the UK’s second national prevalence survey. The authors note that UTI accounts for 25-35% of infections in reports of prevalence studies in European countries, but draw attention to the need for caution in comparing prevalence rates.

Because it is often asymptomatic and resolves spontaneously on removal of the catheter, catheter-associated UTI is generally assumed to be insignificant. However, a proportion of patients remain at risk of UTI for up to 30 days after removal of the catheter. Of patients with UTI, 1-4% develop bacteraemia and, of these, 13-30% die. The infected urinary tract is the most common source of Gram-negative septicemia in hospitalised patients.

The specification for urological catheters is set out in British Standard 1695. This deals with material, gauge, length and balloon volume, and the duration of use of catheters made from different materials. This information should guide decisions on the choice of catheter. Nevertheless, individual patients may react differently to urinary catheters, and a decision to change a catheter should also involve clinical judgement.

Manufacturers recommend, and the Drug Tariff states, that drainage bags should be changed at 5-7 day intervals. The Centers for Disease Control (CDC) guidelines discourage routine changes. While the manufacturers' expert knowledge of the bag material and structure should be taken into account, the decision to change a bag and break the sterile, continuously closed system should be a clinical one, based upon accumulation of sediment, smell or leakage.

Bacteria enter the catheterised urinary tract by the periurethral or intraluminal routes. Women are more likely than men to be infected by rectal flora entering by the periurethral route. Infections occurring by the intraluminal route are more likely to result from catheter care violations.

The diagnosis of bacteruria is based on cultures of urine. There is evidence to suggest that the interpretation of urine culture results may be misleading. Infection may be underestimated if standard criteria are used. Similarly, clinical criteria for the diagnosis of UTI are ambiguous and need careful interpretation.
UTI may be caused by a variety of organisms, in particular Gram-negative species. Gram-positive species may be associated with concurrent antibiotic treatment or prophylaxis.

The needs of patients who require long-term indwelling urinary catheters or intermittent catheterisation are different and require separate guidelines.
GUIDELINE STATEMENTS — INDWELLING URETHRAL CATHETERS

A. General principles

1. The use of urinary catheters should be limited to clinical needs that cannot be met by other means. This may include, but is not limited to, relief of urinary tract obstruction, urinary drainage in patients with neurogenic bladder dysfunction and urinary retention, in urologic surgery or other surgery on contiguous structures, accurate measurement of output in critically ill patients and radiological investigations.

2. Catheter insertion and maintenance should be undertaken by people who are adequately trained in the procedures.

3. Hands should be washed immediately before and after catheter insertion, and any manipulation of the catheter or drainage system.

4. Protective clothing should be used in accordance with the guideline on routine blood and body substance precautions.

5. The system of urine drainage should be sterile and continuously closed, with an outlet designed to avoid contamination and a sampling port. The drainage system should be appropriate to individual patient need.

6. The closed system should only be broken for limited, clearly defined clinical reasons. Bladder washouts should be for specific clinical reasons and not as part of routine practice.

7. The catheter should be changed according to clinical need, and not on a fixed regimen, and with regard to the manufacturer's instructions.

8. In addition to verbal information, patients should be provided with written information in an appropriate language.

9. All procedures involving the catheter and drainage system should be documented in the medical or nursing notes. At a minimum, this should include the name of the person inserting the catheter, the date, type and size of catheter, and the volume of water in the balloon.

B. Insertion of a urethral catheter

1. The catheter should be of material suitable for the anticipated duration of catheterisation.

2. The smallest balloon size should be used, unless a specialist in urology advises otherwise, and inflated with the correct amount of sterile water.

3. The smallest gauge catheter consistent with good drainage should be used. The length will depend on the sex of the patient. If regular or continuous irrigation is anticipated, a three-way catheter should be used.

4. The clinical needs of the patient will determine whether an assistant is required.

5. Large, robust, sterile drapes should be available. These are likely to be most useful to the operator working alone.
6. If not already socially clean, the genital area should be washed with soap and water before catheter insertion.

7. Sterile saline or water may be used for meatal cleansing.

8. The urethra should be lubricated with sterile, single-use, anaesthetic gel.

9. The catheter should be inserted using an aseptic technique and sterile equipment. A second pair of gloves should be available, should contamination occur.

C. Maintenance of the drainage system

1. Drainage bag systems should be simple to operate with one hand, close securely and be easy to position. Where feasible, offer the patient a choice of drainage systems.

2. The position and integrity of the system should be maintained in a manner that is compatible with patient comfort.

3. The drainage bag must be kept below the level of the bladder at all times to maintain an unobstructed flow of urine.

4. The drainage bag should be emptied into a disinfected or single-use container. Contamination of the outlet must be avoided, and the port dried on completion. Alcohol-impregnated swabs may be used to decontaminate the outlet (inside and outside) before and after emptying.

5. When urine samples are aspirated from the sampling port, an aseptic technique and sterile equipment must be used, and the port disinfected with alcohol before and after use. Urine specimens should be taken according to clinical need or as part of a planned programme of assessment, and not as a routine.

6. The urine bag must be changed at catheter change if it is damaged or leaking, when there is an accumulation of sediment or when it begins to smell, rather than on a fixed regimen.

7. Meatal care should be performed at intervals appropriate for keeping the meatus free of encrustations and contamination. Showering or the use of a gentle bidet are preferable. If these are not available, a bath may be taken. The bath should be cleaned before and after use. The drainage bag should be emptied and the tap closed before the patient enters the bath.

8. Waste should be disposed of in accordance with current regulations.
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GUIDELINES FOR THE PREVENTION OF INFECTION ASSOCIATED WITH TRACHEAL SUCTION

TARGET AUDIENCE

All health-care workers involved in clinical care.

BACKGROUND

In many studies, pneumonia is the third most common hospital-acquired infection (HAI). It is also among the most costly; additional costs relate to increased duration of ventilation and an up to three-fold increase in length of stay. Mortality is high, with crude rates of between 30 and 50%. Studies suggest there is a two- to fifteen-fold increase in mortality compared with controls without lower respiratory tract infections (LRTIs).

Certain risk factors for hospital-acquired pneumonia have been identified. The most significant is mechanical ventilation, but others include extremes of age, severe underlying disease, immunosuppression, surgery, particularly to the thoraco-abdominal area, heavy smoking, large volume aspiration, underlying chest disease, lowered levels of consciousness, cardiopulmonary disease, obesity, intubation, 24-hour circuit changes, stress-bleeding prophylaxis with cimetidine (with or without an antacid), antibiotic administration, presence of a nasogastric tube and the season (autumn/winter).

Definitions of pneumonia may include the presence of fever, cough and purulent sputum, and radiological evidence of new or progressive pulmonary infiltrates, suggestive Gram stain and cultures of sputum, tracheal aspirate, pleural fluid or blood. Diagnosis of ventilator-associated pneumonia (VAP) can be difficult. Several consensus groups have advocated culture of protected specimens, not necessarily collected via a bronchoscope, although opinions on the sensitivity and practicality of the various methods differ.

Reports of organisms associated with LRTI vary according to the definitions and diagnostic methods used, wards studied and case mix (especially the number of VAPs), antibiotic therapy and concurrent outbreaks of infection. Forty percent of cultures reveal polymicrobial ‘infection’. Gram-negative organisms predominate. Gram-positive infections (Staphylococcus aureus, including methicillin-resistant strains and Streptococcus pneumoniae) are acknowledged to be important, as are Haemophilus influenzae and Moraxella (Branhamella) catarrhalis, which are perhaps more common in the first 48–96 hours of tracheal intubation.

The most important route by which bacteria enter the lower respiratory tract is through aspiration of micro-organisms from the oropharynx or upper gastrointestinal tract. Factors which promote the colonisation of the pharynx or stomach appear to increase the risk of hospital-acquired pneumonia. Inhalation of bacterial aerosols and spread of organisms via the blood from other infected sites are other possibilities. Abnormal swallowing increases the risk of aspiration and will occur in patients with depressed consciousness, respiratory tract or gastrointestinal tract instrumentation, or in the postoperative state.

Patients receiving mechanically assisted ventilation are at much greater risk of developing pneumonia, with an increased risk of 1% for each day of ventilation being reported. Organisms from the oropharynx may be carried into the trachea during intubation and may be protected from the host defences and antimicrobial agents by the biofilm which forms on the surface of the tube.
Pneumonia is more likely to ensue if secretions accumulate in the lower respiratory tract in intubated patients. Tracheal secretions may pool above the endotracheal cuff and subsequently leak into the lower respiratory tract. This risk can be reduced by using suction regularly to remove secretions. Bronchial secretions may be removed more easily with the assistance of bronchodilators, postural drainage and percussion and, in high-risk patients, by the use of an incentive spirometer or intermittent positive pressure breathing.

Effective decontamination and maintenance of equipment and devices used on patients, e.g. ventilator circuits, hygroscopic condenser-moisture exchangers, wall humidifiers, nebulisers, anaesthetic machines, and pulmonary function testing equipment, can interrupt transmission of micro-organisms and reduce the risk of infection.

Person-to-person transmission of bacteria is reduced by handwashing. Hands should be washed after contact with mucous membranes, respiratory secretions, patient endotracheal or tracheostomy tubes, or any respiratory device used on a patient, whether or not gloves are worn. However, studies of neonatal and paediatric intensive care units suggest that the use of gloves and gowns for handling respiratory secretions, or objects contaminated with such secretions, reduces the risk of LRTI.

Current views on the pathogenesis of LRTI suggest that it is desirable to prevent gastric colonisation with organisms. Stress-bleeding treatment increases the pH of the stomach, which subsequently increases the risk of micro-organisms colonising the gut, and has been shown to be associated with an increased risk of LRTI. If stress-bleeding prophylaxis is needed, the agent should not decrease the patient’s gastric acidity. There is evidence that selective decontamination of the digestive tract (SDD) significantly reduces the risk of aspiration pneumonia, but there is insufficient evidence to demonstrate an effect on mortality. In addition, SDD may result in the emergence of antibiotic-resistant organisms or superinfection with fungi. Further studies are required to see if its use in certain sub-sets of patients is warranted, e.g. those with polytrauma or transplants.

Strategies for the prevention of postoperative pneumonia include ensuring that secretions are cleared, avoiding aspiration during intubation and extubation, adequate humidification of anaesthetic gases and adequate patient hydration. Education and pre- and postoperative reinforcement of the importance of taking deep breaths, frequent coughing and early postoperative mobilisation is especially important, particularly for those with an increased risk of LRTI.

If analgesia (including regional or patient-controlled analgesia) is required, it should have as little cough-suppressant effect as possible. Appropriate support for abdominal wounds will reduce the pain of coughing and deep breathing. If patients are not able to mobilise, they should be turned or repositioned two-hourly, or as required, to prevent pulmonary congestion.
GUIDELINE STATEMENTS — TRACHEAL SUCTION

A. General principles

1. There should be a programme for the effective decontamination and maintenance of equipment and devices used on patients, e.g. ventilator circuits, hygroscopic condenser-moisture exchangers, wall humidifiers, nebulisers, anaesthetic machines, pulmonary function testing equipment.

2. Hands should be washed after contact with mucous membranes, respiratory secretions, endotracheal or tracheostomy tubes, or any respiratory device used on a patient, whether or not gloves have been worn.

3. Secretions should not be allowed to accumulate in the lower respiratory tract. Bronchial secretions may be removed more easily with the assistance of bronchodilators, postural drainage and percussion and, in high-risk patients, by the use of an incentive spirometer or intermittent positive pressure breathing.

4. In ventilated patients such secretions should be removed regularly, especially secretions that gather above the tracheal cuff. They should be removed before the patient is moved, or before the tracheal cuff is deflated for any reason.

5. Current views of the pathogenesis of LRTI suggest that it is desirable to prevent gastric colonisation with organisms. If stress-bleeding prophylaxis is needed, the agent should not increase the patient's gastric pH.

6. Postoperative pneumonia may be prevented by ensuring that secretions are cleared, particularly during prolonged anaesthesia, avoiding aspiration during intubation and extubation, and ensuring adequate humidification of anaesthetic gases and adequate patient hydration. Whenever possible, patients should be instructed in deep breathing and coughing pre-operatively, and enabled to do this postoperatively by appropriate support and analgesia. Early mobilisation should be encouraged. If patients are not sufficiently mobile they should be repositioned at least every 2 hours.

7. When analgesia (including regional or patient-controlled analgesia) is required, it should have as little cough-suppressant effect as possible.

8. Prevention of LRTI should be included in in-service training programmes for clinical staff.

B. Suctioning of respiratory secretions

1. Suction of respiratory tract secretions should be carried out when clinically indicated and not according to a fixed regimen.

2. The underlying principle is to clear secretions without compromising the patient’s cardiorespiratory function and to minimise trauma to the respiratory tract.

3. As the general principles are the same, one guideline is sufficient for all suction procedures i.e. tracheal, endotracheal, oropharyngeal and nasopharyngeal.

4. Suction equipment must be stored on a trolley or tray, which must be cleaned and replenished daily.

5. Disposable aprons and eye protection should be worn.
6. Hands should be washed thoroughly with soap and water, using a technique which will cover all surfaces. They should be rinsed in running water and dried well, preferably with a single-use towel. Alternatively, an alcohol hand rub can be used on clean hands.

7. As a minimum, individually packaged or dispensed clean gloves must be worn on the hand manipulating the catheter.

8. Sterile disposable suction catheters must be used, each introduced once only (with the exception of aspirating through each nostril).

9. The catheter should be introduced gently and without suction. The operator end of the pack should be opened without touching the catheter, which should be held through the packaging while attaching to the suction tubing. The rest of the catheter must be kept in the sterile packet until it can be removed with the gloved hand immediately prior to suction.

10. When whistle tip catheters are unavailable, the suction tubing must be fitted with an appropriate connection, such as a Y connector. This will minimise the risk of traumatising the mucosal surfaces by allowing the catheter to be inserted without suction, and enable suction to be controlled and intermittent during removal. The catheter should be withdrawn with a gently rotating motion while using intermittent suction. If the procedure needs to be repeated, the glove and catheter may be changed. Suction pressure should be as low as possible (and should never exceed 200mm mercury) to minimise the possibility of mucosal damage, while still being effective in removing secretions. Suctioning for 10–15 seconds should be sufficient for effective aspiration of secretions.

11. The operator end of the suction tubing must be kept in an upright position to prevent dripping of any contents. A fresh catheter must not be left attached to the tubing in readiness for the next suction.

12. Gloves and apron should be removed and hands thoroughly washed and dried immediately after an episode of suctioning has been completed.

13. The tubing must be cleaned by pouring sterile water into a receptacle and aspirating all the fluid to leave the receptacle completely dry. This receptacle must be sterile initially and changed every 24 hours. Sterile bicarbonate solutions may be used where secretions are thick and tenacious.

14. The suction fluid must be discarded at least every 24 hours. Reusable containers must be carefully emptied into a sluice, washed with hot water and detergent, and dried thoroughly. Aprons and gloves must be worn, and eye protection is recommended. When full, closed system containers must be discarded as clinical waste, without first emptying the contents.

15. The suction tubing and the fluid container must be changed between patients. The container must be washed with detergent, dried thoroughly and decontaminated following the locally agreed procedures, e.g. in the Hospital Sterilisation and Disinfection Unit (HSDU).
BIBLIOGRAPHY


GUIDELINES FOR THE PREVENTION OF INFECTION ASSOCIATED WITH NASOGASTRIC TUBES

TARGET AUDIENCE
All health-care workers involved in clinical care.

BACKGROUND
The most important route by which bacteria enter the lower respiratory tract is through aspiration of micro-organisms from the oropharynx or upper gastrointestinal tract. Reports of organisms associated with lower respiratory tract infection (LRTI) vary according to the definitions and diagnostic methods used, wards studied and case mix, antibiotic therapy and concurrent outbreaks of infection. Forty percent of cultures reveal polymicrobial 'infection'. Gram-negative organisms predominate, but Gram-positive bacteria are common. Factors that promote the colonisation of the pharynx or stomach appear to increase the risk of hospital-acquired pneumonia.

Feeding via a nasogastric tube is increasingly used as an alternative to parenteral nutrition. However, the administration of enteral feeds can increase nasopharyngeal colonisation through reduction of gastric acidity or the introduction of micro-organisms in contaminated feed solutions. Reflux of fluid from the stomach may occur as the result of increased gastric contents, and this may allow bacteria to pass from the stomach to the upper airway via the nasogastric tube.

Feed solutions provide a favourable medium to support the growth of micro-organisms and are easily contaminated when the feed containers and administration sets are handled. Bacteria in the feed may multiply rapidly at room temperature. Feed solutions are less likely to become contaminated if supplied in ready-to-use containers.

Using methods which reduce the risk of administering contaminated solutions, preventing reflux of gastric contents by correct positioning of the nasogastric tube and the patient, and adjusting the rate of fluid introduced into the stomach may help to prevent hospital-acquired pneumonia occurring in patients receiving enteral feeding.

While these guidelines are specifically directed to the prevention of LRTI, it could also be predicted that the incidence of other infections of the pharynx and gastrointestinal tract will be lowered by their adoption.
GUIDELINE STATEMENTS — NASOGASTRIC TUBES

A. General principles

1. Hands should be washed after contact with mucous membranes, respiratory secretions, or any respiratory device entering the respiratory or gastrointestinal tract, whether or not gloves have been worn.

2. Small bore tubes should be used for enteral feeding, and appropriate placement verified. The rate and volume of feeding should be monitored and, where possible, the head of the patient's bed raised.

3. The clinical indications for enteral tube feeding should be regularly reviewed to limit the duration of device use.

4. Current views of the pathogenesis of LRTI suggest that it is desirable to prevent gastric colonisation with organisms. If stress-bleeding prophylaxis is needed, the agent should not increase the patient's gastric pH.

5. Nasogastric tube insertion should be carried out by staff who have been adequately trained in the procedure.

6. The insertion of the tube and any subsequent changes must be documented in the nursing and medical records, stating the date, site, size and reason for insertion.

B. Insertion of nasogastric tubes

1. The equipment must be placed on a clean tray or other clean flat surface.

2. Eye protection should be available. A disposable apron should be worn and discarded at the end of the procedure. Clean gloves should be worn. Latex gloves are recommended as they afford greater control when manipulating the tube.

3. To reduce the risk of aspiration, the patient should be placed in an upright position or, if this is not possible, on their side.

4. Nostrils should be cleaned prior to insertion. If the patient is unable to clear their nostrils, this should be done with a cotton bud dipped in saline, taking care not to damage the mucosa.

5. Hands should be washed thoroughly with soap and water before and after the procedure, using a technique which will cover all surfaces of the hands. They should be rinsed in running water and dried well, preferably with a single-use towel. Alternatively, an alcohol hand rub can be used on clean hands, using the same technique.

6. After the pack has been opened, the nasogastric tube should be left in the packaging until ready to insert.

7. The tip of a fine bore tube should be lubricated with a sterile solution of water or saline poured into a sterile receptacle. A single-use sachet of sterile lubricant gel should be used for other types of tube.

8. A conscious patient should be encouraged to swallow in order to assist the passage of the tube.

9. If a repeat attempt at insertion is necessary, the same tube can be used, providing it has not been damaged or contaminated.
10. It is important to ensure that the tube is in the correct position by testing the pH of the aspirate or by other agreed local methods, such as auscultation over the abdomen for the sound of air injected down the tube. The syringe should be large (e.g. 20–30ml) to avoid mucosal damage during aspiration, and particular care should be taken when aspirating fine bore tubes as undue pressure may cause the tube to adhere to the gastric mucosa. The syringe used to aspirate must be used once only and disposed of as clinical waste. If there is any doubt as to the correct position, an X-ray should be taken. The nasogastric tube should be secured with non-allergenic tape.

11. If the guidewire used with a fine bore tube has not been contaminated, it can be cleaned and stored in a bag clearly labelled with the patient’s name, and used to reinsert a nasogastric tube that has been removed accidentally. In this case, the nasogastric tube will first require cleaning with sterile water, both inside and out.

12. If a non-disposable receptacle is used for aspirated secretions, it should be cleaned and decontaminated by the method agreed in the infection control policy.

13. Nasogastric tubes should be changed according to the manufacturer’s instructions. These are usually weekly, if made of polyvinyl chloride, and three-monthly, if made of polyurethane.

C. Feeding via nasogastric tubes

1. Whenever clinically possible, patients receiving tube feeds must be nursed in a sitting position, or on their side if unconscious, to prevent aspiration of regurgitated stomach contents.

2. Before handling or administering a feed, hands should be washed thoroughly with soap and water, using a technique which will cover all surfaces of the hands. They should be rinsed in running water and dried well, preferably with a single-use towel. Alternatively, an alcohol hand rub can be used on clean hands, using the same technique. Gloves and aprons need not be worn.

3. Before starting each feed or if the patient is showing signs of respiratory distress, the tube must be checked to confirm that it is in the correct position by pH testing of aspirate or by other agreed local methods, e.g. air auscultation. The syringe should be large (e.g. 20–30ml) to avoid mucosal damage, and particular care should be taken when aspirating fine bore tubes. If there is any doubt about the correct position, an X-ray should be taken. The syringe used to aspirate must be used once only and disposed of as clinical waste. In order to reduce the risk of aspiration, the patient must be monitored frequently to establish that the feed is being absorbed.

4. The tube must be flushed before and after feeding using sterile water poured into a receptacle. The receptacle must be initially sterile, left dry after each use and changed at least every 24 hours. If drugs are to be given via the tube, the feed must be stopped and the tube flushed before and after administration.

5. Careful no-touch technique must be maintained when preparing a feed, transferring it to the feed reservoir, and priming and connecting the administration set to the nasogastric tube.

6. The feed container or reservoir container must be marked clearly with the patient’s name and the date, and time the feed was begun. This must also be recorded in the clinical notes.

7. Once set up, the feed solution must not be allowed to hang for longer than 24 hours, including any time when the feed is interrupted. If the rate of feeding is reduced, staff
should pay particular attention to ensure the 24-hour rule is not exceeded. The administration set, including the feed containers, must be changed every 24 hours and disposed of according to local policy.

8. Nasogastric feeds must be stored and handled according to the manufacturer's and/or dietician's instructions. Where possible, commercially produced, pre-packed feeds should be used, and the preparation of feed on-site should be avoided. If a feed, once opened, is to be stored in a refrigerator, it must be labelled with the patient's name, and the date and time of opening. It should be discarded if not used within 24 hours.

9. Staff should review regularly whether such feeding is necessary, and if so, whether percutaneous endoscopic gastrostomy should be used.

10. Nasogastric tube feeding should be carried out by staff who have been adequately trained in the procedure.
BIBLIOGRAPHY


These guidelines were developed with the help of multidisciplinary groups of clinical staff from 19 hospitals in England and Wales. While making no claims to perfection, they offer a practical approach to good infection control practice, and are suitable for application in a variety of patient care settings.

We hope that these guidelines will contribute to establishing national standards of infection control practice.