

Executive summary

In 1998, the Department of Health (England) commissioned the first phase of national evidence-based guidelines for preventing healthcare associated infections. These focused on developing a set of *standard principles for preventing infections in hospitals together with guidelines for preventing hospital-acquired infections (HAI) associated with the use of short-term indwelling urethral catheters in acute care and with central venous catheters in acute care.*

These guidelines are systematically developed broad statements (principles) of good practice that all practitioners can use and which can be incorporated into local protocols. A nurse-led, multi-professional team composed of infection prevention practitioners, clinical microbiologists/retrovirologist, epidemiologists, and researchers developed the guidelines. A rigorous guideline development process was used to inform the systematic reviews, the clinical and critical appraisal of relevant evidence, and linking that evidence to evolving guidelines. Both general and specialist clinical practitioners were involved in all stages of developing these guidelines, as were representatives from relevant Royal Colleges, learned societies, other professional organisations and key stakeholders.

The introduction to these guidelines describes a robust and validated guideline development model that can be used by others to develop future guidelines. This model is described in more detail in the associated technical reports that can be found on the project web site <<http://www.epic.tvu.ac.uk>>. Locating and appropriately using good quality evidence to inform guideline development in this field is challenging. Evidence from rigorously conducted experimental studies was frequently limited and consequently a range of other types of evidence were systematically retrieved and carefully appraised.

The concluding discussion on implementation highlights potential issues for clinical governance and areas for future research and suggests issues that need to be addressed to allow practitioners to successfully incorporate these guidelines into routine clinical practice.

Summary of guidelines

The type and grade of supporting evidence explicitly linked to each recommendation is described within the full guideline document. ***All recommendations are endorsed equally and none is regarded as optional.***

Standard principles for preventing hospital-acquired infections

Intervention 1: Hospital environmental hygiene

- 1 The hospital environment must be visibly clean, free from dust and soilage, and acceptable to patients, their visitors and staff.
- 2 Where a piece of equipment is used for more than one patient, e.g., commode, bath hoist, it must be cleaned following each and every episode of use.
- 3 Statutory requirements must be met in relation to the safe disposal of clinical waste, laundry arrangements for used and infected linen, food hygiene and pest control.
- 4 All staff involved in hospital hygiene activities must be included in education and training related to the prevention of hospital-acquired infection.

Intervention 2: Hand hygiene

- 5 Hands must be decontaminated immediately before each and every episode of direct patient contact/care and after any activity or contact that potentially results in hands becoming contaminated.
- 6 Hands that are visibly soiled or potentially grossly contaminated with dirt or organic material must be washed with liquid soap and water.
- 7 Apply an alcohol-based hand rub or wash hands with liquid soap and water to decontaminate hands between caring for different patients, or between different caring activities for the same patient.
- 8 Remove all wrist and ideally hand jewellery at the beginning of each clinical shift before regular hand decontamination begins. Cuts and abrasions must be covered with waterproof dressings.
- 9 Effective handwashing technique involves three stages: preparation, washing and rinsing, and drying. Preparation requires wetting hands under tepid running water ***before*** applying liquid soap or an antimicrobial preparation. The handwash solution must come into contact with *all* the surfaces of the hand. The hands must be *rubbed* together vigorously for a minimum of 10–15 seconds paying particular attention to the tips of the fingers, the thumbs and the areas between the fingers. Hands should be rinsed thoroughly prior to drying with good quality paper towels.
- 10 When decontaminating hands using an alcohol handrub, hands should be free of dirt and organic material. The handrub solution must come into contact with all surfaces of the hand. The hands must be *rubbed* together vigorously, paying particular attention to the tips of the fingers, the thumbs and the areas between the fingers, and until the solution has evaporated and the hands are dry.
- 11 Apply an emollient hand cream regularly to protect skin from the drying effects of regular hand decontamination. If a particular soap, antimicrobial handwash or alcohol product causes skin irritation, seek occupational health advice.

Intervention 3: The use of personal protective equipment

- 12 Select protective equipment on the basis of an assessment of the risk of transmission of microorganisms to the patient, and the risk of contamination of health care practitioners clothing and skin by patients' blood, body fluids, secretions, and excretions.
- 13 Gloves must be worn for invasive procedures, contact with sterile sites, and non-intact skin, mucous membranes, and all activities that have been assessed as carrying a risk of exposure to blood, body fluids, secretions and excretions; and when handling sharp or contaminated instruments.
- 14 Gloves should be worn as single use items. Put gloves on immediately before an episode of patient contact or treatment and remove them as soon as the activity is completed. Change gloves between caring for different patients, or between different care/treatment activities for the same patient.

- 15 Gloves must be disposed of as clinical waste and hands should be decontaminated following the removal of gloves.
- 16 Gloves conforming to European Community (CE) standards and of an acceptable quality must be available in all clinical areas.
- 17 Alternatives to natural rubber latex (NRL) gloves must be available for use by practitioners and patients with NRL sensitivity.
- 18 Powdered and polythene gloves should not be used in health care activities.
- 19 Disposable plastic aprons should be worn when there is a risk that clothing or uniform may become exposed to blood, body fluids, secretions and excretions, with the exception of sweat.
- 20 Full body, fluid repellent gowns should be worn where there is a risk of extensive splashing of blood, body fluids, secretions and excretions, with the exception of sweat, onto the skin of health care practitioners.
- 21 Plastic aprons should be worn as single use items for one procedure or episode of patient care and then discarded and disposed of as clinical waste.
- 22 Face masks and eye protection should be worn where there is a risk of blood, body fluids, secretions and excretions splashing into the face and eyes.
- 23 Respiratory protective equipment should be used when clinically indicated.

Intervention 4: The safe use and disposal of sharps

- 24 Sharps must not be passed directly from hand to hand and handling should be kept to a minimum.
- 25 Needles must not be bent or broken prior to use or disposal.
- 26 Needles and syringes must not be disassembled by hand prior to disposal.
- 27 Needles should not be recapped.
- 28 Used sharps must be discarded into a sharps container (conforming to UN3291 and BS 7320 standards) at the point of use. These must not be filled above the mark indicating that they are full. Containers in public areas must not be placed on the floor and should be located in a safe position.
- 29 Consider the use of needlestick-prevention devices where there are clear indications that they will provide safe systems of working for healthcare practitioners.
- 30 Conduct a rigorous evaluation of needlestick-prevention devices to determine their effectiveness, acceptability to practitioners, impact on patient care and cost benefit prior to widespread introduction.

Guidelines for preventing infections associated with the use of short-term indwelling urethral catheters in acute care

Intervention 1: Assessing the need for catheterisation

- 1 Only use indwelling urethral catheters after considering alternative methods of management.
- 2 Review regularly the patient's clinical need for continuing urinary catheterisation and remove the catheter as soon as possible.
- 3 Document catheter insertion and care.

Intervention 2: Selection of catheter type

- 4 Choice of catheter material will depend on clinical experience, patient assessment and anticipated duration of catheterisation.
- 5 Select the smallest gauge catheter that will allow free urinary outflow. A catheter with a 10 ml balloon should be used. Urological patients may require larger gauge sizes and balloons.

Intervention 3: Aseptic catheter insertion

- 6 Catheterisation is an aseptic procedure. Ensure that health care personnel are trained and competent to carry out urethral catheterisation.

- 7 Clean the urethral meatus prior to the insertion of the catheter.
- 8 Use an appropriate lubricant from a single use container to minimise urethral trauma and infection.

Intervention 4: Catheter maintenance

- 9 Connect indwelling urethral catheters to a sterile closed urinary drainage system.
- 10 Ensure that the connection between the catheter and the urinary drainage system is not broken except for good clinical reasons, e.g., changing the bag in line with the manufacturer's recommendations.
- 11 Decontaminate hands and wear a new pair of clean, non-sterile gloves before manipulating a patient's catheter and decontaminate hands after removing gloves.
- 12 Obtain urine samples from a sampling port using an aseptic technique.
- 13 Position urinary drainage bags below the level of the bladder on a stand that prevents contact with the floor. Where such drainage cannot be maintained, e.g., during moving and handling, clamp the urinary drainage bag tube and remove the clamp as soon as dependent drainage can be resumed.
- 14 Empty the urinary drainage bag frequently enough to maintain urine flow and prevent reflux. Use a separate and clean container for each patient and avoid contact between the urinary drainage tap and container.
- 15 Do not add antiseptic or antimicrobial solutions into urinary drainage bags.
- 16 Do not change catheters unnecessarily or as part of routine practice.
- 17 Routine personal hygiene is all that is needed to maintain meatal hygiene.
- 18 Bladder irrigation, instillation and washout do not prevent catheter-associated infection.

Guidelines for preventing infections associated with the insertion and maintenance of central venous catheters**Intervention 1: Selection of catheter type**

- 1 Use a single-lumen catheter unless multiple ports are essential for the management of the patient.
- 2 If total parenteral nutrition is being administered, use one central venous catheter or lumen exclusively for that purpose.
- 3 Use a tunnelled catheter or an implantable vascular access device for patients in whom long-term (>30 days) vascular access is anticipated.
- 4 Consider the use of an antimicrobial impregnated central venous catheter for adult patients who require short-term (<10 days) central venous catheterisation and who are at high risk for CR-BSI.

Intervention 2: Selection of catheter insertion site

- 5 In selecting an appropriate insertion site, assess the risks for infection against the risks of mechanical complications.
- 6 Unless medically contraindicated, use the subclavian site in preference to the jugular or femoral sites for nontunnelled catheter placement.
- 7 Consider the use of peripherally inserted catheters as an alternative to subclavian or jugular vein catheterisation.

Intervention 3: Optimum aseptic technique during catheter insertion

- 8 Use optimum aseptic technique, including a sterile gown, gloves, and a large sterile drape, for the insertion of central venous catheters.

Intervention 4: Cutaneous antisepsis

- 9 Clean the skin site with an alcoholic chlorhexidine gluconate solution prior to CVC insertion. Use an alcoholic povidone-iodine solution for patients with a history of chlorhexidine sensitivity. Allow the antiseptic to dry before inserting the catheter.

- 10 Do not apply organic solvents, e.g., acetone, ether, to the skin before catheter insertion.
- 11 Do not routinely apply antimicrobial ointment to the catheter placement site prior to insertion.

Intervention 5: Catheter and catheter site care

- 12 Before accessing the system, disinfect the external surfaces of the catheter hub and connection ports with an aqueous solution of chlorhexidine gluconate or povidone-iodine, unless contraindicated by the manufacturer's recommendations.
- 13 Use either a sterile gauze or transparent dressing to cover the catheter site.
- 14 If a gauze and tape catheter site dressing is used, it must be replaced when the dressing becomes damp, loosened, or soiled, or when inspection of the insertion site is necessary.
- 15 Do not apply antimicrobial ointment to CVC insertion sites as part of routine catheter site care.
- 16 Routinely flush indwelling central venous catheters with an anticoagulant unless advised otherwise by the manufacturer.

Intervention 6: Replacement strategies

- 17 Do not routinely replace non-tunnelled CVC as a method to prevent catheter-related infections.
- 18 Use guide wire assisted catheter exchange to replace a malfunctioning catheter, or to exchange an existing catheter if there is no evidence of infection at the catheter site or proven CR-BSI.
- 19 If CR-infection is suspected, but there is no evidence of infection at the catheter site, remove the existing catheter and insert a new catheter over a guide wire; if tests reveal CR-infection, the newly inserted catheter should be removed and, if still required, a new catheter inserted at a different site.
- 20 Do not use guide wire assisted catheter exchange for patients with CR-infection. If continued vascular access is required, remove the implicated catheter, and replace it with another catheter at a different insertion site.
- 21 Replace all tubing when the vascular device is replaced.
- 22 Replace intravenous tubing and stopcocks no more frequently than at 72-hour intervals, unless clinically indicated.
- 23 Replace intravenous tubing used to administer blood, blood products, or lipid emulsions at the end of the infusion or within 24 hours of initiating the infusion.

Intervention 7: Antibiotic prophylaxis

- 24 Do not administer systemic antimicrobials *routinely* before insertion or during use of a central venous catheter to prevent catheter colonisation or bloodstream infection.