Summary of new evidence from surveillance

Standard principles

General advice

139 – 01 Education of patients, carers and their healthcare workers

Recommendations derived from this question

1.1.1.1 Everyone involved in providing care should be:

- educated about the standard principles of infection prevention and control and
- trained in hand decontamination, the use of personal protective equipment, and the safe use and disposal of sharps. [2012]

1.1.1.2 Wherever care is delivered, healthcare workers must*have available appropriate supplies of:

- materials for hand decontamination
- sharps containers
- personal protective equipment. [new 2012]

*In accordance with current health and safety legislation (at the time of publication of the guideline [March 2012]): Health and Safety at Work Act 1974, Management of Health and Safety at Work Regulations 1999, Health and Safety Regulations 2002, Control of Substances Hazardous to Health Regulations 2002, Personal Protective Equipment Regulations 2002 and Health and Social Care Act 2008.

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines (National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England)[1]. These guidelines focus on preventing healthcare-associated infections in hospitals. The recommendations about education in hand hygiene and availability of appropriate supplies are consistent with NICE guideline CG139 recommendations and NICE quality standard QS61.

Impact statement
New evidence identified is consistent with NICE guideline CG139.

New evidence is unlikely to change guideline recommendations.

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139 – 02 What information do healthcare professionals, patients and carers require to prevent healthcare associated infections in primary and community care settings?

Recommendations derived from this question

1.1.1.3 Educate patients and carers about:

- the benefits of effective hand decontamination
- the correct techniques and timing of hand decontamination
- when it is appropriate to use liquid soap and water or hand rub
- the availability of hand decontamination facilities
- their role in maintaining standards of healthcare workers' hand decontamination. [new 2012]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
One randomised controlled trial (RCT) compared two different hand hygiene techniques in patients with peritoneal dialysis (PD). The aim of the interventions was to prevent infections related to this treatment (n=22) [2]. One technique consisted in hand washing with water and glycerine soap (one minute) and then hand rubbing with 70% ethyl alcohol gel until fully dry. The second technique consisted in hand rubbing with 70% ethyl alcohol gel until fully dry. The number colony-forming units (CFUs) in both hands were significantly lower in the group that used only gel. Similar results were found in the number of coagulase-negative Staphylococcus colonies that was significantly lower in the group that applied only gel than in the group that used glycerine soap plus gel.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about patient and carers' education and involvement in hand hygiene are consisted with NICE guideline CG139 recommendations.

Impact statement
NICE guideline CG139 recommends that patients and carers need to be educated about the benefits of hand decontamination, the correct techniques of hand decontamination, when it is appropriate to use liquid soap and water or hand rub, the availability of hand decontamination facilities, and their role in maintaining the standards of healthcare workers' hand decontamination. NICE guideline CG139 makes recommendations for primary and community settings. It is considered that the evidence identified is in line with current recommendations. Topic expert feedback highlighted a new version of Epic guidelines. Epic 3 recommendations in this area are consistent with NICE guideline CG139.

New evidence is unlikely to change guideline recommendations.

Hand decontamination

In the full text of NICE guideline CG139, the Guideline committee were made aware about existing guidance of the Department of Health on hand decontamination for the dental profession included in the Health Technical Memorandum 01-05 published in 2009. An update version of this guidance was published in 2013 is available here.

The amendments made to the 2009 edition were related to patient safety in the area of storage of dental instruments. The changes are considered not to have an impact on current NICE guideline CG139, therefore are not discussed further.

> **139 – 03 What is the clinical and cost effectiveness of when to decontaminate hands, including after the removal of gloves, on hand decontamination compliance, MRSA and *C diff.* reduction or cross infection, colony forming units and removal of physical contamination?**

Recommendations derived from this question

1.1.2.1 Hands must be decontaminated in all of the following circumstances:

- immediately before every episode of direct patient contact or care, including aseptic procedures
- immediately after every episode of direct patient contact or care
- immediately after any exposure to body fluids
- immediately after any other activity or contact with a patient's surroundings that could potentially result in hands becoming contaminated
- immediately after removal of gloves. [new 2012]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A systematic review (SR) with meta-analysis and network meta-analysis assessed the efficacy of the World Health Organisation (WHO) campaign (WHO-5) and other initiatives to support hand hygiene in hospital settings. It also described the resources used in these interventions [3]. A total of 41 studies were included (RCTs and observational studies). A meta-analysis of two RCTs showed that the addition of goal setting to WHO-5 improved significantly the hand hygiene compliance. The network meta-analysis showed that WHO-5 is an effective intervention and the addition of other strategies (for example goal setting, reward incentives, and accountability) could lead in an additional improvement of the hand hygiene compliance. However there is considerable uncertainty around the estimates of the effect. Authors stated that some of the included studies reported a rate reduction of certain infectious diseases due to an increase of hand hygiene. The cost of the interventions ranged from $225 to $4669 per 1000 bed days.

A RCT evaluated the efficacy of hand hygiene before donning nonsterile gloves prior to patient contact compared with directly don nonsterile gloves (sample size not described) [4]. The main outcome was the reduction of the number CFU of bacteria in the hands. No differences were identified in the number of CFUs of bacteria between the groups compared. Authors concluded that it would be not necessary to do hand hygiene before donning nonsterile gloves.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals.

Epic 3 recommendations about hand decontamination care are consisted with NICE guideline CG139 recommendations.

Impact statement
New evidence was identified related to the implementation of hand decontamination guidance including the WHO-5 moments of hand hygiene and when hands should be decontaminated. A SR found that WHO-5 campaign and other initiatives were effective in the improvement of hand hygiene compliance and some studies reported a reduction of infectious diseases rates. A RCT reported that hand hygiene before donning nonsterile gloves prior to patient contact could not be necessary. However this study has major limitations. The study did not report the sample size and the impact of the intervention on other important outcomes were not assessed (for example methicillin-resistant Staphylococcus aureus [MRSA] reduction, MRSA cross-infection, etc.). Therefore this study is considered unlikely to have an impact on current recommendations. Topic experts highlighted a new version of Epic guidelines. Epic 3 recommendations in this area are considered consistent with NICE guideline CG139.

New evidence is unlikely to change guideline recommendations.

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139 – 04 What is the clinical and cost effectiveness of cleaning preparations (soap and water, alcohol based rubs, non-alcohol products and wipes) for healthcare worker hand decontamination, on hand decontamination compliance, MRSA and C. diff reduction or cross infection, colony forming units and removal of physical contamination?

Recommendations derived from this question

1.1.2.2 Decontaminate hands preferably with a handrub (conforming to current British standards*), except in the following circumstances, when liquid soap and water must be used:

- when hands are visibly soiled or potentially contaminated with body fluids or
- in clinical situations where there is potential for the spread of alcohol-resistant organisms (such as Clostridium difficile or other organisms that cause diarrhoeal illness). [new 2012]

* At the time of publication of the guideline (March 2012): BS EN 1500:1997.

Surveillance decision

This review question should not be updated.

An amendment is proposed to recommendation 1.1.2.2:

- The footnote needs to be amended to include the recent version of the BS EN 1500:1997. The following text is proposed: *At the time of publication of the surveillance report ([Month] 2016): BS EN 1500:2013.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A randomised cross-over controlled study assessed the efficacy of three different products for hand hygiene in nurses that worked in a neonatal intensive care unit (n=35) [5]. The interventions assessed were plain soap, alcohol hand rub, and povidone-iodine hand scrub. The interventions were followed by 14 days of washout. Alcohol rub, povidone-iodine and have a high pre hygiene CFU count were independently associated with lower CFU counts.

We identified a new version of the BS EN1500:1997 document.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals.

Epic 3 recommendations about cleaning preparations for healthcare worker decontamination care are consisted with NICE guideline CG139 recommendations.

Impact statement
New evidence of a single randomised cross-over controlled trial was identified. This study found that alcohol rub and povidone-iodine solutions could be associated with a lower CFU counts. However, this study has major limitations including a small sample size. It was unclear what they considered a low CFU count and the impact of the interventions on other important outcomes (for example MRSA reduction, MRSA cross infection, etc.). Therefore this study is considered unlikely to have an impact on current recommendations.

Topic expert feedback highlighted a new version of Epic guidelines. Epic 3 recommendations in this area are considered consistent with NICE guideline CG139.

An update of the footnote linked to recommendation 1.1.2.2 is proposed to include the recent version of the BS EN1500:1997 document.

New evidence is unlikely to change guideline recommendations.

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139 – 05 What is the clinical and cost effectiveness of healthcare workers decontaminating wrists vs. not decontaminating wrists or usual practice on MRSA and C. diff reduction or cross infection, colony forming units and removal of physical contamination and transient organisms?

139 – 06 What is the clinical and cost effectiveness of healthcare workers following bare below the elbow policy (short sleeves or rolled up sleeves) vs. no bare below the elbow policy (long sleeves, not rolled up or no specific restrictions) on MRSA and C. diff reduction or cross infection, colony forming units and removal of physical contamination and transient organisms?

Recommendations derived from these questions

1.1.2.3 Healthcare workers should ensure that their hands can be decontaminated throughout the duration of clinical work by:

- being bare below the elbow* when delivering direct patient care
- removing wrist and hand jewellery

- making sure that fingernails are short, clean and free of nail polish
- covering cuts and abrasions with waterproof dressings. [new 2012]

* For the purposes of this guideline, the GDG considered bare below the elbow to mean: not wearing false nails or nail polish; not wearing a wrist-watch or stoned rings; wearing short-sleeved garments or being able to roll or push up sleeves.

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about wrist decontamination and health worker following bare below the elbow policy are consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

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139 – 07 Is hand decontamination technique important?

Recommendations derived from this question

1.1.2.4 An 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 of 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 before drying with good quality paper towels. [2003]

1.1.2.5 When decontaminating hands using an alcohol handrub, hands should be free from 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, until the solution has evaporated and the hands are dry. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary

No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals.

Epic 3 recommendations about hand decontamination technique are consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

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139 – 08 Does hand decontamination damage skin?

Recommendations derived from this question

1.1.2.6 An emollient hand cream should be applied regularly to protect skin from the drying effects of regular hand decontamination. If a particular soap, antimicrobial hand wash or alcohol product causes skin irritation an occupational health team should be consulted. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals.

Epic 3 recommendations about hand skin care are consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

Use of personal protective equipment

139 – 09 Infection control dress code

Recommendations derived from this question

1.1.3.1 Selection of protective equipment must* be based on an assessment of the risk of transmission of microorganisms to the patient, and the risk of contamination of the healthcare worker's clothing and skin by patients' blood, body fluids, secretions or excretions. [2003]

*In accordance with current health and safety legislation (at the time of publication of the guideline [March 2012]): Health and Safety at Work Act 1974, Management of Health and Safety at Work Regulations 1999, Health and Safety Regulations 2002, Control of Substances Hazardous to Health Regulations 2002, Personal Protective Equipment Regulations 2002 and Health and Social Care Act 2008.

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about infection control code dress are consistent with NICE guideline CG139 recommendations. Epic 3 also recommends that health care workers should receive education in this field and supplies of protective equipment should be available when required. This is consistent with the standard principles of NICE guideline CG139.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

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139 – 10 Gloves: their uses and abuses - Do gloves leak?

Recommendations derived from this question

1.1.3.2 Gloves used for direct patient care:

- Must* conform to current EU legislation (CE marked as medical gloves for single use)**and
- Should be appropriate for the task. [new 2012]

1.1.3.3 Gloves must* be worn for invasive procedures, contact with sterile sites and non-intact skin or mucous membranes, and all activities that have been assessed as carrying a risk of exposure to blood, body fluids, secretions or excretions, or to sharp or contaminated instruments. [2003]

1.1.3.4 Gloves must* be worn as single-use items. They must be put on immediately before an episode of patient contact or treatment and removed as soon as the activity is completed. Gloves must be changed between caring for different patients, and between different care or treatment activities for the same patient. [2003]

1.1.3.5 Ensure that gloves used for direct patient care that have been exposed to body fluids are disposed of correctly, in accordance with current national legislation† or local policies (see section 1.1.5). [new 2012]

*In accordance with current health and safety legislation (at the time of publication of the guideline [March 2012]): Health and Safety at Work Act 1974, Management of Health and Safety at Work Regulations 1999, Health and Safety Regulations 2002, Control of Substances Hazardous to Health Regulations 2002, Personal Protective Equipment Regulations 2002 and Health and Social Care Act 2008.

** At the time of publication of the guideline (March 2012): BS EN 455 Parts 1–4 Medical gloves for single use.

† For guidance see (at the time of publication of the guideline [March 2012]): Safe management of healthcare waste (2011).

Surveillance decision

This review question should not be updated.

An amendment is proposed to recommendation 1.1.3.5:

- The footnote needs to be amended to include the recent version of the safe management of healthcare waste document (2011).

  The following text is proposed: † For guidance see (at the time of publication of the surveillance report [Month] 2016): Health Technical Memorandum 07-01.

Evidence update and 2-year surveillance summary (2014)

A cross-sectional study by Guerrero et al. (2012) compared the transfer of Clostridium difficile spores to gloved hands after contact with the skin of infected patients and the environmental surfaces in their rooms (n=30) [6]. Within 3 days of diagnosis, a gloved hand with moistened fingertips (to more closely mimic bare hands) was applied to each patient's groin, abdomen, chest, arm and hand. A fresh pair of gloves was used each time. Imprint cultures of the gloved hands were then obtained on agar plates to recover any C difficile spores transferred from each skin site to the gloves. The same process was used to take environmental cultures from the bed rail, bedside table, telephone and call button in the rooms of the infected patients. Culture plates were incubated for 48 hours and the number of C difficile colonies on each plate was counted.

Half (50%) of all handprint cultures from skin sites were positive for any contamination with C difficile (for the purposes of analysis, the groin was excluded), as were half (50%) of all environment handprint cultures (p=0.99). Likewise, the number of bacterial colonies in the cultures was similar for skin surfaces and environmental surfaces. Of the 5 skin sites assessed, the groin produced the highest number of colonies, followed by the abdomen. The bed rail was the environmental site that produced the highest number of C difficile colonies.

Limitations of this study include the small sample size; all participants were male hospital inpatients, most of whom were elderly, which may limit transferability of results to other settings and populations. The colonies cultured were not molecularly typed to link them to the infected patients. Finally, the handprint cultures were taken from simulations of physical examination and contact with environmental surfaces, rather than from episodes of routine care.

This new evidence was considered consistent with recommendations in NICE guideline CG139.

4-year surveillance summary

We identified two SRs relevant to this question [7,8] and one RCT[9].

The first SR was a Cochrane review that evaluated the effectiveness of personal protective equipment (gloves, gown or mask) in the control of MRSA in hospital settings [7]. The authors did not identify studies meeting the inclusion criteria.

The second SR assessed the effectiveness of the use of gloves in the prevention of healthcare associated infections [8]. They included a total of 23 observational studies. A narrative summary of the results was presented due to the methodological heterogeneity of the included studies. The studies identified highlighted that there is a suboptimal use of gloves among health care workers (overuse or misuse). This suboptimal use could lead to an increase of cross transmission of infectious diseases. The gloves confer a protection against bacterial contamination but this protection could be incomplete. The impact of changes in glove use on hand hygiene compliance is unknown.

A RCT investigated whether received care with nonsterile gloves after hand hygiene or care after hand hygiene alone increased the episodes of late-onset (>72 hours of age) infections in infants admitted in intensive care (n=120) [9]. The infections assessed were bloodstream infectious, urinary tract infections, cerebrospinal fluid infectious or necrotising enterocolitis. No differences were identified in the proportion of late-onset invasive infections or necrotising enterocolitis between the groups. The use of gloves was associated with fewer bloodstream infections and fewer central line-associated bloodstream infections.

We identified an update of the guidance on safe management of health care waste. The new document is available here.

Topic expert feedback

Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about gloves usage are consistent with NICE guideline CG139 recommendations.

Impact statement

New evidence identified is considered consistent with NICE guideline CG139.

An updated version of the safe management of health care waste document was identified. An update of the footnote is proposed to include the last version of the document available.

New evidence is unlikely to change guideline recommendations.

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139 – 11 What is the clinical and cost effectiveness of healthcare workers wearing vinyl, latex or nitrile gloves on user preference and reduction of hypersensitivity, blood borne infections, glove porosity and tears?

Recommendations derived from this question

1.1.3.6 Alternatives to natural rubber latex gloves must be available for patients, carers and healthcare workers who have a documented sensitivity to natural rubber latex. [2012]

1.1.3.7 Do not use polythene gloves for clinical interventions. [new 2012]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014) — No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommends that a range of gloves (medical and protective gloves) that conform to European standards, acceptable to healthcare personnel and suitable for healthcare activities must be available. This is considered consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

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139 – 12 What is the clinical and cost effectiveness of healthcare workers wearing plastic aprons or fluid repellent gowns vs. no aprons or gowns, gloves only or standard uniform on the reduction of blood, bodily fluid and pathogenic microorganism contamination?

Recommendations derived from this question

1.1.3.8 When delivering direct patient care:

- wear a disposable plastic apron if there is a risk that clothing may be exposed to blood, body fluids, secretions or excretions or
- wear a long-sleeved fluid-repellent gown if there is a risk of extensive splashing of blood, body fluids, secretions or excretions onto skin or clothing. [2012]

1.1.3.9 When using disposable plastic aprons or gowns:

- use them as single-use items, for one procedure or one episode of direct patient care and
- ensure they are disposed of correctly (see section 1.1.5). [2012]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A Cochrane review assessed the effectiveness of personal protective equipment (gloves, gown or mask) in the control of MRSA in hospital settings [7]. The authors did not identify studies meeting the inclusion criteria.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about plastic aprons or fluid repellent gowns usage are considered consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified is considered consistent with NICE guideline CG139.

New evidence is unlikely to change guideline recommendations.

139 – 13 When is a facemask, eye protection or other facial protection necessary?

Recommendations derived from this question

1.1.3.10 Face masks and eye protection must* be worn where there is a risk of blood, body fluids, secretions or excretions splashing into the face and eyes. [2003]

1.1.3.11 Respiratory protective equipment, for example a particulate filter mask, must* be used when clinically indicated. [2003]

*In accordance with current health and safety legislation (at the time of publication of the guideline [March 2012]): Health and Safety at Work Act 1974, Management of Health and Safety at Work Regulations 1999, Health and Safety Regulations 2002, Control of Substances Hazardous to Health Regulations 2002, Personal Protective Equipment Regulations 2002 and Health and Social Care Act 2008.

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A Cochrane review assessed the effectiveness of personal protective equipment (gloves, gown or mask) in the control of MRSA in hospital settings [7]. The authors did not identified studies meeting the inclusion criteria.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about eye protection and respiratory protective equipment are consistent with NICE guideline CG139 recommendations. It also provides details about how to use in protective equipment. This is consistent with the standard principles of NICE guideline CG139 that say that everyone involved in providing care should be trained in the use of protective equipment.

Impact statement
New evidence identified is considered consistent with NICE guideline CG139.

New evidence is unlikely to change guideline recommendations.

Safe use and disposal of sharps

139 – 14 Sharps injuries – what's the problem?

Recommendations derived from this question

1.1.4.1 Sharps should* not be passed directly from hand to hand, and handling should be kept to a minimum. [2003, amended 2012]

1.1.4.2 Used standard needles:

- must not be bent** or broken before disposal
- must not be recapped.
- In dentistry, if recapping or disassembly is unavoidable, a risk assessment must be undertaken and appropriate safety devices should be used. [new 2012]

1.1.4.3 Used sharps must be discarded immediately by the person generating the sharps waste into a sharps container conforming to current standards†. [new 2012]

1.1.4.4 Sharps containers:

- must†† be located in a safe position that avoids spillage, is at a height that allows the safe disposal of sharps, is away from public access areas and is out of the reach of children
- must not†† be used for any other purpose than the disposal of sharps
- must not†† be filled above the fill line
- must†† be disposed of when the fill line is reached
- should be temporarily closed when not in use
- should be disposed of every 3 months even if not full, by the licensed route in accordance with local policy. [new 2012]

*The updated recommendation contains 'should' rather than 'must' (which is in the 2003 guideline) because the GDG considered that this is not covered by legislation (in accordance with the NICE guidelines manual, 2009).

** It is acceptable to bend needles when they are part of an approved sharps safety device.

† At the time of publication of the guideline (March 2012): UN3291 and BS 7320.

†† For guidance see (at the time of publication of the guideline [March 2012]): Safe management of healthcare waste (2011).

Surveillance decision

This review question should not be updated.

A footnote to recommendation 1.1.4.2 bullet 3 should be added to reference the Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 (the Sharps Regulations).

An amendment is proposed to recommendations 1.1.4.3 and 1.1.4.4:

- The footnotes linked to these recommendations need to be amended to include the last version of the documents referenced therein. The following text is proposed:

  † For guidance see (at the time of publication of the surveillance report [Month] 2016): Health Technical Memorandum 07-01.

  †† At the time of publication of the surveillance report ([Month] 2016): UN3291 and BS EN OSI 23907:2012.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
We identified an update of the guidance on safe management of health care waste. The updated document is available here.

The BS 7320 document containing the specifications about sharp containers was withdrawn. It was superseded by BS EN ISO 23907:2012.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in

hospitals. Epic 3 recommendations about sharp safe use and disposal are consistent with NICE guideline CG139 recommendations. Epic 3 also recommends that education in sharps safe use and disposal must be provided to all clinical and no-clinical staff as well as how to proceed in case of an accidental exposure.

Impact statement
New versions of some of the documents included in the footnotes linked to recommendations 1.1.4.3 and 1.1.4.4 have been identified. An amendment of the footnotes is proposed to include the last version of these documents. A footnote to recommendation 1.1.4.2 bullet 3 should be added to reference the Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 (the Sharps Regulations).

New evidence is unlikely to change guideline recommendations.

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139 – 15 What is the clinical and cost effectiveness of healthcare workers using safety needle cannulae vs. standard cannulae on compliance and user preference, infection related mortality and morbidity and sharps injuries?

Recommendations derived from this question

The evidence for this review question was considered alongside the evidence for the following question and recommendations were made considering all the evidence. See recommendations at question 139 – 16.

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
See summary of the evidence question 139 – 16.

Topic expert feedback
See topic expert feedback question 139 – 16.

Impact statement
See impact statement question 139 – 16.

New evidence is unlikely to change guideline recommendations.

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139 – 16 What is the clinical and cost effectiveness of healthcare workers using safety needle devices (needlefree, retractable needles, safety re-sheathing devices) vs. standard needles on compliance and user preference, infection related mortality and morbidity and sharps injuries?

Recommendations derived from this question

1.1.4.5 Use sharps safety devices if a risk assessment has indicated that they will provide safer systems of working for healthcare workers, carers and patients. [new 2012]

1.1.4.6 Train and assess all users in the correct use and disposal of sharps and sharps safety devices. [new 2012]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A Cochrane review assessed the effectiveness of safety medical devices on sharps injuries in healthcare staff. A total of 10 studies (observational studies and RCTs) were included (n=23,931) [10]. The interventions evaluated were: 1) safe modifications of blood collections systems, 2) intravenous and injections systems, and 3) multiple devices and sharps containers.

Safe blood collections systems were associated with a reduction of the number of reported sharp injuries compared with regular systems. One of these studies evaluated an outdated recapping shield. Safe intravenous systems were associated with a reduction of the needle stick injuries compared with regular systems in two studies (very low quality). Another two studies did not show a clear reduction of needle stick injuries with safe intravenous systems. More blood splashes were identified with actively engage safety systems (moderate quality). There was not a clear benefit in terms of needle stick injury reductions associated with the introduction of multiple safety devices and safety containers. Authors highlighted that most of the studies included had a high risk of bias.

One RCT evaluated effectiveness and safety of needle-free technology (jet injector) used for the administration of influenza vaccine [11]. They compared a needle free jet injector with needle and syringe in healthy adults (n=1250). Needle free jet injector was no inferior to needle and syringe administration in terms of immune response to influenza vaccine. It was also associated with more local injection reactions. Results related to user preference, sharps injuries or other important outcomes where not assessed (or described) in the abstract.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about sharp safety devices are considered consistent with NICE guideline CG139 recommendations. Epic 3 also recommends that previous to introduction of safer sharp devices, organisation must evaluate the effectiveness, acceptability and costs and involve end-users in this assessment.

Impact statement
New evidence from a Cochrane review and RCT was identified. The Cochrane review assessed different safety medical devices including safety needle devices. Safe blood collection systems and intravenous systems were associated with a reduction of needle stick injuries but the quality of the evidence was

very low. Safe intravenous systems were also associated with an increase of the blood splashes when actively engaged systems were used. However this Cochrane review did not evaluate which type of device is better than other (for example shielding or retraction of the needle) because there was no evidence available. Another RCT evaluated needle-free technology (jet injector) but results related to sharp injuries, user preference or other important outcomes were not evaluated (or reported) in the abstract.

Epic 3 recommendations are considered consistent with NICE guideline CG139 recommendations.

NICE guideline CG139 recommends that sharps safety devices can be used if they provide safer systems of working for healthcare workers, carers and patients, and users should be trained in their use. It is considered that the new evidence identified does not have an impact on current recommendations.

New evidence is unlikely to change guideline recommendations.

Waste disposal

139 – 17 Are there any changes in the legislations which affect the disposal of personal protective equipments in relation to patient care in the primary and community care settings?

139 – 18 Are there any changes in the legislations which affect the disposal of sharp instruments and needles in relation to patient care in the primary and community care settings?

Recommendations derived from this question

1.1.5.1 Healthcare waste must be segregated immediately by the person generating the waste into appropriate colour-coded storage or waste disposal bags or containers defined as being compliant with current national legislation* and local policies. [new 2012]

1.1.5.2 Healthcare waste must be labelled, stored, transported and disposed of in accordance with current national legislation* and local policies. [new 2012]

1.1.5.3 Educate patients and carers about the correct handling, storage and disposal of healthcare waste. [new 2012]

* For guidance see (at the time of publication of the guideline [March 2012]): Safe management of healthcare waste (2011).

Surveillance decision

This review question should not be updated.

An amendment is proposed to recommendations 1.1.5.1 and 1.1.5.2:

- The footnote needs to be amended to include the recent version of the safe management of healthcare waste document (2011).

  The following text is proposed: *For guidance see (at the time of publication of the surveillance report [Month] 2016): Health Technical Memorandum 07-01.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
We identified an update of the guidance on safe management of health care waste. The updated document is available here.

Topic expert feedback
No topic expert feedback was relevant to this evidence.

Impact statement
A new version of the guidance on safe management of health care waste has been identified. An amendment of the footnotes linked to recommendations 1.1.5.1 and 1.1.5.2 is proposed to include the last version of this document.

New evidence is unlikely to change guideline recommendations.

Long-term urinary catheters

139 – 19 Education of patients, carers and healthcare workers

Recommendations derived from this question

1.2.1.1 Patients and carers should be educated about and trained in techniques of hand decontamination, insertion of intermittent catheters where applicable, and catheter management before discharge from hospital. [2003]

1.2.1.2 Community and primary healthcare workers must be trained in catheter insertion, including suprapubic catheter replacement and catheter maintenance. [2003]

1.2.1.3 Follow-up training and ongoing support of patients and carers should be available for the duration of long-term catheterisation. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 includes a section called preventing infections associated with the use of short-term indwelling urethral catheters. The recommendations included in this section are intended for people (adults and children with one year of age or more) who required short-term indwelling urethral catheters (28 days or less). NICE guideline CG139 makes recommendations for long-term urinary catheters (28 days and more). So, the type of interventions assessed in these two guidelines is different. However, Epic 3 recommendations about education of patients, carers and healthcare workers in this field are considered consistent with NICE guideline CG139 recommendations.

Impact statement

New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

139 – 20 Assessing the need for catheterisation

Recommendations derived from this question

1.2.2.1 Indwelling urinary catheters should be used only after alternative methods of management have been considered. [2003]

1.2.2.2 The patient's clinical need for catheterisation should be reviewed regularly and the urinary catheter removed as soon as possible. [2003]

1.2.2.3 Catheter insertion, changes and care should be documented. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)

Wang et al. (2012) conducted a prospective cohort study to measure infections caused by indwelling urinary catheters, enteral feeding devices, or both in nursing home residents [12]. A group of people with indwelling devices (n=90, 48 had a urinary catheter, 30 an enteral feeding device, 12 had both) and a randomly selected comparison cohort of people without devices were recruited from 15 community-based skilled nursing facilities in the USA (n=178). Patients in the indwelling device group were followed up for 263 resident-months and those in the no-device group for 644 resident-months.

The infection rate in the device group was higher than in the non-device group. Patients with indwelling devices also had a higher rate of colonisation with antibiotic-resistant microorganisms than did those without devices. The rate of infection with antibiotic-resistant microorganisms was highest in people with both a urinary catheter and an enteral feeding tube, followed by those with a urinary catheter only and those with a feeding tube only.

Limitations of this study include the possibility of residual confounders affecting the different infection rates in the 2 groups and the variable length of follow up among participants. In addition, no information was available on the infection prevention practices in each of the nursing homes studied.

This evidence indicated that people in community care with urinary catheters, enteral feeding devices or both may have a higher incidence of infection with antibiotic-resistant microorganisms than people without devices, with those who have both feeding devices and urinary catheters most at risk. These data were considered consistent with NICE guideline CG139, which recommends various strategies to prevent infection in people with indwelling devices including removing urinary catheters as soon as possible.

4-year surveillance summary

No relevant evidence was identified.

Topic expert feedback

Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about indications for using indwelling urinary catheters are consistent with NICE guideline CG139 recommendations. Epic 3 also recommends documenting the planned date of removal.

Impact statement

New evidence identified is considered consisted with current NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

139 – 21 Catheter drainage options

Subquestion

How to select the right system?

Recommendations derived from this question

1.2.3.1 Following assessment, the best approach to catheterisation that takes account of clinical need, anticipated duration of catheterisation, patient preference and risk of infection should be selected. [2003]

1.2.3.2 Intermittent catheterisation should be used in preference to an indwelling catheter if it is clinically appropriate and a practical option for the patient. [2003]

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

Subquestion

What is the clinical and cost effectiveness of different types of long-term intermittent urinary catheters (non-coated, hydrophilic or gel reservoir) on symptomatic urinary tract infections, bacteraemia, mortality, and patient preference?

In patients performing intermittent catheterisation, what is the clinical and cost effectiveness of non-coated catheters reused multiple times compared to single-use on urinary tract infections, bacteraemia, mortality, and patient preference?

Recommendations derived from this question

1.2.3.3 Offer a choice of either single-use hydrophilic or gel reservoir catheters for intermittent self-catheterisation. [new 2012]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A Cochrane review [13] and three other references related to this Cochrane review were identified [14-16]. These last three references are not described further.

The Cochrane review assessed different interventions that aimed to reduce urinary tract infections and other complications related to the use of intermittent urinary catheterisation [13]. The interventions assessed were: 1) type of catheter design and type of material, 2) catheterisation techniques (aseptic or clean techniques), 3) single use catheters or multiple-use catheters, and 4) self-catheterisation or catheterisation by others. A total of 31 studies

were included (13 RCT and 18 cross-over trials).

Regarding the type of catheter, type of material, and single or multiple-use catheters no differences were identified in the number of urinary tract infections when comparing single use (sterile) with multiple-use (clean) catheters, hydrophilic compared with non-coated catheters and hydrophilic-coated compared with non-coated catheters. Hydrophilic catheters were associated with higher user acceptability but the studies informing this outcome were considered a high risk of bias given their higher loss of follow-up in the hydrophilic arms. They also had a short duration (8 weeks or less). The other complications reported were bleeding episodes or microscopic haematuria but no other information was described in the abstract.

Most of the studies included in the SR had low sample sizes; the definition of urinary tract infection varied between the studies as was well as the follow-up time.

Authors concluded that there is no convincing evidence to determinate the effect of the interventions assessed in the reduction of urinary tract infections, other complications related to the use of intermittent urinary catheterisation or user satisfaction. The cost-effectiveness of these interventions also needs to be stablished.

A randomised cross-over trial published after the Cochrane review assessed the impact of single use hydrophilic coated catheters compared with multiple use polyvinylchloride catheters for intermittent catheterisation on urinary tract infections in children with neurogenic bladder due to spina bifida (n=66) [17]. The interventions lasted 24 weeks each one. Single use hydrophilic coated catheters were not associated with a reduction of the person-week of urinary tract infections compared with multiple use polyvinylchloride catheters. No differences were identified in the weeks if febrile urinary tract infection or antibiotic use between the interventions compared. The results reported in the abstract included only 45 patients out of 66 patients randomised.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

A Cochrane review found 31 relevant studies in this area. However, authors concluded that there is not convincing evidence to determine the impact of different type of intermittent catheters on urinary tract infections, other complications related to the use of intermittent urinary or user acceptability.

The uncertainty around the benefit of the different type of intermittent catheters was also highlighted in NICE guideline CG139. The types of intermittent catheters assessed were associated with slightly different reductions of symptomatic urinary tract infections. Although some of those differences were statistically significant, the confidence intervals around the estimates were wide and overlapped. For this question, a probabilistic model that took into account all these uncertainties around the relative efficacy of the interventions was constructed in NICE guideline CG139. The model also included the cost of the catheter regime, the cost of the catheter-associated infections, and the quality of life associated with the catheter-associated urinary tract infection. The results were based on low- very low quality of evidence and showed that clean multiple-use non-coated catheters were the most cost-effective type of intermittent catheters. In situations where multiple-use non coated catheters were not considered a valid option, gel reservoir catheters were the most cost-effective option.

However, the guideline development group (GDG) considered other relevant aspects when making this recommendation. For example the higher risk of infection in certain settings (residencies and nursing homes) that could increase if reusable catheters were used. Other relevant aspects considered were the risk of serious long-term outcomes in certain populations (children and the risk of serious kidney damage due to a symptomatic urinary tract infection), the variability in patient's preferences, and the fact that intermittent catheters have a single-use logo that could lead to confusion in patients and raise safety issues if they are reused.

No studies in children were identified in the original guideline. We identified a small randomised cross-over trial in children with neurogenic bladder due to spina bifida. The results showed no differences between single use hydrophilic coated catheters and multiple use polyvinylchloride catheters in the reduction of urinary tract infections. However this trial had more than 20% of loss of follow-up that could affect the validity of the results.

It is considered that the new evidence identified is limited and unlikely to have an impact on current recommendations.

New evidence is unlikely to change guideline recommendations.

Subquestion

What is the clinical and cost effectiveness of different types of long-term indwelling urinary catheters (non-coated silicone, hydrophilic coated, or silver or antimicrobial coated/impregnated) on urinary tract infections, bacteraemia, frequency of catheter change, encrustations and blockages, mortality, and patient preference?

Recommendations derived from this question

1.2.3.4 Select the type and gauge of an indwelling urinary catheter based on an assessment of the patient's individual characteristics, including:

- age
- any allergy or sensitivity to catheter materials
- gender
- history of symptomatic urinary tract infection
- patient preference and comfort
- previous catheter history
- reason for catheterisation. [new 2012]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted that a new version of the Epic 3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England was available [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about selection of catheter type are considered consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

Subquestion

Is one catheter better than another?

Recommendations derived from this question

1.2.3.5 In general, the catheter balloon should be inflated with 10 ml of sterile water in adults and 3–5 ml in children. [2003]

1.2.3.6 In patients for whom it is appropriate, a catheter valve may be used as an alternative to a drainage bag. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about selection of catheter type are considered consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

139 – 22 What is the most clinically and cost effective technique (aseptic technique, non-touch, aseptic non-touch technique or a clean technique) when handling long-term urinary catheters to reduce colony forming units, urinary tract infections, compliance, MRSA or C. diff reduction and mortality?

Recommendations derived from this question

The GDG decided not to make any new recommendations or to change any other specific recommendations in this chapter relating to aseptic or clean techniques. Also see recommendations in question 129-23.

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
See summary of the new evidence in the following question 139 – 23.

Topic expert feedback
No topic expert feedback was relevant to this evidence.

Impact statement
In the original guideline no clinical evidence was identified to answer this question. We identified new evidence and no differences were identified between the aseptic or clean techniques in the reduction of urinary tract infections. The GDG decided not to make recommendations for this question. It is considered that this new evidence is unlikely to impact on this decision.

New evidence is unlikely to change guideline recommendations.

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139 – 23 Catheter insertion

Recommendations derived from this question

1.2.4.1 All catheterisations carried out by healthcare workers should be aseptic procedures. After training, healthcare workers should be assessed for their competence to carry out these types of procedures. [2003]

1.2.4.2 Intermittent self-catheterisation is a clean procedure. A lubricant for single-patient use is required for non-lubricated catheters. [2003]

1.2.4.3 For urethral catheterisation, the meatus should be cleaned before insertion of the catheter, in accordance with local guidelines/policy. [2003]

1.2.4.4 An appropriate lubricant from a single-use container should be used during catheter insertion to minimise urethral trauma and infection. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A Cochrane review [13] and three other references related to this Cochrane review were identified [14-16].These last three references are not described further.

The Cochrane review assessed different interventions that aimed to reduce urinary tract infections and other complications related to the use of intermittent urinary catheterisation [13]. The interventions assessed were: 1) type of catheter design and type of material, 2) catheterisation techniques (aseptic or clean techniques), 3) single use catheters or multiple-use catheters, and 4) self-catheterisation or catheterisation by others. A total of 31 studies were included (13 RCT and 18 cross-over trials). When comparing self-catheterisation with catheterisation by others no differences were identified in the number of urinary tract infections. Regarding the catheterisation techniques no differences were identified in the number of urinary tract infections when comparing aseptic catheterisation technique with clean technique. Authors concluded that there is no convincing evidence to determinate the effect of the interventions assessed in the reduction of urinary tract infections, other complications or user satisfaction.

Topic expert feedback

Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about catheter insertion are considered consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence comparing self-catheterisation with catheterisation by others and aseptic techniques with clean techniques did not identify differences in the number of urinary tract infections. However most of the studies included in the SR were considered as high risk of bias.

NICE guidelines CG139 recommends that health workers need to follow an aseptic technique during catheterisation. Self-catheterisations are considered clean procedures. It is considered that the new evidence identified have not impact on current recommendations.

New evidence is unlikely to change guideline recommendations.

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139 – 24 Catheter maintenance

Subquestion

Leave the closed system alone!

Recommendations derived from this question

1.2.5.1 Indwelling catheters should be connected to a sterile closed urinary drainage system or catheter valve. [2003]

1.2.5.2 Healthcare workers should ensure that the connection between the catheter and the urinary drainage system is not broken except for good clinical reasons (for example changing the bag in line with the manufacturer's recommendations). [2003]

1.2.5.3 Healthcare workers must decontaminate their hands and wear a new pair of clean, non-sterile gloves before manipulating a patient's catheter, and must decontaminate their hands after removing gloves. [2003]

1.2.5.4 Patients managing their own catheters, and their carers, must be educated about the need for hand decontamination* before and after manipulation of the catheter, in accordance with the recommendations in the standard principles section (section 1.1). [2003, amended 2012]

1.2.5.5 Urine samples must be obtained from a sampling port using an aseptic technique. [2003]

1.2.5.6 Urinary drainage bags should be positioned below the level of the bladder, and should not be in contact with the floor. [2003]

1.2.5.7 A link system should be used to facilitate overnight drainage, to keep the original system intact. [2003]

1.2.5.8 The urinary drainage bag should be emptied frequently enough to maintain urine flow and prevent reflux, and should be changed when clinically indicated. [2003]

* The text 'Patients managing their own catheters, and their carers, must be educated about the need for hand decontamination…' has replaced 'Carers and patients managing their own catheters must wash their hands…' in the 2003 guideline.

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about catheter maintenance are consistent with NICE guideline CG139 recommendations. Epic 3 give more details about catheter maintenance techniques. This is consistent with NICE guideline recommendations about education of patients, carers and healthcare workers in catheter maintenance.

Impact statement
New evidence identified is considered unlikely to have an impact on guideline recommendations.

New evidence is unlikely to change guideline recommendations.

Subquestion

Appropriate maintenance minimises infections

Recommendations derived from this question

1.2.5.9 The meatus should be washed daily with soap and water. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals.

Epic 3 recommendations about routine meatal cleansing are considered consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

Subquestion

What is the clinical and cost effectiveness of bladder instillations or washouts on reduction of catheter associated symptomatic urinary tract infections and encrustations and blockages?

Recommendations derived from this question

1.2.5.10 To minimise the risk of blockages, encrustations and catheter-associated infections for patients with a long-term indwelling urinary catheter:

- develop a patient-specific care regimen
- consider approaches such as reviewing the frequency of planned catheter changes and increasing fluid intake

- document catheter blockages. [new 2012]

1.2.5.11 Bladder instillations or washouts must not be used to prevent catheter-associated infections. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about bladder instillations or washouts are consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

Subquestion

Changing catheters

Recommendations derived from this question

1.2.5.12 Catheters should be changed only when clinically necessary or according to the manufacturer's current recommendations. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals.

Epic 3 recommendations about changing catheters are consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

Subquestion

In patients with long-term urinary catheters (more than 28 days), what is the clinical and cost effectiveness of prophylactic antibiotics (single dose or short course) during catheter change on reduction of urinary tract infections?

Recommendations derived from this question

1.2.5.13 When changing catheters in patients with a long-term indwelling urinary catheter:

- do not offer antibiotic prophylaxis routinely
- consider antibiotic prophylaxis* for patients who:
  - have a history of symptomatic urinary tract infection after catheter change or
  - experience trauma** during catheterisation. [new 2012]

* At the time of publication of the guideline (March 2012), no antibiotics have a UK marketing authorisation for this indication. Informed consent should be obtained and documented.

** The GDG defined trauma as frank haematuria after catheterisation or two or more attempts of catheterisation.

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

Enteral feeding

139 – 25 Education of patients, carers and healthcare workers

Recommendations derived from this question

1.3.1.1 Patients and carers should be educated about and trained in the techniques of hand decontamination, enteral feeding and the management of the administration system before being discharged from hospital. [2003]

1.3.1.2 Healthcare workers should be trained in enteral feeding and management of the administration system. [2003]

1.3.1.3 Follow-up training and ongoing support of patients and carers should be available for the duration of home enteral tube feeding. [2003]

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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139 – 26 Preparation and storage of feeds

Recommendations derived from this question

1.3.2.1 Wherever possible pre-packaged, ready-to-use feeds should be used in preference to feeds requiring decanting, reconstitution or dilution. [2003]

1.3.2.2 The system selected should require minimal handling to assemble, and be compatible with the patient's enteral feeding tube. [2003]

1.3.2.3 Effective hand decontamination must be carried out before starting feed preparation. [2003]

1.3.2.4 When decanting, reconstituting or diluting feeds, a clean working area should be prepared and equipment dedicated for enteral feed use only should be used. [2003]

1.3.2.5 Feeds should be mixed using cooled boiled water or freshly opened sterile water and a no-touch technique. [2003]

1.3.2.6 Feeds should be stored according to the manufacturer's instructions and, where applicable, food hygiene legislation. [2003]

1.3.2.7 Where ready-to-use feeds are not available, feeds may be prepared in advance, stored in a refrigerator, and used within 24 hours. [2003]

Surveillance decision

This review question should not be updated.

Store feeds safely

Evidence update and 2-year surveillance summary (2014)

Klek et al. (2011) conducted a before-and-after study in people using home enteral feeding to assess the benefits of a specialised nutrition programme comprising commercial enteral formulas and nutrition support teams (n=203) [18]. People who had been using home enteral tube feeding with homemade diets for at least 12 months were retrospectively identified from an electronic database managed by a home

nutrition company in Poland. These patients were then started on a commercial enteral feeding formula and received regular follow-up support visits every 2–3 months from clinical professionals on nutrition support teams. The rates of hospital admissions and complications were prospectively assessed 12 months after the introduction of this specialised nutrition programme.

Most of the people included were being fed via percutaneous endoscopic gastrostomy tube (61%) or nasogastric tube (21%). The mean number of hospital admissions in this cohort dropped in the 12 months after before the specialised nutrition programme was started. The duration of hospitalisation and the duration of stay in an intensive care unit were also significantly lower after introduction of the programme. Of the types of complication that led to hospitalisation, the specialised nutrition programme was associated with a lower prevalence of pneumonia, anaemia, urinary tract infection and respiratory failure.

Limitations of this study include that it was not clear whether the beneficial effects of the specialised programme were associated with the commercial enteral feeding formula or the supervision by clinical nutrition support teams, or the combination of both. In addition, the observational nature of the study meant that it could not show causality, and the outcomes may have been influenced by confounding factors such as feeding tube type or indication for enteral feeding.

This evidence showed that commercial formulas for home enteral feeding and ongoing clinical support may be associated with fewer hospital admissions and complications than unsupervised feeding with homemade diets. These results were considered consistent with recommendations in NICE guideline CG139.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
No topic expert feedback was relevant to this evidence.

One stakeholder highlighted the benefit of blended diet in children with gastrostomies who became seriously malnourished due to vomiting on formula feeding. This is related to recommendation 1.3.2.1 which advices using wherever possible pre-packaged; ready-to-use feeds in preference to feeds requiring decanting, reconstitution or dilution. However it is important to highlight that NICE guideline CG139 is about infection control and it is not within the remit of the guidance to make recommendations on the most effective diet.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

Administration of feeds

139 – 27 What is the most clinically and cost effective technique (such as aseptic technique, non-touch technique, aseptic non touch technique or a clean technique) when handling PEGs to reduce healthcare-associated infections?

Recommendations derived from this question

1.3.3.1 Use minimal handling and an aseptic technique to connect the administration system to the enteral feeding tube. [new 2012]

1.3.3.2 Ready-to-use feeds may be given for a whole administration session, up to a maximum of 24 hours. Reconstituted feeds should be administered over a maximum 4-hour period. [2003]

1.3.3.3 Administration sets and feed containers are for single use and must be discarded after each feeding session. [2003]

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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139 – 28 Care of insertion site and enteral feeding tube

Subquestion

Care of insertion site and enteral feeding tube

Recommendations derived from this question

1.3.4.1 The stoma should be washed daily with water and dried thoroughly. [2003]

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

Subquestion

What is the clinical and cost effectiveness of single vs. reusable syringes used to flush percutaneous endoscopic gastrostomy tubes on reduction of tube blockages, diarrhoea, fungal colonisation, gastrostomy site infection, peritonitis and vomiting?

Recommendations derived from this question

1.3.4.2 To prevent blockages, flush the enteral feeding tube before and after feeding or administering medications using single-use syringes or single-patient-use (reusable) syringes according to the manufacturer's instructions. Use:

- freshly drawn tap water for patients who are not immunosuppressed
- either cooled freshly boiled water or sterile water from a freshly opened container for patients who are immunosuppressed. [new 2012]

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

Vascular access devices

139 – 29 Education of patients, carers and healthcare professionals

Recommendations derived from this question

1.4.1.1 Before discharge from hospital, patients and their carers should be taught any techniques they may need to use to prevent infection and safely manage a vascular access device*. [2003, amended 2012]

1.4.1.2 Healthcare workers caring for a patient with a vascular access device* should be trained, and assessed as competent, in using and consistently adhering to the infection prevention practices described in this guideline. [2003, amended 2012]

1.4.1.3 Follow-up training and support should be available to patients with a vascular access device* and their carers. [2003, amended 2012]

*The updated recommendation contains 'vascular access device' rather than 'central venous catheter'. This change has been made because peripherally inserted catheters were included in the scope of the guideline update.

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about educations of patients, carers and healthcare workers are consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

139 – 30 What is the most clinically and cost effective technique (such as aseptic technique, non-touch technique, aseptic non-touch technique or a clean technique) when handling vascular access devices to reduce infection related bacteraemia, phlebitis, compliance, MRSA or C. diff reduction and mortality?

Recommendations derived from this question

1.4.2.1 Hands must be decontaminated (see section 1.1.2) before accessing or dressing a vascular access device. [new 2012]

1.4.2.2 An aseptic technique* must be used for vascular access device catheter site care and when accessing the system. [new 2012]

* The GDG considered that Aseptic Non Touch Technique (ANTT™) is an example of an aseptic technique for vascular access device maintenance, which is widely used in acute and community settings and represents a possible framework for establishing standardised guidance on aseptic technique.

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about general asepsis are consistent with NICE guideline CG139 recommendations.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

139 – 31 What is the most clinical and cost effective product or solution for decontamination of the skin prior to insertion of peripherally inserted VADs on catheter tip colonisation, infection related mortality, frequency of line removal, septicaemia, bacteraemia, local or soft tissue infection and phlebitis?

Recommendations derived from this question

1.4.3.1 Decontaminate the skin at the insertion site with chlorhexidine gluconate in 70% alcohol before inserting a peripheral vascular access device or a peripherally inserted central catheter. [new 2012]

Surveillance decision

This review question should not be updated.

One amendment is proposed to recommendation 1.4.3.1:

- A footnote is to be added explaining the MHRA warning related to the use of chlorhexidine and the risk of hypersensitivity reactions (very rare).

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A RCT compared skin preparation with alcohol and 2% nitro-glycerine ointment with 2% chlorhexidine solution for the prevention of catheter-related phlebitis [19]. Patients admitted to a cardiology department and coronary care unit were included (n=100). The abstract does not describe what types of catheters were placed. The follow-up period was 72 hours and sings of phlebitis were assessed every 12 hours. More patients in the chlorhexidine solution group developed sings of phlebitis at 48 hours but no differences were identified at 72 hours of follow-up between the groups compared.

An open-label, randomised controlled trial assessed the effectiveness of skin decontamination with chlorhexidine-alcohol (2% chlorhexidine-70% isopropyl alcohol) prior to insertion of intravascular catheters in the prevention of intravascular catheter related infections [20]. Chlorhexidine –alcohol was compared with povidone iodine-alcohol (5% povidone iodine-69% ethanol), with or without previous scrubbing with detergent of the insertion site. A total of 2546 patients admitted to 11 intensive care units requiring an intravascular catheter (central-venous catheter, haemodialysis or arterial catheters) were included. The findings suggested that chlorhexidine-alcohol reduces the incidence of catheter-related infections but it is also associated with more frequent severe skin reactions (two patients stopped the treatment for this cause). No differences were identified between skin scrubbing and not scrubbing before antiseptic application in the incidence of catheter colonisation.

An RCT compared three different skin antiseptic solutions for the prophylaxis of catheter colonisation in patients admitted in 15 intensive care units requiring central-venous catheters or arterial catheters [21]. The skins preparations compared were 1% alcoholic chlorhexidine gluconate, 5% alcoholic chlorhexidine gluconate and 10% aqueous povidone iodine. A total of 997 were placed and 10% aqueous povidone iodine was associated with a higher number of catheter-tip colonisation compared with the other alcoholic chlorhexidine gluconate solutions.

In January 2012, the Medicines and Healthcare products Regulatory Agency (MHRA) released a drug safety update related to products or devices that contain chlorhexidine. They highlighted hypersensitivity reactions induced by the use of chlorhexidine (including allergic reactions or anaphylactic shock). The prevalence of these hypersensitivity reactions is unknown but likely to be very rare. They stated that chlorhexidine should be avoided in people with history of allergy reaction to this product.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommends the use of 2% chlorhexidine gluconate in 70% alcohol (similar to NICE guideline CG139) and povidone iodine in alcohol in case of patient sensitivity to chlorhexidine.

Impact statement
This section of the guideline is specific to peripheral vascular access devices that are inserted in the community. No new evidence was identified from community settings, only from hospital settings. In summary chlorhexidine gluconate solutions seem to be more effective than povidone iodine solutions in the prevention of catheter-related infections. One study assessed different concentrations of chlorhexidine gluconate (1% and 5%) and

either concentration was superior to povidone iodine solution in the prevention of catheter colonisation.

No differences in the incidence of phlebitis were identified between chlorhexidine solution and alcohol and nitro-glycerine ointment. However this study could have major limitations. Neither the intervention nor the population were well described in the abstract. Nitro-glycerine ointment is a product available in the UK but without license for this indication. It is considered that this evidence does have impact on current recommendations.

One MHRA warning was identified and an amendment in the form of footnotes is proposed to the recommendations on 1.4.3.1 to include this information.

The other evidence identified supports NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

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139 – 32 What is the clinical and cost effectiveness of dressings (transparent semipermeable, impregnated or gauze and tape) covering peripherally or centrally inserted vascular access device insertion sites, including those that are bleeding or oozing, on catheter tip colonisation, frequency of dressing change, infection related mortality, septicaemia, bacteraemia and phlebitis?

Recommendations derived from this question

1.4.3.2 Use a sterile transparent semipermeable membrane dressing to cover the vascular access device insertion site. [new 2012]

1.4.3.3 Consider a sterile gauze dressing covered with a sterile transparent semipermeable membrane dressing only if the patient has profuse perspiration, or if the vascular access device insertion site is bleeding or oozing. If a gauze dressing is used:

- change it every 24 hours, or sooner if it is soiled and
- replace it with a sterile transparent semipermeable membrane dressing as soon as possible. [new 2012]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)

A cohort study by Bashir et al. (2012) tested the antibacterial properties of chlorhexidine gluconate catheter dressings against normal skin flora (n=30) [22]. Two types of chlorhexidine dressing were compared with a control dressing (polyurethane film with no chlorhexidine gluconate): 1) a catheter securement device that continuously released a hydrogel containing 2% chlorhexidine gluconate, and 2) A dry disc containing chlorhexidine gluconate.

At the beginning of the 7-day treatment phase, samples of flora were collected from participants' backs. Antisepsis of the whole back area was then performed with a commercially available skin preparation

containing 2% chlorhexidine gluconate in 70% isopropyl alcohol.

Samples of flora were again collected after this antisepsis. Participants' backs were then split into 4 quadrants: in each quadrant the 2 study treatments and the control film were applied, and an antisepsis only site was designated. At 1, 4, and 7 days after baseline, dressings were removed and samples were taken from all 4 sites in each quadrant (the 2 test sites, the control site and the antisepsis site), which were then cultured for anaerobic bacteria.

After initial antisepsis with the chlorhexidine gluconate commercial skin preparation (before the application of the dressings), a reduction of the mean of the number of skin bacteria cultured was observed. During the treatment phase, the mean level of bacteria growth under the chlorhexidine gluconate gel device was significantly lower than under the control film at day 1 and day 7. Similarly, fewer bacteria were cultured from under the chlorhexidine gluconate disc than from under the control film at day 1 and day 7. When the securement device and disc dressing were compared, significantly fewer bacteria were present under the securement device than the disc dressing at day 7, but not at any other time point.

The authors suggested that patients' own skin flora can colonise central venous catheters and potentially cause bloodstream infections. They hypothesised that the chlorhexidine gluconate dressings they tested could possibly reduce the incidence of catheter-related bloodstream infections from skin flora in people with venous access devices.

Limitations of the evidence include that the participants were healthy and the culture samples were not taken from catheter insertion sites but from unbroken skin. The skin preparation approach meant that no longitudinal data were available from skin sites that had never been exposed to any form of chlorhexidine gluconate. In addition, this study was not able to establish whether growth of normal skin flora was associated with bloodstream infections.

This evidence indicated that chlorhexidine gluconate dressings appear to be more effective than polyurethane films at inhibiting the growth of normal skin bacteria in healthy people after antiseptic preparation. NICE guideline CG139 states that insertion sites should be decontaminated with chlorhexidine gluconate in 70% alcohol before a peripheral vascular access device or a peripherally inserted central catheter is used. It adds that a sterile transparent semipermeable membrane dressing, or a sterile gauze dressing covered with a sterile transparent semipermeable membrane, should be used to cover the vascular access device insertion site.

However, the guideline does not make any recommendations on dressings impregnated with chlorhexidine gluconate. Given the limitations of this study, this evidence was considered unlikely to have an impact on NICE guideline CG139.

4-year surveillance summary

A Cochrane review assessed the impact of antiseptic or antibiotic dressings on the reduction of central venous catheter related infections in infants [23]. Three RCTs that included a total of 855 infants admitted in neonatal intensive care units were identified. Chlorhexidine dressing (previous skin cleaning with alcohol) was associated with a reduction of catheter colonisation and with a higher risk of contact dermatitis compared with polyurethane dressing (previous skin cleaning with povidone-iodine). Regarding the higher risk of contact dermatitis, it was unclear if other factors contributed to this adverse event (for example the cleansing agent used). No differences were identified in other important outcomes assessed (sepsis and catheter-related blood stream infection). The quality of the evidence was considered moderate.

No differences in catheter-related blood stream infection or mortality were identified when silver-alginate patches were compared with control. The quality of the evidence was considered moderate. No adverse events were registered.

Authors concluded that chlorhexidine dressing might have an impact on the reduction of catheter colonisations but no effects were identified in other important outcomes. It was unclear if the higher risk of contact dermatitis related with the use of chlorhexidine dressing

could be attributed to this intervention alone. Authors also highlighted that there is limited evidence to recommend the use of silver-alginate patches.

A RCT compared chlorhexidine dressings with non-chlorhexidine dressings in patients with neutropenia induced by chemotherapy (n=630) [24]. The incidence of catheter-related blood stream infection was higher in the non-chlorhexidine dressing group compared with the chlorhexidine dressing group. The percentage of intolerance to the treatment (leading to discontinuation) was similar between the groups.

A Cochrane review assessed different types of dressings and securement devices to prevent peripheral venous catheters failure [25]. A total of six RCTs were included (n=1539). The interventions assessed were: 1) transparent dressings compared with gauze, 2) bordered transparent dressings compared with securement devices, 3) bordered transparent dressings compared with tape, and 4) bordered transparent dressings compared with sticking plaster.

The findings suggested that transparent dressings reduce the risk of catheter dislodgements or accidental removals compared with gauze, but the quality of the evidence was very low. No differences were identified in the risk of phlebitis and infiltrations between these two interventions. Bordered transparent dressing was also associated with lower risk of catheter dislodgements compared with securement devices but they were also associated with an increase of the risk of phlebitis (quality of evidence very low). When bordered transparent dressings were compared with tape, the former were associated with an increased risk of peripheral venous catheters failures (quality of evidence very low) but no differences were identified in catheter dislodgement. Differences between bordered transparent dressings compared with sticking plaster were unclear. Authors concluded there limited evidence to recommend one type of dressing or securement device.

A Cochrane review assessed different types of dressings and securement devices for central venous catheters [26]. A total of nine RCTs were included (n=7436). The interventions assessed were: 1) gauze and tape compared with standard polyurethane dressings, 2) chlorhexidine gluconate-impregnated dressings compared with standard polyurethane dressings, and 3) medication-impregnated dressings compared with all other dressing types. The majority of the studies were conducted in intensive care units.

No differences were identified in the risk of catheter-related bloodstream infection and catheter tip colonisation between gauze and tape and standard polyurethane dressings (quality of the evidence low-very low).

No differences were identified in the risk of catheter-related bloodstream infection between chlorhexidine gluconate-impregnated dressings and standard polyurethane dressings (quality of the evidence moderate). Fewer catheter-related bloodstream infections per 1000 patient days were associated with chlorhexidine gluconate-impregnated dressings compared with standard polyurethane dressings (quality of the evidence moderate). Chlorhexidine gluconate-impregnated dressings were also associated with a reduction of catheter tip colonisations (quality of the evidence moderate). No differences were identified in rates of skin irritation or damage between these two interventions (quality of the evidence moderate).

Medication-impregnated dressings were associated with a reduction of the incidence of catheter-related bloodstream infections compared with all other dressing types (high quality of evidence).

A multiple treatment meta-analysis showed that sutureless devices are best option for reduce the incidence for catheter-related bloodstream infection followed by chlorhexidine gluconate-impregnated dressings (quality of the evidence low).

Authors concluded that medication-impregnated dressings are effective in the reduction of catheter-related bloodstream infection. Low quality evidence showed that sutureless devices might be the most effective option to reduce catheter-related bloodstream infections.

We identified other RCTs but they were considered in the Cochrane reviews already summarised, therefore they are not described further [27-32].

There is an ongoing RCT in Australia comparing different securement methods to prevent peripheral intravenous catheter failure [33]. Results of a pilot trial that included 85 patients showed that the use of standard polyurethane dressing alone was associated with higher peripheral intravenous catheter failures compared with 1) bordered polyurethane dressing, 2) tissue adhesive with standard polyurethane dressing or a 3) sutureless securement device with standard polyurethane dressing. Tissue adhesive with standard polyurethane dressing showed promising results.

NICE medical technology guidance (MTG25) on the 3M Tegaderm CHG IV securement dressing (Tegaderm CHG) for central venous and arterial catheter insertion sites was published in 2015. It is a transparent semipermeable polyurethane dressing that contains 2% chlorhexidine gluconate. This guidance recommends that '3M Tegaderm CHG IV securement dressing should be considered for use in critically ill adults who need a central venous or arterial catheter in intensive care or high dependency units'. 3M Tegaderm CHG IV securement dressings were associated with reduction of catheter‑related bloodstream infections and local site infections compared with semipermeable transparent (standard) dressings. It was also associated with costs savings when used critically ill adults who need a central venous or arterial catheter in intensive care or high dependency units.

In January 2012, the Medicines and Healthcare products Regulatory Agency (MHRA) released a drug safety update related to products or devices that contain chlorhexidine. They highlighted hypersensitivity reactions induced by the use of chlorhexidine (including allergic reactions or anaphylactic shock). The prevalence of these hypersensitivity reactions was unknown but likely to be very rare. They stated that chlorhexidine should be avoided in people with history of allergy reaction to this product.

Topic expert feedback

Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about the use of sterile transparent semipermeable membrane dressing to cover the vascular access device insertion site is similar to NICE guideline CG139 recommendations. Epic 3 also recommends the use of sterile gauze dressing in case of profuse perspiration or if the insertion site is bleeding or leaking. Epic 3 guidelines recommends replace the gauze dressing when an inspection of the catheter is needed, or when it is soiled, damp or loosened.

Epic 3 made one new recommendation about considering the use of chlorhexidine impregnated sponge dressing for central venous catheter in adults. This type of dressing is not included in NICE guideline CG139.

Impact statement

We identified a Cochrane review that assessed the impact of antiseptic or antibiotic dressings on the reduction of central venous catheter related infections in infants. There was evidence that suggest that chlorhexidine dressing might have an impact on the reduction of catheter colonisations in infants admitted in neonatal intensive care units. Hospitals settings are out of the remit of NICE guideline CG139.

A Cochrane review assessed different types of dressings and securement devices to prevent peripheral venous catheters failure. In the abstract information about the risk of phlebitis was available for some of the comparisons assessed. However other important outcomes were not assessed or not reported (for example catheter tip colonisation, dressing change or frequency of dressing change, infection-related mortality, septicaemia, catheters related bloodstream infections or bacteraemia). It is considered that this study provides limited evidence to impact the recommendations.

Different types of dressings and securement devices for central venous catheters were assessed in a Cochrane review. The results showed that chlorhexidine gluconate-impregnated dressings might be associated and with a reduction of catheter tip colonisations compared with standard

polyurethane dressings. But most of the results came from hospital settings. NICE medical technology guidance (MTG25) also recommends that 3M Tegaderm CHG IV securement dressing should be considered for use in critically ill adults.

Topic experts highlighted a new version of Epic 3 guidelines. This guidance is currently used by clinicians. It is focus on preventing healthcare-associated infections in hospitals. The lasted version recommends the use of chlorhexidine impregnated sponge dressing for central venous catheter in adults.

The evidence identified in this 4-year surveillance point come from studies conducted in hospital settings. Secondary care settings are out of the remit of NICE guideline CG139. It is considered that evidence within primary and community care settings is limited and therefore unlikely to impact on NICE guideline CG139 recommendations at this time.

New evidence is unlikely to change guideline recommendations.

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139 – 33 What is the clinical and cost effectiveness of frequency of dressing change (from daily up to 7 days) on catheter tip colonisation, infection related mortality, septicaemia, bacteraemia and phlebitis?

Recommendations derived from this question

1.4.3.4 Change the transparent semipermeable membrane dressing covering a central venous access device insertion site every 7 days, or sooner if the dressing is no longer intact or moisture collects under it. [2012]

1.4.3.5 Leave the transparent semipermeable membrane dressing applied to a peripheral cannula insertion site in situ for the life of the cannula, provided that the integrity of the dressing is retained. [new 2012]

1.4.3.6 Dressings used on tunnelled or implanted central venous catheter sites should be replaced every 7 days until the insertion site has healed, unless there is an indication to change them sooner. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A Cochrane review assessed the impact of the frequency of dressing change on the incidence of catheter-related infections and other outcomes associated to central venous access devices [21,34]. A total of five RCTs were identified and included children and adult population admitted in hospital settings (n=2277).The studies compared long time intervals (5 to 15 days) with short time intervals (2 to 5 days) between dressing changes. The studies used different types of transparent dressing.

No differences were identified in confirmed catheter-related bloodstream infections, suspected catheter-related bloodstream infections, all-cause mortality, and catheter-site infections between the dressing change intervals assessed. The quality of evidence for these outcomes was low. Longer time intervals were related with a decrease in skin damage in

children but the quality of evidence was very low. No differences were identified in pain during dressing removal between the interventions compared. Authors concluded that it is unclear the impact of the frequency of dressing change on the different outcomes assessed.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals.

Epic 3 recommendations related to frequency of change dressing for central venous devices and tunnelled or implanted central venous catheter are considered consistent with NICE guideline CG139.

Epic 3 did not make different recommendations about the frequency of change dressing for central venous devices or peripheral cannula. Epic 3 recommends change the transparent semipermeable membrane dressing every 7 days or sooner if needed. This recommendation is similar to NICE guideline CG139 recommendation for central venous access devices.

Impact statement
The SR identified assessed different time intervals between dressing changes. No differences were identified between longer or shorter intervals in most of the important outcomes assessed. However, the quality of the evidence was considered low or very low. The studies included in the SR were conducted in hospital settings. We did not identified studies conducted in community settings.

It is considered that the evidence identified is limited and unlikely to impact NICE guideline CG139.

New evidence is unlikely to change guideline recommendations.

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139 – 34 What is the most clinical and cost effective product or solution for skin decontamination when changing VAD dressings on catheter tip colonisation, infection related mortality, frequency of line removal, septicaemia, bacteraemia and phlebitis?

139 – 35 What is the most clinical and cost effective duration of application of decontamination product/solution to the skin prior to insertion of peripherally inserted VAD on catheter tip colonisation, infection related mortality, frequency of line removal, septicaemia, bacteraemia, local or soft tissue infection and phlebitis?

Recommendations derived from this question

1.4.3.7 Healthcare workers should ensure that catheter-site care is compatible with catheter materials (tubing, hubs, injection ports, luer connectors and extensions) and carefully check compatibility with the manufacturer's recommendations. [2003]

1.4.3.8 Decontaminate the central venous catheter insertion site and surrounding skin during dressing changes using chlorhexidine gluconate in 70% alcohol, and allow to air dry. Consider using an aqueous solution of chlorhexidine gluconate if the manufacturer's recommendations prohibit the use of alcohol with their catheter. [2012]

1.4.3.9 Individual sachets of antiseptic solution or individual packages of antiseptic-impregnated swabs or wipes should be used to disinfect the dressing site. [2003]

Surveillance decision

This review question should not be updated.

One amendment is proposed to recommendation 1.4.3.8:

- A footnote is to be added explaining the MHRA warning related to the use of chlorhexidine and the risk of hypersensitivity reactions (very rare).

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
A RCT assessed the impact of medical-grade honey on skin colonisation of insertion sites of central venous catheters [35]. Medical-grade honey was added to standard care (dressing and disinfection with 0.5% chlorhexidine in 70% alcohol). A total of 235 patients admitted to intensive care units were included. Medical-grade honey was not associated with a reduction of skin colonisation compared with standard care.

In January 2012, the Medicines and Healthcare products Regulatory Agency (MHRA) released a drug safety update related to products or devices that contain chlorhexidine. They highlighted hypersensitivity reactions induced by the use of chlorhexidine (including allergic reactions or anaphylactic shock). The prevalence of these hypersensitivity reactions was unknown but likely to be very rare. They stated that chlorhexidine should be avoided in people with history of allergy reaction to this product.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about choice of product or solution for skin decontamination and duration of application of decontamination product/solution are consistent with NICE guideline.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

One MHRA warning was identified and an amendment in the form of footnotes is proposed to the recommendations on 1.4.3.1 to include this information.

New evidence is unlikely to change guideline recommendations.

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139 – 36 What is the most clinical and cost effective product or solution for decontaminating VAD ports and hubs prior to access on catheter tip colonisation, infection related mortality, septicaemia, bacteraemia and frequency of line removal?

Recommendations derived from this question

1.4.4.1 Decontaminate the injection port or vascular access device catheter hub before and after accessing the system using chlorhexidine gluconate in 70% alcohol. Consider using an aqueous solution of chlorhexidine gluconate if the manufacturer's recommendations prohibit the use of alcohol with their catheter. [new 2012]

Surveillance decision

This review question should not be updated.

One amendment is proposed to recommendation 1.4.4.1:

- A footnote is to be added explaining the MHRA warning related to the use of chlorhexidine and the risk of hypersensitivity reactions (very rare).

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
In January 2012, the Medicines and Healthcare products Regulatory Agency (MHRA) released a drug safety update related to products or devices that contain chlorhexidine. They highlighted hypersensitivity reactions induced by the use of chlorhexidine (including allergic reactions or anaphylactic shock). The prevalence of these hypersensitivity reactions was unknown but likely to be very rare. They stated that chlorhexidine should be avoided in people with history of allergy reaction to this product.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about products and solutions for decontaminating VAD ports or hubs are considered consistent with NICE guideline CG139.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

One MHRA warning was identified and an amendment in the form of footnotes is proposed to the recommendations on 1.4.4.1 to include this information.

New evidence is unlikely to change guideline recommendations.

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139 – 37 Inline filters do not help prevent infections

Recommendations derived from this question

1.4.4.2 In-line filters should not be used routinely for infection prevention. [2003]

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

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139 – 38 Antibiotic lock solutions have limited uses in preventing infection

Recommendations derived from this question

1.4.4.3 Antibiotic lock solutions should not be used routinely to prevent catheter-related bloodstream infections (CRBSI). [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about antibiotic lock solutions are consistent with NICE guideline CG139.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

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139 – 39 Systemic antibiotic prophylaxis does not reliably prevent CRBSI

Recommendations derived from this question

1.4.4.4 Systemic antimicrobial prophylaxis should not be used routinely to prevent catheter colonisation or CRBSI, either before insertion or during the use of a central venous catheter. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about systemic antibiotic prophylaxis are considered consistent with NICE guideline CG139.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

New evidence is unlikely to change guideline recommendations.

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139 – 40 A dedicated catheter lumen is needed for parenteral nutrition

Recommendations derived from this question

1.4.4.5 Preferably, a single lumen catheter should be used to administer parenteral nutrition. If a multilumen catheter is used, one port must be exclusively dedicated for total parenteral

nutrition, and all lumens must be handled with the same meticulous attention to aseptic technique. [2003]

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated

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139 – 41 Maintaining catheter patency and preventing catheter thrombosis may help prevent infections

Recommendations derived from this question

1.4.4.6 Preferably, a sterile 0.9 percent sodium chloride injection should be used to flush and lock catheter lumens. [2003]

1.4.4.7 When recommended by the manufacturer, implanted ports or opened-ended catheter lumens should be flushed and locked with heparin sodium flush solutions. [2003]

1.4.4.8 Systemic anticoagulants should not be used routinely to prevent CRBSI. [2003]

Surveillance decision

This review question should not be updated.

Evidence update and 2-year surveillance summary (2014)

A SR and meta-analysis by Oliveira et al. (2012) compared ethanol locks with heparin locks in children receiving parenteral nutrition [36]. The review searched for studies comparing the 2 types of locks in children with intestinal failure and an indwelling central venous catheter for parenteral nutrition. The primary outcome was the rate of catheter-related bloodstream infections per 1000 catheter-days.

A total of 4 before-and-after observational studies were identified that assessed 53 paediatric patients with intestinal failure. The rate of catheter-related bloodstream infections per 1000 catheter-days and the risk of infections were significantly lower in patients who had ethanol locks than in those who had heparin locks. Adverse events data were not pooled; the events reported in the included studies were infrequent but often serious, such as disseminated intravascular coagulation and deep vein thrombosis.

Limitations of the analysis include the small number of patients in the studies assessed, and the heterogeneity among studies with respect to populations, protocols and definitions of outcomes. In addition, bias may have been present because of the retrospective, non-randomised design of the included studies and no formal analysis of adverse events data was conducted.

This evidence suggests that ethanol catheter locks may be associated with fewer catheter-related bloodstream infections than heparin locks in children with intestinal failure who are receiving parenteral nutrition. NICE guideline CG139 recommends that heparin sodium flush solutions should be used with implanted ports or opened-ended catheter lumens when recommended by the manufacturer. The guideline does not make any recommendations on ethanol locks. However, given the limitations of this analysis, this evidence was considered unlikely to have an impact on NICE guideline CG139.

4-year surveillance summary

Central venous catheters

Heparin compared with 0.9% sodium chloride

A Cochrane review evaluated the effectiveness heparin intermittent flushing in the prevention of

central venous catheters occlusions in adults [37]. Heparin was compared with 0.9% sodium chloride intermittent flushing. A total of six RCTs were included (n=1433). Heparin flushes were associated with a reduction of central catheter occlusion when the unit of the analysis was the catheter but not differences were identified when the unit of analysis was the patient. No differences were identified between heparin flushes and *normal saline flushes* number of catheter duration days, risk of catheter-related thrombosis, risk of catheter-related sepsis, risk of mortality or risk of haemorrhage at any site. Authors highlighted that the quality of the evidence was very low-moderate and do not suggest the use of heparin outside of a research context.

Ethanol compared with heparin

Two RCTs compared 70% ethanol locks with heparin locks for the prevention of central venous catheters-associated bloodstream infections [38,39].

The first study included a total of paediatric oncology patients [38]. The locks were administered during two hours and maximum once a week. Heparin lock (1.5 or 3 ml 100 IU/ml) was associated with a higher incidence of central venous catheters-associated bloodstream infections and with lower mild side effects (nausea, taste alteration, dizziness, blushing) compared with ethanol lock. Heparin group had a higher incidence of gram-positive central venous catheters-associated bloodstream infections.

The second study assessed 70% ethanol and heparin saline locks (doses not reported in the abstract) in adult haematology patients with tunnelled central venous catheters (n-42) [39]. No differences were identified in central venous catheters-associated bloodstream infections between the groups compared.

Ethanol compared with standard care

One RCT compared 70% ethanol locks with conventional catheter care (intervention not described in the abstract) in patients undergoing major heart surgery (n=200) [40]. Ethanol locks were administered for two hours every three days. The study was stopped early due to adverse events.

Peripheral intravenous catheters

Normal saline every 12 hours compared with normal saline every 24 hours

A RCT evaluated two different flush frequencies to maintain the patency of peripheral intravenous catheters in children (n=400)[41]. One group received a normal saline flush every 12 hours and other group received a normal saline flush every 24 hours. No differences were identified in the incidence of occlusions between the groups. The results showed that a normal saline flush every 24 hours was not inferior to a normal saline flush every 12 hours in maintain catheter patency. No differences were identified in catheter complications between the groups compared.

Topic expert feedback

Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about intervention to maintain catheter patency and prevent catheter thrombosis are considered consistent with NICE guideline CG139.

Impact statement

We found new evidence that support the use of normal saline solution flushes to maintain peripheral intravenous catheter patency. One non-inferiority RCT found that normal saline flushes once a day seems to preserve the patency of peripheral catheters in children as well as a twice daily saline flush. NICE guideline CG139 does not recommend a specific flush frequency. However it is considered that this single trial provides limited and insufficient evidence to impact current recommendations.

We identified three studies that compared ethanol flushes with heparin flushes in paediatric and adult population with central venous catheters; two of them in oncology population and another one in patients undergoing to major cardiac surgery. One study in adult population stopped early due to adverse events related with ethanol and the other one did not find differences between the interventions compared. One study found that in paediatric oncologic patients ethanol flushes might prevent central venous catheters-associated bloodstream infections, mainly caused by gram-positive bacteria. However, we did not identify studies that compared ethanol flushed with normal saline flushes. We consider that the new evidence identified is limited and insufficient to justify an update.

New evidence is unlikely to impact on the guideline.

139 – 42 Needleless devices require vigilance

Recommendations derived from this question

1.4.4.9 If needleless devices are used, the manufacturer's recommendations for changing the needleless components should be followed. [2003]

1.4.4.10 When needleless devices are used, healthcare workers should ensure that all components of the system are compatible and secured, to minimise leaks and breaks in the system. [2003]

1.4.4.11 When needleless devices are used, the risk of contamination should be minimised by decontaminating the access port with either alcohol or an alcoholic solution of chlorhexidine gluconate before and after using it to access the system. [2003]

Surveillance decision

This review question should not be updated.

One amendment is proposed to recommendation 1.4.4.11:

- A footnote is to be added explaining the MHRA warning related to the use of chlorhexidine and the risk of hypersensitivity reactions (very rare).

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
No relevant evidence was identified.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about the use needless devices by healthcare workers are considered consistent with NICE guideline CG139.

Impact statement
New evidence identified was considered consistent with NICE guideline CG139 recommendations.

One MHRA warning was identified and an amendment in the form of footnotes is proposed to the recommendations on 1.4.4.11 to include this information.

New evidence is unlikely to change guideline recommendations.

139 – 43 Change intravenous administration sets appropriately

Recommendations derived from this question

1.4.4.12 In general, administration sets in continuous use need not be replaced more frequently than at 72-hour intervals unless they become disconnected or a catheter-related infection is suspected or documented. [2003]

1.4.4.13 Administration sets for blood and blood components should be changed every 12 hours, or according to the manufacturer's recommendations. [2003]

1.4.4.14 Administration sets used for total parenteral nutrition infusions should generally be changed every 24 hours. If the solution contains only glucose and amino acids, administration sets in continuous use do not need to be replaced more frequently than every 72 hours. [2003]

Surveillance decision

This question should not be updated.

Evidence update and 2-year surveillance summary (2014)
Peripheral intravenous catheters

A Cochrane review compared outcomes when replacing peripheral intravenous catheters (cannulae) only when clinically indicated with replacing catheters routinely. The review sought RCTs of patients in hospitals, nursing homes or community settings who had peripheral intravenous catheters for at least 3 days. The primary outcomes were catheter-related blood stream infection, thrombophlebitis and cost [42].

A total of 7 trials with 4895 patients were identified. In the routine replacement groups, catheters were changed every 72 to 96 hours in 5 trials and every 48 hours in 2 studies. Of the 5 studies (n=4806) that assessed catheter-related bloodstream infections, only 2 (n=4038) reported any infections. Pooled analysis of these 5 studies showed no significant difference in the incidence of catheter-related bloodstream infections with clinically indicated catheter removal versus routine removal every 72 to 96 hours. Likewise no difference was seen in the rates of phlebitis with the two strategies. The 3 trials that measured cost showed that cannulation costs were lower in the clinically indicated catheter removal group than in the routine removal group.

Limitations of this evidence include that 5 of 7 the studies analysed were conducted in Australia (n=4806) and only 1 took place in a community setting (n=200). Blinding of investigators was not possible in the included studies because of the nature of the intervention. In addition, the confidence interval for the pooled analysis of catheter-related bloodstream infections was wide, creating uncertainty around the relative risk. The data on phlebitis were too heterogeneous when all 7 trials were combined, so the analysis for this outcome used only 5 of the included studies.

This evidence indicates that changing peripheral intravenous catheters (cannulae) when clinically indicated rather than every 72 to 96 hours in hospitalised or community patients may not affect the incidence of catheter-related bloodstream infections or phlebitis. Replacement of the catheter only when signs of inflammation, infiltration or blockage are present may be a more appropriate strategy than routine replacement. This approach will also benefit the patient by reducing the number of cannulations.

In the Evidence Update, this evidence was considered to have a potential impact on NICE guideline CG139, in that it suggests a change in practice. Given that the details of any impact were outside the scope of the Evidence Update, in the 2-year surveillance review (2014) decisions on how the new evidence impacted guidance were made. After consideration of the existing guideline and the nature of the new evidence identified in the Evidence Update, it was concluded that this evidence was unlikely to impact on existing recommendations. The evidence was of limited quality and insufficient to justify an update.

4-year surveillance summary
Administration sets

We identified a Cochrane review that assessed the impact of different frequencies of administration sets on the incidence of microbial colonisation, infection and mortality in people admitted to hospitals [43]. Authors included RCT and controlled trials. A total of 16 were included (n=5001).

No differences were identified between different frequencies of administration set replacement in the risk of catheter-related bloodstream infections, infusate-related bloodstream infections, catheter colonisation, or infusate colonisation. Less frequent administration set replacement was associated with a significant reduction of bloodstream infection. Less frequent administration set

replacement was not associated with an increase of mortality rates in neonates but the effect was borderline (risk ratio [RR] 1.84, 95% CI 1.00 to 3.36). Subgroup analysis by type of infusion (parenteral nutrition and/or fat emulsions compared with infusate), type of catheter (arterial compared with venous catheter) or participant (adults compared with neonates) did not have an impact on the results. Most of the studies were considered at moderate-high risk of bias.

Authors concluded administration sets that do not contain lipids, blood or blood products could be replaced in intervals up to 96 hours. In neonates more frequent replacement could be needed. Overall, the evidence was considered of low-moderate quality.

Topic expert feedback
Topic experts highlighted a new version of the Epic guidelines [1]. These guidelines focus on preventing healthcare-associated infections in hospitals. Epic 3 recommendations about the change of intravenous administration sets differ from those in NICE guideline CG139 in terms of frequency of change of administration sets in continuous use and frequency of change of administrations sets for blood and blood components. Epic 3 recommends change the administration sets in continuous use every 96 hours instead of every 72 hours as recommended in NICE guideline CG139. Epic 3 also recommends change the administration sets for blood and blood components every 12 hours or when the transfusion episode is completed. NICE guidelines CG139 recommends change these components every 12 hours or according to the manufacturer's recommendations.

Impact statement
In the Evidence Update and 2-year surveillance review (2014) a Cochrane review was identified. This Cochrane review suggested that changing peripheral intravenous catheters when clinically indicated instead of every 72 or 96 hours does not have an impact on the incidence of catheter-related bloodstream infections. However this evidence had limited quality and it was considered insufficient to justify an update of NICE guideline CG139 recommendations.

Some evidence of low-moderate quality identified in this 4-year surveillance review indicates that change administration sets not containing blood, blood products or lipids every 96 hours is not associated with an increase of risk infection in hospital settings.

Hospital settings are included in the scope of Epic 3 guidelines. These guidelines recommend change administration sets every 96 hours. This guidance is keep up to date and it used by clinicians. It is considered that as the evidence was not primary and community care settings it is therefore unlikely to impact on NICE guideline CG139 recommendations at this time.

New evidence is unlikely to change guideline recommendations.

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139 – 44 What is the clinical and cost effectiveness of multi dose vials vs. single-use vials for administrating infusions or drugs on preventing contamination of the infusate and healthcare-associated infection?

Recommendations derived from this question

1.4.4.15 Avoid the use of multidose vials, in order to prevent the contamination of infusates. [new 2012]

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.

NQ – 01 **What is the clinical and cost effectiveness of impregnated central venous catheters (antimicrobial impregnation, coating or bonding) on reduction of catheter-related infection, sepsis, mortality, catheter colonisation and other type of catheter-related infections?**

Surveillance decision

This review question should not be added.

Evidence update and 2-year surveillance summary (2014)
No relevant evidence was identified.

4-year surveillance summary
One Cochrane review [44] and two SRs assessed [45,46] the effectiveness of impregnated central venous catheters. These two SRs were published before the Cochrane review therefore they are not discussed further.

The Cochrane review included a total of 57 studies (n=16,784 catheters) that assessed 11 types of impregnations. The studies were conducted in intensive care units, oncology units and also included people with long-term total parenteral nutrition. Only adults were included.

Catheter impregnation was associated with a reduction of catheter-related bloodstream infections and catheter colonisation. The quality of the evidence was moderate- high. No differences were identified in clinically diagnosed sepsis, all-cause mortality and catheter-related local infections with impregnated catheters. The quality of the evidence was also moderate- high. Some of these findings varied depending on the type of population assessed. For example impregnated catheters reduced catheter colonisation in intensive care units but not in haematological, oncological units or patients receiving long-term total parenteral nutrition. No differences were identified in adverse events between the interventions assessed (thrombosis/thrombophlebitis, bleeding, erythema, and/or tenderness at the insertion site).

Authors concluded that impregnated catheters might have a beneficial effect in the reduction of catheter related bloodstream infections and catheter colonisation. However these effects could vary depending on the setting. The impact on other important outcomes (sepsis or mortality) is unclear given the small amount of evidence identified.

A RCT conducted in UK assessed the effectiveness of impregnated central catheters in children (n=1485) [47,48]. The types of catheters assessed were standard central venous catheters, antibiotic-impregnated catheters, and heparin-impregnated catheters. Impregnated catheters (antibiotic-impregnated or heparin-impregnated catheters) were not associated with a reduction of the risk of bloodstream infections compared with standard central venous catheters. Antibiotic-impregnated catheters were associated with a reduction of the risk of bloodstream infections compared with heparin-impregnated catheters and standard central venous catheters. The percentage of catheter-related adverse events or mortality was similar between groups compared. A cost-effectiveness analysis using individual-level data of this study showed that the incremental cost-effectiveness of antibiotic-impregnated catheters was £54,057 per bloodstream infections avoided compared with standard central venous catheters but there was an important uncertainty in cost [48]. A cost impact analysis showed that in a scenario of a baseline risk of bloodstream infections superior to1.2 per 1000 CVC-days the additional cost of purchasing antibiotic-impregnated catheters for all children who require them would be less than the value of resources associated with managing bloodstream infections in paediatric intensive care units. Authors concluded that the adoption of antibiotic-impregnated catheters might be beneficial but it is unclear the impact on NHS resources.

Topic expert feedback
No topic expert feedback was relevant to this evidence.

Impact statement

NICE guideline CG139 does not include recommendations in this area. We identified new evidence assessing the effectiveness and cost-effectiveness of impregnated central venous catheters that found they might have a beneficial effect in the reduction of catheter related bloodstream infections in adults, and antibiotic-impregnated catheters in children. Most of the studies identified were conducted in hospital settings (intensive care units). The remit of NICE guideline CG139 is on prevention of healthcare-associated infection in primary and community care. Therefore it is proposed to do not incorporate this question in NICE guideline CG139 as evidence within primary and community care settings was limited and therefore unlikely to impact on the guideline at this time.

New evidence is unlikely to change guideline recommendations.

Research recommendations

Priority

Standard principles of infection prevention and control

RR – 01 What are the barriers to compliance with the standard principles of infection prevention and control that patients and carers experience in their own homes?

New evidence was found (139 – 01) but an update is not planned because the evidence supports the current guideline recommendations. The research recommendation would be answered by a study design that was not included in the search (usually systematic reviews or randomised controlled trials).

- The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.

Hand decontamination

RR – 02 When clean running water is not available, what is the clinical and cost effectiveness of using wipes, gels, handrubs or other products to remove visible contamination?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

- It was proposed to remove the research recommendation from the NICE version of the guideline and the NICE research recommendations database because there is no evidence of research activity in this area. We considered the views of stakeholders through consultation. It was decided to retain this research recommendation based on the feedback from stakeholder consultation.

Intermittent urinary catheters: catheter selection

RR – 03 For patients performing intermittent self-catheterisation over the long term, what is the clinical and cost effectiveness of single-use non-coated versus single-use hydrophilic versus single-use gel reservoir versus reusable non-coated catheters with regard to the following outcomes: symptomatic urinary tract infections, urinary tract infection-associated bacteraemia, mortality, patient comfort and preference, quality of life, and clinical symptoms of urethral damage?

New evidence relevant to the research recommendation was found (139 – 21) but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.

- The research recommendation will be retained because there is evidence of research activity in this area.

Indwelling urinary catheters: catheter selection

RR – 04 For patients using a long-term indwelling urinary catheter, what is the clinical and cost effectiveness of impregnated versus hydrophilic versus silicone catheters in reducing symptomatic urinary tract infections, encrustations and/or blockages?

New evidence relevant to the research recommendation was found (139 – 21) but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.

- The research recommendation will be retained because there is evidence of research activity in this area.

Indwelling urinary catheters: antibiotic prophylaxis

RR – 05 When recatheterising patients who have a long-term indwelling urinary catheter, what is the clinical and cost effectiveness of single-dose antibiotic prophylaxis in reducing symptomatic urinary tract infections in patients with a history of urinary tract infections associated with catheter change?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

- It was proposed to remove the research recommendation from the NICE version of the guideline and the NICE research recommendations database because there is no evidence of research activity in this area. We considered the views of stakeholders through consultation. It was decided to retain this research recommendation based on the feedback from stakeholder consultation.

Vascular access devices: skin decontamination

RR – 06 What is the clinical and cost effectiveness of 2% chlorhexidine in alcohol versus 0.5% chlorhexidine in alcohol versus 2% chlorhexidine aqueous solution versus 0.5% chlorhexidine aqueous solution for cleansing skin (before insertion of peripheral vascular access devices [VADs] and during dressing changes of all VADs) in reducing VAD related bacteraemia and VAD site infections?

New evidence relevant to the research recommendation was found (139 – 31 and 139 – 34) but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.

- The research recommendation will be retained because there is evidence of research activity in this area.

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