



# Guidelines for preventing infections associated with the insertion and maintenance of short-term indwelling urethral catheters in acute care

These guidelines focus on providing evidence-based recommendations for preventing hospital-acquired infections associated with the use of short-to-medium term indwelling urethral catheters in acute care settings. These recommendations are not detailed procedural protocols and need to be incorporated into local guidelines. The recommendations are divided into four distinct interventions:

1. Assessing the need for catheterisation;
2. Selection of catheter type;
3. Aseptic catheter insertion;
4. Catheter maintenance.

## Intervention 1

## Assessing the Need for Catheterisation

**Catheterising patients places them in significant danger of acquiring a urinary tract infection. The longer a catheter is in place, the greater the danger**

There is consistent evidence that a significant number of hospital-acquired infections are related to urinary catheterisation.<sup>1–4</sup> The risk of infection is associated with the method and duration of catheterisation, the quality of catheter care and host susceptibility. The prevalence of catheterised patients in hospitals in England is 12.6 percent.<sup>5</sup> The highest incidence of infection is associated with indwelling urethral catheterisation.<sup>6</sup> Many of these infections are serious and lead to significant morbidity. Between 20 and 30 percent of catheterised patients develop bacteriuria, of whom 2–6 percent develop symptoms of urinary tract infection (UTI).<sup>6</sup> The risk of acquiring bacteriuria is approximately 5 percent for each day of catheterisation.<sup>7,8</sup> Of patients with a UTI, 1–4 percent develop bacteraemia and, of these, 13–30 percent die.<sup>1,2</sup> Duration of catheterisation is strongly associated with risk of infection, i.e., the longer the catheter is in place, the higher the incidence of urinary tract infection.<sup>6</sup>

Advice from best practice emphasises the importance of documenting all procedures involving the catheter or drainage system in the patient's records<sup>1</sup> and providing patients with adequate information in relation to the need, insertion, maintenance and removal of their catheter.<sup>1</sup>

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

## References

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**Intervention 2****Selection of Catheter Type****Is one catheter better than another?**

Our systematic review<sup>1</sup> identified three experimental studies that compared the use of latex with silicone catheters.<sup>2–4</sup> No significant difference in the incidence of bacteriuria was found. Four studies compared the use of silver coated (silver alloy or silver oxide) catheters with silicone, hydrogel or Teflon latex.<sup>5–8</sup> A systematic review and meta-analysis of these and other studies found that silver alloy (but not silver oxide) catheters were associated with a lower incidence of bacteriuria.<sup>9,10</sup> However, silver alloy coated indwelling urethral catheters are not currently available in the UK.

Evidence from best practice indicates that the incidence of catheter-associated infection in the short term is not influenced by any particular type of catheter material.<sup>11,12</sup> However, many practitioners have strong preferences for one type of catheter over another. This preference is often based on clinical experience, patient assessment, and which materials induce the least allergic response. Smaller gauge catheters with a 10 ml balloon minimise urethral trauma, mucosal irritation and residual urine in the bladder, all factors that predispose to catheter-associated infection.<sup>13</sup>

**4. Choice of catheter material will depend on clinical experience, patient assessment and anticipated duration of catheterisation.** Category 3

**5. Select the smallest gauge catheter that will allow free urinary outflow. A catheter with a 10 ml balloon should be used. Urological patients may require larger gauge sizes and balloons.** Category 3

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**Intervention 3****Aseptic Catheter Insertion****Catheterisation is a skilled aseptic procedure**

Principles of good practice, clinical guidance<sup>1,2</sup> and expert opinion<sup>3-7</sup> agree that urinary catheters must be inserted using sterile equipment and an aseptic technique. Expert opinion indicates that there is no advantage in using antiseptic preparations for cleansing the urethral meatus prior to catheter insertion.<sup>1,8</sup> Urethral trauma and discomfort will be minimised by using an appropriate sterile, single-use lubricant or anaesthetic gel. Ensuring healthcare practitioners are trained and competent in the insertion of urinary catheters will minimise trauma, discomfort and the potential for catheter-associated infection.<sup>1,3,7,9</sup>

- 6. Catheterisation is an aseptic procedure. Ensure that health care personnel are trained and competent to carry out urethral catheterisation.** **Category 3**
- 7. Clean the urethral meatus prior to the insertion of the catheter.** **Category 3**
- 8. Use an appropriate lubricant from a single use container to minimise urethral trauma and infection.** **Category 3**

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**Intervention 4****Catheter Maintenance****Leave the closed system alone!**

Maintaining a sterile, continuously closed urinary drainage system is central to the prevention of catheter-associated infection.<sup>1–6</sup> The risk reduces from 97 percent with an open system to 8–15 percent when a sterile closed system is employed.<sup>7–9</sup> Breaches in the closed system, such as unnecessary emptying of the urinary drainage bag or taking a urine sample, will increase the risk of catheter-related infection and should be avoided.<sup>4,9,10</sup> Hands must be decontaminated and clean, non-sterile gloves worn before manipulation.

There is no evidence as to how often catheters should be changed. Best practice suggests changing only when necessary, i.e., according to either the manufacturers recommendations or the patient's clinical need.<sup>4,6</sup> Reflux of urine is associated with infection and, consequently, drainage bags should be positioned in a way that prevents back-flow of urine.<sup>4,5</sup> It is also recommended that urinary drainage bags should be hung on an appropriate stand that prevents contact with the floor.<sup>9</sup>

A number of studies have investigated the addition of disinfectants and antimicrobials to drainage bags as a way of preventing catheter-associated infection.<sup>11</sup> Three acceptable studies<sup>12–14</sup> from our systematic review<sup>15</sup> demonstrated no reduction in the incidence of bacteriuria following the addition of hydrogen peroxide or chlorhexidine to urinary drainage bags. Urinary drainage bags should be changed when clinically indicated and/or in line with the manufacturer's recommendations.

**9. Connect indwelling urethral catheters to a sterile closed urinary drainage system.**

Category 3

**10. Ensure that the connection between the catheter and the urinary drainage system is not broken except for good clinical reasons, e.g., changing the bag in line with manufacturer's recommendation.**

Category 3

**11. Decontaminate hands and wear a new pair of clean, non-sterile gloves before manipulating a patient's catheter and decontaminate hands after removing gloves.**

Category 3

**12. Obtain urine samples from a sampling port using an aseptic technique.**

Category 3

**13. Position urinary drainage bags below the level of the bladder on a stand that prevents contact with the floor. Where such drainage cannot be maintained, e.g., during moving and handling, clamp the urinary drainage bag tube and remove the clamp as soon as dependent drainage can be resumed.**

Category 3

**14. Empty the urinary drainage bag frequently enough to maintain urine flow and prevent reflux. Use a separate and clean container for each patient and avoid contact between the urinary drainage tap and container.**

Category 3

**15. Do not add antiseptic or antimicrobial solutions into urinary drainage bags.**

Category 1

**16. Do not change catheters unnecessarily or as part of routine practice.**

Category 3

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### Appropriate maintenance minimises infections

- *Meatal cleansing with antiseptic solutions is unnecessary.*

Our systematic review<sup>1</sup> considered six acceptable studies that compared meatal cleansing with a variety of antiseptic/antimicrobial agents or soap and water. No reduction was demonstrated in bacteriuria when using any of these preparations for meatal care compared with routine bathing or showering.<sup>2–7</sup>

Expert opinion<sup>8–10</sup> and another systematic review<sup>11</sup> support the view that vigorous meatal cleansing is not necessary and may increase the risk of infection and that daily routine bathing or showering is all that is needed to maintain meatal hygiene.

### 17. Routine personal hygiene is all that is needed to maintain meatal hygiene.

Category 1

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- *Irrigation, instillation and washout do not prevent infection.*

Systematic review evidence failed to demonstrate any beneficial effect of bladder irrigation, instillation or washout with a variety of antiseptic or antimicrobial agents in preventing catheter-associated infection.<sup>1–9</sup>

Evidence from best practice supports the above and indicates that the introduction of such agents may have local toxic effects and contribute to the development of resistant microorganisms. However, continuous or intermittent bladder irrigation may be indicated during urological surgery or to manage catheter obstruction.<sup>10–14</sup>

### **18. Bladder irrigation, instillation and washout do not prevent catheter-associated infection.**

**Category 2**

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## Glossary

Bacteraemia	Bacteria in the bloodstream.
Bacteriuria	The presence of bacteria in the urine with or without associated symptoms of infection. In the absence of symptoms this is referred to as <i>asymptomatic bacteriuria</i> or (in the case of a patient with an indwelling catheter) <i>catheter colonisation</i> .
Bladder instillation	Introducing a therapeutic liquid into the bladder and leaving it there for a variable 'holding' time to dissolve particulates/encrustation, alter pH, or suppress bacterial growth.
Bladder irrigation	The continuous flushing through a double lumen catheter or the filling and emptying of the bladder with fresh fluid to prevent the formation or retention of clots that would otherwise cause obstruction to catheter drainage.
Bladder washout	The introduction into the bladder of a sterile fluid which is allowed to drain more or less immediately, for the purpose of diluting the bladder contents/unblocking an obstruction to restore free catheter drainage.
Catheter-associated infection	The occurrence of local or systemic <i>clinical symptoms</i> or signs attributable to bacteria present either within the urinary tract, or in the bloodstream (with the urinary tract as the source). Infection may arise: <ul style="list-style-type: none"> <li>• either at the time of, or immediately following catheter insertion;</li> <li>• or subsequently, because the colonising flora within the catheterised urinary tract becomes invasive (this may occur spontaneously, or follow catheter manipulation).</li> </ul> <p>NB. The presence of pus cells in the urine (pyuria) of a patient with an indwelling catheter does not, by itself, signify infection.</p>
Short-term catheter	A catheter left in place for 1–7 days.
Medium-term catheters	A catheter left in place for 7–28 days, after which the temporary indication that prompted catheterisation in the first place no longer applies.
RCT	A clinical trial where at least two treatment groups are compared, one of them serving as the control group, and treatment allocation is carried out using a random, unbiased method.
Randomised controlled trial	