Reducing the risk of infection with indwelling urethral catheters

Ten key issues and best practice on short term indwelling urinary catheters

**BACKGROUND**

Indwelling urinary catheters are one of the most invasive medical devices used in the acute care setting. Urinary catheters are the frequent cause of healthcare associated infection. Catheter associated urinary tract infection (CAUTI) causes unnecessary distress to patients and delays recovery. The high impact intervention urinary catheter care bundle sets out the key elements of care in prevention of CAUTI (DH, 2007). Compliance with best practice can reduce the risk of infection.

The daily risk to catheterised patients of developing bacteriuria is 3–6% and cumulatively increases the longer the catheter remains in place (Pratt et al, 2007). Consequently, around 50% of hospitalised patients catheterised for longer than 7–10 days develop bacteriuria (Pratt et al, 2007). Many of these infections are serious and lead to significant morbidity and mortality. There are numerous continence aids available and these should be considered before electing to use an indwelling catheter.

**GOOD PRACTICE POINT**

Only use an indwelling catheter when absolutely necessary and when all other options have been considered and rejected.

**WHICH CATHETER IS BEST?**

There are many types of urinary catheters and the selection of a catheter depends on patient assessment, the reason for catheterisation and the length of time the catheter is likely to be required. The most commonly used is the latex Foley balloon inflating catheter, which was first introduced in the 1920s. However, with more patients becoming sensitive to latex, other materials may be required (Elvy and Colville, 2009).

**REFERENCES**


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Reducing the risk of healthcare associated infection (HCAI) is a key government target (Department of Health, 2003). Indwelling urethral catheters are one of the most common invasive medical devices used in acute care settings and, consequently, are a frequent cause of HCAI. This article describes 10 key issues and best practice points for practitioners to consider when caring for someone who requires short term urinary catheterisation, in other words, for fewer than 30 days.

**IS AN INDWELLING URINARY CATHETER NECESSARY?**

Urinary catheters are used for a variety of reasons in acute care settings, including:
- Relief of acute/chronic retention of urine;
- To monitor urine output accurately;
- During surgery;
- To investigate the urinary tract;
- Urinary bladder irritation;
- To instil drugs directly into the bladder.

Urinary catheters should never be used for the convenience of staff.

When assessing the need for a urinary catheter, the risk of catheter associated urinary tract infection (CAUTI) should be considered.

The introduction of a catheter into the bladder circumvents the body’s normal defence mechanisms and enables microorganisms to track up the external catheter surface into the bladder (Curran and Murdoch, 2009).

Once a catheter is in situ, bacteria in the urinary drainage bag or introduced via the catheter/bag’s connection points create biofilms on the surface of the catheter lumen, which are a precursor to CAUTI (Barford and Coates, 2009).

Cover image: Coloured X-ray of the pelvis, showing a healthy lower urinary tract. SPL.
Evidence suggests that catheters coated with silver alloy are clinically effective in reducing the incidence of CAUTI, although the cost benefit is less clear (Brosnanah et al, 2008; Schumm and Lam, 2008).

Catheters impregnated with antibiotics also reduce bacteriuria in hospitalised adults catheterised for less than one week (Schumm and Lam, 2008).

What is clearer is that, whichever type of catheter is selected, the smallest gauge possible that allows the free flow of urine should be used, and it should have a balloon no larger than 10ml. These precautions help to minimise urethral trauma, mucosal irritation and residual urine in the bladder, all of which contribute to CAUTI (Pratt et al, 2007).

**GOOD PRACTICE POINT**
Select the type of catheter most appropriate for the patient and use the smallest gauge possible.

**CATHETER INSERTION TECHNIQUE**
As has already been noted, insertion of a urinary catheter potentially introduces microorganisms into the bladder (Barford and Coates, 2009).

To minimise this, catheterisation must be a skilled aseptic procedure and should only be undertaken by staff who are trained and competent (Pratt et al, 2007). Expert opinion indicates that there is no advantage in using antiseptic preparations for cleansing the urethral meatus before catheter insertion and sterile normal saline is sufficient (Dunn et al, 2000; Kunin, 1997).

Urethral trauma and discomfort will be minimised by using an appropriate sterile, single use lubricant or anaesthetic gel (Pratt et al, 2007).

**GOOD PRACTICE POINT**
Urethral catheterisation is a skilled aseptic procedure and should only be undertaken by those who have been trained and assessed as competent.

**DOCUMENTATION**
Following catheter insertion, the procedure and reason for catheterisation should be documented in the patient’s records, along with the type and batch number of the catheter inserted.

Health Protection Scotland has produced an insertion checklist to prompt/remind staff of the issues to be considered and the correct procedure (Curran and Murdoch, 2009).

Once a catheter has been inserted, the need for the catheterisation should be assessed daily and the catheter removed as soon as possible.

There is some evidence to suggest that computer management systems improve documentation and, in so doing, reduce the length of time catheters are in situ (Cornia et al, 2003).

**GOOD PRACTICE POINT**
Documentation and daily assessment of ongoing need for catheterisation minimise the time that a catheter is in situ.

**MAINTAINING A CLOSED SYSTEM**
One way of minimising the risk of CAUTI is to maintain a closed system. This means access and breaks in the system should be kept to an absolute minimum.

The design of systems today means that urinary drainage bags can be emptied as required via a tap at the base and the system left intact for longer periods of time.

Manufacturers’ instructions on urinary drainage bag changes are increasingly recommending an extended period of use. A systematic review suggests that sealed drainage systems (where the catheter and bag are attached by the manufacturer) contribute to preventing bacteriuria (Dunn et al, 2000). This has been recently borne out by a UK study that demonstrated a 41% reduction in CAUTI with sealed systems (Madoe et al, 2009).

**GOOD PRACTICE POINT**
To reduce the risk of CAUTI, keep the system closed.

**CATHETER MAINTENANCE**
As reflux and stagnation of urine contribute to CAUTI, the catheter bag should be positioned below the bladder and hung on a stand to avoid contamination (Pratt et al, 2007).

Keeping the urinary drainage bag below the level of the bladder is equally as important when assisting patients to move from bed to chair to avoid backflow of urine.

Securing the catheter using a securement device appears to reduce urethral damage especially in men where the meatal opening often gets sore and infected due to the dragging effect.


REFERENCES


WEB EXTRAS

my5momentsofhandhygiene.com/5-moments-of-hand-hygiene

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they offer no advantage over routine personal hygiene (daily bath or shower) (Webster et al, 2001; Dunn et al, 2000).

GOOD PRACTICE POINT

Secure the catheter system to avoid dragging and keep the drainage bag below the bladder to prevent the backflow of urine. Encourage a daily bath or shower to maintain meatal hygiene.

IRRIGATION, INSTILLATIONS AND WASHOUTS

A systematic review supports the view that adding antimicrobial solutions to drainage bags has no effect on reducing the incidence of CAUTI (Saint and Lipsky, 1999). Likewise, there is no evidence demonstrating any beneficial effect of bladder irrigation, instillation or washout with a variety of antiseptic or antimicrobial agents in preventing CAUTI (Muncie et al, 1989; Saint and Lipsky, 1999; Kennedy et al, 1992).

Evidence from best practice confirms this, indicating that not only do these activities break the closed system but also the introduction of such agents may have local toxic effects and contribute to the development of resistant microorganisms (Kunin, 1997). However, continuous or intermittent bladder irrigation may be indicated during urological surgery or to manage catheter obstruction.

GOOD PRACTICE POINT

Avoid irrigations,instillations or washouts unless clinically indicated.

HAND HYGIENE

Although leaving the system alone is best practice, there are occasions when one has to access the system, for example to empty the urine drainage bag or to obtain a urine sample.

When these occasions arise, hands must be decontaminated and non-sterile gloves worn before the system is accessed (Pratt et al, 2007; WHO, 2006). In some instances, a plastic apron may also be required to prevent contamination of uniforms. Once the activity has been completed, gloves should be removed and disposed of correctly and hands decontaminated (Pratt et al, 2007; WHO, 2006).

GOOD PRACTICE POINT

Decontaminate hands and do non-sterile gloves before handling a urinary catheter system.

EDUCATION AND TRAINING

Given the frequency of urinary catheterisation in hospital patients and the associated risk of urinary tract infection, it is important that patients, their relatives and healthcare workers responsible for catheter insertion and catheter management are educated about infection prevention.

Staff training on infection prevention and control is now mandated by the Health and Social Care Act 2008 which came into force on 1 April 2009 (DH, 2009). To enable trusts to meet this requirement, an e-learning module on preventing HCAI associated with the use of short term urinary catheters is available free of charge to all healthcare workers in England. This can be accessed by logging on to: www.infectioncontrol.nhs.uk (Pellowe, 2009).

GOOD PRACTICE POINT

Ensure that all staff are educated and trained in preventing CAUTI.

HIGH IMPACT INTERVENTION CARE BUNDLES

Care bundles were devised by the Institute of Health Improvement and have been incorporated by the DH into the Saving Lives programme as high impact interventions (DH, 2007).

A care bundle is a set of practices which, when performed consistently, has been shown to improve patient outcomes.

High impact intervention number 6 is the urinary catheter care bundle and reflects the evidence in the national epiC2 guidelines (Pratt et al, 2007). In addition to setting out the key elements of care, there is an audit tool that practitioners can use to assess their compliance.

Completion of the audit will demonstrate where weaknesses in practice need to be addressed and provides evidence of an organisation’s commitment to service improvement.

GOOD PRACTICE POINT

In all areas where short term catheters are used, practitioners should assess their practice using the Saving Lives care bundle.

CONCLUSION

CAUTI is an all too common HCAI that causes unnecessary distress to patients and delays their recovery. Attention to and compliance with these good practice points would reduce the risk of CAUTI and assure staff that they are demonstrating best practice in their care.