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Reducing the risks associated with urinary catheters

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Reducing the risks associated with urinary catheters

NS485 Madeo M, Roodhouse AJ (2009) Reducing the risks associated with urinary catheters. *Nursing Standard*. 23, 29, 47-55. Date of acceptance: February 11 2009.

Summary

The NHS strives to create and promote a safe environment for patient care in which risks are minimised. Urinary catheterisation is a common healthcare procedure but it is an invasive intervention that carries the risk of infection. Evidence-based guidelines have been developed to minimise the risks associated with these devices and to allow healthcare professionals to implement best practice at all times. This article looks at evidence-based guidance and technological innovations aimed at reducing infection risks and improving patient outcomes.

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Aims and intended learning outcomes

Indwelling urinary catheterisation is a common procedure carried out by nursing staff, but it is not without risk. This article aims to provide guidance to healthcare professionals to reduce the risk of infection associated with urinary catheters. After reading this article you should be able to:

- Identify common pathogens that can occur in patients with a urinary catheter.
- List possible endogenous and exogenous risk factors that may contribute to a catheter-associated urinary tract infection (CAUTI).
- Review the essential components required to perform an aseptic urinary catheterisation.
- Review your practice in light of the latest evidence base.

Introduction

The NHS strives to create a safe, clean environment in which infection risks are minimised and specialist clinical care can be delivered (Department of Health (DH) 2008, Duerden 2008). The risk of a healthcare-associated infection (HCAI) such as a urinary tract infection (UTI) cannot be eliminated entirely, but with appropriate infection control practice and the use of modern technology the risks to the patient can be reduced considerably. Urinary catheterisation is a common healthcare intervention. However, it is not without associated risks, which should be taken seriously. Healthcare interventions should be underpinned by best practice evidence to help minimise potential risks to patients. Urinary catheterisation should be undertaken as a last resort once other continence promotion measures have been explored. Reasons for catheterisation include:

- Acute or chronic retention of urine.
- Pre and post-operative bladder drainage.
- Instillation of treatment agents into the bladder, for example chemotherapy.

- Bladder drainage as a result of obstruction, for example as a result of blood clots.
- Urodynamic or radiological investigations.
- Measurement of urinary output in critically ill patients.
- Management of urinary incontinence as a last resort after other methods have failed.

Urinary catheters bypass the normal defence mechanisms of the body, so risks associated with the use of such devices may occur, particularly if the catheter is in place for a prolonged period. A UTI is the most likely complication associated with catheter use.

The literature suggests considerable variation between the number of catheters used in hospital and the proportion of catheterised patients cared for within different specialties. Glynn *et al* (1997) found the overall rate of catheterisation in acute care was 26.3%, with a range of 12-40% dependent on specialty. The Hospital Infection Society (2007) recorded that up to 31% of inpatients had a urinary catheter. The frequency with which urinary catheterisation occurs should not be viewed as confirmation of its safety (Magnall and Watterson 2006). There is a suggestion that, because of the frequency of urinary catheterisation, staff may develop 'catheter apathy', viewing complications as a consequence of the procedure that is acceptable, harmless and easy to treat (Tew *et al* 2005).

Urinary catheterisation and the management of catheterised patients is traditionally the responsibility of nurses. The implementation of best practice encompassing infection prevention evidence will reduce associated risks and help to prevent serious complications such as a bloodstream infection.

Time out 1

In discussion with colleagues, conduct an informal review of whether catheter apathy is evident where you work.

- How often are patients catheterised and has careful consideration been given to the need for catheterisation?
- How long do catheters remain in place and is intermittent catheterisation considered?
- Is there an appreciation of the risks associated with catheter use?

Infection risks

UTIs are the second largest single group of HCAI in the UK, amounting to around 20% of all infections acquired in hospitals (Hospital Infection Society 2007). The financial cost of a UTI was estimated in 1999 at £1,327 per patient, which is likely to cost more today, typically occupying a hospital bed for an extra six days and costing the NHS more than £124 million a year (Plowman *et al* 1999). Estimates indicate that 8.5-10.0% of all patients who have indwelling catheters develop CAUTIs (Saint and Lipsky 1999, Puri *et al* 2002). CAUTIs contribute to increased morbidity and mortality (Emmerson *et al* 1996).

Studies suggest that 10-30% of patients with short-term catheters will develop bacteriuria (Pellowe *et al* 2004, Tambyah 2004). A CAUTI leads to an almost threefold increase in the risk of death, independent of other co-morbidities (Goolsarran and Katz 2002). The most important risk factor for bacteriuria and the development of a CAUTI is the duration of urinary catheterisation (Puri *et al* 2002). For example, a patient who has a catheter in place for 14 days is at considerable risk of developing bacteria (extended-spectrum beta-lactamase producers) in the bladder that may become resistant to antibiotics (Goolsarran and Katz 2002).

Extended-spectrum beta-lactamases are enzymes that can be produced by certain Gram-negative bacteria making them resistant to cephalosporins such as cefuroxime, which is a commonly used antibiotic in many hospitals. The Health Protection Agency (HPA) monitors trends in the numbers of bacteria producing these enzymes, and notes any increase. Extended-spectrum beta-lactamase producers can be detected among a number of Gram-negative bacteria including *Escherichia coli*, which are the most common pathogens causing UTIs. A positive urine culture with a single organism of $\geq 10^4$ colony forming units/ml, combined with urinary symptoms, may be diagnostic of a UTI, which in some patients will require treatment with antibiotics (HPA 2006).

There is a substantial body of evidence demonstrating a link between the over-prescribing and inappropriate use of antibiotics and the potential risk of developing *Clostridium difficile* infection and meticillin-resistant *Staphylococcus aureus* (DH 2007). Patients with CAUTIs who are subsequently treated with antibiotics may develop infections, which adversely affect the hospital's performance targets. Urinary catheters are the second most common cause, after central venous catheters, implicated in the development of bacteraemias in patients where invasive devices are used (Public Health Laboratory Service 2002).

Healthcare professionals should act to reduce the risk of CAUTIs by following the urinary catheter care bundle, which can be found at www.clean-safe-care.nhs.uk. The care bundle includes aspects such as correct hand hygiene practice, use of personal protective equipment, appropriate assessment and use of equipment, aseptic technique and maintaining a closed system.

Time out 2

Make a list of the ways in which you and your colleagues work to reduce the risks associated with catheter use. Once you have completed your list, compare your interventions with those discussed in this article.

Reducing the risks of catheter-associated urinary tract infection

There are two recognised pathways through which bacteria can gain entry to the bladder of a catheterised patient: the periurethral pathway and the intra-luminal pathway. The periurethral route involves the migration of bacteria into the bladder between the outside of the catheter and the inner side of the urethral wall. The intra-luminal route involves the upward movement of bacteria inside the catheter drainage system as a result of contamination of the drainage bag, either through the outflow tap or as a result of catheter disconnection. The intra-luminal route is thought to be the most common for bacterial entry (Garibaldi *et al* 1980, Maki and Tambyah 2001).

Studies have confirmed that bacteria associated with CAUTIs grow in glycocalyx-enclosed microcolonies in a biofilm on the catheter surface, which helps to protect the bacteria from the body's natural defence mechanisms (Nickel *et al* 1989, Ha and Cho 2006). Once the microorganisms attach to the catheter surface and produce the biofilm, they can multiply and disseminate (Tenke *et al* 2004). The microbial adherence to the catheter surface is therefore important in the pathogenesis of many CAUTIs. These bacteria have a number of advantages over other planktonic bacteria in that they are resistant to shear forces, phagocytosis and antibacterial agents (Trautner and Darouiche 2004). The development of anti-infective impregnated and silver-hydrogel coated catheters are designed to inhibit adherence of microorganisms to the catheter surface, particularly those from periurethral flora (Maki and Tambyah 2001).

An observational study by Mulhall *et al* (1993) found that disconnection of the urinary catheter and drainage bag occurred in 11% of catheter care procedures, and that incorrect emptying of drainage bags was also a common problem. DeGroot-Kosolcharoen *et al* (1988) evaluated the use of a pre-connected drainage bag system, which incorporated a tamper-proof seal on the catheter junction, but failed to demonstrate any significant advantage over traditional systems. However, a systematic review conducted by Dunn *et al* (2000) found that pre-connected systems contributed to the prevention of bacteriuria.

The pre-connected system (Figure 1) is a relatively new concept in the UK and, as such, few studies have been undertaken to examine its potential. In a study of 205 patients in medical wards, Madeo *et al* (2005) observed a decrease of 40 to 27 cases of CAUTIs. This represented a reduced rate of 41% of CAUTI using the pre-connected system compared with a conventional catheter and bag system.

National guidance In 1998, the DH commissioned the first phase of national evidence-based guidance for preventing HCAIs. This was followed by the publication of the epic project (Pratt *et al* 2001). As a result of the development of these guidelines, healthcare professionals have principles of good practice that they can incorporate into local protocols to prevent HCAIs linked with the use of short-term urethral catheterisation in acute care. More recently, the National Institute for Health and Clinical Excellence (NICE) commissioned guidelines for the prevention of HCAIs in primary and community care, which examined the use of long-term catheterisation and management issues (Pellowe *et al* 2004). The epic guidelines have also been updated (Pellowe *et al* 2004, Pratt *et al* 2007). The guidance informs the following review of catheterisation technique and best practice for the care and management of patients with urinary catheters.

FIGURE 1

Pre-connected system

Time out 3

Conduct an investigation of your local catheter care policy and examine this in line with the principles of best practice recommended by Pratt *et al* (2007).

Catheter selection

The decision to catheterise a patient should not be taken lightly and should be made only after considering alternative methods of management (Pratt *et al* 2001, 2007). Once the decision has been taken to insert a urethral catheter an assessment should be carried out to establish the correct device to use, taking into account diameter, balloon size, length and composition of the catheter (Tew *et al* 2005).

Circumference Catheter size is measured in Charrière (Ch). The Ch is the outer circumference of the catheter measured in millimetres and is roughly equivalent to three times the diameter. For example, a 12Ch catheter has a diameter of 4mm (Dougherty and Lister 2008). The urethral mucosa contains elastic tissue, which closes around the catheter. Larger catheters have been associated with increased catheter-related problems, in particular leakage (Kennedy 1983) and extreme pain (Roe and Brocklehurst 1987). Therefore, the smallest catheter that will provide adequate drainage should be used to prevent unnecessary trauma, which may later result in infection (Wilson 2001). Under normal circumstances a size 12Ch or 14Ch catheter is suitable for the majority of patients, with larger catheters reserved for specific purposes following urological advice (Winson 1997).

Length There are two lengths of adult catheter available: standard length of 40-45cm or female length of 20-26cm. The shorter female length catheter is more discreet and is less likely to cause trauma or infection as a result of reduced movement in and out of the urethra. Infection in women may also be caused by the looping or kinking of longer-length catheters (Dougherty and Lister 2008).

Balloon size In adult patients, a catheter with a 10ml balloon inflated with sterile water should be used (Pratt *et al* 2007, Dougherty and Lister 2008). Larger 30ml balloons should be reserved for patients following urological surgery as they are associated with urinary leakage, pain and bladder spasm (Robinson 2001). They also sit higher in the bladder, which allows a residual pool of urine to collect below the balloon that provides a reservoir for infection (Getliffe 1996).

Material There are two main types of catheter material used in Foley catheters: latex and silicone. The bonding or coating determines how long the catheter can remain in place. Practitioners should always refer to the manufacturer's recommendations to ensure correct use of the device.

A polytetrafluoroethylene catheter provides a smooth coating over the latex core of the catheter to reduce urethral irritation. Silicone is an inert material, which reduces urethral irritation. As a silicone catheter has no latex core it has a wider lumen, therefore allowing better drainage (Dougherty and Lister 2008). However, it is quite stiff and can be uncomfortable (Pomfret 2000). Hydrogel is a hydrophilic polymer, which also coats a latex core and becomes smoother when rehydrated by moisture in the urethra, reducing friction within the urethra. It is inert and is reported to be resistant to bacterial colonisation and encrustation (Roberts *et al* 1990, Woollons 1996).

The use of silver alloy and hydrogel-coated catheters has been clinically proven to delay the onset and decrease the incidence of CAUTIs by 26% to 47% (Karchmer *et al* 2000, Saint *et al* 2000), with many review bodies recognising their value (Association for Continence Advice 2004, Brosnahan *et al* 2004, HPA 2004, Seymour 2006). The use of this type of anti-infective catheter is an option for addressing the problem of antibiotic-resistant pathogens, although further work is required before efficacy is proven and cost effectiveness is established (Pratt *et al* 2007).

Time out 4

Consider any discussions that have been held locally about the merits and limitations of different catheter materials.

- To what extent do such conversations reflect the findings from research reported here and accommodate issues such as cost?
- If there are other important considerations that you have noted, to whom did you report these so that supplying companies could be consulted and purchase policy updated?
- If products have not been evaluated in this way, how might you ensure that the right catheter is chosen for the right function and patient?

Ongoing care: the nurse's role

A patient's risk of developing a CAUTI increases with the duration of catheterisation (Saint and

Lipsky 1999, Puri *et al* 2002). It is important that the patient's clinical need for continued catheterisation is reviewed regularly and that the catheter is removed as soon as possible (Pratt *et al* 2007). If prolonged catheterisation is required alternative methods of bladder drainage should be considered, such as intermittent self-catheterisation, which has a lower risk of CAUTI (Getliffe and Dolman 2003).

Catheters should be connected to a sterile catheter bag or valve, creating a closed system. Maintaining a sterile closed drainage system is central to the prevention of CAUTIs. The risk of infection with an open system is 97% but this falls to between 8% and 15% when a sterile closed system is adopted (Gillespie *et al* 1964). Breaking the closed system should be avoided; unnecessary emptying or changing of the catheter bag or taking a urine sample will increase the risk of infection.

Before touching any part of the closed drainage system the nurse's hands should be cleaned and a pair of single-use non-sterile gloves should be worn. Hands should be cleaned again after removing the gloves. It is important that patients and carers are educated in techniques of hand decontamination if they are involved in catheter care (Pratt *et al* 2001, 2007, Pellowe *et al* 2003).

Reflux of urine towards the bladder is associated with infection. It is important that catheter bags are positioned below the patient's bladder, either attached to their leg or on a catheter stand. The majority of bags, including specialised belly bags, have an anti-reflux valve to prevent the backflow of urine. Every effort should be made to prevent kinks in the tubing as they prevent urine drainage.

The tubing should be clamped for short periods of time if the patient's activity is likely to cause backflow of urine, for example when a patient sits in the bath. If drainage bags are on stands or hung at the side of a patient's bed it is important to reduce the risk of ascending infection by preventing the drainage port touching the floor. Drainage bags should not be allowed to overfill and should be emptied frequently enough to maintain urine flow and therefore prevent reflux. Overnight a larger capacity bag should be attached to the drainage port of the leg bag to form a linked system (Pratt *et al* 2001, 2007, Pellowe *et al* 2003).

When emptying the catheter bag, hands should be decontaminated and a pair of single-use non-sterile gloves should be worn. The drainage port should be cleaned with an alcohol swab and the urine drained into a single-use container avoiding contact between the drainage port and the container. The tap should then be cleaned with a new alcohol swab (Pratt *et al* 2007, Dougherty and Lister 2008).

If there is a clinical need to take a catheter specimen of urine, this should be taken from a sampling port using an aseptic technique (Pratt *et al* 2001, 2007, Pellowe *et al* 2003). The port should be cleaned with an alcohol swab and a sterile syringe should be used to aspirate the urine. Cleaning the port with an alcohol swab should be repeated at the end of the procedure (Dougherty and Lister 2008).

Patients, if possible, should be encouraged to carry out meatal cleansing as part of their daily hygiene routine. Normal urethral secretions may be increased as a result of irritation caused by the catheter and form crusts around the meatus. Removal of these crusts may expose damaged tissue susceptible to colonisation, which may then ascend to the bladder (Royal College of Nursing 2008). Studies have shown no evidence to suggest meatal cleansing with or without antiseptic reduces the incidence of CAUTI, although vigorous cleaning may increase the risk of infection (Saint and Lipsky 1999, Getliffe and Dolman 2003). However, in the absence of such evidence, Pellowe *et al* (2003) and Leaver (2007) recommend gentle genital hygiene using soap and water.

A high fluid intake of more than two litres a day has traditionally been recommended for catheterised patients (Wilson 1997). The rationale for this is that diuresis (increased production of urine by the kidney) will help to void bacteria from the bladder, and diluted urine will impair bacterial growth and reduce the concentration of encrustation components. Catheter drainage does not allow the normal physiological flushing and scouring action of micturition, and in addition the bladder is incompletely emptied as a result of urine pooling below the catheter balloon. Increased diuresis does not appear to have any effect on the development of catheter-associated biofilms; therefore they continue to provide a source of infection. Although there is no clear evidence to suggest that drinking large quantities of fluid will prevent CAUTIs it should still be encouraged to reduce bladder spasm, constipation and dehydration (Getliffe and Dolman 2003).

Drinking cranberry juice or taking cranberry capsules is often linked with reducing UTIs; however, most of the evidence is anecdotal (Getliffe and Dolman 2003). There is some evidence that cranberry juice may decrease the number of symptomatic UTIs over a 12-month period, particularly for women with recurrent infections, but its effectiveness in other groups is less certain (Jepson and Craig 2008).

Time out 5

With a colleague, take it in turns to audit a catheterisation procedure conducted by each of you. Provide feedback for each other on what was done particularly well and any aspects that could be improved. A suitable audit tool can be found at www.clean-safe-care.nhs.uk

All-in-one Foley tray

Bard has developed an all-in-one Foley tray, which incorporates the equipment needed for urinary catheterisation (Box 1). This system is a new concept for the UK but has been in use in the United States (US) and elsewhere for a number of years. The Foley tray contains commonly used products. A range of catheter materials, sizes and lengths are available. It is hoped that, by accessing a single pack rather than several items, healthcare professionals' speed and efficiency will be optimised.

The procedure for urethral catheterisation using the Foley tray is described in Box 2. The rationale for choosing the particular constituents of the tray is based on evidence-based guidelines (Pratt *et al* 2001, 2007, Pellowe *et al* 2003).

Catheterisation procedure

Whenever catheterisation is undertaken, to provide informed consent patients should be made aware of the procedure, aftercare and the possible complications that may arise with short-term and if necessary long-term catheter use (Hart 2008). The need for catheterisation, the procedure and subsequent care should be documented in line with Nursing and Midwifery Council (2005) guidance.

In addition to the infection risks associated with urethral catheterisation, patients can experience pain and trauma (Parker 1999, Hart 2008). Therefore it is imperative that the procedure is carried out by trained and competent healthcare professionals (Pellowe *et al* 2003, Pratt *et al* 2007).

Evidence dictates that urinary catheters should be inserted using sterile equipment and an aseptic technique (Pratt *et al* 2007). Hands should be decontaminated before carrying out the procedure and cleaned with alcohol gel before putting on sterile gloves. Because of the theoretical risk of exposure to bodily fluids, a single-use plastic apron should be worn (Pratt *et al* 2001, 2007, Pellowe *et al* 2003).

While an aseptic technique should always be used to clean the meatus, sterile 0.9% sodium chloride is recommended as there is no advantage in using any specific antiseptic solution as a cleansing agent (Pellowe *et al* 2003, Pratt *et al* 2007). The use of antiseptic agents may irritate the mucous membranes making this painful for the patient.

Trauma can occur during catheterisation, which can increase the risk of CAUTI (Dougherty and Lister 2008). Both epic (Pratt *et al* 2001, 2007) and NICE (Pellowe *et al* 2003) guidelines recommend the use of an appropriate sterile single-use lubricant or anaesthetic gel to reduce trauma and discomfort. The use of anaesthetic gel may have an advantage in reducing discomfort but often this is not left for the recommended length of time – over four minutes – therefore negating any anaesthetic properties (Tanabe *et al* 2004). A syringe of sterile lubricant is included in the tray but local policy should be adhered to when deciding which type of gel to use.

All catheters used in Foley trays are pre-connected to a drainage bag, which has a tamper-proof seal at the catheter/drainage bag junction. There is limited evidence on how often catheter bags should be changed. One study showed higher rates of symptomatic and asymptomatic CAUTIs were associated with a three-day urinary drainage bag change regimen compared to a no routine change regimen (Keerasuntonpong *et al* 2003).

To reduce CAUTIs best practice suggests that breaking the closed system to change the drainage device should only be done when necessary and in line with the patient's clinical need or manufacturer's recommendation (Pellowe *et al* 2003, Pratt *et al* 2007).

BOX 1

Contents of an all-in-one Foley tray

- Two pairs of latex-free gloves.
- Apron.
- Rubbish bag.
- Waterproof surface blanket.
- Sterile field/patient protection fenestrated drape.
- Vial 0.9% sodium chloride solution.
- Five gauze swabs.
- 10ml prefilled syringe of sterile water.
- 10ml syringe.
- Syringe of urethral lubricant.
- Foley catheter stabilisation device.
- Pre-connected catheter and drainage bag (choice of catheters and drainage bags).

BOX 2

Procedure for urethral catheterisation using the all-in-one Foley tray

- Explain the procedure to the patient and gain his or her consent.
- Assist the patient into an appropriate supine position.
- Wash hands.
- Open the outer packaging of the Foley tray and slide it on to the top of a clean trolley.
- Open the paper cover to reveal the contents.
- Put on the disposable plastic apron.
- Attach the rubbish bag to the trolley.
- Place the waterproof surface blanket under the patient's buttocks and thighs.
- Clean hands with alcohol hand gel.
- Put on sterile gloves (single or double glove in line with local policy).
- Open the 0.9% sodium chloride solution and empty into the well of the plastic tray.
- Place the sterile paper over the patient's thighs to create a sterile field.
- In men, wrap a gauze swab around the penis and retract the foreskin if necessary. Clean with swabs soaked in 0.9% sodium chloride solution using single strokes away from the meatus.
- In women, use a gauze swab to separate the labia minora to visualise the urethral meatus. Clean with swabs soaked in 0.9% sodium chloride solution using single downward strokes away from the meatus.
- If using a double glove technique remove the outer set of gloves.
- In men, grasp the penis behind the glans and extend. Maintain this extension throughout the procedure.
- Insert the nozzle of the urethral lubricant into the urethra and squeeze to empty the syringe. In men, massage the gel along the urethra.
- Place the pre-connected catheter system on the sterile field covering the patient's thighs.
- Holding the catheter through the packaging, gently insert the catheter using a slow steady pressure.
- If urine is draining advance the catheter almost to its bifurcation.
- Inflate the catheter balloon using the syringe of sterile water, observing the patient for discomfort.
- Withdraw the catheter gently.
- Clean away any excess lubricant. In men, reduce or reposition the foreskin.
- Remove the sterile field.
- In preparation for stabilising the catheter fully extend the leg and position the catheter straight on the front of the thigh. Then back the catheter up approximately 3cm to create some slack. This amount of slack is important as it allows movement of the swivel clamp while it is not enough to cause the catheter to kink.
- Open the Foley catheter stabilisation device and clean the thigh using both skin preparation swabs. Allow to dry for around ten to 15 seconds.
- Press the Foley catheter into the stabilisation device ensuring that the bifurcation of the catheter sits neatly around the central post. This will stop the catheter from pulling. Close the lid by pressing from the side of the lid (this prevents the catheter from being pinched).
- Position the stabilisation device on the prepared area. To avoid applying too tightly peel away the paper backing one side at a time.
- Position the catheter bag below the bladder either on a stand ensuring that the drainage port is not in contact with the floor or using leg straps.
- Dispose of all the equipment in the clinical waste bag in line with local procedure.
- Measure the residual urine and document the procedure in the patient's records.

(Based on Head 2006, Bard 2008, Dougherty and Lister 2008)

As manufacturers generally recommend weekly bag changes the pre-connected system has a double advantage as it can remain in place for 14 days, so reducing cost (Ushizaka and Shibita 1998), although further work is needed to determine the optimal frequency to change catheter bags.

National guidance does not make any recommendation on methods of catheter fixation (Billington *et al* 2008). If the catheter is not secured properly, or if irritation causes the patient to pull on the device itself or the connecting tube, the catheter may migrate from its intended point of fixation. Any movement-induced trauma and inflammation can predispose the patient to infection and lead to tissue necrosis, blockage of urethral glands, urethral cleavage (damage to the urethral wall), and bladder irritability and spasms (Hanchett 2002).

The clinical evidence to support effective catheter stabilisation as a direct contributor to minimising the risk of CAUTIs is limited. However, anecdotal evidence from the US supporting new initiatives to stabilise catheters and reduce infection rates is encouraging

References

Association for Continence Advice (2004) *Urethral Catheterisation*. ACA, London.

Bard (2008) *Bard Comprehensive Care, Catheter Fixation: StatLock® Foley Stabilisation Device Instructions for Use*. BARD Ltd, Crawley.

Billington A, Crane C, Jownally S, Kirkwood L, Roodhouse A (2008) Minimizing the complications associated with migrating catheters. *British Journal of Community Nursing*. 13, 11, 502-506.

Brosnahan J, Jull A, Tracy C (2004) Types of urethral catheters for management of short-term voiding problems in hospitalised adults. *Cochrane Database of Systematic Reviews*. Issue 1.

Darouiche RO, Goetz L, Kaldis T, Cerra-Stewart C, AlSharif A, Priebe M (2006) Impact of StatLock securing device on symptomatic catheter-related urinary tract infection: a prospective, randomized, multicenter clinical trial. *American Journal of Infection Control*. 34, 9, 555-560.

DeGroot-Kosolcharoen J, Guse R, Jones JM (1988) Evaluation of a urinary catheter with a preconnected closed drainage bag. *Infection Control and Hospital Epidemiology*. 9, 2, 72-76.

Department of Health (2007) *Saving Lives: Reducing Infection, Delivering Clean and Safe Care. Taking Blood Cultures*. The Stationery Office, London.

Department of Health (2008) *The Health Act 2006: Code of Practice for the Prevention and Control of Healthcare Associated Infections*. The Stationery Office, London.

Dougherty L, Lister S (Eds) (2008) *The Royal Marsden Hospital Manual of Clinical Nursing Procedures*. Seventh edition. Wiley-Blackwell, Oxford.

Duerden B (2008) Tackling health-care associated infections in the NHS: progress so far. *Journal of Infection Prevention*. 9, 2, 4-7.

Dunn S, Pretty L, Reid H, Evans D (2000) *Management of Short Term Indwelling Urethral Catheters to Prevent Urinary Tract Infections*. Joanna Briggs Institute, Adelaide.

Emmerson AM, Enstone JE, Griffin M, Kelsey MC, Smyth ET (1996) The Second National Prevalence Survey of infection in hospitals: overview of the results. *Journal of Hospital Infection*. 32, 3, 175-190.

Garibaldi RA, Burke JP, Britt MR, Miller MA, Smith CB (1980) Meatal colonization and catheter-associated bacteriuria. *New England Journal of Medicine*. 303, 6, 316–318.

Getliffe K (1996) Care of urinary catheters. *Nursing Standard*. 11, 11, 47-54.

Getliffe K, Dolman M (Eds) (2003) *Promoting Continence: A Clinical and Research Resource*. Second edition. Baillière Tindall, London.

Gillespie WA, Lennon GG, Linton KB, Slade N (1964) Prevention of urinary infection in gynaecology. *British Medical Journal*. 2, 5406, 423-425.

Glynn A, Ward V, Wilson J (1997) *The Socio-Economic Burden of Hospital Acquired Infection*. Public Health Laboratory Service, London.

Goolsarran VJ, Katz TF (2002) Do not go with the flow, remember indwelling catheters. *Journal of the American Geriatrics Society*. 50, 10, 1739-1740.

Ha US, Cho YH (2006) Catheter-associated urinary tract infections: new aspects of novel urinary catheters. *International Journal of Antimicrobial Agents*. 28, 6, 485-490.

Hanchett M (2002) Techniques for stabilizing urinary catheters. Tape may be the oldest method, but it's not the only one. *American Journal of Nursing*. 102, 3, 44-48.

Hart S (2008) Urinary catheterisation. *Nursing Standard*. 22, 27, 44-48.

Head C (2006) Insertion of a urinary catheter. *Nursing Older People*. 18, 10, 33-36.

Health Protection Agency (2004) *Rapid Review Panel Reports: BardexIC – Silver Alloy Coated Hydrogel Catheters*. www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947346328 (Last accessed: March 11 2009.)

Health Protection Agency (2006) *Diagnosis of UTI: Quick Reference Guide for Primary Care*. www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947404720 (Last accessed: March 11 2009.)

Hospital Infection Society (2007) *The Third Prevalence Survey of Healthcare Associated Infections in Acute Hospitals in England 2006*. www.his.org.uk/_db/_documents/Summary_of_preliminary_results_for_England.pdf (Last accessed: March 11 2008.)

Jepson RG, Craig JC (2008) Cranberries for preventing urinary tract infections. *Cochrane Database of Systematic Reviews*. Issue 1.

Karchmer TB, Giannetta ET, Muto CA, Strain BA, Farr BM (2000) A randomized crossover study of silver-coated urinary catheters in hospitalized patients. *Archives of Internal Medicine*. 160, 21, 3294-3298.

Keerasuntonpong A, Thearawiboon W, Panthawanan A *et al* (2003) Incidence of urinary tract infections in patients with short-term indwelling urethral catheters: a comparison between a 3-day urinary drainage bag change and no change regimens. *American Journal of Infection Control*. 31, 1, 9-12.

Kennedy A (1983) Incontinence advice. 1. Long-term catheterisation. *Nursing Times*. 79, 17, 41-45.

Leaver RB (2007) The evidence for urethral meatal cleansing. *Nursing Standard*. 21, 41, 39-42.

Madeo M, Barr B, Owen E (2005) A study to determine whether the

(Darouiche *et al* 2006). Providing better catheter stabilisation by the use of an approved device may address these issues.

Conclusion

Urinary catheterisation is a common procedure undertaken by nurses in acute care settings. This procedure is not risk free and should only be undertaken when all other options have been thoroughly explored. Urinary catheters need to be removed as soon as possible to minimise the risk of CAUTIs. If used, catheters need to be correctly anchored to the patient to prevent trauma or accidental removal.

The publication of evidence-based guidelines for urinary catheters will assist practitioners to implement best practice and reduce the risks of CAUTI. All clinical staff need to be trained and competent in the management of a patient with a urinary catheter to make the experience as safe and effective as possible **NS**

Time out 6

Now that you have completed the article you might like to write a practice profile. Guidelines to help you are on page 60.

use of a pre-connect urinary catheter system reduces the incidence of nosocomial urinary tract infections. *British Journal of Infection Control*. 6, 4, 22-25.

Magnall J, Watterson L (2006) Principles of aseptic technique in urinary catheterisation. *Nursing Standard*. 21, 8, 49-56.

Maki DG, Tambyah PA (2001) Engineering out the risk for infection with urinary catheters. *Emerging Infectious Diseases*. 7, 2, 342-347.

Mulhall AB , King S, Lee K, Wiggington E (1993) Maintenance of closed urinary drainage systems: are practitioners more aware of the dangers? *Journal of Clinical Nursing*. 2, 3, 135-140.

Nickel JC, Feero P, Costerton JW, Wilson E (1989) Incidence and importance of bacteriuria in postoperative, short-term urinary catheterization. *Canadian Journal of Surgery*. 32, 2, 131-132.

Nursing and Midwifery Council (2005) *Guidelines for Records and Record Keeping*. NMC, London.

Parker LJ (1999) Urinary catheter management: minimizing the risk of infection. *British Journal of Nursing*. 8, 9, 563-570.

Pellowe CM, Pratt RJ, Harper P *et al* (2003) Evidence-based guidelines for preventing healthcare-associated infections in primary and community care in England. *Journal of Hospital Infection*. 55, Suppl 2, S2-127.

Pellowe CM, Pratt RJ, Loveday HP, Harper P, Robinson N, Jones SRLJ (2004) The epic project. Updating the evidence-base for national evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England: a report with recommendations. *British Journal of Infection Control*. 5, 6, 10-16.

Plowman R, Graves N, Griffin M *et al* (1999) *The Socio-Economic Burden of Hospital-Acquired Infection*. Public Health Laboratory Service, London.

Pomfret I (2000) Catheter care in the community. *Nursing Standard*. 14, 27, 46-51.

Pratt RJ, Pellowe C, Loveday HP *et al* (2001) The epic project: developing national evidence-based guidelines for preventing healthcare associated infections. *Journal of Hospital Infection*. 47, Suppl, S3-82.

Pratt RJ, Pellowe CM, Wilson JA *et al* (2007) epic2: National evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England. *Journal of Hospital Infection*. 65, Suppl 1, S1-64.

Public Health Laboratory Service (2002) *Surveillance of Hospital-Acquired Bacteraemia in English Hospitals 1997-2002*. www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947379958 (Last accessed: March 11 2008.)

Puri J, Mishra B, Mal A *et al* (2002) Catheter associated urinary tract infections in neurology and neurosurgical units. *Journal of Infection*. 44, 3, 171-175.

Roberts JA, Fussell EN, Kaack MB (1990) Bacterial adherence to urethral catheters. *Journal of Urology*. 144, 2 Pt 1, 264-269.

Robinson J (2001) Urethral catheter selection. *Nursing Standard*. 15, 25, 39-42.

Roe BH, Brocklehurst JC (1987) Study of patients with indwelling catheters. *Journal of Advanced Nursing*. 12, 6, 713-718.

Royal College of Nursing (2008) *Catheter Care: RCN Guidance for Nurses*. RCN, London.

Saint S, Lipsky BA (1999) Preventing catheter-related bacteriuria: should we? Can we? How? *Archives of Internal Medicine*. 159, 8, 800-808.

Saint S, Veenstra DL, Sullivan SD, Chenoweth C, Fendrick AM (2000) The potential clinical and economic benefits of silver alloy urinary catheters in preventing urinary tract infection. *Archives of Internal Medicine*. 160, 17, 2670-2675.

Seymour C (2006) Audit of catheter-associated UTI using silver alloy-coated Foley catheters. *British Journal of Nursing*. 15, 11, 598-603.

Tambyah PA (2004) Catheter-associated urinary tract infections: diagnosis and prophylaxis. *International Journal of Antimicrobial Agents*. 24, Suppl 1, S44-48.

Tanabe P, Steinmann R, Anderson J, Johnson D, Metcalf S, Ring-Hurn E (2004) Factors affecting pain scores during female urethral catheterization. *Academic Emergency Medicine*. 11, 6, 699-702.

Tenke P, Jackel M, Nagy E (2004) Prevention and treatment of catheter-associated infections: myth or reality? *EUA-EBU Update Series*. 2, 3, 106-115.

Tew L, Pomfret I, King D (2005) Infection risks associated with urinary catheters. *Nursing Standard*. 20, 7, 55-61.

Trautner BW, Darouiche RO (2004) Role of biofilm in catheter-associated urinary tract infection. *American Journal of Infection Control*. 32, 3, 177-183.

Ushizaka A, Shibita K (1998) Summary of surveillance of urinary tract infection. *Infection Control*. 7, 10, 67-71.

Wilson J (1997) Control and prevention of infection in catheter care. *Community Nurse*. 3, 5, 39-40.

Wilson J (2001) *Infection Control in Clinical Practice*. Second edition. Baillière Tindall, London.

Winson L (1997) Catheterization: a need for improved patient management. *British Journal of Nursing*. 6, 21, 1229-1252.

Woollons S (1996) Urinary catheters for long-term use. *Professional Nurse*. 11, 12, 825-832.