Troubleshooting indwelling catheter problems in the community

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Patients in the community may often have a long-term urinary catheter in place. The management of this usually falls to the community nurse therefore he or she needs to understand the basic procedures involved in urethral and suprapubic catheterisation, as well as being familiar with potential complications and how to troubleshoot. Catheter blockages are the most common problem encountered in long-term catheterisation and it is important that the nurse knows how to address this methodically and identify and treat the cause. This article offers practical and evidence-based advice on some of the common issues that can arise in the management of people who have long-term catheters in place.

KEYWORDS:
Continence ■ Urinary continence ■ Indwelling catheters

Urinary incontinence is a very common symptom that can affect people of any gender or age and can range in severity from mild to very severe (National Institute for Health and Care Excellence [NICE], 2013). Current statistics estimate that there are 14 million people with a bladder problem in the UK, and a further 6.5 million with a bowel problem, both of which are probably underestimates (Bladder and Bowel Foundation, 2015).

The International Continence Society has defined urinary incontinence as involuntary leakage of urine (Abrams et al, 2002) and various abnormalities (e.g. urogenital fistula, cancerous pelvic mass) can compound the situation and increasing the risk of leakage further.

Urinary incontinence can restrict a patient’s day-to-day functioning affecting education, social life and employment. Ultimately, this can lead to social isolation, distress, low self-esteem and potential mental health problems (All Party Parliamentary Group for Continence Care [APPGCC, 2013]).

In 2013, the APPGCC published its in-depth survey into other effects of incontinence that may be not as widely appreciated, such as falls, infections and pressure sores. These are all factors that can cause an increase in unnecessary hospital admissions and with the current economic climate it is a requirement that all healthcare professionals must be vigilant.

The risk of moisture lesions/pressure sores are a concern for all trusts because of delayed discharge; the cost of any extra treatment required to heal the skin, including equipment such as mattress, etc; and the cost of increased nurse visits even after discharge. All this, of course, is quite apart from the harm done to patients themselves in terms of pain and poor quality of life, etc.

When it comes to urinary incontinence, it is important that community nurses are proactive and not reactive — this involves trying to understand urinary incontinence and addressing it according to the patient’s needs (APPGCC, 2013).

THE SCIENCE — COMMON BLADDER SYMPTOMS
Symptoms of bladder dysfunction include:
› A sudden urge to go to urinate or difficulty ‘holding on’ is a symptom of urgency or urge incontinence
› Needing to urinate more than eight times in a single day can be a sign of urinary frequency
› Nocturia is signalled by repeated urination through the night; nocturnal enuresis is wetting the bed at night
› Mixed urinary continence is signalled by a mixture of the above symptoms
› Urination upon laughing, coughing, sneezing or exercise is a symptom stress urinary incontinence (SUI)
› Overflow incontinence is signalled by small leakages of urine that are not noticed by the individual.

Source: Bladder and Bowel Foundation: www.bladderandbowelfoundation.org
If the patient has a medical condition that requires a long-term or indwelling catheter — such as multiple sclerosis, Parkinson’s disease, bladder cancer, or during palliative care if the skin integrity is being compromised — then a silicone- or hydrogel-coated catheter should be used as they are less likely to become encrusted, which can result in bladder stones (see below for a full explanation of this phenomenon) (European Association of Urology, 2012).

Infection

Urinary catheters account for more healthcare-associated infections than any other device (Kleinpell et al, 2008), therefore managing them effectively is key. If the patient experiences persistent asymptomatic bacteriuria, silver-coated catheters can be used (Tenke et al, 2008), but these are only recommended for 28 days (European Association of Urology, 2012).

In the community, good management means ensuring that nurses’ catheter-management skills are well-developed to prevent patients simply being sent to A&E. Catheter blockage and encrustation are the main two problems associated with indwelling catheters (European Association of Urology, 2012), and nurses need to be aware of the latest research and best practice so that they can provide evidence-based care (Evans, 2001; Getliffe, 2004).

CATHETER BLOCKAGES

Sudden catheter blockages are distressing for patients (Getliffe, 2004) and represent an emergency, which require fairly quick management. Community staff — in particular district nurses — need to understand how to manage this common problem as it can occur at any time (European Association of Urology, 2012; RCN, 2012a).

Catheter blockage can occur in 40–50% of patients (European Association of Urology, 2012) and one of the commonest problems is where the lumen (the inside space of the catheter) becomes blocked through encrustation or the build-up of debris (RCN, 2012a).

When a urinary catheter has been in situ for 28 days or more, the probability of a urinary infection increases (Prinja and Chapple, 2013). Bacteria can easily migrate along the outer or inner surface of the catheter, usually within 2–10 days of insertion (Feneley et al, 2011). Here they can form a biofilm (a living layer of cells) on the catheter’s outer surface, which in turn produces a ‘sticky’ glycocalyx (a glycoprotein-polysaccharide covering that surrounds the cell membranes of some bacteria) which adheres to the catheter surface, often protecting the bacteria from antibiotic therapy (Evans, 2001; European Association of Urology, 2012).

Catheters can block through a combination of encrustation and bacterial build-up, impeding the flow of urine.

Encrustation

Encrustation occurs when bacteria within the urine (Proteus mirabilis) produce an enzyme called urease — this splits urinary urea into ammonia and carbon dioxide (Getliffe, 2004; Hagen et al, 2010). The bacteria cause an increase in the pH of the urine, producing the optimum alkaline conditions for struvite (magnesium ammonium phosphate) and calcium phosphate (hydroxyapatite) crystals to develop around the eyelets, lumen and balloon of the catheter (Getliffe, 2004).

These crystals can ‘fall’ into the bladder and form bladder stones (Hagen et al, 2010). Regular pH testing of the urine can help to ascertain which patients may be prone to catheter blockage and allow for planned catheter changes (Getliffe, 2004). A ‘normal’ urine pH averages 6.0 but can range from 4.5–8.0 — catheterised patients with a pH over 6.8 will have alkaline urine which may result in encrustation.

Fluid balance

When managing a patient with an indwelling catheter, the community nurse should try to ensure that the patient takes in regular fluids — this will help to dilute the
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Five-minute test

Answer the following questions about this topic, either to test the new knowledge you have gained or to form part of your ongoing practice development portfolio.

1. What are some of the common bladder symptoms?
2. Can you identify why encrustation might occur?
3. What are some of the key elements that cause encrustation to block a catheter?
4. Why is bypassing such a problem in catheters?
5. What are the dangers of poor urine drainage?

urine, thereby reducing the risk of encrustations and blockages (European Association of Urology, 2012). Fluid balance charts can help to establish input/output and to track the type of fluid being drunk, and help the nurse to assess if continence is being adequately managed.

As encrustation is less likely in acidic urine — cranberry juice and/or ascorbic acid (this comes in a dissolvable powder) may help, but there is still further research needed in this particular area (Getliffe, 2004; European Association of Urology, 2012).

Catheter maintenance solutions

Catheter maintenance solutions such as bladder washouts and instillations can be useful in extending the longevity of the catheter — these come in various volumes and versions, depending on the manufacturer, but essentially aim to flush-out the catheter by introducing a sterile catheter maintenance solution into the bladder through the catheter, hopefully removing any blockages (Getliffe, 2004).

However, these kind of solutions do require specialist knowledge, particularly as the catheter is a closed system is disrupted each time it is opened (the entire catheter system including the catheter itself, tubing, the drainage bag, etc is ‘closed’ to prevent infection — the use of a maintenance solution, ‘breaks’ this closed system as it needs to be insterted) (Pomfret, 1996).

Similarly, with the advent of independent prescribing it is imperative that nurses employ best practice when using catheter maintenance solutions (RCN, 2012a), for instance they should not be used on a regular basis but in conjunction with catheter diaries so that the nurse can plot when the catheter is going to block and try to preempt this with a catheter maintenance solution.

Some of the catheter maintenance solutions available include (European Association of Urology, 2012; BMA and the Royal Pharmaceutical Society, 2015):
- Citric acid 3.22%: this is used to prevent the development of encrustation by dissolving any mineral deposits
- Citric Acid 6%: used for patients whose catheters persistently block. Before a catheter is taken out the solution helps to dissolve any crystals that have formed around the tip, which if not removed could cause trauma to the urethral tissue. This solution is recommended for severe encrustations but can cause irritation
- Sodium chloride: this solution helps to ‘flush-out’ any debris/mucus that has collected around the catheter. However, this solution has a neutral pH, and therefore will not dissolve any encrustations.

Catheter maintenance solutions should not be a first-line treatment and a thorough assessment should always be undertaken to make sure they are needed.

Documentation

Keeping accurate charts can assist the nurse in understanding any patterns and the possible need for catheter changes (usual practice is to change the catheter every three to five weeks to lessen the chance of encrustation developing) (Getliffe, 2004).

Documenting how often the patient’s catheter is being changed can help to inform the nurse if it might need to be changed more often than stipulated by the manufacturer.

Diet and exercise

Diet and exercise do play a part in the longevity of urinary catheters, particularly if the patient is prone to constipation. Constipation impacts on the catheter because as the bowel expands it can press on the urethra and prevent the flow of urine through the catheter.

Charting the patient’s bowel habit can be a useful tool in establishing whether constipation is an issue and whether the patient’s fluid or nutritional intake may need to be adjusted (RCN, 2012b).

BYPASSING

Bypassing — where the urine leaks between the catheter’s shaft and the urethral mucosa — is another common problem for community nurses (European Association of Urology, 2012), which can be distressing for the patient and can hinder accurate recording of urine output. Here again, documenting the fluid intake and the types of fluid being drunk are important, for instance too much caffeine can irritate the bladder wall, causing a spasm that may expel the catheter.

A healthy diet containing plenty of fibre is also important when it comes to bypassing (RCN, 2012b). If the patient’s bowel becomes over-distended it can press on the catheter and obstruct the flow of urine (RCN, 2012b).

If a patient’s catheters are being expelled frequently, the option of a suprapubic catheter (inserted into the bladder through a small incision in the abdomen) should be considered otherwise the urethra can become wider, allowing urine to bypass the lumen of the catheter (Evans, 2001). Simply increasing the Charrière (diameter size) of the catheter or balloon will not solve this problem.
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POOR URINE DRAINAGE

Poor drainage is generally a mechanical dysfunction, often where the tubing has become ‘kinked’. The community nurse should examine the position of the bag to make sure it is being supported and lying below the level of the bladder, thus allowing the urine to drain through gravity (Evans, 2001).

For patients who are in wheelchairs and using ‘belly’ or thigh drainage bags, this can pose a problem in that the bag position can be higher than the bladder itself, impeding drainage. In this case, extra tubing can be used to assist drainage, while making sure that the tube is not kinked (Getliffe, 2004).

It is also important to check for constipation, which can impede catheter drainage, and to ensure the patient’s bowels return to normal function, through fluid intake, nutrition and medication if appropriate.

If the catheter is still not draining, the nurse should remove it and check for encrustation by cutting the catheter lengthways along the lumen. Otherwise, bladder spasm or contraction — which can be caused by a urinary tract infection (UTI) or irritation from the catheter (see below) — should be considered, (RCN, 2012a). Another option is to check if the patient is dehydrated.

After inserting a new catheter it is also crucial to check its position, that is at the right length, and that the drainage holes (also called the ‘eyes’) are properly located in the bladder (RCN, 2012a).

BLADDER SPASMS/ PAIN

Bladder spasms or contractions are best managed by the use of antimuscarinic medication. This blocks the muscarinic receptors at the detrusor muscle, which control the contractions in the bladder, thereby calming the spasm. However, it is important to check that constipation is not also a factor. Other solutions may be to consider a smaller catheter size, smaller balloon size, or different catheter material (European Association of Urology, 2012).

Bladder pain can accompany a spasm and the nurse should check the patient’s bowels as constipation can put pressure on the bladder and again, antimuscarinic medication could help reduce the pain. If the pain does not abate, however then further investigation by a urologist may be required (European Association of Urology, 2012).

REMOVAL OF SUPRAPUBIC CATHETERS

Removal of all-silicone suprapubic catheters can pose particular problems as the balloon that anchors the catheter in the bladder may not return to its original shape and can form a ‘cuff’, making removal difficult (Evans, 2001).

Manufacturers recommend that nurses make sure that all of the water has been withdrawn from the balloon, then allow the catheter to stay in situ for at least five minutes — this allows the catheter to regain its original shape (European Association of Urology, 2012). Rotating the catheter slowly on withdrawal may also help.

Overgranulation of the insertion site can also be a problem. The solution here is to change the angle at which the catheter lies against the abdomen and tape it accordingly. If persistent, this can also be treated with a silver nitrate ‘stick’ or ‘pencil’ — these are caustic and when applied to the area, slough away any excess tissue (European Association of Urology, 2012).

However, chemical burns have been reported in extended application and a barrier such as petroleum jelly or white soft paraffin should be applied to protect the normal skin (Hampton, 2007).

CONCLUSION

The management of long-term urinary catheters often comes under the jurisdiction of the nurse. This requires skill in urethral and suprapubic catheterisation procedures, as well as familiarity with potential complications and how to troubleshoot them. Catheter blockages are the most common problem and it is crucial that the nurse knows how to address these methodically, and identify and treat the cause (RCN, 2012a).

Catheter maintenance solutions are still valuable tools in the longevity of the catheter, but more research is needed on their efficacy (Getliffe, 2004). Until then it is the only method available for nurses to try to prevent blockages before they occur. (European Association of Urology, 2012).

It is advisable to get to know the staff in the local continence service/urology department as well as finding out which continence-related medications are available on the local formulary.

REFERENCES


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KEY POINTS

- Urinary incontinence can restrict a patient’s day-to-day functioning affecting education, social life and employment.

- When it comes to urinary incontinence, it is important that community nurses are proactive and not reactive.

- Nurses need to be familiar with any potential catheterisation complications and know how to troubleshoot them.

- Catheter maintenance solutions are still valuable tools in the longevity of the catheter, but more research is needed.

- It is advisable that community nurses get to know the staff in the local continence service/urology department as well as finding out which continence-related medications are available on the local formulary.