

# Safe and effective catheterisation for patients in the community

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## Safe and Effective catheterisation for patients in the community

### Introduction to catheterisation

Catheterisation is defined as “drainage or aspiration of the bladder or urinary reservoir (such as a mitrofanoff- a surgically formed channel into the bladder)” (Vahr et al, 2013 pg13). “A catheter is a thin hollow flexible tube which can be inserted into the bladder either through the urethra or a suprapubic channel to drain the urine” (Geng et al, 2012, pg12). Catheterisation can be intermittent (termed intermittent self-catheterisation) or indwelling. Long term indwelling catheterisation can be transurethral (figure 1) or suprapubic (into the bladder via the anterior abdominal wall) (figure 3) (Geng et al, 2012). Suprapubic catheters are usually inserted by a doctor, but the procedure can be undertaken by a clinical specialist nurse.

Figure 1

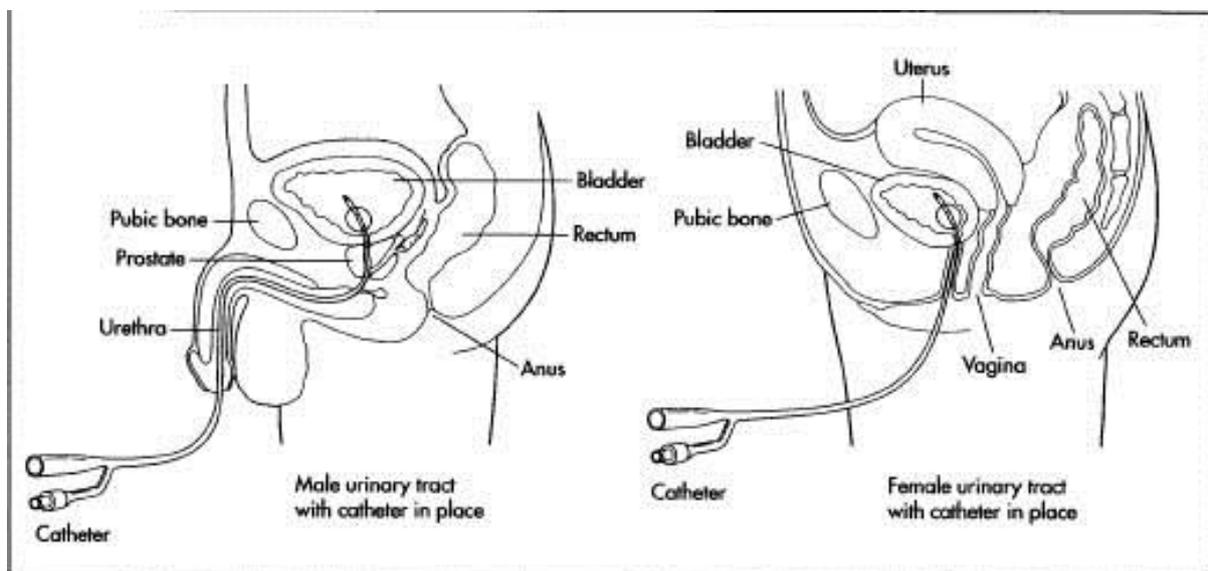
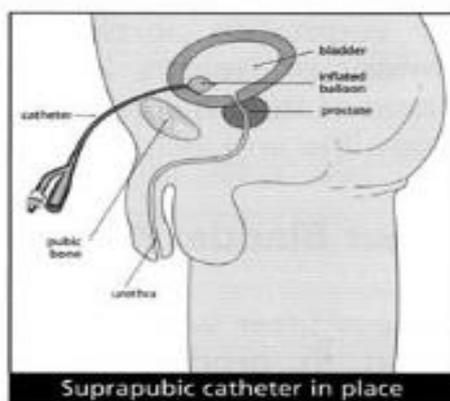


Figure 2



Intermittent self-catheterisation (ISC) is an accepted method for bladder emptying, and involves the subsequent removal of the catheter (Abrams et al, 2002). ISC is a clean technique which is often performed independently by the patient or by a carer. For many ISC promotes independence, self-management, preserves intimacy and sexuality and often improves quality of life (NICE, 2010,

Nazarko, 2012 and NICE, 2013). Although ISC is recommended over indwelling catheters (NICE, 2013), it does not suit all patients and the patients wishes must be taken into account.

Approximately 450,000 people use a long-term urinary catheter in the UK (Prinjha and Chapple, 2013). Permanent catheters are used by 3% of the community population and 16% of those in residential care over 65 years (Royal College of Physicians (RCP), 2010) and between 9-40% of those in nursing homes (McNulty et al, 2003), and these figures are likely to rise as the population ages. Long-term catheters occupy an estimated 4% of a district nurses case load in the UK (Getliffe and Newton, 2006). However people of any age may require a permanent indwelling catheter.

The care and management of catheters in the community is expensive and time consuming (Sassoon., Abercrombie and Goodrum, 1991 and (Kohler-Ockmore and Feneley, 1996), with the burden on the individual and services high (Elves and Feneley, 1997). Therefore catheterisation must be regarded as a last resort for the management of urinary problems. Despite this, catheterisation will remain the best option for some patients (National Clinical Guideline Centre UK, 2012, section 10). The method of catheterisation depends on the individual's requirements, but can also be limited by the availability of clinical expertise and services (National Clinical Guideline Centre UK, 2012).

There are a number of complications associated with catheterisation, which include infection, physiological/structural damage, urological cancer and psycho-social problems (Warren, 1997, Pomfret, 2000 and Delnay et al, 1999). Infection is interrelated to problems with encrustation and blockage (National Clinical Guideline Centre UK, 2012)

### **Bladder function and dysfunction**

The function of the bladder is to store and expel urine. An average adult bladder can hold between 350 and 500mls of urine and the first sensation of bladder fullness occurs at around 200mls. Capacity can be reduced to as little as 100mls if the bladder is scarred and fibrotic, but can also exceed 500mls where the bladder has become flaccid and overstretched (Lukacz et al, 2011). Disease and ageing can affect bladder sensation. In a healthy bladder, after the bladder empties a small amount of urine may remain (less than 75mls), this is termed a post-void residual (PVR) (Newman and Wilson, 2011 and Kelly, 2004). In patients with chronic retention the bladder becomes desensitised due to overstretching of the bladder muscle and so sensation of bladder fullness may be absent. If a person cannot void or empty the bladder completely the PVR increases, which can lead to urinary tract infections (UTI) incontinence and permanent damage to the bladder and kidneys.

Chronic retention develops slowly and often presents with symptoms of urinary frequency, urgency, nocturia and dribbling or overflow incontinence, and is typically painless (Basson., van der Walt, and Heyns, 2012).

The majority of long-term catheter users have neurogenic bladder dysfunction associated with conditions such as multiple sclerosis, stroke and spinal cord injury (National Institute for Health and Care Excellence, (NICE) 2012 and Wilde et al, 2010). Difficulties with bladder emptying can also occur as result of:

- Side effects from medications such as anticholinergics, BOTOX® (injected into the bladder for detrusor instability) and antipsychotics
- Bladder outflow obstruction due to constipation, prostate enlargement or urethral stricture
- Post anaesthetic - the use of spinal and epidural anaesthesia increases the risk of urinary retention post operatively

- Surgical procedures for stress incontinence. These work on the principle of causing a certain degree of outflow obstruction to the bladder outlet, as a consequence this can cause impairment to bladder emptying in some patients.
- Post-natal – due to pudendal nerve damage
- Ageing – due to the reduced elasticity and contractility of the bladder muscle

(Vahr et al, 2013)

## **Indications and contraindications for catheterisation**

### Indications for catheterisation

The indications for indwelling catheterisation and ISC are the same, however the choice should rest with the patient where possible. However catheterisation should only be required in the presence of a residual volume which results in symptoms and complications. Indwelling catheterisation should only be considered for intractable incontinence where it is the patients choice or there are significant other risks such as maintaining skin integrity where there are sacral or perineal wounds or to improve comfort in end of life care (NICE, 2013, NICE, 2010, Gammack, 2002 and Geng, 2012). It is important to remember however that a lack of resources to support appropriate toileting and care should never be used as a reason for catheterisation (Royal College of Nursing (RCN), 2012).

Indications for catheterisation include:

- Acute and chronic urinary retention
- Maintain a continuous flow of urine in patients with voiding difficulties
- Need for accurate measurement of urinary output in critically ill patients
- To allow for bladder irrigation – such as following prostate surgery
- Peri-operatively for urological and gynaecological conditions

In addition to the indications for urethral catheterisation the following indications for supra-pubic catheterisation apply:

Patient preference due to patient needs e.g. wheelchair user, sexual issues.

- Acute prostatitis.
- Obstruction, stricture, abnormal urethral anatomy.
- Pelvic trauma.
- Complications of long-term urethral catheterisation.
- Complex urethral or abdominal surgery.
- Faecally incontinent patients who are constantly soiling urethral catheter.

(Geng et al, 2012)

## **Contraindications**

There are few contraindications for ISC, and in the main they are related to high intravesical pressure, which requires free drainage to prevent renal damage (Vahr et al, 2013). Complications include: UTI, genital infections such as epididymitis, urethral bleeding, urethritis, urethral stricture, incontinence and bladder stones (Igawa., Wyndaele and Nishizwa, 2008).

Indwelling urinary (suprapubic and urethral) catheters account for more healthcare associated infections than any other device, with as many as half of users experiencing recurrent infections, blockage and associated leakage (Stickler and Feneley, 2010). Long term indwelling catheterisation (suprapubic and urethral) also increases the risk of bladder carcinoma (Igawa., Wyndaele and Nishizwa, 2008). The main contraindications for indwelling urethral catheterisation are acute prostatitis and where there is suspicion of urethral trauma (Geng, 2012).

Contraindications for suprapubic catheterisation include:

- Known or suspected carcinoma of the bladder.
- Previous lower abdominal surgery.
- Coagulopathy – a clotting disorder and bleeding disorder in which the blood's ability to clot (coagulate) is impaired - until the abnormality is corrected.
- The presence of ascites.
- Prosthetic devices in lower abdomen e.g. hernia mesh.

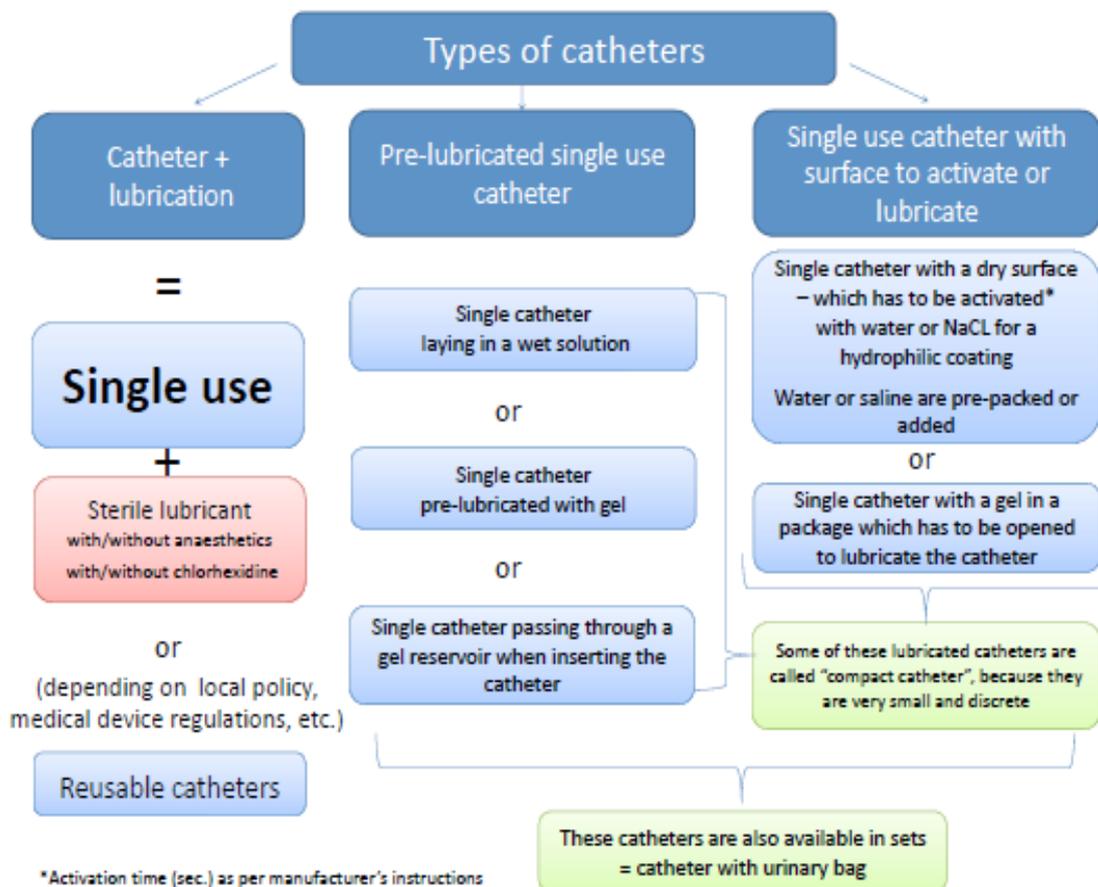
(Geng et al, 2012)

### **Selecting the correct catheter**

#### Intermittent Self Catheterisation

For ISC the main aspects from a patient's perspective are comfort, ease of use, privacy and dignity and maintenance of independence where possible. Nelaton is the generic term to describe ISC catheters. Nelaton catheters fall into three main categories: hydrophilic, pre-lubricated and uncoated (usually reusable). Figure 3 shows the different types of ISC catheters available.

Figure 3



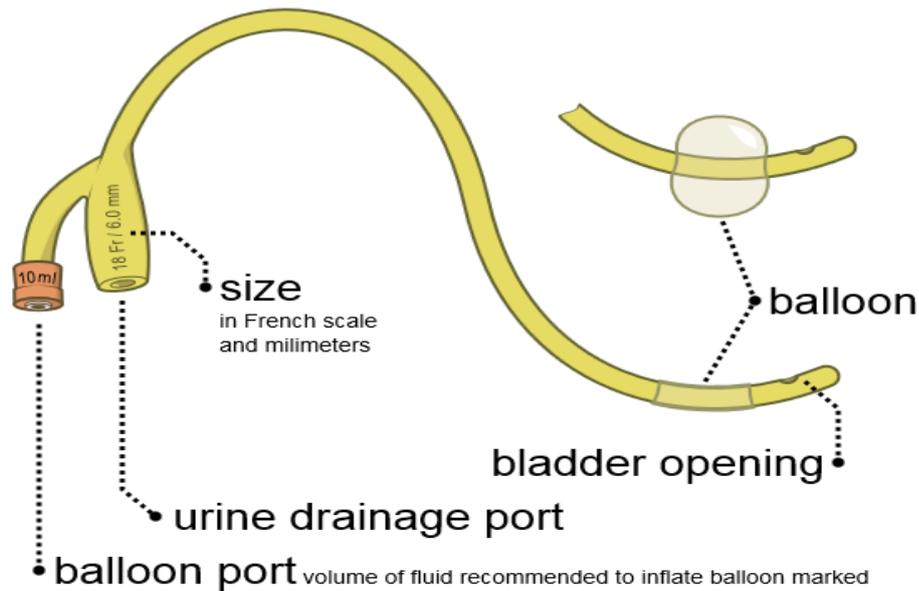
(Vahr, 2013).

The use of hydrophilic coated catheters has been demonstrated to reduce the incidence of UTI's and haematuria (Li et al, 2013). However there is insufficient evidence to conclude that the incidence of UTI in ISC is affected by the use of sterile single use or coated catheters when compared with clean reusable catheters (Getliffe et al, 2007 and NICE, 2012). The lubrication gel on catheters (either separate or pre-lubricated) is designed to reduce friction and therefore protect the urethral mucosa (Spinu et al, 2012). NICE (2012) guidance states that patients should be offered a choice of either single use hydrophilic or gel reservoir catheters. If urethral trauma is an issue alternative catheter design or materials to ease passage should be considered (Newman and Willson, 2011). Small sizes should be offered (10-12fg for females and 12-14fg for males) to reduce urethral trauma. Antibacterial and silver –coated alloy indwelling catheters have been demonstrated to reduce UTI rates in short term catheterisation for inpatients, however their effect in catheters used for ISC is as yet unproven (Wyndeale et al, 2012).

#### Selection of Indwelling Catheters

Jean Francois Reybard developed the first indwelling catheter in 1853 (Geng, 2012), with an inflated balloon to secure it in place within the bladder. One channel is used for urine and one for inflating the balloon (Figure 4).

Figure 4- Foley catheter with balloon



For urethral catheterisation the smallest gauge catheter possible should be used, in order to minimise urethral trauma: Female 12/14 Ch Male 12/14/16 Ch (Nicolle, 2014). The rate of infection is similar when using latex or silicone catheters and whether or not there is a hydrogel coating (Nicolle, 2014).

Suprapubic catheterisation can use the same Foley balloon catheters as urethral catheterisation. Also larger gauge catheters can be used with suprapubic catheterisation, which due to the increased lumen size, can decrease the frequency of blockage (Nicolle, 2014). Foley balloon catheters are the main types seen in patient who are catheterised long term within the community. However post-operatively a catheter without a balloon may be inserted, which requires suturing to secure it in place. These are short term catheters and require a suture kit for removal.

Choosing the right catheter system for a patient requires a comprehensive individual assessment. The catheter system includes the catheter, catheter bag (day and night use) or catheter valve and the system used to secure the leg bag and catheter. The community practitioner needs to ensure that the correct/best system is in place for long term use as acute hospitals do not always have the range and choice of products available to suit all patients.

#### Securing catheter and supporting the drainage bag

Catheters and drainage equipment that are poorly supported can increase the risk of urethral trauma and catheter associated urinary tract infection. Catheter securement devices aim to prevent traction of the catheter against the bladder neck, which can lead to pressure damage. A poorly secured catheter moves whenever the client moves, generating a “pistoning” effect, which can lead to trauma and a false track forming within the urethra. This increases the client’s risk of bacterial infection and trauma. Poorly secured catheters can be inadvertently removed when clients are transferred and mobilising (Geng et al, 2012). There are a number of devices available for securing catheters and healthcare professionals need to consider the individual when making a choice.

#### Catheter materials

A variety of different catheter materials are available, which can be separated into short and long term catheter materials. Short-term may be used for up to 28 days. Long-term catheters are ones which are expected to stay in for more than 28 days (up to 12 weeks) and are changed regularly as part of a care strategy). Although in general most patients within the community will require a catheter material designed for long term catheterisation, healthcare professionals need to consider how frequently the catheter is requiring changing (due to blockage) as short term catheters can be a less expensive option.

The following should be considered when choosing for an individual:

- Ease of insertion (comfort of the patient)
- Tissue compatibility
- Any known allergies (latex)
- Tendency for encrustation and formation of biofilm

#### Latex

Latex is made from natural rubber, and although it is a flexible material, it has disadvantages. Latex is vulnerable to encrustation from mineral deposits from the urine, can cause discomfort on insertion due to a high friction surface and is implicated in latex allergic reactions, the development of urethritis and urethral stricture (Cottenden, et al, 2009). Latex should therefore be restricted to short term use, however in practice most hospitals will use alternative materials due to the potential for latex allergies.

#### Silicone

100% silicone catheters provide a hypoallergenic option, which as it is uncoated has a larger lumen and therefore a reduced tendency to block through encrustation. Silicone is gentle on tissue which potentially causes less irritation and damage. However the catheter balloon can lose fluid which can lead to displacement. On deflation the catheter balloon can also develop cuffing which can lead to increased discomfort and urethral trauma on catheter removal (Newman, 2007).

There is insufficient evidence to determine which type of catheter is best for long term indwelling catheterisation in adults (Jahn et al, 2007), however silicone catheters may be preferable in reducing encrustation and therefore blockage.

#### PTFE (polytetrafluoroethylene)

PTFE-coated latex catheters was developed to protect the urethra against latex. PTFE-coated catheters are smoother than latex, which aims to reduce encrustation and irritation. However these should not be used for patients who are sensitive or allergic to latex (Geng et al, 2012).

#### Hydrogel coated

Hydrogel catheters are hydrophilic, making them soft, which can reduce friction and urethral irritation (Geng et al, 2012).

#### Silver-coated catheters

These are latex or silicone catheters coated with a thin layer of silver alloy with hydrogel. The silver provides antiseptic properties, which can reduce the incidence of bacteraemia for around 1 week

but the evidence does not support the use to reduce catheter associated urinary tract infection (Pickard et al, 2012).

#### Nitrofurazone-coated catheter

Nitrofurazone is a bactericidal used as an antibiotic. Although associated with a small decrease in asymptomatic bacteriuria, there is no evidence to suggest they reduce the incidence of symptomatic infection (Pickard et al, 2012). They are also associated with increased catheter changes and therefore increased discomfort. As a result routine use is not supported (Nicolle, 2014 and Gould, 2009))

### **Procedure within the community**

Within the community it can be difficult to provide the sterile surfaces achievable within acute settings. However surfaces used for catheter insertion and care procedures, such as changing the leg bag must be visibly clean. Cleaning should follow local infection control policies. The immediate area should be assessed and appropriate measures taken to ensure the individuals privacy and dignity. Patients and carers need to be informed about the correct storage of equipment and how to prevent infection. Many people will manage their own catheters, and they need to feel confident and proficient in the procedure, aware of the signs and symptoms of infection and how to access help if required (National Clinical Guideline Centre UK, 2012). Expert opinion indicates that antiseptic preparations for urethral meatal cleansing prior to catheterisation do not provide an advantage – social/hygienic cleansing with water is sufficient (National Clinical Guideline Centre UK, 2012). The maintenance of a sterile, closed urinary drainage system is essential to reducing catheter associated infection (National Clinical Guideline Centre UK, 2012). Healthcare workers should ensure that the connection between the catheter and the drainage system is only broken for a good clinical reason. Healthcare workers are required to decontaminate their hands and wear a clean pair of non-sterile gloves prior to dealing with a patients catheter and must decontaminate their hand following the procedure. Carers and patients must be educated about the need for hand decontamination before and after catheter bag changes (National Clinical Guideline Centre UK, 2012).

The use of catheter valves over a closed catheter bag system (with or without drainage) requires further research to determine whether one is preferred to reduce catheter related infection (National Clinical Guideline Centre UK, 2012). So at present this remains client preference or determined by the patients dexterity or carer availability.

### **Insertion – lubricant gel**

Urethral trauma and discomfort can be reduced with the use of a sterile single use lubricant or anaesthetic gel (National Clinical Guideline Centre UK, 2012). Evidence supports the use of an anaesthetic gel containing lidocaine in order to minimise pain and discomfort for both men and women (Siderias., Guadio and Singer, 2004 and Chung, 2007).

### **Conclusion**

The care and management of catheters in the community is expensive and time consuming with the burden on the individual and services high. Therefore catheterisation continues to be regarded as a last resort for the management of urinary problems. However, catheterisation remains the best option for some patients long term. The choice of catheterisation (intermittent or indwelling)

depends on the individual's requirements, dexterity or availability of carers who are able to carry out this for them. The choice of catheter material, drainage system and securement device should be based on an holistic assessment of the patient or whether there are carers available to manage the devices.

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