

# Intermittent catheterisation: an option for managing bladder dysfunction

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## Intermittent Catheterisation

Intermittent catheterisation is a safe and effective way of preserving renal function in people with bladder dysfunction. IC involves the insertion and removal of a catheter to drain the bladder. It can be used as a one off intervention to measure residual urine if a bladder scanner is unavailable, or as a long-term option to manage dysfunction of the bladder (Vahr et al, 2013 and Abrams et al, 2003).

Intermittent catheterisation can be performed by the individual (Intermittent self-catheterisation, ISC) or performed by a healthcare professional or carer (intermittent catheterisation, IC). ISC is a clean technique when used by the individual, and a sterile technique (IC) when performed by healthcare professionals or carers (Seth., Haslam and Panicker, 2014).

### Potential complications

Although IC is the preferred option for bladder drainage in bladder dysfunction, complications and adverse events can occur, especially when IC is performed long-term. Complications include stricture formation (more common in men), pain, urinary tract infection (UTI), bladder stone formation (Joshi, and Mittal, 2014), urethral trauma, urethral bleeding and urethritis in both sexes (Vahr et al, 2013 and Newman and Wilson, 2011). Urethral bleeding is particularly common in women, especially when learning the ISC technique (Igawa., Wyndaele and Nishizwa, 2008 and Turi et al, 2006). Any persistent bleeding should be investigated as this may indicate urethral trauma or urinary tract infection. The long term use of IC can increase the risk of bladder calculus formation. The pathogenesis relates to the introduction of pubic hair when the catheter is inserted which acts as the origin (nidus) for the stone formation (Joshi and Mittal, 2014 ).

Urethral trauma can be secondary to using unlubricated catheters, or the use of force when inserting the catheter, which can lead to bladder spasm (Vapnek., Maynard and Kim, 2003). Urethral trauma can also compromise the mucosal lining of the urethra leading to infection (Elvy and Colville, 2009)

Patients often experience pain on insertion and/or removal of the catheter. This can be related to bladder spasm or a UTI. Pain on removal of the catheter may be due to the suctioning effect which pulls the bladder wall into the catheter eyelets, removing the catheter more slowly can prevent this (Newman and Wilson, 2011).

### Infection

One of the main benefits of IC over indwelling catheterisation is the potential reduction of UTI's (Collis Pellatt and Woodward, 2011). There are currently no randomised controlled trials that confirm IC as having a lower risk of UTI's, however there are studies that indicate IC is a safe method of reducing urological complications (Weld and Dmochowski, 2000) and therefore the incidence of UTI's (Vahr et al, 2013, National Clinical Guideline Centre UK, 2012 and Scottish Intercollegiate Guidelines Network (SIGN), 2012).

The risk of UTI's is higher in women due to a shorter urethra, with bacteria able to reach the bladder more easily and colonise the bladder wall (Woodbury., Hayes and Askes, 2008). This risk is exacerbated by the greater likelihood of women introducing bacteria from faecal matter following a bowel movement. Table 1 indicates the factors that increase the risk of UTI in IC.

Factors that increase the risk of intermittent self-catheterisation related urinary tract infections (Table 1)

Risk factor	Rationale
Inadequate frequency of bladder emptying (IC)	Can lead to large bladder volumes and bladder distension, with longer periods of urine stagnation. (Wyndaele, 2002 and Shekelle et al, 1999)
Inadequate emptying at time of catheterisation	Residual urine left in the bladder, promotes an environment for bacterial colonisation If a women presents with recurrent UTI's residual urine after catheterisation should be checked with a bladder scanner.
Inappropriate fluid intake	A low fluid intake is linked to inadequate catheterisations. When low volumes of urine are produced, patients are less likely to perform ISC at desired intervals, producing urine stagnation and bladder distension. However if fluid intake is too high this can lead to frequent catheterisation which can increase the risk of introducing harmful bacteria
Traumatic catheterisation	Trauma breaks the bladder urothelium and urethral lining increasing the risk of infection

#### IC regime

An individualised care plan should identify the appropriate frequency of catheterisation, based on the individual's goals, functional bladder capacity and post void residual volume (Prieto et al, 2014). In individuals who are unable to empty their bladder, and IC regime of 4-6 times a day is required (Nazarko, 2012). Where the individual is able to void, the residual urine will determine the IC regime, often between 1 and 3 times a day (Sauewein, 2002 and Naish, 2003). Table 2 illustrates the frequency of IC required depending on bladder function.

Table 2 – Frequency of intermittent catheterisation (Naish, 2003)

Residual bladder volumes	Frequency
Unable to void	On average 4-5, possibly 6 times a day (depending on incontinence symptoms)
Over 500mls	More than three times daily
Between 300-500mls	2-3 times daily
Between 150-300mls	1-2 times daily
Less than 150mls	Daily
Less than 100mls on three consecutive occasions	Stop and re-assess residual urine levels – may need to undertake ISC as little as once a week.

#### Types of catheters

There is insufficient evidence to suggest that the incidence of UTI is reduced by the use of sterile single use or coated catheters compared to clean reusable catheters (National Clinical Guideline Centre UK, 2012). However, the use of lubrication gel on catheters (either separate or pre-lubricated) is designed to reduce friction and protect the urethral mucosa (Spinu et al, 2012). There is evidence to suggest that hydrophillic catheters can reduce UTI and haematuria (Li et al, 2013, Cardenas and Hoffman, 2009 and Stöhrer et al, 2009). A non-tocuh technique has also been found to reduce rates

of UTI (Hudson and Murahata, 2005). If urethral trauma is an issue alternative catheter designs or materials to ease passage (Newman and Wilson, 2011). Small sizes should be offered (10-12fg for females) to reduce urethral trauma.

The use of antibacterial and silver –coated alloy indwelling catheters have been demonstrated to reduce UTI rates in short term indwelling catheterisation for inpatients, however the effect in catheters used for IC is as yet unproven (Wyndeale et al, 2012)

From an individuals point of view the most important aspects when choosing a catheter are comfort, discretion, ease of use and maintainance of independence where possible. Individuals should always be offered the product most suitable for their needs. (Vahr et al, 2013). NICE (2012) guidance states that patients should be offered a choice of either single use hydrophilic or gel reservoir catheters.

### Fluid intake

Encouraging a good and appropriate fluid intake is particularly important for patients undertaking IC. A total fluid intake (from beverages and within foods) should be around 2.5 litres should be encouraged (Newman and Wilson, 2011). There is limited evidence to suggest that cranberry juice and vitamin C prevent the growth of bacteria in the urethra and bladder and reduce the incidence of UTI (Woodbury., Hayes and Askes, 2008, Hess et al, 2008, Jepson and Craig, 2008 and Igawa., Wyndaele and Nishizwa, 2008). However, cranberry ingestion is contra-indicated for some patients, particularly those on warfrin therapy, and should not be recommended (British Medical Association and Royal Pharmaceutical Society, 2016 (March)).

### Conclusion

IC is a safe option for managing bladder dysfunction. The most important measures in preventing UTI's in people undertaking IC are adequate education, patient concordance, use of an appropriate catheter type and material and a consistent technique. Patients need to be provided with a choice of catheter to enable them to perform the technique independently where possible. The use of hydrophilic coated catheters and a no-touch technique can reduce the risk of urinary tract infections.

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