Intermittent self-catheterisation: making it safer and easier

Clinical and patient benefits of GentleCath™ Glide

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Foreword

Sue Woodward, Head of Clinical Education, Florence Nightingale Faculty of Nursing, Midwifery and Palliative Care, King's College, London

Intermittent catheterisation is not a new procedure, having been practised for thousands of years using hollow stems, bamboo or rolled leaves (Nazarko, 2013). However, it was not until 1972 that Lapides et al identified its benefits in reducing the potential life-threatening complications of indwelling catheterisation (Lapides et al, 1972). I have been working in this field of practice for almost 30 years and have written many papers on the subject, some of which the authors of this supplement have been kind enough to cite, so was delighted to be invited to write this foreword. While the techniques for intermittent self-catheterisation (ISC) have not changed much over the time I have been working in this area, the medical devices used for the procedure have advanced considerably, with GentleCath™ Glide being the latest addition to the range.

ISC is now considered the gold standard for bladder drainage and is recommended by all relevant National Institute for Health and Clinical Excellence (NICE) guidelines. As Sharon Holroyd identifies in her article in this supplement, indwelling catheters should be used as a last resort, and yet so often this is not the case. Nurses frequently still insert an indwelling catheter, possibly perceiving it to be easier or less time-consuming than teaching a patient to self-catheterise. However, I would argue that this should be a quality-of-life decision—is this in the best interests of the patient? ISC can be used in a variety of settings. It is also suitable for patients for whom it would not normally be considered, such as those who are experiencing postoperative urinary retention (Woodward, 2015). Almost invariably, ISC will reduce morbidity associated with catheter-acquired urinary tract infections (CAUTIs) and promote other positive outcomes, such as improved bladder function (Hälleberg Nyman et al, 2013).

The benefits of ISC far outweigh the risks, although it must be acknowledged that, for some patients, the thought of undertaking the procedure is abhorrent (Woodward and Rew, 2003). The articles in this supplement clearly articulate the advantages and disadvantages of ISC, which should be considered during clinical decision-making. Patient narratives and case studies, such as those presented here, can help nurses understand the patient's perspective and are valuable in informing practice and individualised approaches.

We now have a much better understanding of some of the risks associated with catheterisation, and the use of a lubricant is recommended for all procedures, including indwelling catheterisation (Woodward, 2005). Over the years, manufacturers have used a variety of techniques to lubricate intermittent catheters, including hydrophilic coatings, gel lubricants and glycerine. While no one would question using a lubricant to reduce friction and thus the potential for urethral trauma, there is no evidence to support one form of lubricant over another. Nurses are left to base decisions on which type of catheter is best for their patient on other factors, such as packaging, ease of use, comfort and discretion. Many of these considerations are highlighted in this supplement. It is vital to keep up to date on advances in both the evidence base and the equipment available. Nurses need to be product aware. This supplement will help keep them at the forefront of developments.

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Lapides J, Diokno AC, Silber SJ, Lowe BS. Clean, intermittent self-catheterization in the treatment of urinary tract disease. J Urol. 1972; 107(3):458–61

Nazarko L. Intermittent self-catheterisation and catheter fixation. Br J Community Nurs. 2013; 18(7):322–5

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How intermittent self-catheterisation can promote independence, quality of life and wellbeing

Sharon Holroyd, Lead Clinical Nurse Specialist for Continence, Beechwood Community Health Centre, Halifax, and Chairperson, Yorkshire Association for Continence Advice

Intermittent catheterisation is considered the gold standard for bladder drainage. This article describes intermittent self-catheterisation (ISC) and which patients are likely to benefit from it. Before deciding on a patient's suitability for ISC, health professionals should carry out a full assessment and ensure the patient and/or carers are taught the skills necessary to perform the procedure. ISC enables patients to be more independent because they can choose how often and where to undertake it, which encourages adherence. The range of products is vast; the nurse can guide patients to select the catheter most suited to their individual needs

The practice of draining urinary bladders using hollow tubes has been evidenced for thousands of years, when it was common to use any hollow material such as plant stems, bamboo or rolled-up leaves (Nazarko, 2013). The materials used progressed to wood, metals with natural antimicrobials such as silver and, eventually, latex and silicone (Robinson, 2017).

Intermittent catheterisation (IC) is cited as the gold standard method for draining the bladder due to the lower risk of adverse reactions when compared with an indwelling catheter. Despite this, it is often underused in clinical practice, with health professionals instead using indwelling self-retaining balloon catheters to manage bladder-drainage issues. This article looks at the rationale for choosing intermittent catheters, and discusses what to include in patient assessments and the associated risks and benefits of IC. It aims to outline evidence-based best practice on how to select the most appropriate intervention, reduce risk and encourage patient adherence through the provision of effective education.

Indwelling catheters

Indwelling Foley catheters have long been the first choice for health professionals for patients requiring bladder drainage assistance. This may be because they are easy to insert and leave in situ: they use an inflation balloon to keep the catheter in place, rather than requiring repeated insertion of intermittent catheters.

The definition of a urethral Foley indwelling catheter is the passage of a hollow tube (catheter) into the urinary bladder via the urethra for the purpose of continuous drainage (Geng et al, 2012). Suprapubic catheterisation is defined as the insertion of a Foley catheter into the bladder via the anterior abdominal wall for the purpose of continuous drainage (Geng et al, 2012; Vahr et al, 2013). The indwelling Foley catheter may be inserted short term (<28 days) or long term (changed at up to 12 weeks) (Vahr et al, 2013; Loveday et al, 2014).

The Foley catheter has a self-retaining balloon that is inflated on insertion to hold it in place. Its popularity soared in the 1930s when US urologist Frederick Foley promoted the use of the latex balloon catheter that still bears his name, a device that has changed little since then (Feneley et al, 2015). Drawbacks to its use include its continued presence within the body: this increases the risk of biofilm formation, leading to encrustation, bypassing, trauma to the urethral or suprapubic tract tissues and, ultimately, catheter-associated urinary tract infections (CAUTIs), which may develop into sepsis and even death (Yarde, 2015; Feneley et al, 2015; Garcia

et al, 2007; Stickler, 2014). Although many of the risks to the wearer are recognised, more than 1 million are used in NHS care every year (Loveday et al, 2014).

As far back as the 1970s, research demonstrated the significant and sometimes life-threatening risks of prolonged use of indwelling catheters (Lapides et al, 1972; Newman, 2007; National Institute for Health and Care Excellence (NICE), 2012a; Loveday et al, 2014). Therefore, the recommendation is that indwelling catheters should be used as a last resort after other options have been considered or tried, and failed (Newman, 2007; Loveday et al, 2014; Yarde, 2015).

Intermittent catheters

IC, by contrast, has been cited as the gold standard for assisted bladder drainage. IC is defined as drainage or aspiration of the bladder or urinary reservoir using a hollow tube/catheter that is subsequently removed (Abrams et al, 2002; Vahr et al, 2013). The intermittent catheter is removed once the bladder has been drained adequately, thereby eliminating the issue of biofilm formation commonly found with the balloon catheter. The procedure is undertaken by the patient or, if the individual is unable to do it, by a nominated person (relative, carer or professional). The technique can be adapted to suit many situations or scenarios. The European Association of Urology Nurses (EAUN) defines the techniques for carrying out IC as follows (Vahr et al, 2013):

- Sterile IC: this is carried out by another person, in an operating theatre or a diagnostic environment, using sterile equipment, materials and full personal protective equipment, including gloves, sterile gown and mask
- Aseptic technique: defined as inserting a sterile catheter using an appropriate solution to cleanse the genitalia, the use of sterile gloves or tweezers, and applying sterile lubricant when the catheter material is not pre-lubricated. It is commonly carried out on an individual by another appropriate person, usually a health professional.
  - No-touch technique involves the use of a sterile ready-to-use catheter with an adaptor or packaging that is designed to prevent the person touching the catheter material on insertion and removal. Generally, the urethral opening is cleansed using standard hygiene with non-antimicrobial solutions, although there has been discussion about the potential benefits of using antimicrobial cleansing in high-risk patients (Cunha et al, 2013; Levers, 2014). This approach may be carried out by the individual or a nominated relative.
  - Clean IC refers to the procedure carried out by the patient or a caregiver in the home using a sterile or reusable catheter and no gloves. However, since any procedures must be performed in line with local guidance on standard infection control and management, gloves may be used; the genitalia or stomal opening is cleansed using standard hygiene but with soap and water rather than disinfectant.

Box 1. Advantages of intermittent catheterisation

- Reduces urinary tract and catheter complications, including urethral trauma, infection and encrustation
- Improved urinary symptoms
- Increased independence: patient chooses when it is convenient to catheterise
- Bladder fills and empties completely and regularly
- Improved protection of upper urinary tract from reflux
- Maintains dignity and reduces embarrassment
- Improves leisure activities
- Allows freedom of choice in relation to clothing
- Allows freedom from appliances such as pads or drainage bags
- Helps improve and maintain sexual/intimate relationships
- Improves quality of life
- Potential for improved continence in between catheterisations
- Available on prescription in many countries

(Adapted from Bakke and Malt, 1993; Getliffe and Dolman, 2007; Yates, 2016)

Indications for intermittent catheterisation

IC is indicated whenever the bladder requires emptying and the individual is unable to do this unaided. The causes may be structural, physiological or psychological. A bladder that is unable to empty fully on a regular basis can carry significant health risks, including infection, sepsis, renal failure and death.

Urethral obstruction is commonly caused by prostate enlargement or urethral stricture, which narrow the internal diameter of the urethra, affecting the flow of urine from the bladder to the outlet. This may increase pressure within the bladder as it works harder to pass the urine past the obstruction. Typically, patients report an altered flow, stop/start stream and having a feeling of incomplete emptying. Individuals with this type of obstruction often compensate

for the obstructed flow by engaging the use of abdominal muscles to ensure effective emptying. Abdominal emptying of the bladder is not sustainable in the long term and patients report a decline in effectiveness over time (Doherty, 2006).

Constipation affects about 25% of the population at some point within their lifetime (Belsey et al, 2010; Tack et al, 2011). A rectum full of hard constipated stool exerts undue pressure on the urethra, leading to a reduced flow or complete retention of urine. Many individuals will require short-term use of a catheter until this has been resolved.

Neurological conditions, such as multiple sclerosis, Parkinson's disease, stroke, diabetes, spinal-cord injury and motor neurone disease, can result in either incomplete emptying of the bladder or underactivity (known as an atonic non-contractile and hypotonic bladder) and overactivity (known as a hypertonic bladder). These terms indicate that the detrusor muscle function is diminished, ineffective or completely lost, causing a failure in bladder emptying, either in part or full. The normal micturition pathways between the pontine micturition centre in the brain and the nerve supply in the bladder are interrupted or lost, causing retention of residual volumes of urine or complete retention (Vahr et al, 2013). Medication and surgical techniques cannot correct this type of dysfunction, so catheterisation is used to help empty the bladder effectively (Panicker et al, 2010). Detrusor-sphincter dyssynergia occurs during the voiding phase of micturition, where the detrusor muscle and the urethral sphincter contract simultaneously, instead of the normal detrusor contraction, sphincter relaxation pathway that is seen in effective voiding. The cause may be psychological, physiological or structural, and it is common in individuals with an underlying neurological condition (Woodward et al, 2013).

Medications such as anticholinergics, antipsychotics and antimuscarinics may affect the emptying capability of the bladder. Treatments commonly used for overactive bladder symptoms, such as Botox®, carry a recognised risk of partial or full retention of urine following instillation, although the effect usually wears off with time (usually within 6 months) (NICE, 2013). Surgery intended to treat stress urinary incontinence symptoms, or any surgical technique that affects the urinary tract, may result in the need to use catheters to drain the bladder. Any anaesthetic that affects the pathways between the brain, spinal cord and bladder nerve supply may also lead to the temporary use of catheters (Niazi and Taha, 2015). Urinary tract infections and the ageing process are also common causes of incomplete or ineffective bladder emptying (Godfrey, 2008).

Benefits and risks of intermittent catheterisation

One of the main recognised advantages for intermittent self-catheterisation (ISC) over indwelling catheters is the reduced incidence of CAUTIs (NICE, 2012b). Body image is also a concern with indwelling catheter systems: these, including drainage equipment, can be difficult to conceal under clothing and can cause embarrassment and lead to a reluctance to go outside the home. They can also affect an individual's own and their partner's perception of their intimacy and sexuality, creating a barrier to 'normal' life (Doherty, 2006; Chapple et al, 2014).

Box 2. Risks associated with intermittent catheterisation

- Urinary infections
- Prostatitis
- Urethritis
- Trauma, including false passageway formation
- Urethral stricture
- Meatal stenosis
- Bladder perforation
- Catheter knotting
- Pain
- Discomfort
- Bleeding
- Formation of bladder stones

(Vahr et al, 2013)

Few complications are associated with intermittent catheterisation, and any risks have been reduced with the greater choice of products

Intermittent catheters do not sit in place for longer than a few minutes, so they have less of an effect on body image (Woodward et al, 2013; Rew and Lake, 2013). They can also promote self-control and management, encouraging independence and improving privacy as the user can adapt their technique and catheterisation schedule to suit their lifestyle (Woodward and Rew, 2003; Rew and Lake, 2013).

The bladder protects itself from infection by regularly filling and emptying over 24 hours. Having a self-retaining balloon catheter in place disrupts this normal flow and increases the risk of infection and trauma, both in the bladder and urethral tract (Garcia et al, 2007; Feneley et al, 2015). IC greatly diminishes the risks and can preserve renal function by preventing bladder overdistension (Moore et al, 2007). *Box 1* lists the advantages.

According to the literature, there are relatively few risks or complications associated with IC, and many risks have been reduced with the increasing choice of products (Vahr et al, 2013). The risks are recognised as rare and of less concern compared with the benefit gained from ISC (Newman and Willson, 2011). The main risks are infections, including urinary tract infection, prostatitis and urethritis; less common risks are listed in *Box 2* (Vahr et al, 2013).

Patient assessment

While IC is the gold standard for assisted bladder drainage (Royal College of Nursing (RCN), 2012; NICE, 2012a; Vahr et al, 2013), it should be considered and undertaken only after a thorough patient assessment (Vahr et al, 2013; Woodward et al, 2013; Mangnall, 2015; Robinson, 2017). This should include a voiding diary, retention or post-void residual volumes, oral fluid intake, bowel history and medication review (Doherty, 2006; Mangnall, 2015; Robinson, 2017). Information on the structure and physiology of the urinary tract may be useful. Individuals need to be able to carry out the procedure reliably and regularly, or have a nominated person to do this.

Patient motivation is an important consideration for teaching ISC. Assessment of functional ability is important: eyesight, dexterity and mobility may affect the ability to use intermittent catheters successfully and the approach may need to be adapted to each individual. For example, a registered blind person can be taught IC techniques using touch and an appropriate product. Consideration of cognitive function is also essential: a person with dementia may not be able to carry out the procedure independently but may be compliant if assisted by someone. Emotional and psychological issues may be important factors for patients who may be fearful or embarrassed about exposing or touching their genitalia (McConville, 2002; Mangnall, 2015). Fear of pain, injury or infection needs to be addressed during assessment (Shaw et al, 2008).

Assessing the environment within which the technique is likely to be performed is important because this may affect adherence. The Medicines and Healthcare products Regulatory Agency (MHRA) (2014) has a list of factors that need to be considered before proposing the use of medical devices, and can be used when considering the pros and cons of ISC (*Box 3*).

There are few contraindications to the use of intermittent catheters, and these relate mainly to high intravesical pressure, which requires continuous and free-flowing

Box 3. Factors to assess when considering the use of medical devices

- The patient's clinical and social needs
- Which medical device would best suit the patient's needs
- Whether the risks associated with the device are acceptable and minimised
- What are the patient's physical capabilities, e.g. manual dexterity when handling the device
- The patient's sensory capabilities, e.g. eyesight and hearing
- The patient's ability to remember and understand how to use the device
- Any previous experience with the device
- The patient's expectations
- Whether the environment in which the device will be used is suitable, e.g. home or work
- Level of responsibility in obtaining, storing and disposing of used catheters
- Whether the manufacturer provides informal educational materials
- Is the product available on prescription?

(Medicines and Healthcare products Regulatory Agency, 2014)

Intermittent catheters promote self-management and independence, and offer greater privacy as they enable patients to adapt their catheterisation technique and schedule to suit their lifestyle

drainage to avoid renal damage (Vahr et al, 2013). A relative contraindication would be the inability of the individual to carry out the procedure and the absence of an appropriate person to assist: for example, a patient who has a stroke may have IC performed by another person while residing in a rehabilitation unit; on return home, however, the procedure may not continue in the absence of an appropriately trained person. It may not be appropriate for a spouse or relative to be the nominated assistant as the procedure is intimate and may adversely change the dynamics of a relationship. Some registered care providers may not be permitted to undertake IC on behalf of another as they are restricted by their terms of employment with regard to intimate clinical tasks.

Access to specialist services and the option for review, or simply to ask questions, should be available. Ideally, this should be part of an annual review (Vahr et al, 2013), although this is not always possible and will vary from area to area, depending on local service commissioning.

Teaching intermittent self-catheterisation

There are many issues to consider when teaching IC techniques to individuals or nominated caregivers. If a patient is not motivated, unwilling to do it or does not understand the implications of poor bladder management, adherence will be affected (Woodward and Rew 2003; Woodward et al, 2013).

An awareness of infection, its signs and symptoms and management is essential. Education on IC should include hand hygiene and personal hygiene, but these may be overlooked. It may also be taken for granted that the patient/caregiver already knows how to wash their hands effectively (Robinson, 2017).

Fluid intake is another factor, and advice must be provided on what constitutes a good or appropriate volume. Consideration of the patient's ability to access fluids must be part of the assessment and teaching phase: for example, if a person relies on others to provide adequate fluids to drink, this may affect their bladder function and catheter management schedule.

The frequency of using intermittent catheters needs to be determined and the patient or caregiver encouraged to become confident in doing this, depending on the underlying cause of bladder issues, social or environmental restrictions and patient choice. Naish (2003) has drawn up guidelines on the frequency of catheterisation, based on bladder residual volumes and function (*Box 4*). However, it is essential to include voided and residual volumes when assessing bladder capacity as capacity varies between individuals. This will ensure accuracy and reflect total bladder volume/capacity. Individuals with partial emptying may vary the frequency of catheter usage from day to day. IC frequency should aim to maintain a bladder volume of no more than 500 ml to avoid overdistension and potential reflux (Vahr et al, 2013; Yates, 2016).

Box 4. Frequency of intermittent self-catheterisation, based on bladder volume

- Unable to void: catheterise 4–5 times a day to help maintain bladder volume @ 50 ml
- Residual volume >500 ml: catheterise three times a day
- Residual urine 300–500 ml: catheterise twice a day
- Residual volumes 150–300 ml: catheterise once a day
- Residual urine <150 ml: catheterise either daily or alternate days
- Residual urine <150 ml on three consecutive occasions: **stop** using catheters and reassess urinary residuals

Adapted from Naish, 2003

People learn at different speeds and in different ways, so it is important not to overload the individual with too much information. Most manufacturers of intermittent catheters provide a variety of teaching tools on their use, such as booklets, DVDs and online aids. The environment in which teaching takes place must also be considered. Where possible, the patient should be taught in their home: they will be more relaxed and the practical aspects of how their home is set up for ISC may encourage their willingness and belief that this technique is right for them. ISC should be taught in a quiet, private environment, and the patient offered the opportunity to ask questions, and learn and practise the technique (McConville, 2002; RCN, 2012; Mangnall, 2012). The use of anatomical models may help explain the structure of the urinary tract. Several shorter sessions may be better than one long session, as many patients/carers will not achieve competence after a single session (Mangnall, 2015).

The growing market means that a vast range of products is available. These include catheters that are single-use, reusable, compact, standard, hydrophilic-coated, gel-coated, sleeved and/or have bags, handling aids and tapered tips. Hydrophilic catheters have a polymer coating that absorbs and binds to the catheter material, offering a smooth slippery surface to reduce friction and ease insertion. This type of catheter may need to be activated before use, depending on the packaging and manufacturer's instructions. Gel-coated catheters are prepared with a sticky coating, which is designed to reduce friction on insertion, and require little or no preparation before use.

In the UK, single-use sterile catheters are recommended, although research is ongoing into reusable products. Catheter materials vary and include polyvinyl chloride (PVC), silicone, ethylene vinyl acetate (EVA), latex and polyolefin-based elastomer (POBE). Each has advantages and disadvantages regarding flexibility, allergy, sensation and reduced friction, which will differ from patient to patient (Vahr et al, 2013).

The tip of the catheter used is an important consideration and will depend on clinical symptoms. The rounded Nélaton catheter is the standard tip: it is soft and flexible, and has a straight proximal end containing two drainage eyelets. Tiemann and coudé tip catheters have a slightly curved proximal end, which may be useful when the person has a known stricture or enlarged prostate. The tip is a little more rigid than other catheters such as the Nélaton tip, allowing the catheter to find its way around an obstruction. Another type is a flexible rounded-tip catheter that has the appearance of a rounded bulb. The principle of this type of device is that it centralises itself within the urethral passage and reduces the friction caused by the catheter touching the urethral walls.

Catheters may come with an integral bag or a sleeve to offer no touching of the catheter material, and in compact or standard sizes. Packaging can pose issues for individuals with eyesight or dexterity restrictions, which will affect choice. Similarly, the storage, carriage and disposal of catheters will be considerations. It has been suggested that offering patients a maximum selection of three types of catheter is most appropriate at the initial stages of teaching ISC (Robinson, 2017) so as not to overwhelm them. One type of catheter may not suit every aspect of an individual's lifestyle and the same product will not suit every patient. It is important to offer choice and encourage the patient to make an informed decision to suit their needs.

Conclusion

IC is considered the gold standard and first-choice method for bladder drainage because it avoids some of the risks associated with an indwelling catheter. The process can be daunting for an individual to consider and requires an experienced specialist health professional to undertake a robust, individualised assessment.

The assessment and teaching process requires time and patience, and should be delivered in a suitable environment that offers privacy. If the individual does not have the capacity or capability to carry out ISC, a suitable person should be identified and given appropriate training to enable them to undertake the procedure safely. Encouraging adherence and consistency with ISC will improve patients' health outcomes and quality of life.

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Selecting an intermittent self-catheter: key considerations

Cathy Davis, Urogynaecology, Clinical Nurse Specialist, King's College Hospital NHS Foundation Trust.
Angie Rantell, Lead Nurse Urogynaecology/Nurse Cystoscopist, King's College Hospital NHS Foundation Trust

This article explores the factors that must be considered when assessing patients for intermittent self-catherisation (ISC). It discusses the various types of intermittent catheters and their properties. Key considerations for the health professional when making product recommendations are covered and emphasis is placed on teaching patients the ISC technique. The article also highlights what patients value in terms of product choice and the importance of ongoing support. It concludes by introducing the GentleCath Glide, a new product that incorporates FeelClean™ technology, which leaves less residue on the hands and clothes

According to the National Institute for Health and Care Excellence (NICE) (2015), intermittent self-catherisation (ISC) is the gold standard for urine drainage. It is performed by the patient independently and involves using a catheter to drain the bladder, after which the catheter is removed. The procedure can be done up to several times a day. The modern version is usually made of polyvinyl chloride (PVC), and a number of different types are available. Nurses should be familiar with these so they can help patients make the best, most informed choice.

Why intermittent self catherisation?

There are several reasons why patients may have to perform ISC. It can be used as a short- or long-term management system. In the short term, it can be used to manage immediate postoperative complications, such as incomplete emptying following intravesical injections of Botox or immediately post-surgery for stress urinary incontinence, for instillation of medication directly into the bladder or for postpartum retention (Rantell, 2012).

Patients who may have to perform ISC in the longer term include those with neurological disorders such as multiple sclerosis who rely on this procedure for bladder emptying due to lower urinary tract dysfunction. This may be due to an acontractile bladder, detrusor-sphincter dyssynergia or detrusor underactivity (Rantell, 2012). ISC is used not only to facilitate bladder emptying, but also to manage symptoms related to incomplete bladder emptying, including frequency, urgency and nocturia (Barton, 2000). To determine the need for ISC, a full assessment should be carried out.

Assessment

In the past, ISC was performed predominantly by patients with neurogenic voiding difficulties, but it has been shown to be beneficial to most patients experiencing incomplete bladder emptying (Mangnall, 2006). Several factors should be considered when determining the need for ISC and, prior to its initiation, a comprehensive history should be taken. This should include a full medical history, assessment of signs and symptoms, including the onset and severity of lower urinary tract symptoms (LUTS), a physical examination and appropriate tests (NICE, 2012). Patients with incomplete bladder emptying will usually present with LUTS and may report difficulty voiding (*Box 1*).

Patients may be asymptomatic and will not be aware that they are not fully emptying their bladder. For this reason, all patients should have a post-void residual check. Residual urine has been defined as 'the volume of urine left in the bladder immediately following completion of voiding' (Abrams et al, 2002). Post-void residual can be assessed in two ways:

- Via a portable ultrasound scan of the bladder (although non-invasive, it may be inaccurate as it can detect masses other than urine)
- Via a Nélaton (in-out) catheter (this is invasive, with risk of urinary tract infection (UTI), but much more accurate).

Box 1. Signs and symptoms of incomplete emptying

- Frequency
- Urgency
- Nocturia
- Incontinence (stress and urgency)
- Feeling of incomplete emptying
- Change in sensation when voiding/poor urinary stream
- Lack of sensation, both before or while voiding
- Straining to void
- Suprapubic discomfort/pain
- Distended lower abdomen
- Urinary tract infection
- Hydronephrosis

Sources: Barton, 2000; adapted from Moore, 1995

Generally, a residual volume greater than 150 ml is deemed significant; however, there is no standardised recommendation. It is also important to note that what is determined as an acceptable urinary residual will differ between men and women. If a reproducible significant residual is found, further investigation and management need to be initiated; however, local guidelines should be followed at all times. As mentioned in the Royal College of Nursing (RCN) (2012) guidance, the decision to start ISC should never be based on urinary residuals alone. When diagnosing incomplete emptying, it is important to determine the cause of the problem (*Table 1*). If there is a preventable/reversible cause, this should be treated. Before teaching ISC, any physical barriers that can impair the procedure should be considered (*Box 2*).

Patient motivation and adjustment

ISC can be a daunting prospect for many patients. Although it is a relatively easy procedure to perform, which can be fitted into daily life and significantly improve quality of life (Kessler et al, 2009), it can have significant psychological effects. McConville (2002) found that patients experienced feelings of worry, shock, annoyance, fright and depression when told they would need to undertake ISC.

In the UK, ISC is usually taught by nurses. A holistic nursing assessment, not just a physical one, should be undertaken when deciding if a patient has the ability to perform ISC (Woodward and Rew, 2003). While a patient may be capable of the skill physically, they may struggle to get to grips with the process psychologically. Performing ISC, particularly on a long-term basis, requires a lot of self-motivation. The nurse, therefore, should assess the patient's motivation and willingness to carry out the procedure before teaching it. Patients sometimes expect ISC to be quick, easy, safe and painless, so it is important to manage their expectations from the outset.

The benefit to the patient should always outweigh the risk, as this will affect motivation and adherence (Addison, 2001). The urge to maintain independence has been shown to be a motivational factor to performing ISC (Cobussen-Boekhorst et al, 2016a). Some patients will never get to grips with the idea and may develop an aversion to the procedure (Woodward and Rew, 2003). This should be identified and managed appropriately by discussing alternative options with them.

Catheter selection

Once the need for ISC has been established and motivation assessed, the next step is to guide the patient to choose the most appropriate catheter for their needs. Before selecting a product, the patient should be informed of all available options and, ideally, have the opportunity to see (and feel) a variety of different catheters. Studies have shown that, when deciding on a suitable catheter, patients value being offered choice (Wilde et al, 2011; Cobussen-Boekhorst et al, 2016b).

When advising a patient on selection, a number of factors should be taken into consideration, including how often the patient will need to perform ISC, where it will be performed and whether any special aids will be required. The frequency with which individuals should conduct clean ISC will be based on urinary residuals. Several formulas can be used to determine the frequency of ISC (*Table 2*). Other factors that will affect frequency of catheterisation include fluid intake, the speed at which the residual increases and whether the patient has the ability to pass urine via the urethra.

Types of intermittent catheters

Nélaton is the collective term used to describe intermittent catheters. Unlike Foley catheters, Nélaton devices do not have a balloon and so are not are designed to remain in the bladder. A range of catheters should be available for ISC, and can be single-use or reusable. Research shows almost exclusive use of single-use catheters in the UK (Prieto et al, 2015); these can be broken down into three subgroups: hydrophilic-coated catheters, prelubricated catheters and uncoated catheters.

Box 2. Physical barriers to ISC

- Poor eyesight
- Reduced manual dexterity
- Reduced mobility
- Body habitus
- Changing nature of disease

Adapted from Rantell, 2012

Table 1. Common causes of incomplete bladder emptying	
Condition	**Common causes**
Detrusor underactivity (reduced bladder contractions) and acontractile detrusor (absent bladder contractions)—conditions known as detrusor dysfunction	• Diseases affecting the brain and spinal cord: multiple sclerosis, Parkinson's disease, spina bifida and stroke • Diseases affecting the nerve supply to the bladder, such as diabetes mellitus • Acquired problems affecting the spinal pathway, such as paraplegia • Medications, such as anticholinergics and antipsychotics, that relax the detrusor muscle
Detrusor sphincter dyssynergia (DSD)—when the detrusor muscle contracts but the urinary sphincter does not relax	• Damage to the sacrospinal cord, usually due to injury or disease affecting the nerve and muscle action e.g. Parkinson's disease and multiple sclerosis
Urethral stricture causing difficulty with bladder emptying	• Infection • Trauma • Surgery to the urethra
Obstruction causing difficulty with the process of bladder emptying	• Enlarged prostate due to benign prostatic hyperplasia • Constipation • Urogenital prolapse • Pregnancy • Post-surgery or delivery
Sources: Barton, 2000; Nazarko, 2009; Rantell, 2012	

These groups can be subdivided further:

Hydrophilic coated

- Activated system, ready to use
- Not activated: sterile water provided for activation
- Not activated: water added by user.

Prelubricated

- Prelubricated, closed system with integrated collection bag
- Prelubricated, with protective sleeve for no-touch insertion.

Uncoated

- Non-lubricated: water-soluble gel added by user (Prieto et al, 2015).

Catheter properties

Hydrophilic-coated catheters

Hydrophilic coatings are used to reduce surface friction and enhance lubricity. This style of catheter has a dehydrated hydrophilic coating, which can be felt when touching it. The catheters need to be soaked in water for about 30 seconds to activate the coating, lubricating it and making it ready for use.

The literature shows that many people find catheterisation straightforward to perform, but consider the preparation involved to be a hindrance

They usually come packaged with a sachet of sterile water that activates the coating when pressed (Nazarko, 2013). Due to the nature of the coating, these catheters should be discarded after use. There is some evidence that hydrophilic-coated catheters reduce the risk of UTI, but as the trials performed were methodologically weak, this is yet to be demonstrated convincingly (Bermingham et al, 2013; Prieto et al, 2015).

Prelubricated catheters

This style of catheter comes coated in gel and is usually contained inside a sterile package. It does not require additional preparation and is ready to use immediately. These catheters can be closed system, i.e. come with a collection bag attached.

Table 2. Frequency of intermittent self-catheterisation	
Residual volume in bladder	**Frequency of ISC (per day)**
Unable to void	5–6 times (maximum)
>500 ml	4–5 times
Between 300 ml and 500 ml	2–3 times
Between 150 ml and 300 ml	1–2 times
<150 ml	Once
<100 ml on three consecutive occasions	Stop and reassess need for ISC
Adapted from Naish, 2003	

Uncoated catheters

This requires lubrication before use. It can be more cumbersome for patients as they will need to carry around lubrication as well as the catheters. Because they are not pre-coated, these catheters can be reused for up to 1 week (Barton, 2000).

In their systematic review, Prieto et al (2015) stated that 'despite reviewing 31 randomized trials and 20 specifically addressing UTI, there is still no convincing evidence that UTI, other complications and user acceptability are affected by single-use catheters, specialised coatings or … a sterile technique'.

Sizes

Intermittent catheters come in various sizes and lengths. Size is denoted in Charriere (Ch) or French gauge, and ranges from Ch8 to Ch20. Women generally use Ch10–12 and men Ch10–14 (Barton, 2000). Standard (sometimes referred to as male) length catheters are generally 40 cm long, while female catheters are about 20 cm. There are also female compact length catheters, which are usually about 7 cm in length. In male compact catheters, it is just the packaging that is compact.

Product selection: what is important to the patient?

There is, as yet, no adequate evidence to indicate which catheter/technique is best for performing ISC. However, NICE guidance [CG 139] states that the patient should be given a choice between single-use hydrophilic or gel-coated catheters for ISC (NICE, 2017). In the past, there was a lack of research on what patients found important when choosing a catheter. More recently, this been covered more extensively in the literature, with many qualitative studies focusing on patients' experience of ISC (Logan et al, 2008; Kessler, 2009; Wilde et al, 2011; Cobussen-Boekhorst et al, 2016a; 2016b).

Patients will require ongoing support. While nurses can provide this, their input can be supplemented with DVDs, booklets and online resources

The most common theme in the literature was incorporating ISC into daily life: while many people found the skill of catheterisation itself straightforward, the preparation involved beforehand was a hindrance. Another problem was finding an adequate environment within which to perform ISC at a comfortable pace. These factors should be considered when helping patients choose from the many available devices. Choosing the correct catheter has been shown to influence adherence to catheterisation (Logan et al, 2008; Shaw et al, 2008; Wilde et al, 2011; Logan, 2017).

Product selection: nursing considerations

When helping patients choose a suitable product, the patient's needs, such as mobility, dexterity and body mass index (BMI), must be considered. For wheelchair users or those with poor dexterity, an integrated system should be considered (Rantell, 2012). For women with an increased BMI or large pannus, a female length catheter may be too short, so a male length will be more suitable. For those who have to perform ISC more frequently, a compact catheter may be better as these are more convenient to carry around. This style may also be preferable for patients who are embarrassed about performing ISC, as they are designed to be more discreet.

Catheter costs vary and cost-effectiveness should be taken into consideration, but this should not be the determining factor in selection. It is important to be aware of what is available on local formularies when making product recommendations.

GentleCath Glide

GentleCath Glide is a hydrophilic gel-coated catheter that has recently become available on the market (*Figure 1*). It is impregnated with a hydrophilic coating and is packaged with a sachet of sterile water: once activated, the hydrophilic polymer reacts with the water to create a smooth, slippery coating on the catheter surface to reduce friction during ISC. The activation process takes place immediately, after which the catheter is ready for use. To make optimal use of this time, the catheter can be mounted on a wall using the sticky-back attachment and

Figure 1. The GentleCath Glide

hand hygiene can be performed. The catheter also features a no-touch sleeve to reduce the possibility of bacterial contamination of the catheter during insertion, as it removes the need to handle the device directly.

The combination of the low-friction coating and the no-touch sleeve theoretically reduce the risk of infection and should make the process of ISC more comfortable for the user. While a number of these features are not unique to the GentleCath Glide, the FeelClean technology used in its design is: when compared with some counterparts, this technology has been shown in in vitro studies to leave less residue (ConvaTec, 2017a and b). It may thus be less messy, as little or no residue is left on the hands and clothes once the procedure has been performed.

The GentleCath Glide can be attached to a drainage bag for patients who prefer to use a closed system. These need to be ordered as separate supplies and are not currently available as an integrated system. *Figure 2* illustrates how to insert the GentleCath Glide. Case study evidence on the catheter is presented later in this supplement.

Support for users

ISC can be a difficult skill to master and individuals should be given adequate time to learn it. Patients, particularly women, often feel under pressure to master the skill straightaway and to get it right the first time (Ramm and Kane, 2011). An individualised approach should be taken for each patient. The nurse should consider any additional aids, such as mirrors, leg separators or handling aids, that may be required to facilitate easier ISC. When teaching the skill, a significant amount of time can be spent reassuring patients and alleviating fears (Logan, 2017), which may affect the actual amount of time the patient has to practise.

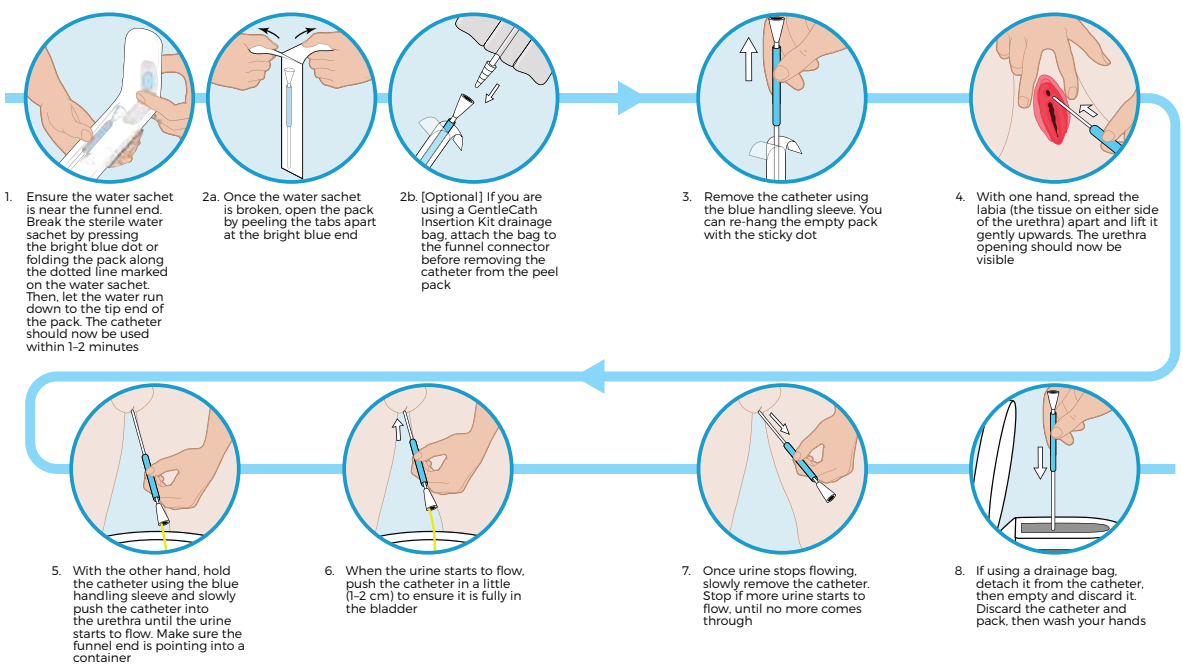

Figure 2. Application of GentleCath Guide

While nurses are an important resource for the patient, they cannot be available 24/7, so it is important that the patient has access to additional resources when at home, such as booklets and DVDs (Ramm and Kane, 2011). Like many of its contemporaries, ConvaTec, which manufactures GentleCath Glide, offers online patient support services that include a selection of videos patients can customise to suit their specific needs. The website has a patient blog and a section covering individuals' stories of living with ISC. There is also a page where patients can provide feedback. Not all patients can access the internet, and so there is a downloadable guide to using the catheters that can be printed off and given to this group of patients. A pictorial guide to using the catheters also comes in the packaging. After the initial teaching, the patient should be followed up regularly not only to offer additional support but also to monitor adherence (Logan, 2017).

Conclusion

For patients experiencing incomplete bladder emptying, ISC is a relatively easy procedure to master and, for most, will be more acceptable than a long-term urethral or suprapubic catheter. ISC can significantly improve quality of life.

Before being taught ISC, the patient should undergo a thorough assessment to ensure that ISC is appropriate, that they will be capable of performing the procedure and are adequately motivated to adhere to the ISC regimen.

There is a wide range of catheters for patients to choose from, and the nurse should guide the patient to make the best possible choice for their needs. Patients value being included in the decision-making process and should be offered a number of catheters to see and feel before making the final choice.

Patients will require ongoing support and, while the nurse will be a valuable resource, DVDs, booklets and online resources will provide them with this. The GentleCath Glide is one of many catheters available on the market that may be considered when teaching patients ISC.

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Case Study:

Teaching intermittent self-catheterisation

Ellie Stewart, Clinical Nurse Specialist, Urogynaecology, Guy's and St Thomas' NHS Foundation Trust

Mrs Smith is 55 years old and has fibromyalgia and hypertension. She has had overactive bladder symptoms (urinary frequency, urgency, nocturia and urge incontinence) for the past 20 years. She has tried all conservative management options (bladder retraining, caffeine reduction, pelvic floor exercises and antimuscarinic medications), with little improvement in her symptoms. She was still incontinent every time she needed to go to the toilet. Her symptoms were having a serious impact on her quality of life. For the past 5 years, she had worn incontinence pants all of the time; she needed to toilet map before she left home and restricted what she drank beforehand and while out. Her work colleagues teased her because of the number of times she went to the toilet during the day. Her grandchildren also teased her because she wore 'nappies'.

Following urodynamic investigations and discussion with her consultant about her options, she decided to have botulinum toxin injections into her bladder. Due to the 5–6% risk of postoperative voiding difficulties (Sievert et al, 2014), she had to learn intermittent self-catheterisation (ISC) in case she would be unable to empty her bladder following the injections. It is easier to teach this pre-operatively, so that patients can learn and perfect their technique without the pressure of not being able to empty their bladder.

Mrs Smith attended a urogynaecology clinic, where the clinical nurse specialist explained the ISC procedure to her. All of the important issues (hand hygiene, meatus wash, non-touch technique and disposal of single-use equipment, as well as troubleshooting and iatrogenic urinary tract infection prevention) were discussed in simple language using diagrams and catheters, where necessary. She was given a selection of catheters to use and chose GentleCath Glide (ConvaTec), mainly because she thought it would be easier to open the packaging (her hand and grip were often weak due to her fibromyalgia, and so she was unable to tear or twist the lid of other catheters or risked touching them when she did). She also preferred hydrophilic- to gel-coated catheters, as she thought they felt smoother and more lubricated, and so would glide in more easily and cause less trauma.

Because she was slim and willing to learn, she was easily able to identify the urethra after an initial demonstration. She liked the non-touch sleeve, which meant that she had more control while inserting the catheter and was less concerned about accidentally touching it.

In this instance, no bag into which the urine could drain was provided with GentleCath Glide. Learners have many things to think about when perfecting their technique, and the addition of a bag on the catheter can reduce anxiety about where the urine will go. It was therefore necessary to purchase one separately. To address this, ConvaTec is including 10 night bags in its home pack, which patients are given before their prescription is fulfilled. These night-bags can also be used for training purposes.

Overall, the teaching experience was easy and the catheters were a good choice for Mrs Smith. She took with her details of the educational material provided by GentleCath Glide, which she used when practising her technique at home: www.gentlecath.co.uk/#personalise-your-guide

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The teaching experience was easy and GentleCath Glide was a good choice for the patient, who found its educational material useful

The patient's name has been changed

Case Study:

Trialling a catheter

Tony Tasak, Senior Continence Nurse, Wirral Integrated Bladder and Bowel Service, Fender Way Health Centre

Mr Abbott is a 70-year-old man with a history of prostate cancer, which was treated with radical radiotherapy (a high dose of radiotherapy to the prostate) followed by Zoladex, a hormone therapy used to treat the symptoms of prostate cancer. Two years later, he developed difficulty passing urine and had surgery to a urethral stricture. Following this, he experienced leakage of urine, mostly at night. He managed this with incontinence pads, but also underwent bladder retraining and started a progressive regimen to strengthen his pelvic floor.

Despite this, the nocturnal leakage continued even though Mr Abbott remained mostly dry during the day, when he was able to void urine without difficulty. He was beginning to suffer short-term memory loss and was attending a memory clinic. The sleep disturbance caused by the incontinence was having a negative impact on both him and his wife.

Three months ago (approximately 3 years after his initial cancer diagnosis), Mr Abbott was found to have regular post-void residual urine volumes of over 200 ml. He was prescribed Doxazosin, an alpha blocker used to treat the symptoms of an enlarged prostate, but this had little effect. He was referred to the Wirral bladder and bowel service. Following assessment, it was suggested that he try intermittent self-catheterisation (ISC) before bedtime. A senior continence nurse explained the process to him, and he felt it was something he could manage. He was shown three catheters: Actreen (Braun), LoFric Primo (Wellspect Healthcare) and SpeediCath (Coloplast). Mr Abbott selected SpeediCath as it is a gel catheter and he considered it to be the simplest to use (it does not need to be activated with water). After performing ISC under observation at home, Mr Abbott undertook the procedure before going to bed. This proved successful, and he was able to sleep through the night with minimal or no disturbance, voiding as normal the next morning.

The patient's name has been changed

However, Mr Abbott acquired two symptomatic urinary tract infections during the next 2 months. He was reviewed by the bladder and bowel team. He reported that he had recently had difficulty inserting the SpeediCath, and it appeared he was handling the catheter more than previously. A possible solution was to change to a catheter with better non-touch properties. We had recently acquired a sample of the Hydrosil Gripper (Bard), which we demonstrated to Mr Abbott along with GentleCath Glide (ConvaTec) and LoFric Primo. These are all hydrophilic catheters. Hydrosil and GentleCath Glide are very similar: both contain a water sachet within the packaging and a gripper sleeve with which to hold the catheter during insertion. LoFric Primo is packaged so that the plastic wrapper can be torn in two places, leaving a section of plastic that can be used as a gripper.

Mr Abbott found the LoFric Primo water sachet easy to burst, but had difficulty gripping and tearing open the plastic packaging as he lacked the strength in his fingertips. He initially found bursting the water sachets in the Hydrosil and GentleCath Glide a little more difficult, but managed this well with practice. Mr Abbott selected the GentleCath Glide, as its gripper sleeve is longer than the Hydrosil one, and he felt he could handle it more easily, with less chance of touching the catheter. He tried the GentleCath Glide over the weekend, and reported that, once he had mastered the water sachet, the catheter was easy to insert. He also considered GentleCath Glide to be slightly more rigid than the SpeediCath, which also aided insertion.

Mr Abbott has since been prescribed GentleCath Glide 10 ch, which he continues to use successfully.

From a continence nurse perspective, non-touch ISC catheters can help reduce contamination and infection (Hudson and Murahata, 2005). Other non-touch gel catheters are available, such as SpeediCath Flex (Coloplast) and Va-Pro Pocket (Hollister). These have a flexible plastic sleeve covering the entire length of the catheter, but are much more expensive than the simple hydrophilic catheters. Having the water sachet inside the packaging makes the catheter easier to use, and the addition of a gripper sleeve appears to improve confidence, increasing the likelihood that patients will adopt ISC as an alternative to indwelling catheterisation.

Hudson E, Murahata RI. The 'no-touch' method of intermittent catheter insertion: can it reduce the risk of bacteria entering the bladder? Spinal Cord. 2005; 43(10): 611–4

Case Study:

Overcoming fear and anxiety

Janice Golding, Urology Nurse Practitioner, West Suffolk Hospital NHS Foundation Trust

Mr Smith is a 75-year-old man who was referred for a trial of micturition following an episode of retention. Unfortunately, due to various medical conditions, he had been told that the anaesthetic would place him at high risk during prostate surgery. Discussion about his symptoms revealed a picture of chronic retention, with a urinary flow that had been declining over several years. His flow was very hesitant, and abdominal straining was required to maintain it. He would often double void in an attempt to empty his bladder and experienced post-micturition dribble. He also had nocturia, although this did not bother him.

When the indwelling catheter was inserted, he had a large residual volume of urine (1.7 litre). As a result, he was told that he might need to self-catheterise. However, he came to the clinic with a fixed idea that he would not be able to do this and enquired further about what the prostate surgery would involve. It was explained to him that, even if he underwent surgery, he might nonetheless need to learn how to self-catheterise, as he would probably still have a degree of incomplete bladder emptying.

The concept of intermittent self-catheterisation (ISC) was then discussed in more detail: the advantages and disadvantages of keeping his long-term catheter in situ were compared with those for ISC, even if the indwelling catheter used had a type of valve that enables more normal bladder function and was discreet under clothing, and thus more comfortable to wear. Mr Smith was shown various intermittent catheters, taught how to activate the lubricant, and informed about their ease of use and portability. He had difficulty accepting that he might need to rely on ISC, not understanding that natural voiding might not automatically resume after his indwelling catheter was removed.

It was explained that using intermittent catheters would allow him to try to void naturally. At first, Mr Smith was still sceptical and left the clinic armed with information but with his long-term catheter in situ, even though he found it extremely uncomfortable.

He was next seen by the urology nurse practitioner a few weeks later, when he said that he wanted to give ISC a go. He was shown various catheters, but had no preferences. One of his most consistent questions was how far to insert the device. After looking at the various catheters, Mr Smith examined and activated the GentleCath Glide. It proved to be simple to use and firm enough for shaky hands. It was also possible to use the sleeve as a guide as to how far to insert it. Mr Smith successfully self-catheterised at his first attempt, and surprised himself by how easy it was. Supplies were given and ordered and, on telephoning him a couple of days later, he confirmed that he had received his prescription and was managing extremely well.

GentleCath Glide was simple to use and firm enough for shaky hands. The patient successfully self-catheterised at his first attempt and surprised himself by how easy it was. He has continued using it

The patient's name has been changed

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References: 1. Hudson E. & Murahata R.I. The 'no-touch' method of intermittent urinary catheter insertion: can it reduce the risk of bacteria entering the bladder? Spinal Cord 2005;43(10):611–614. **2.** Charbonneau-Smith R. No-touch catheterisation and infection rates in a select spinal cord injured population. Rehabilitation Nursing 1993;18(5):296–299, 305.