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A consensus statement on when to start clean intermittent self-catheterization: An untapped resource?

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Abstract

Background: Clean intermittent self-catheterisation (CISC or ISC) is used by patients/carers to empty the bladder if needed. Sometimes the urethral lumen leading out of the bladder is blocked; sometimes, the bladder (detrusor) muscle itself or the autonomic motor nerves innervating the bladder are damaged, resulting in a failure of the detrusor muscle to work, leading to a failure of the bladder being able to empty adequately. Prior consensus as to the

indications and timing of CISC has yet to be provided. This article aims to provide a multidisciplinary consensus view on this subject.

Conclusion: It is evident that every patient needs to be considered individually, bearing in mind the symptoms and investigations to be considered. We emphasise the importance of considering the term Bladder Voiding Efficiency (BVE). One group of patients who might find CISC helpful are those with a neurological disorder; these include spinal injury patients, multiple sclerosis, Parkinson's, and a condition called cauda equina. Sometimes bladder problems are treated with anticholinergics, and others may be treated with Botox. These may cause the bladder not to empty at all, which is good for leaks but needs self-catheterisation to empty the bladder. In the past, hospitals used a permanent catheter called an 'indwelling' or a 'suprapubic' catheter. These can have side effects, including infections, stones, and pain. For CISC, disposable catheters are the best option for patients as they come in different sizes and styles to provide individualised care. In conclusion, we would like hospitals to consider each patient separately and not use a general 'one-size-fits-all' bladder function for these patients.

KEYWORDS

bladder voiding efficiency, CISC, clean intermittent self-catheterization, consensus statement, intermittent self-catheterization, ISC, neurogenic lower urinary tract dysfunction (NLUTD), neurourology, nonneurogenic bladder dysfunction (NNLUTD), retention

1 | INTRODUCTION

Intermittent self-catheterization (ISC), often called clean intermittent self-catheterization (CISC), has been widely used for the last 50 years and is an effective way for patients/carers to empty the bladder in situations where this is clinically indicated. CISC is now well-accepted in routine clinical practice, but we have identified that there is no consensus statement relating to the use of this important procedure. A multidisciplinary group of healthcare practitioners, including doctors and nursing colleagues, chosen for their longstanding interest and clinical practice expertise in the field of functional and neurourology was convened, including a patient representative specializing in the area of continence management (see authors and affiliations). We addressed what we believe are the most important questions relating to CISC to issue clinical practice recommendations based on consensus using the modified nominal group technique.

Before CISC became widely available, indwelling urethral catheters were the principal method of treating poor bladder emptying. Both indwelling long-term urethral and suprapubic catheterization are associated with recurrent urinary tract infection and sometimes urosepsis, the potential for bladder stone formation, and

ultimately a reduction in anatomical bladder volume. In addition, long-term urethral catheterization can damage the distal urethra in men resulting in a hypospadiac deformity requiring reconstruction capacity.

Fundamentally, CISC is indicated in cases whereby complete bladder emptying cannot be achieved naturally or by noninvasive means. This often occurs due to either bladder outlet obstruction, or inadequate detrusor contraction or lack of coordination of detrusor-sphincter function, in the latter two circumstances usually due to potential neurogenic lower urinary tract dysfunction (NLUTD). In most instances, CISC is considered the gold standard rather than permanent urethral or suprapubic catheterization.¹¹ In terms of prevalence, there were approximately 66 million CISC catheters prescribed in 2015 in England, costing £103 million (NHS England data, 2015). Based on the average patient using three CISC catheters per day,^{2,5} there are more than 60,000 CISC users in England alone. Consequently, CISC incurs significant economic costs and morbidity, including recurrent UTIs, visible hematuria, discomfort and trauma to the bladder outflow, and increased risk of urethral strictures or false passages. However, it can also be cost-effective (<https://bladderinterestgroup.co.uk/wp-content/uploads/2021/12/Cost-of-Poor-Bladder-Management-Report-2021.pdf>). When considering the indications for CISC, it is

surprising that in contemporary clinical practice, there is heterogeneity and inconsistency of practice in terms of definitions, thresholds, and frequency of catheterization; this remains an area where there still needs to be an agreed consensus. Therefore, we set out to achieve consensus among a multidisciplinary group of stakeholders (see Appendix 1 – Members of the Panel) consisting of urologists, microbiologists, specialist nurses, trialists, researchers, and patient advocates through a series of consensus group meetings undertaken in person and virtually. A modified nominal group technique was used,^{3,6} with consensus being defined by majority agreement (i.e., >50% of participants).

The evidence base relating to continence in both neurological and nonneurological patients has been reviewed in detail in the European Association of Urology (EAU) guidelines (2023) and the 2021 AUA guideline on management of NLUTD regarding ISC. The evidence reviewed which has been considered in detail by the panelists when formulating their answers to the following questions, which were prioritized:

- What are the clinical scenarios relevant to CISC?
- For chronic low-pressure urinary retention causing symptoms or complications due to incomplete bladder emptying, when is CISC indicated and how often should it be performed?

2 | RESULTS AND DISCUSSION

2.1 | What are the clinical scenarios relevant to CISC?

Clearly, the passage of a catheter aims to empty urine from the bladder. First, it is important to consider the different clinical scenarios and, in doing so, subdivide patients into those with known neurological disease and those who do not have a clearly defined neurological disorder.

2.1.1 | NLUTD

In all patients with likely NLUTD, it is essential for them to undergo a urodynamic study, particularly a videourodynamic study using contrast to identify the underlying functional disorder affecting the lower urinary tract. In patients with neurological disease, an important group is those with detrusor-sphincter dyssynergia (this is a failure of coordinated activity between the detrusor and the sphincter resulting in loss of normal relaxation of the urethral sphincteric mechanism at the time of detrusor contraction). In many of these patients with a

neurological disorder, there is also clear urodynamic detrusor overactivity and, therefore, both troublesome storage symptoms combined with voiding dysfunction due to detrusor/sphincter dyssynergia. In these patients, there is a concern about an increased intravesical pressure leading to retrograde transmission of pressure to the upper tracts. Many of these patients have these functional problems consequent upon a spinal cord injury.

In most cases of urodynamically proven neurogenic detrusor overactivity, therapy with either intravesical botulinum toxin or an augmentation (clam) cystoplasty results in poor bladder emptying requiring CISC. Other neurogenic patients, such as those with multiple sclerosis with urodynamically proven neurogenic detrusor overactivity, are treated with anticholinergics, and failing response to these, the use of botulinum toxin injection into the bladder wall. These patients often develop poor detrusor emptying, and while this improves their storage symptoms, it results in significant voiding dysfunction, which is best managed by the use of CISC, providing they have adequate hand control. If the patient is willing to perform CISC, this consequence is positive as CISC allows the patients a far improved quality of life as they have reduced frequency and incontinence and more control of their symptoms. Another important subgroup of patients is those with paradoxical detrusor function, for example, due to a neurological deficit resulting from cauda equina compression or a disorder such as some forms of Parkinson's disease where initial detrusor overactivity on filling is complicated by detrusor underactivity on voiding.

2.1.2 | Nonneurogenic lower urinary tract dysfunction (NNLUTD)

An important group of patients also has poor bladder emptying due to detrusor underactivity on voiding with symptoms known as the “underactive bladder” without an obvious cause. It is clearly established that a proportion of this population also has idiopathic detrusor overactivity during bladder filling, and the incidence of this increases with age. Many such patients may have an underlying neurological cause which has not been demonstrable. These patients often must rely on CISC for effective bladder emptying, which becomes the mainstay of therapy. There are other important subgroups of NNLUTD patients who can benefit from CISC:

- In a subgroup of patients without known neurological disease, their presentation is with chronic retention, often manifest by incontinence or recurrent urinary

infections as a presenting feature. In a proportion, there is an increasing pressure in the bladder on filling, resulting in chronic high-pressure urinary retention with significant impairment of upper tract function and, in some cases, severe renal failure. CISC is a very valuable therapeutic approach in this scenario, both initially and following appropriate evaluation with urodynamics as treatment in the longer term

- In patients with bladder outlet obstruction and acute retention who have failed a trial without catheter (TWOC), then CISC, while awaiting definitive treatment, is an invaluable therapeutic option as compared with a chronic indwelling catheter. Indeed, some of these patients may decide to continue with CISC as an alternative to surgery, particularly as they may have co-existing medical morbidity, potentially increasing the risks associated with a surgical procedure. Nevertheless, in a subset of patients with significant bladder outlet obstruction, in particular men with very large prostates causing obstruction, long-term catheterization may be preferable over CISC if CISC causes significant resistance, discomfort, UTIs, recurrent visible hematuria or false passages owing to the frequency of the catheterizations (i.e., once every 3 months for indwelling catheterization vs. several times daily for CISC).
- Therapeutically, iatrogenic acute urinary retention may develop after intravesical botulinum toxin injections for detrusor overactivity, which is usually of limited duration and can be managed by CISC until detrusor function returns. Recent evidence has demonstrated that this is uncommon in patients below 50 years of age but is more common in men than women.
- Another indication for CISC is in patients with urethral stricture to maintain the urethral caliber when surgical urethroplasty is not considered appropriate.
- A small group of female patients present with idiopathic urinary retention, the so-called Fowler's syndrome; in these patients, CISC is the treatment of choice but may not be feasible due to the significant discomfort experienced both on attempted passage of the catheter and on withdrawing the catheter which produces sphincteric spasm, which causes pain.
- CISC is also the mainstay of therapy in patients with a continent diversion, particularly with a Mitrofanoff procedure. In NLUTD patients, in this patient group, it is also an important adjunct to clinical management of postclam cystoplasty in the significant proportion of patients who do not empty their bladder to completion and as a temporizing measure to treat retention following botulinum toxin injection treatment.

In all patients using CISC, they may find that when they start using CISC, they will no longer be able to void

spontaneously, and they must be reassured that this can be an inevitable consequence of the therapy.

2.2 | For chronic low-pressure urinary retention causing symptoms or complications due to incomplete bladder emptying, when is CISC indicated and how often should it be performed?

It is clear from the above discussion that there are various reasons for instituting CISC. In cases with incomplete bladder emptying with postvoid residuals, debate exists over whether to institute CISC and how frequently it should be performed.

In terms of the frequency of CISC, each case has to be judged on its merits, and it depends on the volume intake by the patient, but also particularly where incontinence supervenes when a certain level of residual is reached, there is always the risk, particularly in patients who are not ambulant such as in care homes, of skin breakdown and health issues that result from urine and fecal exposure.

Guidelines regarding when and for whom to recommend CISC are lacking in the literature, but our consensus view is that if the voiding efficiency is less than 50% (in other words, a residual >50% of the total bladder capacity), then CISC should be considered.

A useful decision-making tool is to consider the so-called bladder voiding efficiency (BVE), which represents the ratio of the average maximum voided volume (from the bladder diary) divided by the functional bladder capacity (BC) calculated summing the average maximum voided volume with the postvoiding residual (PVR) (measured by ultrasound or catheterization).^{4,7} To summarize, therefore:

$$BVE = \frac{\text{average maximum VV per day}}{\text{BC per void.}}$$

A ratio of less than 40% is sometimes said to be the lower limit of acceptable function, below which CISC should be considered as a therapeutic option. We believe BVE is a more meaningful way of predicting the need for CISC than the PVR value alone. For example, if two men, A and B, void 1200 mL of urine in 24 h, and both have an average PVR of 100 mL. A has an average VV of 100 mL; therefore, his BC is 200: 100 + 100, and BVE 50%, and he voids 12 times per 24 h. However, B has an average VV of 400 mL, so his BC is 500: 100 + 400, and BVE 80%, so he voids two or three times daily. If CISC is used in A, the frequency is reduced from 12 to 6 times, whereas B will only see a change of once, making CISC of little use to him symptomatically. Therefore, in most patients with PVRs of more than 150–200 mL and a normal

bladder capacity of 300–500 mL, the patient may consider CISC worthwhile if frequency bothers them. The BVE as evidence of the importance of the numeric value for a residual is apparent, as shown by these examples. Clearly, if the patient is in retention, then the BVE is not relevant, as the residual equals the capacity of the bladder (i.e., 100%). Some of us believe that there should be a discussion as to whether the term BVE should be replaced by the newer term “bladder voiding inefficiency” (BVIE) because the higher the value, the lower the effectiveness of bladder emptying (Chapple personal comment).

It is, however, important to consider the need for CISC on an individual, patient-by-patient basis. If a patient has a large residual, for example, 300–400 mL, which is seen in many male patients, is asymptomatic, and there is no evidence of upper tract changes, then in our experience, they can be monitored without the need for CISC; but it is important to monitor them regularly with, assessment of symptoms and ultrasound of the upper tracts and monitoring their renal function. It is also often difficult for an asymptomatic individual with no evidence of sequelae from their raised residual to institute an invasive CISC regimen. However, if patients are symptomatic or are told their kidneys are at risk due to retrograde pressure, they are more likely to comply. An absolute indication for CISC is a patient with a residual volume affecting the upper renal tract with upper tract distension due to back pressure from the bladder to the kidneys (i.e., chronic high-pressure urinary retention). Videourodynamics is useful and recommended in unclear cases, particularly in the neuropathic population. Other sequelae of a raised postvoid residual include recurrent urinary tract infections, bladder stones, and frequency of urination which may form the rationale for recommending CISC. Although it lies outside the scope of this article, it is very important to raise the issue that CISC also provides a portal into the bladder, via which various agents can be administered, for instance, in the context of bladder pain syndrome, hyaluronic acid agents and in the context of prevention of infection antibiotics such as gentamicin as a treatment for recent infective episodes.

3 | CONCLUSIONS

It is clear from the above discussion that CISC is an important therapeutic modality, but there is inconsistency in clinical practice regarding when to implement it and how often. We have outlined the absolute and relative indications for CISC based on NLUTD versus NNLUTD conditions. For chronic low-pressure urinary retention, we recommend using a combination of BVE and a detailed clinical assessment of the patient on a case-by-case basis when considering if CISC is required. We also believe sweeping

generalizations over instituting CISC at a certain threshold level (e.g., <800 mL postvoid residual) are, in our view, inappropriate in the majority of cases as it is important to consider every patient individually to provide the best outcome for them regarding the management of their upper and lower urinary tract and to focus on improving their quality of life.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no data sets were generated or analyzed during the current study.

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