

## W18: ICS Core Curriculum (Free): Intermittent catheterisation in patients with neurological disease: Indications and challenge

Workshop Chair: Collette Haslam, United Kingdom  
29 August 2018 08:35 - 10:05

| Start | End   | Topic  | Speakers  |
|-------|-------|--|---|
| 08:35 | 08:40 | Introduction   | Collette Haslam   |
| 08:40 | 08:55 | ICI guidelines on IC and indication for neurological patients  | Rizwan Hamid  |
| 08:55 | 09:10 | Challenges in performing ISC in patients with neurological disease and the role of appliances                          | Collette Haslam   |
| 09:10 | 09:25 | What is the patient's perspective on ISC?  | Doreen McClurg  |
| 09:25 | 09:40 | Complications of IC in neurological patients- urinary tract infections and urethral trauma                             | Pawan Vasudeva  |
| 09:40 | 09:55 | Alternatives to bladder emptying if IC is not suitable: Crede manoeuvre, triggered voiding, indwelling catheterisation | Emmanuel Braschi  |
| 09:55 | 10:05 | Cases studies and conclusion   | Collette Haslam<br>Rizwan Hamid<br>Emmanuel Braschi<br>Pawan Vasudeva<br>Doreen McClurg |

### **Aims of Workshop**

At the time where intermittent catheterisation is recognised as the basic management technique of chronic urinary retention for spinal cord diseases management, this workshop led by the NU Promotion Committee will focus on practical issues and provide tips and tricks.

### **Learning Objectives**

To promote basic knowledge on IC for caregivers: teaching patients, answering questions and ensure good practice and follow-up.

### **Learning Outcomes**

Audience should be able to teach and promote it, whatever the country of practice and level of available materials.

### **Target Audience**

Nurses, Physician assistant, residents and fellows, more generally caregivers dedicated to spinal cord diseases.

### **Advanced/Basic**

Basic

### **Conditions for Learning**

Interactive and practical discussions.

### **Suggested Learning before Workshop Attendance**

Guidelines.

### **Suggested Reading**

ICI 2017 references.

## **ICI Guidelines on Intermittent Catheterization in neurological diseases**

**Rizwan HAMID FRCS(Urol), MD(Res)**

Intermittent catheterization (IC), including intermittent self-catheterization (ISC), aims to resume normal bladder storage and regularly complete urine evacuation. They avoid some of the complications of indwelling catheterization (IDC). IC can improve incontinence, or make patients with neurogenic bladder continent, if; bladder capacity is sufficient, bladder pressure is kept low, urethral resistance is adequate, and fluid intake is balanced with frequency of catheterization.

Most appropriate technique and catheter depend on individual anatomic, social and economic possibilities. Two main techniques have been adopted, aseptic IC (IC) and clean IC (CIC). The aseptic non-touch technique involves the use of sterile materials each time and insertion of the catheter “out of the sheath” without touching it directly (“nontouch technique”). De Ridder et al. [21] compared SpeediCath hydrophilic-coated catheters versus uncoated polyvinyl chloride (PVC) catheters, in SCI patients. This 1-year, prospective, open, parallel, comparative, randomised, multi centre study indicated a beneficial effect regarding UTI when using hydrophilic-coated catheters.

Kovindah and adersbacher investigated whether a silicone catheter reused over years for clean IC was safe for men with SCI. Reused silicone catheter appeared to function as well as disposable. However, to reuse urinary catheters, one should consider the increased risk of infection. The authors suggest that for SCI patients in developing countries, CIC with a reusable silicone catheter may be a suitable and safe choice if one cleans and applies it. A systematic Cochrane review summarizing current evidence on the relationship between sterile single-use catheters or clean reused catheters and the incidence of UTIs concluded that there are no definitive studies illustrating that incidence of UTIs is affected by sterile single-use or coated catheters compared to clean reused catheters.

However, the current research base is weak and design issues are significant. Based on the current data, it is not possible to state that one catheter method is better than another and further research is needed. Research to evaluate clean vs. sterile PVC catheter use and coated vs. uncoated catheter use (both sterile and reused), is needed. It seems that single or multiple use silicone catheters are becoming more popular especially in Asian countries, studies are available only from the Japanese silicone catheter.

### **Conclusions**

- IC in the neurogenic bladder is effective and safe in short and long term.
- Complications such as UTI are regularly seen and seem to be related to both, the catheterization and the preexisting LUT
- Urethral and bladder complications seem to increase in the long-term
- In order to reduce and prevent complications, appropriate materials and correct techniques should be taught.

### **Recommendations**

- IC is the first choice treatment for those with inability to empty the bladder adequately in neurogenic voiding dysfunction and valuable for achieving continence.
- Proper education and teaching are necessary to achieve a good outcome.
- To prevent and reduce complications, a nontraumatizing technique should be achieved.
- Due to the poor quality of studies it is currently not possible to state whether any IC method or catheter type is advantageous

## **Challenges in performing ISC in patients with neurological disease and the role of appliances**

**Collette Haslam**

There are many challenges for all patients contemplating and learning ISC however for the patient with a neurological disease these can be manifested by the idiosyncrasies of the disease and disability. These challenges can affect compliance in performing ISC.

Exploring the factors that affect our patients can improve compliance in this patient group. The commonly reported internal factors such as the physical disabilities in positioning, dexterity and cognition with the issues of visual impairment and anatomical barriers that may be an also an issue are often reported. Our neurological disease patients have the above issues alongside the usual psychological, misconceptions and anxiety issues associated with ISC.

When we discuss and teach ISC we at times omit consideration of the complexity of the external factors that may impact on the daily ability to ISC.

The guidance from the UK Department of Health Good Practice in Continence Services and the National Service Framework for Long Term Conditions suggests that patients have access to an integrated continence service. This should ensure training, support and follow-up, however this has been found to vary in various areas of the country which may also be an international consideration. Other external factors such as inadequate toilet facilities in public areas – washing, transferring and placement for catheterisation supplies being named as an issue.

The choice of catheter and appliances to assist ISC requires a knowledgeable instructor in ISC teaching, as it is through experience and working with neurological patients that the instructor learns to adapt the teaching methods and available appliances to the individual.

It is often through working with the different patient groups that we as health care professionals gain knowledge about the available appliances, and adaptations to existing appliances. These can aid the patient in catheterisation and the ability to continue if their neurological condition progresses.

The challenging aspects to patients learning and maintaining their ability in self catheterisation a service which has a broad knowledge base will best serve this group of patients.

### **What is the patient's perspective on ISC**

**Doreen Mc Clurg**

CISC is now the gold standard for patients with urinary retention and is perceived as being a relatively simple and quick procedure which allows patients to independently manage bladder emptying in the community, reducing bladder symptoms, and also safe-guarding renal functions. However, it has also shown that compliance dwindles with time with retrospective reviews reporting compliance of 35% to 84 %. During the workshop findings from several prospective cohort studies will be discussed which have identified the steps some patients go through before agreeing to try CISC. The key factors which seem to make compliance, especially in the long-term will also be discussed as will measures that teaching clinicians could introduce to help bring about the behavioural change required for initiation and continuation of use. The qualitative findings from the COSMOS study will be presented. In this study 20 patients were interviewed at the start of their training in the use of CISC and again 8 months later. In addition the views of 10 patients who had been advised to use CISC but during the study period and not agreed to try will be reported and the importance of the patient's 'head being in the right place' is highlighted.

### **Complications of IC in neurological patients-Urinary tract infections and Urethral trauma**

**Pawan Vasudeva**

Intermittent Catheterization (IC) is an effective bladder drainage method in patients with neurogenic lower urinary tract dysfunction (NLUTD) associated with incomplete bladder emptying. While IC is preferred over other forms of bladder emptying (indwelling catheter, reflex voiding etc) and has revolutionized bladder management in NLUTD patients, it is not without its own complications.

#### **Urinary Tract Infection:**

One of the most frequent complications associated with IC is urinary tract infection (UTI). The National Institute on Disability and Rehabilitation consensus statement defined UTI in NLUTD spinal cord injury patients as bacteriuria WITH tissue invasion and resultant tissue response WITH signs and /or symptoms. Quantitative urine culture criteria that have optimal sensitivity and specificity for diagnosis of bacteriuria include: For IC specimen : >10<sup>2</sup> CFU/ml , For clean void into condom collection devices specimen: >10<sup>4</sup> CFU/ml, For indwelling catheters/suprapubic aspirates: any detectable concentration.

Although UTI is common in the neurological population on IC, the actual incidence rates vary widely in the literature. This may be attributed to multiple factors including the criteria used for diagnosing UTI, different techniques of IC, varying frequencies of IC, different prophylaxis regimens and so on.

#### **Prevention:**

Patient education and emphasis on hygiene, adherence to catheterization protocol and proper catheterization technique likely play an important role in UTI prevention in such patients. Various catheter practices have been promoted with the hope to reduce the rates of UTI's. These include:

- ✓ A "Aseptic/Sterile" technique over "Clean" IC
- ✓ Single use catheter over a multiple use catheter
- ✓ Hydrophilic coated over non coated
- ✓ Antimicrobial prophylaxis over no antimicrobial prophylaxis

Currently there is insufficient data to show superiority of one catheter practice over the other.

#### **Treatment:**

Once a symptomatic UTI is documented, it must be treated promptly with appropriate antimicrobials. Asymptomatic bacteriuria does not require to be treated with antibiotics.

#### Genital Infection (Epididymitis):

Epididymitis has been reported in patients undergoing IC with an incidence of 2-28%. Although overall sperm quality is better in NLUTD patients on IC than on an indwelling catheter, an episode of epididymitis can decrease sperm counts and lower fertility potential of such patients.

#### Urethral Complications:

Urethral friction and trauma consequent to IC may result in urethral bleed, false passage, meatal stenosis and urethral stricture.

##### Prevention:

Gentle introduction and adequate lubrication are the key points for prevention. While there is some evidence that a hydrophilic catheter may be less traumatic than the non coated catheters, the data is still evolving.

##### Treatment

In case an IC leads to urethral trauma and false passage, a course of antibiotic and six weeks of indwelling catheter is usually sufficient treatment for the false passage to disappear and IC to be restarted.

#### Miscellaneous complications:

IC is associated with a much lower incidence of complications like bladder/renal stones, worsening bladder compliance, hydronephrosis and vesicoureteral reflux when compared to an indwelling catheter.

### **Alternatives to bladder emptying if IC is not suitable: Crede manoeuvre, triggered voiding, indwelling catheterisation**

**Emmanuel J, BRASCHI (Urol), MD**

Adult neurogenic lower urinary tract dysfunction (ANLUTD) is prevalent in many neurological diseases. The condition is known to be life threatening if not properly managed. The conservative treatment is in almost all cases the first to give and will remain the primary choice in the majority of patients with neurogenic bladder. Treatment will depend on the type of underlying disease, on the bladder dysfunction, urethral conditions, its natural evolution but also on the patient's general condition, patient and family's wishes and the available resources. Urodynamic testing will be necessary in many patients to gain more complete diagnosis of how the neurogenic dysfunction has changed the function of different components in the lower urinary tract and their interaction. Decisions on treatment should depend on an accurate diagnosis of what type of neurologic dysfunction is present in a specific patient. Not only the bladder activity but also the coordination with the bladder neck and the striated external sphincter needs to be studied and documented.

Intermittent catheterization (IC) is the first choice treatment for those with inability to empty the bladder adequately and safely in neurogenic voiding dysfunction. It is a valuable tool for achieving continence. In general, the purpose of catheterization is to empty the bladder and to resume normal bladder storage and regularly complete urine evacuation. With IC there is no need to leave the catheter in the LUT all the time, thus avoiding complications of indwelling catheterization (ID).

However, not all patients are candidates for IC. It is when we must choose a second option that best suits the reality of our patient.. Different methods of emptying are available:

A) Behavioral therapy: Triggered reflex voiding, Bladder expression (Crede and Valsalva Maneuver)

B) Indwelling urethral catheters – transurethral (ID) / suprapubically (SC)

C) Condom catheter and external appliances

Although these methods have decades of existence, they continue as valid options and can be a very good solution in the correctly selected patient. Although some techniques such as triggered voiding and bladder expression have lost their predominant position.

Indications, limitations, complications, long-term acceptance, how, when , why, tips and tricks from the literature and from personal experience in a National Rehabilitation Center in Argentina will be discussed.

#### Take Home Message:

Intermittent catheterization (IC) is the first option in patients with neurological disease. However, not all are candidates and their indication should not be forced. If all the conditions required to perform CI are not assured, a second option must be chosen in order to adapt to each patient in particular and allow us to preserve their renal function and grant an acceptable quality of life. With tips and tricks these objectives can be achieved.

Rizwan Hamid 

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† All financial ties (over the last year) that you may have with any business organisation with respect to the subjects mentioned during your presentation

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☐ Self-funded

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## ICI guidelines for intermittent catheterization & indications for neurological patients


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## Introduction

- Why should we proactively treat NBD after SCI
- Principles of management
- Guidelines
- Complications of catheters
- Controversies in IC
- Summary

## Renal dysfunction and Mortality

- World War I - 80%
- World War II - 40%
- Korean War – 25%
- Vietnam War - Minimal
- Today - Negligible



## Renal failure no longer the leading cause

- Antibiotics
- Catheterisation (Guttman)
- Understanding complications of the “high pressure bladder”
- Education to patient/family
- Follow-up Testing

## Aims of treatment

- Restoration of normal LUT function
- Maintaining continence
- Protection of upper tract
- Maintain Quality of Life

EAU Guidelines

## Consider the long-term effects



- In terms of the urinary tract
- The quality of life issues
- The appropriateness of treatment
- The durability of treatment

## Life expectancy



- Normality should be the aim
- Differences between the paraplegics & quadriplegics
- Neurological diseases like MS are different than SCI



## The Guidelines



European Association of Urology

AUA/SUFU Joint Urodynamic Guidelines

AUA/SUFU Joint Urodynamic Guidelines

AUA/SUFU Joint Urodynamic Guidelines

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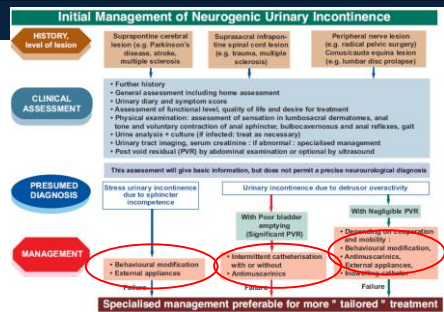
AUA/SUFU Joint Urodynamic Guidelines

AUA/SUFU Joint Urodynamic Guidelines

Should we follow the guidelines?



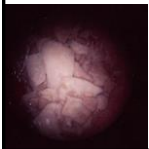
NICE National Institute for Health and Care Excellence



## Catheters



- Indwelling urethral catheters are **not** recommended in neurogenic patients
- Increases the risks of:
  - UTI
  - renal impairment
  - bladder stone formation
  - urethral stricture
  - urethral erosion
  - bladder cancer



Epidemiology and risk factors for urinary tract infection in patients with spinal cord injury. *Caletsky DA, Patel A, Garcia-Loreto R, Hennessy C, Galloway R. J Urol. 2000 Oct; 164(4):1285-9.*  
 Risk of urinary tract infection in patients with indwelling catheters after spinal cord injury. *Chen R, Clowers D, Mayo ME. Urology. 1997 Sep; 49(3):339-42.*



## Complications of urethral catheters



| Reference   | N (n=523 patients in study) | Follow-up      | UTIs                    | Urethral strictures | Upper urinary tract stones | Spinal dysplasia               | Urethral strictures | Urethral erosion | Genital hematomas | Cancer | Needle dissection             |
|---|-----------------------------|----------------|-------------------------|---------------------|----------------------------|--------------------------------|---------------------|------------------|-------------------|--------|-------------------------------|
| Hollingsworth et al <sup>14</sup>                           | /                           | /              | 212% (12.12-40.97)      | /                   | /                          | 0.7% (0.0-18.7)                | /                   | 13.5% (0.0-41.8) | 1.9% (0.0-5.0)    | /      | /                             |
| Katzman et al <sup>15</sup>                                 | 133                         | 10.9 yr        | 53.7% (15.0-82.4)       | 38%                 | 32%                        | 10%                            | 3%                  | 22%              | 20%               | 0.8%   | /                             |
| Ward and Donchowski <sup>16</sup> (extrapolated from graph) | 114                         | 10.3 ± 12.4 yr | 6% (prolonged catheter) | 20%                 | 54%                        | 25% (8% post-urethral abscess) | 22%                 | /                | /                 | /      | 22% VUR, 20% abnormal imaging |
| Larsen et al <sup>17</sup>                                  | 50 (04-82.2 SPT)            | 7 yr           | 75% (15.0-95.0)         | 11%                 | 32%                        | 3% (post-urethral abscess)     | 22%                 | 21%              | 40%               | /      | 23% penile chylal drainage    |

## Suprapubic catheter



- SPC is easier to manage in terms of hygiene and catheter changes
- 90% of patients prefer SPC over urethral
- SPC remains a valuable option quadriplegic patients
- SPC care is important to reduce morbidity in patients with NBD



The surgical risk of suprapubic catheter insertion and long-term sequelae. Aktouma RS, Jha N, Kourilsk C, Koozein D, Montgomery RS, Patel MS, Ann R Coll Surg Engl. 2008 Mar; 196(2):110-3. In: Evidence: systematic evidence synthesis in health technology - A systematic study of evidence.

## Complications of suprapubic catheters



| Reference                                      | N (n=523 patients in study) | Follow-up      | UTIs                      | Urethral strictures | Upper urinary tract stones | Spinal dysplasia | Urethral strictures | Urethral erosion            | Genital hematomas | Cancer | Needle dissection             |
|--|-----------------------------|----------------|---------------------------|---------------------|----------------------------|------------------|---------------------|-----------------------------|-------------------|--------|-------------------------------|
| Katzman et al <sup>15</sup>                    | 40                          | 10.9 yr        | 67.5% (10.0-95.0)         | 41%                 | 26%                        | 4%               | 0                   | /                           | 20%               | 4%     | /                             |
| Signers et al <sup>18</sup>                    | 149                         | 68 mo          | 27%                       | 22%                 | 8%                         | 2%               | /                   | 7%                          | /                 | 0.7%   | 6% renal scarring, 14% VUR    |
| Althoff et al <sup>19</sup>                    | 219 (50)                    | 50 mo          | 26%                       | /                   | /                          | /                | /                   | /                           | /                 | /      | /                             |
| Ward and Donchowski <sup>16</sup> (from graph) | 36                          | 10.3 ± 12.4 yr | 3% (prolonged catheter)   | 22%                 | 26%                        | 0%               | 0%                  | /                           | /                 | /      | 20% VUR, 20% abnormal imaging |
| Niemans et al <sup>20</sup>                    | 110 (94)                    | /              | 2.5% (prolonged catheter) | 25%                 | /                          | /                | /                   | 10%                         | /                 | /      | 4%                            |
| Mittal et al <sup>21</sup>                     | 34                          | 6.0 yr         | 15%                       | 65%                 | 9%                         | 0%               | 0%                  | 20% (21% mild, 1% moderate) | 0%                | 0%     | 0%                            |
| MacClennan et al <sup>22</sup>                 | 44                          | 50 mo          | 40%                       | 41%                 | 7%                         | 2%               | /                   | 11%                         | 15%               | 0%     | 0%                            |

## Clean self intermittent catheterization



- Gold standard
  - Sterile v clean
- Effective in patients with:
  - Detrusor underactivity or a
  - Detrusor overactivity (provided it can be controlled)
- The prevalence of complications can be limited by:
  - Adequate patient education
  - Use of non-traumatizing techniques
  - Adequate precautions to prevent infections



## Clean self intermittent catheterization



- IC aims to resume normal bladder storage and regularly complete urine evacuation
- They avoid some of the complications of IDC
- IC can improve incontinence, or make patients with neurogenic bladder continent, if; bladder capacity is sufficient
- Bladder pressure is kept low, urethral resistance is adequate, and fluid intake is balanced with frequency of catheterization
- A post-void residual greater than 150 ml is an independent risk factor for development of UTI in stroke patients

## Clean self intermittent catheterization



- Most appropriate technique and catheter depend on individual anatomic, social and economic possibilities
- Two main techniques have been adopted, aseptic IC & clean IC
- The aseptic non-touch technique involves the use of sterile materials each time and insertion of the catheter "out of the sheath" without touching it directly - "nontouch technique"
- Clean technique is washing hands but catheterization can be without a "nontouch technique"

## Clean self intermittent catheterization



- Mainstay of treatment in paraplegics – often in conjunction
- Bladder compliance is better maintained in pts undertaking CISC
- FU at 18 years - significantly lower complication rate with
  - CISC (27.2%)
  - spontaneous voiding (32.4%)
  - suprapubic catheterization (44.4%)
  - chronic urethral catheterization (53.5%)

Comparison of bladder management complication outcomes in female spinal cord injury patients. Bennett CJ, Young JB, Adkins RW, Clark F. J Urol. 1999;161:1401-1404.

## Clean self intermittent catheterization



- Females
  - CISC a significantly lower complication rate (17%)
  - compared with pads (40%)
  - indwelling catheter (greater than 200%) groups.

Comparison of bladder management complication outcomes in female spinal cord injury patients. Bennett CJ, Young JB, Adkins RW, Clark F. J Urol. 1999;161:1401-1404.

## Comparison of Complications between catheters



| Complication                         | Intermittent catheter | Urethral catheter | SPT  |
|--------------------------------------|-----------------------|-------------------|------|
| Symptomatic urinary tract infections | †                     | ††††              | †††† |
| Bladder cancer                       | †                     | ††                | ††   |
| Bladder stone                        | †                     | ††††              | †††† |
| Worsening bladder compliance         | †                     | ††                | ††   |
| Urinary incontinence                 | ††                    | ††                | ††   |
| Urethral strictures                  | ††                    | ††                | =    |
| Epididymitis                         | ††                    | ††                | =    |
| False passages/hematuria             | ††                    | =                 | =    |
| Upper tract stones                   | †                     | ††                | ††   |
| Hydrophrenitis                       | †                     | †††               | †††  |
| Complication                         | Intermittent catheter | Urethral catheter | SPT  |
| Vesicoureteric reflux                | †                     | †††               | †††  |
| Urethral erosion                     | =                     | ††††              | =    |

## Catheter controversies



- one catheter design, material
- sterile technique versus clean
- single-use or multiple-use catheters

## Hydrophilic or not?!



- SpeediCath hydrophilic- coated catheters v polyvinyl catheters
- SCI patients
- 1-year, prospective, open, parallel, comparative, randomised, multi centre
- Primary endpoints were occurrence of symptomatic UTI & hematuria
- Secondary endpoints were development of urethral strictures and convenience of use
- **The results indicate a beneficial effect regarding UTI when using hydrophilic-coated catheters**

## Hydrophilic or not?!



## META ANALYSIS of RCT

- There was a significantly lower incidence of reported UTIs in the hydrophilic-treated group compared with the non-hydrophilic
- Hematuria was also reported significantly less in the hydrophilic group
- Meta-analysis supports the benefit of hydrophilic over non-hydrophilic
- Most of the evidence came from men
- **It must be noted that much of the literature comparing IC brands is industry sponsored and must be interpreted cautiously**
- A realistic approach in clinical practice would be to allow patients to try several brands and types to choose the preferred for their own needs



### Reusable or not?!



- Silicone catheter reused over years for clean IC was safe for men with SCI were investigated
- Reused silicone catheter appeared to function as well as disposable
- To reuse urinary catheters one should consider the increased risk of infection
- SCI patients in developing countries can do CIC with a reusable silicone catheter in a safe manner if one cleans and applies it

### Complications affecting the Urethra



- False passage
- Urethral stricture
- Catheterisation difficulties
- Undermining of the bladder neck
- Urethral cleavage (male and female)



### False Passages



- Caused by traumatic catheterisation
- Can cause the catheter to go into the false passage and even more trauma
- For the acute try a period of indwelling catheterisation
- Is it treatable - inject bulking?



### EAU Guidelines for catheterization



|   | GR |
|---|----|
| Intermittent catheterization is the standard treatment for patients who are unable to empty their bladder   | A  |
| Patients should be well instructed in the technique and risks of IC   |    |
| Aseptic IC is the method of choice  | B  |
| The catheter size should be 12-14 Fr  | B  |
| The frequency of IC is 4-6 times per day  | B  |
| The bladder volume should remain below 400  | B  |
| Indwelling transurethral and suprapubic catheterization should be used only exceptionally, under close control, and the catheter should be changed frequently. Silicone catheters are preferred and should be changed every 2-4 weeks, while (coated) latex catheters need to be changed every 1-2 weeks. | A  |

### Conclusions



- Combination of antimuscarinics and CSIC is the mainstay of management of NBD
- This maintains a low pressure bladder and facilitates complete bladder emptying.
- CSIC should be started during the spinal shock phase once stable
- Four to six catheterizations per day are usually recommended
- The maximal volume drained is between 300 and 500 ml
- The recommended type of catheter is hydrophilic coated catheters because they are associated with less urinary tract infections, urethral injuries and hematuria episodes
- The suggested urine output per day is between 1.5 to 2 litres
- A new catheter is to be used each time
- The patient washes the hands only with soap before performing CSIC.
- Several factors can impede a patient's ability to perform CSIC including
  - impaired manual dexterity (quadriplegia)
  - persistent cognitive dysfunction (brain injury)
  - simply the patient is unable to master the technique due to body habitus or lack of desire
  - In quadriplegia, a tendon transfer surgery could be needed before patients start CSIC.

### ICI Recommendations



- IC is the first choice treatment for those with inability to empty the bladder adequately and safely in neurogenic voiding dysfunctionIt is a valuable tool for achieving continence. (A)
- Proper education and teaching are necessary to achieve a good outcome. (B)
- To prevent and reduce complications, a nontraumatizing technique (external lubricant or lubricant coated catheters) with adequate frequency of catheterization and complete emptying should be achieved. (B)
- Annual follow-up is needed. (B/C)
- Due to the poor quality of studies it is currently not possible to state whether any IC method or catheter type is advantageous (Grade D) and further research on the topic is strongly recommended

Collette Haslam

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Affiliations to disclose<sup>†</sup>:

None to disclose

† All financial ties (over the last year) that you may have with any business organisation with respect to the subjects mentioned during your presentation

Funding for speaker to attend:

☐ Self-funded



☒ Institution (non-industry) funded

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## Challenges in performing ISC in patients with Neurological Disease and the role of appliances

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NHS Foundation Trust

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## Clean Intermittent Catheterisation (CISC)

The use of a clean technique to drain the bladder with the subsequent removal of the catheter which the patient performs himself/herself (ICS)

*Gold standard for the management of urinary retention*

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## Patient performance of CISC is a crucial component of the management of incomplete bladder emptying

Neurological conditions affected

- Spinal cord Injury
- Multiple Sclerosis
- Multiple System Atrophy
- Parkinsons' Disease

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## Benefits of CISC

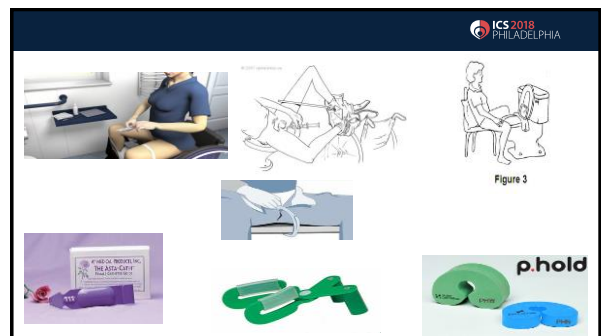
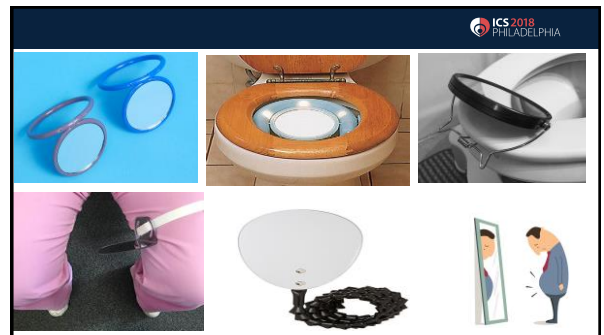
*Improved Quality of Life with better symptom management*

- Reduction in frequency, urgency and incontinence
- May reduce incidence of UTI
- Reduce daytime fatigue
- Increased confidence
- Safe-guarding renal function

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## Catheters for intermittent self catheterisation





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Open Access Full Text Article

**Ensuring patient adherence to clean intermittent self-catheterization**

Jai H Seth, Collette Haslam, Jalesh N Panicker

Department of Uro-Neurology, University College London Institute of Neurology and the National Hospital for Neurology and Neurosurgery, London, UK

**Abstract:** Patient performance of clean intermittent self-catheterization is a crucial component of the management of incomplete bladder emptying, which can arise from a variety of conditions. This allows patients to have more control over their bladder emptying, and avoids the inconveniences that come with an indwelling urethral catheter. There are, however, barriers that patients face when performing this task which may ultimately limit adherence. In this article, these barriers are discussed in more detail with potential solutions to counter them.

**Keywords:** clean intermittent self-catheterization, catheters, barriers, compliance, adherence

**Internal**  
**External**

This article was published in the following Dove Press journal:  
Patient Preference and Adherence  
12 February 2014  
Number of times this article has been viewed

Dovepress  
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REVIEW

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**Challenges to CISC**

Internal factors (patient related)

*Physical disabilities*

- Positioning
- Dexterity
- Cognition
- Mobility
- Anatomical

*Psychological factors*

- Misconceptions and anxiety
- Embarrassment and poor confidence
- Stigma
- Fears

Seth, Haslam, Panicker. Patient Preference and Adherence 2014

### External Factors

- Availability of appropriate catheters and appliances
- Quality of teaching and the training environment
- Access to public toilets
- Inadequate facilities in public toilets
- Community follow-up, access for help and advice
- Availability of experienced nurse specialist

### Conclusion

A dedicated professional service which provides high quality teaching, continual advice, reassurance and support will improve the challenges in neurological patients learning and continuing with CISC, while maintaining patient's quality of life.

## What is the patient's perspective on ISC ?

Doreen McClurg, ICS Neurourology Committee

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Improving health through research

**GCU**  
GLASGOW CATHOLIC UNIVERSITY

**MS**  
Multiple Sclerosis Society



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Funding for speaker to attend:

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## Advantages of Intermittent Catheterization over Indwelling Urinary Catheter ...

- Improved self-care and independence
- Reduced risk of common indwelling catheter-associated complications
- Reduced need for equipment (such as drainage bags)
- Less barriers to intimacy and sexual activities
- Potential for reduced lower urinary tract symptoms (frequency, urgency, incontinence) between catheterizations

Adapted from Newman & Wein, 2009.

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## ISC – The evidence ...

- **de Ridder et al. (1997)** stated that 'few data exist on the efficacy of intermittent catheterisation in MS.'
- **Pohl et al. (2002)** An early dropout rate of about 20% has been described in children and adolescents
- **McConville (2002)** Results of a questionnaire 20% did not receive enough training (n=46)
- **Woodward et al. (2003)** Non-compliance is the main reason for patients' inability to perform ISC and very few studies address the patients' problems and challenges in everyday life. Only 20% of those persons initially on ISC remained on the same form of bladder management over time.
- **Pilloni et al. (2005)** Patients over 70 could perform ISC with 18/23 improved QoL

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## ISC – The evidence ...

- **Oh et al.; Akkoc et al.; Kreuter et al. (2005)** – spinal cord injuries. Poorer QoL than controls, but compared to non SCI
- **Alpert et al. (2005)** genitally sensate children
- **Theo van Achterberg (2007)** In 2 studies (n=10/20), determinants of short and long term adherence
- **Vahter et al. (2008)** 23 patients with MS, 20 learned ISC, at 3 months 6/20 had ceased. Those with poorer cognitive function could learn but needed more support
- **Logan & Shaw. (2008)** Adequate instruction and information empowered patients to take control and master the treatment (n=15)
- **Shaw & Logan (2008)** Positive impacts related to improved QoL, negative impacts on practical difficulties, worry & stigma

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## ISC – The evidence ...

- **McClurg et al. (2008)** Evidence to suggest that ISC is discontinued within one year. Out of 75 patients, 25% of males and 40% of females had discontinued
- **Kessler et al. (2008)** Results of a questionnaire, 60% improved QoL, but those with neurogenic voiding dysfunction may be more bothered by performing ISC than non-neurogenic patients
- **Jamison et al. (2009)** Cochrane review, highlighted the lack of research in the area of catheter policies for people with neurogenic bladder
- **Jacquet et al. (2009)** Results suggested that the need to perform ISC for the rest of one's life resulted in a traumatic crisis
- **Moore et al. (2009)** Cochrane review based on current evidence it is not possible to state that any catheter type, technique or strategy is better than another

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## ISC – The evidence

- **Cameron et al (2010)** Only 20% of those persons initially on ISC remained on the same form of bladder management over time. More support needed (n=24,726 from 1973-2005)
- **Logan & Shaw (2011)** Spinal cord injured patients need more support in the community to continue to use ISC (n=15)
- **Wilde et al (2011)** Identified 6 major themes in self-management issues in people using ISC long term
- **Newman & Wilson** Review of ISC and Current Best Practices Urologic Nursing 2001 Vol 31(1) 12-48

## A prospective exploration of the experiences of continence services in people with multiple sclerosis with a primary focus on the factors affecting the continuity of use of intermittent self-catheterisation



McClurg D, Bugge C, Elders A et al. 2018 Factors affecting continuation of clean intermittent catheterisation in people with MS. Multiple Sclerosis Journal  
<https://doi.org/10.1177/1352458518768722>

## AIMS

- **To understand the factors that influence the use and discontinuation of ISC**
- **Prospectively** explored (*for one year*) the experiences of people with MS who are referred to continence services, especially those who undertake Intermittent self-catheterisation (ISC)
- Undertook qualitative interviews with a sub-section which included those that continued, discontinued and did not start
- Undertake a survey using the MS registry

## Data collection:





|                                       |   |
|---------------------------------------|---|
| Bladder diary                         | } Continence Advisers        |
| Clinical assessment and treatment log |   |
| ICIQ-Fluts                            | } Researcher at Glasgow   |
| ICIQ LUTS + demographics              |   |
| Eq-5D                                 |   |
| Qualitative Interview                 | } Chief Investigator (DM)  |

Figure 2 CoSMoS Flow Chart – Prospective Longitudinal Cohort

12 month questionnaire (n=204)  
 204 sent  
 188 returned  
 56 used ISC, 13 stopped  
 13 resistors  
 119 non-users



## Qualitative Interviews

- N=20
- Within 2 months of referral and at 12 months
- 39 interviews
- 6 had discontinued

### Survey

Of the 11,000 registrants, 2227 (20%) responded to the survey; from the responders 454(20%) had used CIC, of whom 167 (36%) had then discontinued

## Data analysis:

### Quantitative:

- Statistical and modelling analysis of demographic data, bladder diary, clinical assessment forms and QoL questionnaires.

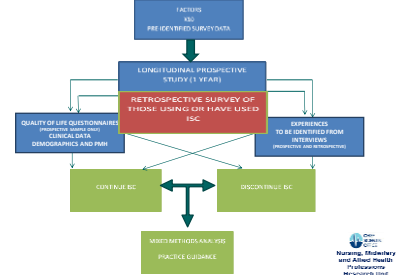
### Qualitative:

- Interview transcripts will be analysed in a systematic process using a Framework approach.

### Triangulation

- Similarities – longitudinal, qualitative and surveys

## Statistical analysis plan



|                                | Non ISC<br>(N=115) | Resistant to ISC<br>(N=13) | Started/Discontinued<br>(N=13) | Started/Continued<br>(N=13) |
|--------------------------------|--------------------|----------------------------|--------------------------------|-----------------------------|
| Age (years) - mean (SD)        | 51 (12.0)          | 46 (10.9)                  | 51 (10.1)                      | 50 (12.5)                   |
| Female - n (%)                 | 114 (84%)          | 9 (69%)                    | 11 (85%)                       | 11 (72%)                    |
| Length of time with MS - n (%) |                    |                            | Fisher's exact test p=0.480    |                             |
| 0-5 years                      | 41 (31%)           | 6 (46%)                    | 4 (33%)                        | 14 (33%)                    |
| 6-10 years                     | 23 (17%)           | 5 (38%)                    | 2 (15%)                        | 6 (14%)                     |
| 11+ years                      | 70 (52%)           | 2 (15%)                    | 6 (50%)                        | 23 (53%)                    |
| Type of MS - n (%)             |                    |                            | $\chi^2=0.071$ (df=2) p=0.965  |                             |
| Relapsing Remitting            | 70 (52%)           | 7 (54%)                    | 7 (58%)                        | 21 (49%)                    |
| Primary Progressive            | 26 (19%)           | 3 (23%)                    | 3 (25%)                        | 8 (19%)                     |
| Secondary Progressive          | 13 (10%)           | 2 (15%)                    | 2 (17%)                        | 13 (30%)                    |
| Not known                      | 25 (19%)           | 1 (8%)                     | 0 (0%)                         | 1 (2%)                      |
| Mobility (Main)                |                    |                            | $\chi^2=1.270$ (df=3) p=0.736  |                             |
| No aid                         | 59 (43%)           | 4 (30%)                    | 4 (30%)                        | 11 (25%)                    |
| One stick                      | 38 (28%)           | 3 (23%)                    | 3 (23%)                        | 12 (28%)                    |
| Two stick                      | 19 (14%)           | 3 (23%)                    | 3 (23%)                        | 10 (23%)                    |
| Rollator                       | 13 (10%)           | 2 (15%)                    | 3 (23%)                        | 8 (18%)                     |
| Wheel chair                    | 3 (2%)             | 1 (8%)                     | 1 (8%)                         | 2 (5%)                      |
| Scooter                        |                    |                            |                                |                             |
|                                |                    |                            | $\chi^2=0.789$ (df=2) p=0.897  |                             |

|                                | Non ISC<br>(N=115) | Resistant to ISC<br>(N=13) | Started/Discontinued<br>(N=13)   | Started/Continued<br>(N=13) |
|--------------------------------|--------------------|----------------------------|----------------------------------|-----------------------------|
| MS Symptoms (Main)             |                    |                            |                                  |                             |
| Pain                           | 86 (64%)           | 8 (61%)                    | 8 (61%)                          | 15 (35%)                    |
| Balance                        | 126 (93%)          | 13 (100%)                  | 12 (92%)                         | 14 (32%)                    |
| Fatigue                        | 125 (92%)          | 12 (92%)                   | 12 (92%)                         | 12 (28%)                    |
| Bowel                          | 86 (64%)           | 8 (61%)                    | 9 (69%)                          | 7 (16%)                     |
| Vision                         | 57 (42%)           | 7 (52%)                    | 7 (52%)                          | 12 (28%)                    |
| Tremor                         | 51 (38%)           | 5 (38%)                    | 5 (38%)                          | 17 (40%)                    |
| Leg Spasm                      | 88 (65%)           | 10 (77%)                   | 9 (69%)                          | 12 (28%)                    |
| Dexterity                      | 89 (66%)           | 9 (69%)                    | 8 (61%)                          | 1 (2%)                      |
| All                            | 12 (8%)            | 4 (31%)                    |                                  |                             |
| Presence of UTIs               |                    |                            | $\chi^2=10.923$ , df=4, p=0.0459 | Yes 22 (51%)                |
|                                |                    |                            | Yes 3 (23%)                      | 47 (11.5)                   |
| Baseline LUTS - mean (SD)      | 43 (12.3)          | 47 (12.3)                  | Oh square test p=0.064           | 46 (16.4)                   |
| Baseline FLUTS - mean (SD)     | 15 (6.8)           | 20 (7.8)                   | Mann Whitney p=0.499             | 18 (6.9)                    |
| Baseline EQ-SD - mean (SD)     | 0.63 (0.19)        | 0.54 (0.30)                | Mann Whitney p=0.811             | 0.64 (0.19)                 |
| Baseline EQ-SD VAS - mean (SD) | 59 (12.9)          | 55 (17.4)                  | Mann Whitney p=0.068             | 62 (11.0)                   |
|                                |                    |                            | Mann Whitney p=0.910             | 61 (14.5)                   |

## Date analysis -10 primary variables

- Age
- Gender
- Teaching methods
- Teaching Intensity
- Social support
- Bladder Symptoms
- MS Symptoms
- Type of MS
- Time since diagnosis
- UTIs

| Study Variable              | Longitudinal n=54<br>13 discontinued  | Qualitative n=26<br>6 discontinued  | Survey n=54<br>167 discontinued   | Level of agreement   |
|-----------------------------|---|---|---|--|
| Age                         | No significant association between age and continuation/ discontinuation  | Silence: Participants perspectives were that age was not relevant to continuation   | No significant association between age and continuation/ discontinuation  | Agreement. Age does not influence continuation/ discontinuation  |
| Gender                      | No significant association between gender and continuation/ discontinuation   | Silence: Participants did not raise gender as a relevant issue to continuation  | No significant association between gender and continuation/ discontinuation   | Agreement. Gender does not influence continuation/ discontinuation   |
| Teaching method/ place      | No significant association between where CIC teaching occurred and continuation/ discontinuation. Majority were taught in clinic, some at home. | Interviewees had been taught at home or at the clinic. Some participants noted a preference for teaching at home because    | No significant differences were identified between those who continued and those who discontinued in place/method of teaching but more of those who discontinued were taught in clinic. | Partial agreement, with some suggestion that home teaching may be preferential to people with MS.                    |
| Teaching intensity/ support | More of those who continued had been seen more often (4-6 times) but the difference was not statistically significant                           | Interviewees referred to professional support as being important to their ability to continue (or not) with CIC             | There was a non significant association between continuation and having greater access to a continence adviser.   | Agreement. Those who have more professional support at teaching and on continuation are more likely to continue CIC. |
| Social Circumstances        | Those who lived alone or who were single parents were significantly more likely to discontinue than those who lived with a partner.             | Interviewees referred to support from those at home as being important to their ability to continue with CIC                | There was a significant association between having support at home and continuation   | Agreement. Having people to support at home is an important predictor of continuation of CIC.                        |
| Bladder symptoms            | No significant association between bladder symptoms and continuation/ discontinuation   | Participants talked about the reduction in nocturia and hence improved sleep as being key factors in why they continue CIC. | Significant improvements were noted in nocturia, leakage and frequency and these positively influenced continuation   | Partial agreement. Improvement in bladder symptoms may positively influence continuation.                            |

|                      |   |   |  |   |
|----------------------|---|---|--|---|
| MS symptoms          | There was a significant association between MS symptoms and continuation with a higher proportion of those who discontinued reporting symptoms.   | Participants talked about how their deteriorating symptoms prevented them from undertaking CIC  | Poor dexterity and/or pain in worsening symptoms were significantly associated with discontinuation.   | Agreement: Experience of symptoms commonly associated with MS (such as poor dexterity) negatively influence continuation. |
| Type of MS           | No significant association between type of MS and continuation/ discontinuation   | Silence: participants did not talk about their type of MS when discussing continuation or discontinuation   | There was no significant association between type of MS and continuation/ discontinuation but there was non-significant tendency for those with SP/PP to be more likely to discontinue | Partial agreement: Type of MS does not seem to influence continuation.  |
| Time since diagnosis | No significant association between time since diagnosis and continuation/ discontinuation   | Participants talked about variation of symptoms overtime and how that affected their need to continue or discontinue CIC. Time since diagnosis was reported as not having an influence on continuation. | No significant association between time since diagnosis and continuation/ discontinuation  | Agreement: Length of time since diagnosis does not influence continuation/ discontinuation.                               |
| UTIs                 | Participants were more likely to continue CIC if they had had UTIs prior to starting CIC but, if UTIs were experienced once CIC commenced then people with MS were significantly more likely to discontinue | Participants were clear that UTIs that developed since starting CIC were influential in their decision to stop CIC.   | A significant association between UTIs and continuation with experience of UTI being more likely to lead to discontinuation.   | Agreement: The development of UTIs after the commencement of CIC negatively affected continuation.                        |

It was evident that the individual had to be “ready” to try CIC with some feeling “overwhelmed” initially with the need to use CIC. However, once started and after some time of learning and adjustment patients tended to feel much more positive about doing CIC. This tendency was further strengthened if patients experienced clear benefits of doing CIC.

Training was provided in the clinic or the patient’s home, occasionally both.

“and I couldn’t face my bladder but the nurse was brilliant, she was so patient. She came out to the house, she was just brilliant, dead calm, showed me what to do” (Patient 79)

Others were shown in hospital - felt the nurse was

“really helpful”. (Patient 25)

“You know it’s like she gave me catheters and stuff like that but I’ve used them for a while ...no... I have tried them a few times but ... got the infection and to be honest with you I haven’t used them since. It was – no – well, yeah I had to go to the doctors and get the antibiotics and the sheer inconvenience and I felt dirty and I didn’t like it. So it really put me off” (Patient 27)

There was evidence that ideas about CIC evolved over time and these changes were dependent on their beliefs around and experience of CIC and their symptom change. Many who use CIC did not necessarily like it or enjoy it but they reported that it was an option that improved their bladder management:

“Yeah, I can remember, yeah, and I was dead against it..... Now it’s a lot better now, it’s really fine now. Yeah, a lot better now, a big improvement (Patient 1)

I suppose it’s like anything else, it takes time to think about it and it’s one of those things now that you weigh up the pros and the cons and the fact that, yes, it has given me a better quality of life” (Patient 58)

**Conclusion –**  
Intermittent self-catheterisation is a complex issue which needs to be introduced sensitively to MS patients

Although the analysis of the data indicates that it leads many patients to “having a sense of control” and “sleeping all night” it was evident that the individual had to be “ready” to prevent feeling “overwhelmed” initially with the need to use intermittent self-catheterisation (ISC).

For those who discontinued ISC the main reason was having recurrent urinary infections which left them “feeling dirty” and at times suffering from an exacerbation of their MS symptoms which impacted greatly on their quality of life and overall sense of wellbeing.

Participants’ perceptions of ISC can vary and change as they progress through their MS trajectory as they become expert in their condition but support of clinicians and family is crucial

**Unplanned outcomes**

➤ Smaller than anticipated number of patients with MS referred to the continence service who went on to be recommended to undertake ISC - 69/204 (34%)

➤ The number of participants who did not attempt ISC although recommended to do so - 13/69 (19%).



Other Literature

Seth J, Haslam C, Panicker J. 2014. Ensuring patient adherence to clean intermittent self-catheterisation Dove Press

Survey of 44 patients performing CISC for a variety of reasons

**Internal factors** (patient related) Physical disabilities • Positioning • Dexterity • visual impairment • Anatomical • Cognition • Psychological factors • Misconceptions and anxiety • Embarrassment and poor confidence • Stigma • Fears

**External factors** • Access to public toilets • inadequate facilities in public toilets • Availability of appropriate catheters and assistance appliances • Quality of teaching and the training environment • Community follow-up access to help or advice • Availability of experienced nurse specialist

Antibiotic use ANTIC STUDY

Continuous low-dose antibiotic prophylaxis for adults with repeated urinary tract infections (AntIC): a randomised, open-label trial Fisher H, et al. Lancet 2018 [http://dx.doi.org/10.1016/S1473-3099\(18\)30279-2](http://dx.doi.org/10.1016/S1473-3099(18)30279-2)

203 participants received prophylaxis and 204 no prophylaxis

The incidence of symptomatic antibiotic-treated UTIs over 12 months was 1.3 cases per person-year (95% CI 1.1–1.6) in the prophylaxis group and 2.6 (2.3–2.9) in the control group, giving an incidence rate ratio of 0.52 (0.44–0.61; p<0.0001), indicating a 48% reduction in UTI frequency after treatment with prophylaxis.

However, resistance against the antibiotics used for UTI treatment was more frequent in urinary isolates from the prophylaxis group than in those from the control group at 9–12 months of trial participation (nitrofurantoin 12 [24%] of 51 participants from the prophylaxis group vs six [9%] of 64 participants from the control group with at least one isolate; p=0.038), trimethoprim (34 [67%] of 51 vs 21 [33%] of 64; p=0.0003), and co-trimoxazole (26 [53%] of 49 vs 15 [24%] of 62; p=0.002).

**Interpretation** Continuous antibiotic prophylaxis is effective in reducing UTI frequency in CISC users with recurrent UTIs, and it is well tolerated in these individuals. However, increased resistance of urinary bacteria is a concern that requires surveillance if prophylaxis is started

Participant experiences of clean intermittent self-catheterisation, urinary tract infections and antibiotic use on the ANTIC trial – A qualitative study McClurg et al International Journal of Nursing Studies 81 DOI: 10.1016/j.ijnurstu.2018.01.012

26 semi-structured qualitative interviews

Three overarching topics were revealed with corresponding themes:

- the experiences of intermittent self-catheterisation and urinary tract infections (normalisation, perceived burden);
- attitudes towards antibiotics for urinary tract infection treatment (nonchalant attitudes, ambivalence towards antibiotic resistance);
- experiences of low-dose prophylaxis antibiotics (habitual behaviour and supportive accountability).

**Conclusion:** The emotional and practical burden of catheter use and urinary tract infection was considerable. Beliefs pertaining to antibiotic use were based on utility, gravity of need and perceived efficacy. These opinions were often influenced by clinician recommendations.

## Complications of IC in Neurological Patients : UTI and Urethral Trauma

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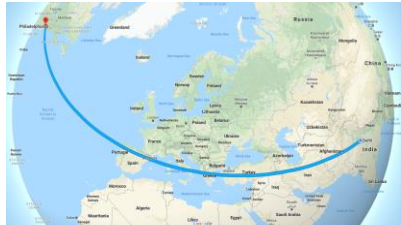
Affiliations to disclose\*:

None

\* All financial ties (over the last year) that you may have with any business organization with respect to the subjects mentioned during your presentation

Funding for speaker to attend:

- ☒ Self-funded
- ☐ Institution (non-industry) funded
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### • Urinary Tract infections in NB patients on IC

Magnitude of the problem

Definition

Risk Factors

General preventive measures

Treatment

Prevention of recurrent UTI's

Genital Infections

### Urethral Trauma in NB patients on IC

Magnitude of the problem

Risk Factors

Prevention

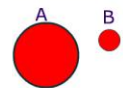
Treatment

**Summary**



## UTI in NB patients on IC

### Magnitude of the Problem



- Estimated that **62-74 people/100,000** are on IC
- Prevalence of repeated symptomatic UTI's among IC users : **20-25%**
- Significant morbidity ; Decreased HRQOL
- Lead cause for septicemia in patients with SCI / Increased mortality
- Increasing Antibiotic resistance has complicated matters

*Ref: Fisher 2018*

## Defining Urinary Tract Infection

### Bacteriuria with Pyuria AND One of more Systemic Signs/Symptoms

**Bacteriuria:** (Quantitative Urine Culture Criteria)

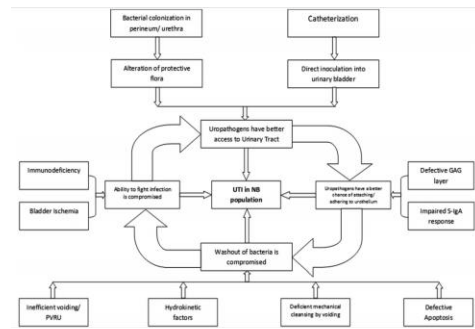
- Condom collection device  $\geq 10^4$  cfu/ml
- On Intermittent catheterization  $\geq 10^2$  cfu/ml
- Indwelling cath/Suprapubic aspirate Any detectable conc

#### Signs/Symptoms

- Cloudy urine with increased odor
- Loin/Suprapubic pain, Pain during micturition, Onset of UI
- Fever, Malaise, Lethargy, Sense of unease
- Increased Spasticity, Autonomic hyperreflexia

Ref: NIDRR Consensus statement 1992

## Risk Factors



Ref: Vasudeva and Madersbacher 2014

## General Preventive Measures

- **Patient education:** Utmost Importance

Physician/Nurse must be sufficiently trained



#### Key Points:

Size: 12-16 catheter

Adequate Lubrication /Gentle Handling /Atraumatic Catheterization

Hand Cleaning / Meatus cleaning /Catheter cleaning

Self IC over caregiver IC.

Ref: Wyndaele 2005

- **Optimize Bladder management: Filling and Emptying**

Avoid bladder overfilling : Adequately frequent IC (4-6 times/day)

Pull Catheter out slowly / Add Valsalva / (Empty Completely)

- EACH IC : Due importance to all of the above factors

- Manage Incontinence

- Adequate bowel management

Ref: Bakke 1993, Shekelle 1999, Pannek 2017

## Aseptic technique Vs Clean Technique

|               | Aseptic            | Clean  |
|---------------|--------------------|--|
| Gloves        | Sterile            | Clean / Clean hands                                |
| Catheter      | Single use sterile | Single use sterile/<br>Multiple use clean catheter |
| Drainage tray | Sterile            | Clean  |

Asymptomatic Bacteriuria : **No Difference**

Incidence of Symptomatic UTI : **No Difference**

Number of weeks to Onset of UTI : **No Difference**

Ref: King 1992, Duffy 1995, Preito Fingerhut 1999, Moore 2006 Preito 2014

## Single Use (Sterile) Vs Multiple Use (Clean)

Asymptomatic Bacteriuria : **No Difference**

Incidence of Symptomatic UTI : **No Difference**

Number of weeks to Onset of UTI : **No Difference**

Ref: King 1992, Moore 1993, Duffy 1995, Sutherland 1996, Pachler 1999, Preito

Fingerhut 1999, Schlager 2001; Vapnek 2003, Leek 2013; Moore 2013 Preito 2014

Consensus on How long can a catheter be reused : **No**

Consensus on cleaning technique : **No**

**Hydrophilic Vs Uncoated**

| Metanalysis Author/ Year        | UTI  |
|---------------------------------|--|
| Bermingham et al 2013           | No Difference  |
| Li Li et al 2013                | Significantly reduced<br>(Odds of UTI decrease by 64%) |
| Preito J et al 2014 ( Cochrane) | No Difference  |
| Clark et al 2016                | Significantly reduced                                  |
| Rognoni et al 2017              | Significantly reduced ( ERR 16%)                       |

**Treatment****Asymptomatic bacteriuria :**

- Do not Treat ( Unable to eradicate/ Early return/ Resistant M.O)
- Exceptions:
  - Urological procedure
  - Prosthesis implantation
  - Pregnant
  - Immunosuppressed patients

**Suspecting UTI:**

Urine Sample / Consider Blood Culture / Consider USG KUB

*Ref: Blardeau 2008*

**Documented UTI : Duration of therapy ??**

- No data on Optimum duration
- Based on Localization/Clinical response/Co-morbidities
- UTI without fever : **7-10 days** antibiotic course
- UTI with fever: **14 day** antibiotic course
- UTI + parenchymal involvement: Extend duration
- **Choice of Antibiotic:** Monotherapy usually sufficient
- Mild symptoms: Nitrofurantoin, if sensitive
- Severe UTI: Fluoroquinolone
- MRSA( outpatient): Trimethoprim-Sulfamethoxazole
- MRSA(Hospitalized): Vancomycin

*Ref: Everaert K 2009 ,Pannek 2017*

**Prevention of Recurrent UTI's****What is "Recurrent" UTI**

Arbitrarily defined by the occurrence of 3 episodes /year or 2 episodes/6 months or 1 episode in last 3 months.

**1<sup>st</sup> Step:** Go back to the basics

Re evaluate and Optimize Bladder Management

Catheterization technique /frequency /adequacy

Bladder filling dynamics ( Compliance / VUR)

Upper tracts (Hydronephrosis/ complications like stones )

**KEEP  
CALM  
AND  
GET BACK  
TO BASICS**

**Antibiotic Prophylaxis :**

- Avoid the use of long-term antibiotics for recurrent UTI's

*Ref: Niel-Weise BS 2012, EAU 2018*

- RCT involving 51 NHS organizations (UK) ; 361 patients analysed
- **Low dose AB prophylaxis** Vs No prophylaxis over 12 months
- **48%** reduction in UTI frequency; Antibiotic resistance also more
- Role for Individualized Management :
  - ? Individual patient distress from repeated UTI
  - ? local threat of Antimicrobial resistance

*Ref: Fisher 2018 Lancet*

**WOCA Therapy**

*Ref: Salomon J 2006*

- D Mannose (1.5 grams BD) Initial Results promising
- Intravesical Bacterial Interference(Ecoli) Under Evaluation for NB
- Oral Probiotic Therapy ( Lactobacillus) Under Evaluation for NB
- Methenamine hippurate: No Role
- Cranberry: No Role

*Ref: Phe V 2017 , Toh 2017 Lee BB 2016 Lee BB 2007, Lee BS 2012, Jepson RG 2012*

### Alternative Medicine :



Prospective Study in patients with SCI and recurrent UTI

10 controls / 25 subjects who received adjunctive homeopathic drug

Significant decrease in self reported UTI's at 1 year

High satisfaction with homeopathic care

*Ref: Pannek 2018*

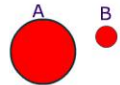
### Genital Infections

- Epididymitis / EO (2-28%)
- Can lower the fertility (Azoospermia from 7% to 50% in a study)
- IC is an independent risk factor for development of EO
- Urethral Stricture may predispose to EO

*Ref: Allas 1986, Ku 2006*

### Urethral Trauma in NB patients on IC

### Magnitude of the Problem



- Catheter introduction : Urethral irritation / Urethral trauma
- **Urethral Bleeding:** 1/3<sup>rd</sup> of patients on long term IC ( mostly males)
- **False Passages**
- **Urethral Strictures:** Located distally/Proximally (<10% -25%)  
(The numbers requiring intervention are much lower)  
(3% in a 4 yr follow up study -33% in a 14 year follow up study)

*Ref: Guenther M 2001, Krebs J 2015*

### Risk Factors for Stricture

- Duration of IC ( most occur after 5 years)
- High catheterization frequency
- Forceful manipulation
- Frequent urethral bleeding
- ? Prior Indwelling catheterization

*Ref: Wyndaele JJ 1990 , Mandal 1993, Gunther 2000 Biardeau 2016*

### Prevention

- **Patient education:** Utmost Importance  
Physician/Nurse must be sufficiently trained

#### Key Points:

Size: 12-16 catheter

Adequate Lubrication /Gentle Handling /Atraumatic Catheterization

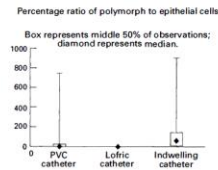
Increased Striated Sphincter tone: Wait at Sphincter for **1-2 min**

*Ref: Di Benedetto P 2011*



### Are Hydrophilic Catheters Less "Irritating" and Less traumatic ??

- Polyvinylpyrrolidone binds water molecules to the catheter surface
- Friction reduces by 90-95%
- Hypothesis : Lesser Microtrauma /Bleeding/Inflammatory response



Ref: Vaidyanathan S 1994

### Hydrophilic Vs Non Hydrophilic

| Study (RCT)          | Microscopic Hematuria |
|----------------------|-----------------------|
| Vapnek et al 2003    | Significant decrease  |
| De Ridder et al 2005 | No Difference         |
| Cardenas et al 2011  | Significant decrease  |
| Li Li 2013(MA)       |                       |

| Study(RCT)           | Macroscopic Hematuria |
|----------------------|-----------------------|
| De Ridder et al 2005 | No difference         |
| Spinu et al 2012     | Significant decrease  |
| Defoor et al 2017    | No difference         |

### Treatment

- Suspect if difficulty in catheterization/ Recurrent UTI ( E-O)
- RGU/MCU or a urethroscopy to confirm
- False passage: IDC 3-6 wks + 5 day antibiotic course
- Stricture: (Least to most invasive)



Ref: Michielsen DP 1999, Biarreau 2016

### Summary

- IC for NB, considered standard of care , has its own complications
- Diagnosis of UTI in NB patient on IC is a challenge
- Do not screen for UTI /treat ABU in NB patient on IC
- UTI in NB patients on IC is always complicated
- No established therapy exists for recurrent UTI prevention
- Forceful manipulation should be an absolute "NO" for patients on IC
- No technique/method/catheter type has shown conclusive superiority for preventing IC complications in NB patients
- Patient education, motivation, compliance and optimized bladder management are key for preventing complications of IC

Thank You

**W18: ICS Core Curriculum :****Intermittent catheterisation in patients with neurological disease: Indications and challenge****Alternatives to bladder emptying if IC is not suitable:**

- Crede manoeuvre
- Triggered voiding
- Indwelling catheterisation

Dr Emmanuel Braschi  
(Argentina)



If all the conditions required to perform IC are not present, a second option must be chosen,  
**IC indication must never be forced**

**Other voiding patterns:**

- A) Behavioral therapy: Triggered reflex voiding, Bladder expression (Crede and Valsalva Maneuver)
- B) Indwelling catheterization: Transurethral (ID) / Suprapubic (SPC)
- C) Condom catheter (CC)



If all the conditions required to perform IC are not present, a second option must be chosen ...

**Variables:**

- Underlying disease, it's natural evolution, neurological deficits (mental status) and degree of disability
- Patient and family's wishes (comfort, convenience, sexuality)
- LUT dysfunction: Urodynamic testing: bladder, internal and external sphincter.
- Urethral conditions
- Available resources



**Behavioral therapy:** \*Triggered reflex voiding  
\* Bladder expression (Crede and Valsalva Maneuver)

Urodynamically safe and stable. (Videourodynamic study if available) + EMG

Only if adequate Follow-up is guaranteed

No Guidelines on suitable intervals for bladder emptying: Voiding Diary, PVRV and UD parameters

**Contraindications:**

- Reflux into ureters, seminal vesicles or prostate.
- Hernias, pelvic organ prolapse, hemorrhoids
- Autonomic dysreflexia
- Recurrent UTIs
- Urethral pathology (Strictures)
- Unbalanced voiding (high PVRV)

**Complications:** bladder and renal function deterioration (High pressures)

**Triggered reflex voiding**

Based on a non-physiological sacral reflex. Compromises C-fibers. Limited role in ANLUTD.

Not recommended: risk of bladder high pressures (Drake et al, 2016)

**Variuos manoeuvres possible:** by patient or carer: suprapubic tapping, thigh scratching, ano-rectal manipulation

Detrusor-sphincter dyssynergia or detrusor-bladder neck dyssynergia present in over 90% of suprasacral lesions (SCI)

**Contraindications:** 1 more:

- No adequate detrusor contraction: too low, too high, too short or too long.

**Consider in:** after surgical or chemical (BTX) sphincterotomy, bladder neck incision, alpha-blockers

**Limitations:** Urinary Incontinence between triggering episodes (antimuscarinics + external appliances), 80% asymptomatic bacteriuria



**BLADDER EXPRESSION: CREDE (Manual compression of the lower abdomen)  
VALSALVA (Abdominal straining)**

**Has been recommended for a long period of time in the past**

**Many authors just don't recommend it: high pressure:**

- (Drake et al, 2016), (Stohrer et al, 2009), (Abrams et al, 2008)

**•Indication (?)**: underactive detrusor + underactive or incompetent sphincter mechanism

**•Urodynamically safe:** usually high pressures, high PVRV, poor urinary flow. Flaccid Paraplegic patients: induce a mechanical obstruction at the level of the external sphincter, can use alpha-blockers, surgical or chemical (BTXA) sphincterotomy: risk of urinary stress incontinence.

**Contraindications:** detrusor-sphincter dyssynergia or sphincter hyperreflexia or if it creates high intravesical pressure

**Complications:** may increase urinary and fecal incontinence, RVU, prostatitis, epididymo-orchitis, genital-rectal prolapse, and hemorrhoids



### B) Indwelling urethral catheters – transurethraly (ID)



**Should be avoided:** risk factors for UTI and long-term complications. (Stohrer et al, 2009)

**Indications:** difficulty or impossibility in performing IC; persistent leakage between IC

**Silicone** catheters have advantage over latex catheters. (Talja M et al,1990)

**Complications:** Many and well know. Higher than IC :encrustation, predictive of bladder and renal stones. **Urethral trauma:** traumatic iatrogenic hypospadias in men (Urinary incontinence) false passages, strictures, diverticuli, UTIs, Cystitis, epididymo-orchitis, prostatitis, bacteriuria, bleeding, fistula (improper size and technique), bladder neck incompetence, meatus and urethral sphincter erosion, squamous cell bladder carcinoma.

**Regularly changed:** (not well studied) prevent obstruction – UTI --Stones – Urosepsis (Relationship between urethral trauma and urosepsis) Chronic patient with little complications: 4-6 weeks

**When bladder high pressures:** Consider: ( antimuscarinics + ID ) or ( BTX A + ID)

Spinal Cord (2001) 39, 794-300

### B) Indwelling urethral catheters – transurethraly (ID)



**Encrustation:** high volume intake + regular catheter change.



**Bladder irrigation and antibiotic prophylaxis:** not recommended as a routine UTI-control method.

**Asymptomatic bacteriuria:** after 2 weeks of ID: 100%. **NEVER TREAT.** Only symptomatic UTIs.

**Clamping the Catheter:** no agreement : risk of UTIs, unawareness of overdistension and leakage. Health care professional team characteristics: Autonomic Dysreflexia (AD)

Spinal Cord (2001) 39, 794-300

Spinal Cord (2001) 39, 794-300

### B) Indwelling urethral catheters – transurethraly (ID)



**Inform the presence of ID to the rest of the team (and how to deal with it):** occupational therapists, physiotherapists, nurses.

**ID removed ASAP :** In acute and subacute phase. More time with ID, more complications and more difficult to achieve rehabilitation objectives in LUT.

**If it can not be removed:** fixation to the abdomen in males (taking care of the penile-scrotal angle)



Spinal Cord (2001) 39, 794-300

### B) Indwelling urethral catheters – suprapubically (SPC)



**Silicone** catheters have advantage over latex catheters. (Talja M et al,1990)

**Asymptomatic bacteriuria:** after 5-7 weeks of SPC: 100%. **NEVER TREAT.** Only symptomatic UTIs

**Indications:** failure of IC, severe urethral damage, worsening of the original disease.

**When long-term catheterization is needed:**  
**SPC preferred to Transurethra catheter (ID): CONVERT ASAP**

**Advantage:** no urethral trauma, no urethral pain. Less infections (orquiepididimitis and prostatitis). Enhanced independence, a perceived benefit to body image, and provision of dry and catheter-free genitalia (Improve sexuality)

Spinal Cord (2001) 39, 794-300

Spinal Cord (2001) 39, 794-300

Neurology and Uroynamics 27:475-479 (2008)

### B) Indwelling urethral catheters – suprapubically (SPC)



**Risks:** requires a minor surgery: potential bowel, prostatic, vaginal or paravesical blood vessels (bleeding) injuries.

**Insertion technique:** No evidence which one is best. Open suprapubic cystostomy under general or spinal anesthesia: Gold standard. Others: Suprapubic trocar (16 Fr)

**Complications:** Renal and bladder stones, UTIs, catheter blockage, persistent urethral leakage, New-onset reflux, Carcinoma (8% risk after 25 years of catheterization Locke et al, 1985)

**Many authors don't recommended** (Stohrer et al, 2009)

**But recent investigations:** (Feifer et al, 2008):

**Anti-cholinergics + frequent catheter changes + bladder washing + volume intake =**

**Similar morbidity to IC**

Spinal Cord (2001) 39, 794-300

Spinal Cord (2001) 39, 794-300

Neurology and Uroynamics 27:475-479 (2008)

### FOLLOW UP AND LONG-TERM ACCEPTANCE



**Follow up : what to check: clinical outcome (complications), acceptance**  
(Urodynamicallly safe, renal function control, PVRV, ultrasound)

Original Article

Bladder management and urological complications in patients with chronic spinal cord injuries in Taiwan

Sheng-Fu Chen, Yuan-Hong Jiang, Jia-Fong Jhang, Cheng-Ling Lee, Hann-Chong Kuo\*

Department of Urology, Buddhist Tzu Chi General Hospital and Tzu Chi University, Hualien, Taiwan \*Tzu Chi Medical Journal 26 (2014) 25-38

Patients with a duration of SCI > 5 years chose indwelling catheters or a cystostomy more often than CIC.

In INAREPS (Argentina):

Long-term acceptance depends mainly on how fast it is proposed to perform IC to the patient after the injury. (First months vs several years)



**TAKE HOME MESSAGES**

**IC indication must never be forced**

**General recommendation vs special case:** Decision depends on the experience of the team

**Objective :** Best Match (Bladder Voiding options and your patient)

**Your action safe lives and improve quality of life in Neurourology:**

Tips and tricks: check if the action is done correctly (even if you do not perform it)

**Multidisciplinary work:**

Complications always coming, try to reduce them and recognize them ASAP

Always have a Urologist near...(better with experience in Neurourology)



Thanks Danke Merci ॐ अरर شكر Ευχαριστίες 謝謝  
Grazie ありがとう Obrigado Благодарю вас  
½ è 0:61 Gracias!



## Case Study 1

Male patient with Multiple Sclerosis  
Initial Expanded Disability Status Scale (EDSS) 3  
Frequency, Urgency, PVR 150mls  
Anticholinergic  
Will not self catheterise

Three years later – PVR 300mls, UTIs, Incontinent  
EDSS 6.5

ISC –managing well-symptomatically improved

## Case Study 2

62 year old Female – right handed  
Stroke- left hemisphere  
Dysphagia  
Right side weakness  
Indwelling catheter inserted in Accident and Emergency

2 TWOCs on ward –catheter reinserted due to incontinence –free drainage  
4 weeks later referred to inhouse continence service

## CARE PLAN



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30 November - 1 December, Brussels, Belgium

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