Best Practice Recommendations for Bladder Management in the Spinal Cord Afflicted Patient in South Africa

The Continence Advisory Panel (CAP):
Francois Theron[1,2*], Virginia Wilson[3,4*], Ernst Scriba[5*], Raymond Campbell[6], Michelle van Zyl[7*], Darwin Terry[8*], Andries Visser[9], George Louw[10], Ari Seirlis[11].

[1] Orthopaedic Surgeon, Private Practice, Pretoria
[2] Honorary Consultant, Tshwane Rehabilitation Centre, Pretoria
[3] Private Practice, Netcare Rehabilitation Hospital, Johannesburg
[4] Chair: South African Spinal Cord Association (SASCA)
[5] Principal Medical Officer, Western Cape Rehabilitation Centre, Cape Town
[6] Urologist, Private Practice, Pretoria
[7] Rehabilitation Doctor: Life Pasteur Rehabilitation Unit, Bloemfontein
[8] Private Practice, Pretoria
[9] Private Practice, Pretoria
[10] Medical Advisor; Medscheme Administrators, Johannesburg
[11] CEO, QuadPara Association of South Africa (QASA), Durban

** Members of the SASCA Executive*

Declaration
The CAP is an interest group of the Southern African Spinal Cord Association (SASCA). Members of CAP were supported by QuadPara Association of South Africa (QASA) to participate in all CAP meetings and did not receive remuneration for time or services rendered. These recommendations were supported via a research grant from the QASA, where funding was required for meetings, travel and subsistence.

These recommendations were reviewed externally by the South African Urological Association (SAUA) and international experts in the management of the Spinal Cord Afflicted and the Neurogenic Bladder.

These recommendations will be reviewed every three years, or earlier should further evidence demand such a review.

Contents

1. Background

Recent research of the standard of care and related quality of life of the spinal cord afflicted (SCA) community in South Africa, has revealed significant gaps in practice and challenges regarding levels of care and access to services and supplies specifically related to the neurogenic bladder.[1]

As a population, there is evidence that people with disabilities experience poorer health outcomes than the general population. People with SCA are at higher risk of secondary conditions such as pneumonia, pressure ulcers and urinary tract infections (UTIs). These conditions frequently lead to hospitalisation and can also result in increased costs for care, reduced employability, decreased quality of life, and lowered life expectancy.[2]

In response to this, the Continence Advisory Panel (CAP), under the auspices of the SASCA, has produced these best practice recommendations to further evidence-based bladder management (mainly in the SCA), that ensures social continence and appropriate and safe drainage of the neurogenic bladder. The recommendations aim to prevent unwanted and costly bladder complications (i.e. infections, stones, renal reflux, and scarring).

These recommendations have been drawn up in South Africa by clinicians working specifically in the field of rehabilitation medicine and the SCA, with inputs from urology specialists. They refer to available international clinical guidelines and research – e.g. European Association of Urology (EAU).

These recommendations are in line with the CAP vision[1] to:

- Establish the standard of care for people living with SCA (specifically relating to continence) who want to lead active and fulfilling lives;
- To improve access to continence care for South Africans through education, advocacy, and service, thereby improving the standard of care, dignity, and quality of life (QoL).

These South African recommendations are intended to be used by consumers (SCA consumers/patients), clinicians, policy makers and funders, and should be read in conjunction with current international guidelines and evidence of clinical best practice and experience, many of which are referenced in this paper, in the interests of improving patient-centred decision-making and outcomes for all parties involved.

These recommendations should not be viewed as a rewriting of any accepted guidelines, but rather as an attempt to draw attention to current best practice principles as practiced in South Africa. The CAP does not intend to promote or impose any particular method or product on any individual patient, but we do view it as our responsibility to inform them of available alternatives, and the rationale for these recommendations.

2. Bladder management strategies

Bladder management strategies are long-term treatment plans with implications for maintaining health and quality of life. To make informed choices about the most appropriate method of bladder management, consumers, family members and/or carers require information about the risks and benefits of the available options.[3]

These recommendations are consistent with well-entrenched principles reflected in international guidelines (mainly the European Association of Urology - EAU - guidelines) and prescribed by the International Spinal Cord Society (ISCoS).[4] Reference is also made to other publications, mainly from English-speaking countries, and published subsequent to the EAU guidelines.

Consumers with neurogenic urinary tract dysfunction, their family members and/or carer's, need specific information and training. Consumers starting to use, or who are using, individually decided-upon bladder management strategies require:

- Training, support, and review from healthcare professionals who are trained to provide support in the relevant bladder management systems and are knowledgeable about the range of products available.
- Access to a range of products and services that meet their needs.[5]

Clean Intermittent Catheterisation (CIC) is accepted as the gold standard for the management of the neurogenic bladder worldwide. International literature might also refer to clean intermittent self-catheterisation (CISC) or intermittent self-catheterisation (ISC), or other similar abbreviations. Appropriate techniques and selection of catheters are subject to specific patient care environments (i.e. sterile, aseptic, no-touch, and clean techniques).[6] The identification of a carer is an important consideration in the case where the consumer is unable to self-catheterise.

The prevalence of complications can be limited by adequate patient education, use of non-traumatising techniques and adequate precautions to prevent infections.[7]

3. Recommendations (Phased approach)

Spinal cord services for SCA in South Africa vary in logistics and intensity. Levels of care are delivered at different institutions and different educational standards.[8]

Care pathways are therefore (for practical purposes) divided into three phases in the management of the neurogenic bladder in the South African context.

Of utmost importance in all three phases is the prevention of catheter-associated urinary tract infections (CAUTI) through correct staff and patient supervision/training and monitoring, education in hand hygiene as well as the maintenance of the clean closed-loop/circuit-principle with indwelling catheters (IDC).

CIC is the gold standard for all three phases. The average frequency of catheterisation is 4-8 times per day. It has also been proven to be the preferred method of catheterisation in patients who have neurogenic bladder dysfunction.[7]

The primary aims (and their prioritisation) when treating neuro-urological disorders are:

- protection of the upper urinary tract;
- improvement of urinary continence;
- restoration of (parts of) the lower urinary tract (LUT) function;
- improvement of the patient's QoL.

3.1.Phase 1 – Early/Acute Management

After injury, the initial monitoring of physiological stability, including urine output and timely catheterisation, is of utmost importance.

Awareness of urinary retention immediately post-injury (catheterisation), preservation of the urethra (limiting prolonged trans-urethral catheterisation) and continence (to prevent pressure sores) are the focus in this phase.

Prolonged indwelling urethral catheterisation is a major cause of iatrogenic urethral strictures in SCA males. Urethral strictures can compromise the feasibility and safety of patients to be managed by CIC or condom and bag urinary drainage. Attempts at reconstructive surgical repair are much less successful than in the neurologically intact population. A urethral stricture can impact upon the SCA patient's management for the rest of his life.

The option of a supra-pubic catheter (SPC) also needs to be considered. Alternatively, aseptic CIC (even in intensive care settings) is a worthwhile option if staff allocation and expertise allow for this. In the aseptic technique, the catheters remain sterile, the genitals are disinfected, and sterile lubricant is used.[7]

If experience in SCA management is absent/lacking, the help of a Urologist (with an interest in SCA urology) should be sought to assist in the correct management of the above. The same principle applies to any complications related to neurogenic bladder management (i.e. traumatic catheterisations, possible renal/bladder injuries, etc.).

The early detection and treatment of urinary tract infections (UTIs) is vital in this early phase, as long-term damage can thereby be prevented.

Further important considerations during this phase are: the extent of the patient's disability, cost-effectiveness, technical complexity, and possible co-morbid complications.

3.2. Phase 2 – Rehabilitation (preferably in a specialised centre)

Suitability of the SCA patient for CIC needs to be the top priority in this phase, if not already implemented earlier. Care needs to be taken in patient selection as patient insight and compliance are vital for success in intermittent catheterisation.

The dexterity and mental capacity of the SCA patient, and/or the availability of a willing caregiver to perform the catheterisation, are paramount factors in the decision-making process. Avoid intermittent catheterisation in individuals with SCA who have one or more of the following:[9]

- Inability to catheterize themselves.
- A carer who is unwilling to perform catheterisation.
- Abnormal urethral anatomy, such as stricture, false passages, and bladder neck obstruction.
- Bladder capacity less than 200 ml.
- Poor cognition, little motivation, inability or unwillingness to adhere to the catheterisation time schedule.
- High fluid intake regimen.
- Adverse reaction to passing a catheter into the genital area multiple times a day.
- Tendency to develop autonomic dysreflexia with bladder filling/urethral instrumentation despite treatment.

It is recommended that a choice of either single use hydrophilic or gel reservoir catheters for intermittent self-catheterisation should be offered.[10] The "gold standard" in CIC remains a new sterile catheter, because of the decreased risk of infection.[11]

Numerous general medical and social factors also need to be considered when dealing with urinary incontinence (a checklist might be of benefit in this).[26] A dedicated multi-disciplinary approach in all SCA patients is vital in attaining a good outcome and long-term success.

Recommendations for catheterisation (EAU)

Recommendations	LE	GR
Use intermittent catheterisation, whenever possible aseptic technique, as a standard treatment for patients who are unable to empty their bladder.	3	A
Thoroughly instruct patients in the technique and risks of intermittent catheterisation.	3	A
Use a catheter size between 12-16 Fr.	4	B*
Avoid indwelling transurethral and suprapubic catheterisation whenever possible.	3	A

**Upgraded based on panel consensus*

When indwelling catheter (IDC) is decided upon, this needs to be a silastic catheter, changed 4 to 6 weekly. Latex catheters should not be used for long-term catheterisation.

If condom and bag drainage is the determined choice, the general interval of changing these is every 1 to 3 days.

Important factors (during rehabilitation phase):

3.2.1. Minimum investigations to appropriately assess the neurogenic bladder

1) Urodynamic study (UDS) needs to be performed at approximately three months post-injury, or at the discretion of the treating SCA physician/urologist. The UDS is an essential tool in the neurogenic bladder assessment, and is crucial in deciding what choice of bladder management is selected. It is

internationally accepted that reflex neurogenic activity of the SCA bladder has usually returned at three months post injury. A patient in whom normal sensory voiding (with acceptable residual urine) returns within a few weeks of the injury, does not need a UDS.

Recommendations for urodynamics and uro-neurophysiology (EAU)

Recommendations	LE	GR
Non-invasive testing is mandatory before invasive urodynamics is planned.	4	A*
Perform a urodynamic investigation to detect and specify lower urinary tract (dys-)function, use same session repeat measurement, as it is crucial in clinical decision-making.	1b	A
Use video-urodynamics for invasive urodynamics in neuro-urological patients. If this is not available, then perform a filling cystometry continuing into a pressure flow study.	4	A*
Use a physiological filling rate and body-warm saline.	4	A*
Specific uro-neurophysiological tests are elective procedures and should only be carried out in specialised settings.	4	C

1) **Upgraded based on panel consensus.*
2) Video-urodynamics combines filling cystometry and pressure flow studies with radiological imaging. Currently, video-urodynamics is considered to provide the most comprehensive information for evaluating neuro-urological disorders.

2) Uroflowmetry or genito-urinary ultrasound assessment of post-void residual urine (RU) should be repeated at least two or three times in patients who are able to void.

3) Abdominal X-ray (AXR), including the pelvis, and ultrasound of kidneys and bladder. Intravenous pyelogram is an optional investigation. The initial ultrasound and AXR can be done as in-patient.

4) CT scan with or without contrast is an important investigation in suspected upper tract pathology.

3.2.2. Assisted bladder emptying (caution)

Triggered reflex voiding is not recommended as there is a risk of pathologically elevated bladder pressures. Only in the case of absence of, or surgically reduced, outlet obstruction may it be an option.

Caution: bladder compression techniques to expel urine (Credé) and voiding by abdominal straining (Valsalva manoeuvre) create high pressures and are potentially hazardous, and their use should be discouraged.

3.2.3. Pharmacological considerations

Urological drugs initiated during this phase are to be prescribed by an experienced SCA clinician or in consultation with a urologist.

Recommendations on drug treatment (EAU)

Recommendations	LE	GR
Use antimuscarinic therapy as the first-line medical treatment for neurogenic detrusor overactivity.	1a	A
Alternative routes of administration (i.e., transdermal or intravesical) of antimuscarinic agents may be used.	2	A
Maximise outcomes for neurogenic detrusor overactivity by considering a combination of antimuscarinic agents.	3	B
Prescribe α-blockers to decrease bladder outlet resistance.	1b	A
Do not prescribe parasympathomimetics for underactive detrusor.	1a	A
Do not prescribe drug treatment in neurogenic stress urinary incontinence.	4	A*

3.2.4. Bowel Management

A consistent and effective bowel management programme is essential to the "urological health" of SCA patients as constipation/faecal impaction will negatively affect their general well-being, and specifically urological outcomes.

3.2.5. Autonomic Dysreflexia

The early detection and management of autonomic dysreflexia (AD) is imperative in the SCA population, as this condition can be potentially life-threatening. This usually occurs only in lesions above T7 (potentially "unsafe" bladder).

3.3. Phase 3 – Post Discharge/Rehabilitation

It is widely accepted that "urinary tract morbidity" ranks as a major cause of hospital readmission in individuals with SCA, and is still a leading factor in mortality in this population. Adequate phase 1 and 2 management will improve this.

Discharge planning is an important part of the rehabilitation phase and must include regular follow-up at a specialised unit/urologist. Earlier follow-up for high-risk patients (especially on CIC) is strongly advised if any doubt exists regarding compliance or high-risk behaviour.

Recommendations for follow-up (EAU)

Recommendations	LE	GR
Assess the upper urinary tract at regular intervals in high-risk patients.	4	A*
Perform a physical examination and urine laboratory every year in high-risk patients.	4	A*
Any significant clinical changes should instigate further, specialised, investigation.	4	A*
Perform urodynamic investigation as a mandatory baseline diagnostic intervention in high-risk patients at regular intervals.	3	A

**Upgraded based on panel consensus.*

The early identification of potential SCA complications (of which incontinence is a high risk indicator) cannot be underestimated. The correct management of these is an important step in the cost-effective and morbidity-saving chain of events. For instance, the prevention of one pressure sore (which often follows incontinence) can relate to a cost saving of approximately R500 000.

Many surgical interventions exist that can improve/restore continence in SCA patients (e.g. onabotulinumtoxinA, sacral anterior root stimulators, urinary diversions, artificial sphincters, bladder neck procedures, etc.). These fall outside of the framework of these recommendations and need specialist and individualised decision-making and management plans (see decision-making ladder below for possible options).

Recommendations for minimal invasive treatment

Recommendations	LE	GR
Use botulinum toxin injection in the detrusor to reduce neurogenic detrusor overactivity in multiple sclerosis or spinal cord injury patients if antimuscarinic therapy is ineffective.	1a	A
Bladder neck incision is effective in a fibrotic bladder neck.	4	B

Recommendations for surgical treatment

Recommendations	LE	GR
Perform bladder augmentation in order to treat refractory neurogenic detrusor overactivity.	3	A

The biggest challenge in phase 3 is the absence of readily available resources. The Patient Rights Charter of South Africa stipulates the right to basic medical care: in the SCA field, this means the right to the provision of adequate basic medical care including the supply of sundries (for human dignity and health). This thus relates to both the provision of expertise (especially in rural areas) and that of basic urological equipment, sundries and medication. The changing of urological (and bowel) management by unassuming, well-meaning staff poses a grave danger to the health of SCA patients.

4. Overriding principles for decision-making:

4.1. Treatment options:

A practical and systematic approach needs to be used by South African clinicians working in the field of SCA. Decision-making in the correct management/treatment options needs a dedicated team of SCA clinicians in all three phases (as set out above), and needs to be individualised. Input from a urologist with interest in SCA is imperative to widen the range of options open to patients.[12]

Treatment options currently available/used in the South African context should include the following:

- Spontaneous voiding
- Timed voiding (with/without condom and bag)
- Intermittent Catheterisation
- Condom and bag (without sensation)
- Chronic Indwelling Catheter
- Suprapubic Catheter
- Intravesical onabotulinumtoxinA
- Transurethral Sphincterotomy
- Sacral Nerve Stimulation (Interstim)
- Bladder Augmentation
- Urinary Diversion

The safety (risk vs. benefit) of any of these options needs to be evaluated/weighed-up. The objective is to achieve the least invasive and most effective/safe option. The use of medication in any of the above options must be carefully considered. Discussion of possible options with the SCA individual is mandatory. Individual health status, patient insight/compliance, social environment and circumstances need to be taken into consideration in this decision. It is not in the scope of these recommendations to go into detail of every step of the possible options. The approach is in line with the international, commonly used clinical guidelines.[9, 13]

4.2. Urinary tract infection (UTI) prevention

UTIs present in challenging/insidious ways in the SCA population. Clinical experience in recognising a symptom complex in these patients is helpful, and will reduce the inappropriate use of antibiotics.

The routine use of urinary dipsticks for screening for UTI is not advised. Routine use of antibiotic prophylaxis is discouraged and reserved for exceptional cases, when all other avenues have been explored. Investigation of underlying contributing factors (bowel, bladder emptying and structural abnormalities) is mandatory.

4.3. General "rules" applicable to the use of antibiotics in the neurogenic bladder:

- Treat bacteriuria only if symptomatic (**bacterial colonisation does not require treatment**);
- Urine microscopy, culture, and sensitivity (MCS) is mandatory prior to initiating antibiotics in symptomatic patients, but it should not delay prompt treatment
- Choose antimicrobials with as little impact on bowel flora as possible
- Adjust antibiotics according to sensitivity of organism
- Treat proven infections for at least 5 days. Re-infections are treated for 7 to 14 days
- Repair structural and functional risk factors
- Prophylaxis only to be used in recurrent infections and in consultation with experienced clinicians/urologist
- Patients with indwelling catheters should not be given routine antibiotic prophylaxis.

5. Clean Intermittent Catheterisation (CIC) practices

5.1. Current view

In the 1970s, intermittent catheterisation was introduced and is now considered the gold standard for the management of neurogenic bladder dysfunction.

International guidelines (e.g. EAU and National Institute for Health and Care Excellence - NICE) do not explicitly recommend single-use over multiple use catheters, but propose a patient-orientated choice with specific reference to patient-specific requirements. We subscribe to this recommendation as it aligns with our obligations as medical practitioners, and to the respective health legislation. We believe that SCA patients need to be empowered to live as independently as possible, with the provision of adequate and appropriate continence care products to ensure quality of life, medical stability, and safety.

The EAU (European Association of Urology) recommends that intermittent catheterisation, whenever possible with an aseptic technique, should be standard treatment for patients who are unable to empty their bladder. Indwelling transurethral and suprapubic catheterisation should be avoided wherever possible. https://uroweb.org/guideline/neuro-urology

Aseptic CIC is defined (EAU) as genital disinfection with use of sterile catheters and instruments/gloves.

- CIC should be implemented in SCA patients ASAP after SCA
- CIC is dependent upon

  a) adequate hand function/dexterity
  b) absence of cognitive impairment
  c) full cooperation of the patient

- SCA patients require education and training in the technique and risks of CIC. This training should include:

  a) hand hygiene
  b) technique of self-catheterisation
  c) cleaning and storage of catheter (if re-used)
  d) recognition and awareness of signs and symptoms of UTI and how to access medical advice and treatment.
  e) understanding of adequate fluid intake per 24 hours
  f) correct size of a catheter, in adults, between 12-16 Fr

  Optimal bladder drainage at regular intervals to prevent bladder over-distension, is crucial for the mental health and quality of life for persons with SCA. [27,28,29]

There is a lack of uniformity and standardisation in (nursing) practice in terms of performing clean, intermittent catheterisation.[11]

5.2. Rationale for single use hydrophylic intermittent catheters

Cardenas et al. report that the use of a hydrophilic-coated catheter for CIC is associated with a delay in the onset of the first antibiotic-treated symptomatic UTI, and a 21% reduction in the incidence of symptomatic UTI in patients with acute SCI during the acute inpatient rehabilitation. Using a hydrophilic-coated catheter minimises UTI-related complications, treatment costs, rehabilitation delays, and reduces the emergence of antibiotic-resistant organisms.[14]

In a recently published meta-analysis regarding IC usage, Li et al. reviewed five randomised controlled trials (RCTs) with a total of 462 SCI/SCA subjects. There was a significantly lower incidence of reported UTIs in the hydrophilic-treated (disposable) group when compared with the non-hydrophilic-treated (uncoated disposable and multiple use) group. Haematuria was also significantly less in the hydrophilic catheter group than in the non-hydrophilic catheter group. Their meta-analysis found that UTIs and haematuria are less frequently associated with the use of hydrophilic-coated catheters for IC in patients with SCI.[15]

Chartier-Kastler et al. report that compact catheters, designed as they are for further discretion, offer a 28% increase in quality of life over non-compact IC. Given evidence of less UTIs, less haematuria and better quality of life (QoL), compact hydrophilic-coated IC appears to be the best treatment option. Clinicians will need to base their decision of catheterisation technique on clinical judgement in conjunction with the users.[16]

There are no clear guidelines about length of time for catheter use if the patient is re-using an uncoated catheter. Although widespread practice, there is no consensus on how many times a single-

use catheter should be re-used, and the practice is regarded as off-label use. Guidelines do, however, refer to clean techniques that imply cleaning and storage of these catheters for an indeterminate number of times, although again there is no scientific evidence for number of uses. There is also insufficient data for recommending a cleaning method for multiple use catheters. [17]

Several studies have investigated the advantages and disadvantages of reusable catheters in the home setting, where catheterisation is performed by the patient or a caregiver. Available data on IC does not provide convincing evidence that single or multiple uses are superior for all clinical settings.

Currently, clinicians need to base decisions about which technique and type of catheter to use on clinical judgment, in conjunction with specific patient requirements/choice. Differential costs of catheters/techniques may also influence decision-making.[11] The type of catheter (hydrophilic/coated vs. non-coated) used for IC has not been conclusively proven to reduce the risk of symptomatic UTI.[18]

A 2014 Cochrane Review by Prieto et al., compared types of catheter designs, aseptic catheterisation techniques versus clean technique, single-use (sterile) catheters versus multiple-use (clean) catheters, self-catheterisation versus catheterisation by others and any other strategies designed to reduce UTI and other complications in adults and children using intermittent catheterisation for incomplete bladder emptying. Despite a total of 31 trials, it was concluded that there was still no convincing evidence that the incidence of UTI is affected by any of these strategies. [30]

The opinion that was expressed in the 2014 Cochrane Review had a strong influence on healthcare providers and agencies to recommend re-use of catheters. However, concerns raised by many clinicians regarding these conclusions led to an independent appraisal by Christison et al. of the data and analyses presented, and identified crucial discrepancies of data extraction and analyses within this review. In contrast to Prieto et al, these analyses revealed a trend to favour single over multiple use of catheters. After addressing these concerns to Cochrane's acting Editor-in-Chief, the most recent version of the 2014 Cochrane review has been withdrawn from publication. [31]

Results from a recent meta-analysis by Rognoni et al. confirmed that hydrophilic-coated catheters are associated with a reduced risk of UTI among patients using IC. On the other hand, a risk reduction for haematuria associated to hydrophilic-coated catheters in general, was not demonstrated. However, the conclusions from the study are compromised by several limitations, such as the heterogeneity of outcomes and definitions, the lack of available high quality randomised controlled trials as well as a higher dropout rate in the arms related to hydrophilic catheters. In view of these limitations, uncoated catheters may still maintain a place in the clinical practice. There are limitations and gaps in the evidence base, and the designation of non-coated catheters as single-use devices.[19]

Single-use hydrophilic-coated catheters increase social participation by saving time, increasing independence, and reducing the burden related to CIC. [28,29]

It is recommended that a precautionary principle should be adopted, and that patients should be offered a choice between hydrophilic and gel reservoir catheters.[18]

5.3. Vulnerable patient groups

Vulnerable patient groups doing CIC that should be considered for hydrophilic-coated IC, should include the following:

- Patients in hospitals, nursing homes, rehabilitation centres
- Immunosuppressed patients
- Patients with re-current UTIs or haematuria.

5.4. Economic Considerations

By reducing the number of UTIs through the introduction of CIC instead of permanent IDC, it has been possible to halve the incidence of renal failure and mortality in SCA people. However, the additional costs of CIC are possibly offset even by the lower rate of UTIs, and the fact that care for a permanent catheter is no longer necessary.[20]

The choice of catheter for IC is currently influenced by economic consideration in the selection of re-using single-use non-coated reusable, single-use non-coated, or hydrophilic-coated catheters. No economic analysis has yet been conducted in South Africa comparing any of these techniques, although re-use of single-use catheters is currently most prevalent.

Birmingham et al. published a cost-effectiveness analysis[18] using data from trials with various IC catheter types, finding a slight difference to the risk of symptomatic UTI. The analysis, however, focused only on the acute treatment of symptomatic UTIs, but did not consider their lifetime downstream sequelae such as renal function, only focusing on acute management issues. Furthermore, this analysis did not include the most recent and largest study in hospitalised SCI patients comparing UTI incidence rates for single-use hydrophilic-coated and uncoated catheters.[14]

Clark et al. used a probabilistic decision analysis conducted to investigate the cost effectiveness of hydrophilic catheters versus uncoated catheters using a lifetime perspective. Hydrophilic catheters were estimated to be a cost-effective solution when compared with uncoated catheters with a relatively low incremental cost effectiveness ratio (ICER) in the UK context.[21]

Consideration of the patient's quality of life and needs, their therapeutic goals and economic status, must become the measure of care. To this end, a system of ongoing exchange and regular discussion should be established with all those involved in the care process, e.g. patients, health insurance funds, specialist physicians, and providers and manufacturers of medical technical aids.

6. Conclusions

Management of the urinary tract of people with SCA is continuing to evolve. Unfortunately, the scientific evidence base on which treatment decisions must be made, is inconclusive. It is therefore important that clinicians take heed of the lessons that have been learnt in SCI centres over the decades but, at the same time, continue to question the accepted wisdom and subject it to scientific challenge.

The care of this group of patients is hugely rewarding for the treating clinical team, as high-quality urinary tract management has a major positive impact on patients' quality of life, health outcome and cost-effective treatment. On an international scale, there is an urgent need to devise cost-effective SCI management regimes that translate the results of the best SCI centres to the health care systems of the developing world.[18]

It is the recommendation of the CAP that bladder management decision-making in the SCA population in South Africa needs specialised care. A phased approach will improve the attention to detail in our resource-challenged environment. This includes appropriate early care (phase1), expert assessment of the neurogenic bladder and initiation of appropriate choice of long-term strategy (phase 2), and mandatory follow-up regimes for long-term care (phase 3). This approach will equate to improved long-term positive outcomes.

Medical practitioners should promote confirmed safe, non-infecting and non-traumatic techniques for bladder management. In South Africa, the Health Professions Act[22] requires practitioners to provide patients with information on treatment options available, and to obtain their informed consent for the treatment thus chosen. Part of this process is a discussion on the benefits, risks, and costs of the options available.

Effective communication between healthcare professionals and patients is essential, where treatment and care should consider patient needs, preferences, and circumstances. The National Health Act[24] also requires that practitioners should offer "the best possible care at a cost-effective rate" [25]. Cost effectiveness and low costs are not equivalent terms. The issue is rendered more difficult by the absence of measurements of total treatment and care pathway savings in the medium to longer term, which result from the avoidance of inferior care. Reduced complications and co-morbidities and earlier return to normal activities are examples of such unmeasured outcomes.

References

1. Continence Advisory Panel (CAP) (2014). Position Paper. www.sasca.org.za
2. International Perspectives on SCI. (December 2013). WHO. Ch 4: pp. 69-70.
3. Urinary incontinence in neurological disease: Management of lower urinary tract dysfunction in neurological disease. (August 2012). NICE clinical guideline IPG 148. p. 34.
4. http://www.elearnsci.org/ via ISCoS website http://www.iscos.org.uk/ under “eLearning”.
5. Urinary incontinence in neurological disease: Management of lower urinary tract dysfunction in neurological disease. (August 2012). NICE clinical guideline IPG 148. p 16.
6. Evidence-based Guidelines for Best Practice in Urological Health Care Catheterisation Urethral intermittent in adults. (March 2013). EAUN pp. 13-15.
7. European Association of Urology Guidelines on Neurogenic LUTD (2012). pp. 11, 32.
8. Brand, M. (2014). Standing for Standards in Bladder Management – QASA. (2014). Presentation SASCA Conference.
9. Bladder Management for Adults with Spinal Cord Injury: A Clinical Practice Guideline for Health-Care Providers. Consortium for Spinal Cord Medicine. (2006). The Journal of Spinal Cord Medicine volume 29 number 5, pp. 527-573.
10. Infections: Prevention and control of healthcare-associated infections in primary and community care. NICE Clinical guideline CG139. p. 19.
11. EAUN Guidelines for Best Practice for Urological Health Care Catheterization. (2012). p. 27.
12. Harrison, Simon C.W. (2010). Managing the urinary tract in spinal cord injury. Indian J Urol. Apr – Jun; 26(2): 245–252.
13. http://www.scinurse.org. International Network of Spinal Cord Injury Nurses.
14. Cardenas, DD., et al. (May 2011). Intermittent Catheterization with a Hydrophilic-Coated Catheter Delays Urinary Tract Infections in Acute Spinal Cord Injury: A Prospective, Randomized, Multicenter Trial. Academy of Physical Medicine and Rehabilitation 1934-1482/ Vol. 3, pp. 408-417.
15. Li, L., et al. (2013). Impact of Hydrophilic Catheters on Urinary Tract Infections in People with Spinal Cord Injury: Systematic Review and Meta-Analysis of Randomized Controlled Trials. Archives of Physical Medicine and Rehabilitation 94: 782-7.
16. Chartier-Kastler, E., et al. (2013). A Prospective, Randomized, Crossover, Multicenter Study Comparing Quality of Life Using Compact versus Standard Catheters for Intermittent Self-Catheterization. The Journal of Urology. Vol. 190, pp. 942-947.
17. Hakansson, MA. (2014). Reuse versus single-use catheters for intermittent catheterization: what is safe and preferred? Review of current status. Spinal Cord. pp. 1–6.

18. Birmingham, AL., et al. Intermittent self-catheterisation with hydrophilic, gel reservoir, and non-coated catheters: a systematic review and cost effectiveness analysis. *BMJ* 2013; 345:e8639 doi: 10.1136/bmj.e8639 (Published 8 January 2013).
19. Rognoni, C., et al. (2017). Intermittent catheterisation with hydrophilic and non-hydrophilic urinary catheters: systematic literature review and meta-analyses. BMC Urology 17: 4.
20. Intermittent Catheterization: Care provision and reimbursement in Germany. Quality of Life Initiative. www.faktor-lebensqualitaet.de
21. Clark JF., et al. (2015). A cost-effectiveness analysis of long-term intermittent catheterisation with hydrophilic and uncoated catheters. Spinal Cord. pp. 1–5.
22. South African Health Professions Act 56 of 1974. www.hpcsa.co.za
23. Urinary incontinence in neurological disease: Management of lower urinary tract dysfunction in neurological disease. (August 2012). NICE clinical guideline IPG 148, p. 8.
24. South African National Health Act, Act 61 of 2003. www.hpcsa.co.za
25. Health Professions Council of South Africa. Ethical Rule 23. www.hpcsa.co.za
26. http://www.geronpta.org.za/wp-content/uploads/2012/01/9.5-Management-of-Urinary-Incontinence-in-Older-Persons-at-Primary-Level.pdf (p. 22.)
27. McIntyre., et al. (2014) Applied Research Quality Life. 9: 1081-1096 DOI 10.1007/s11482-013-9289-8
28. Berklund Johannsen. (2007) A novel product for intermittent catheterisation: its impact on compliance with daily life-international multicenter study. Eur Urol: 2007 Jul: 52(1):213-220 E pub 2006 Nov 29
29. Pascoe G. Evaluation of two coated catheters in intermittent self-catheterisation. B J Nursing 2001; 10(5): 325-329 DOI: 10.12968/bjon.2001.10.5.5360
30. Preito J., et al. (2014). Intermittent catheterisation for long-term bladder management. Cochrane Database of Systematic Reviews 2014, Issue 9. Art. No.: CD006008. DOI: 10.1002/14651858.CD006008.pub3.
31. Christison C., et al. (2017). Intermittent catheterization: The devil is in the details. Journal of Neurotrauma. (doi: 10.1089/neu.2017.5413).