European Association of Urology Nurses

Evidence-based Guidelines for Best Practice in Urological Health Care

A Summary of the EAUN Guidelines on Urethral Intermittent Catheterisation in Adults

March 2025

Supported by an unrestricted educational grant from Wellspect

Limitations and disclosure

The EAUN acknowledge and accept the limitations of this document. It should be emphasised that the current guidelines provide information about the treatment of an individual patient according to a standardised approach. The information should be considered as providing recommendations without legal implications. While every effort has been made to ensure the accuracy of the contents at the time of publication, neither European Association of Urology Nurses (EAUN) nor the authors offer any guarantee as to the accuracy of the information contained in them nor accept any liability, with respect to loss, damage, injury, or expense arising from any error or omission in the contents of this work. References to products or tools within this document do not constitute an endorsement of these products or tools.

Suggested citation

Vahr Lauridsen S, Geng V, Lurvink H; EAUN Guidelines Working Group. *A Summary of the EAUN Guidelines on Urethral Intermittent Catheterisation in Adults: Evidence-based Guidelines for Best Practices in Urological Health Care.* European Association of Urology Nurses; 2025. Presented at the 25th International EAUN Meeting, Madrid, March 22, 2025. Accessed www.eaun.org

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Acknowledgements

Susanne Vahr Lauridsen, Veronika Geng, and Hanneke Lurvink reviewed and approved this summary. Medical writer John Gregory, IIWCC, ISWA, Opencity Inc., edited and produced the summary. The summary was funded by an unrestricted educational grant from Wellspect.

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The original 2024 guidelines were funded by an unrestricted grant from Coloplast and Wellspect. While the content is intended to be consistent with the original document, this summary was not endorsed by Coloplast.

TABLE OF CONTENTS

List of tables and figures

Foreword by Susanne Vahr Lauridsen, PhD, RN (DK)

Susanne Vahr Lauridsen chaired the EAUN Guidelines Working Group. She is a clinical RN and senior researcher, working at the surgical and urology department, Herlev-Gentofte and at WHO Collaborating Centre, Parker Institute, Bispebjerg and Frederiksberg Hospitals, Copenhagen University Hospital. She is associate professor at Copenhagen University, Denmark.

On behalf of the Working Group, we are happy to present this updated summary of the EAUN *Guidelines for urethral intermittent catheterisation in adults*.[1] This summary also includes recommendations for intermittent urethral dilatation and is an important step in applying these guidelines in real-world settings.

For guidelines to be effective, health care professionals, patients, and stakeholders need to know about them. The guidelines should also be easy to understand and use. Nurses can access EAUN Guidelines through the EAUN website and translations by national urology (nurses) societies via their national society. This summary makes the *Guidelines* even more user-friendly, and the pocket format will make it easy to use in clinical practice. The first EAUN *Guidelines* summary was popular, as we saw based on downloads and citations, and increased awareness of the EAUN *Guidelines* outside Europe.

The *Guidelines* aim to provide evidence-based advice for nurses and other health care professionals performing intermittent catheterisation (IC) and urethral dilatation. It also helps those who teach patients and caregivers how to perform catheterisation. Following these *Guidelines* can prevent harm to patients and improve adherence to self-catheterisation. Better self-care and independence greatly enhance quality of life (QoL).

There is still limited evidence on patient outcomes and experiences with IC. However, since the *Guidelines*' release in 2013, more studies have been published.[2] The updated 2024 version includes a chapter on patient perspectives, highlighting the barriers and facilitators they face in daily life. No new evidence has been published regarding urinary tract infections (UTIs), and there is still limited support for one catheter product over another.

With this summary and pocket format of the *Guidelines*, on behalf of the Working Group, we hope that more nurses and other health care professionals will be able to make informed decisions about patient care and caregiver support in urethral IC and urethral dilatation.

Record of changes

Updates in *Urethral intermittent catheterisation in adults*, 2024 relative to the 2013 (second) edition [1,2]:

- The title of the Guidelines has been adjusted to *Urethral intermittent catheterisation in adults including urethral intermittent dilatation*.
- Recommendation statements rephrased for clarity with the number of individual recommendations decreased to 57.
- **1. Abbreviations.** An extended list of abbreviations has been moved to the beginning of the document for ease of reference.
- **4. Definitions.** The list and detail supporting the definitions has been expanded.
- **6. Complications.** The section has been updated with clear definitions.
- **7. Catheter material, types of catheters and equipment.** Updated the catheter material, included new catheter designs, and removed help devices that were not available anymore.
- A list of catheters was included for illustration purposes only in **7.7.1 Catheters and catheter sets.**
- **14. Patient perspective/experience with intermittent catheterisation.** The section is new and covers the patient perspective and which barriers and facilitators patients experience when integrating IC in their everyday life.
- Ambiguous text carefully reviewed and rephrased.
- One hundred and twelve new references were added, of which one reference recommended by a reviewer was included. Ninety-six references from the 2013 were retained.[2]
- A new **Appendix L. Questionnaires/tools for evaluating intermittent catheterisation/intermittent self-catheterisation** has been added.

Introduction

Intermittent urethral catheterisation is necessary for individuals with difficulty in voiding due to neurogenic or non-neurogenic lower urinary tract dysfunction. These *Guidelines* are intended for specialist nurses and other health care professionals who are involved in the procedure of IC and have already acquired competence in this field.[1]

This summary refers to all nurses who work with people performing IC as nurse specialists. Job titles within the specialty differ by jurisdiction. Specialist nurses should operate within the scope of practice of their regulatory framework and local organisational policies and procedures.

The summary is restricted to the procedure in adults only. The full *Guidelines* include illustrations, references, and annotated procedures to help nurses identify problem areas and to carry out effective patient care. The order of the content in this summary differs from the original.

The European Association of Urology Nurses (EAUN) is a professional organisation of nurses in Europe who specialise in urological care. In Europe, there is variation in the education and competency of nurses in urology, with activities and roles differing among countries. However, the Working Group has tried to ensure that every nurse and health care professional may gain some benefit from using these *Guidelines*. Refer to the full *Guidelines* **Section 3. Methodology** for a description of the process methodology for the development of the document.

This summary reflects all the recommendations of the full *Guidelines*. The rating system to appraise the level of evidence (LE) and grade system is presented in Table 1. Minor corrections have been made where needed.

Table 1. Level of evidence and grade of recommendation

Level	Type of evidence
1a	Evidence obtained from meta-analysis of randomised trials
1b	Evidence obtained from at least one randomised trial
2a	Evidence obtained from one well-designed controlled study without randomisation
2b	Evidence obtained from at least one other type of well-designed quasi-experimental study
3	Evidence obtained from well-designed non-experimental studies, such as comparative studies, correlation studies, and case reports
4	Evidence obtained from expert committee reports or opinions or clinical experience of respected authorities*
Grade	**Type of evidence - nature of recommendation**
A	Based on clinical studies of good quality and consistency addressing the specific recommendations and including at least one randomised trial
B	Based on well-conducted clinical studies, but without randomised clinical trials
C	Made despite the absence of directly applicable clinical studies of good quality

Note. The asterisk (*) on level 4 denotes including qualitative studies.

Indications, contraindications, and alternatives for IC

Indications

Indications for IC include[3-5]:

- acute or chronic urinary retention due to non-neurogenic or neurogenic conditions
- overflow incontinence (eg, benign prostatic hyperplasia and urethral stricture)
- incomplete emptying (eg, neurogenic/hypotonic bladder or after interventions such as bladder augmentation, intravesical onabotulinum toxin A injection, and mid-urethral tape insertion)
- continent urinary diversions (eg, Mitrofanoff pouch and Studer neobladder)
- intravesical instillation (eg, Bacillus Calmette-Guérin or mitomycin C for superficial bladder cancer)
- investigations (eg, urodynamics)
- bladder washouts (eg, with normal saline to remove mucus)
- to avoid any potential complications during insertion of radioactive therapeutics (eg, caesium into the cervix).

It is important to acknowledge that if performed for a large residual volume, IC should only be performed in the presence of symptoms or complications, arising from this residual volume of urine rather than being based on a post-micturition residual volume only.

Complications of a large post-void residual volume of urine include:

- bladder calculi
- renal failure
- patient discomfort
- lower urinary tract symptoms (eg, nocturia, urgency, and/or frequency)
- incontinence.

Refer to section 5.1 of the full *Guidelines* for a description of the four categories of lower urinary tract dysfunction requiring IC.

Contraindications

The few absolute or relative contraindications to IC are summarised in Table 2.

Table 2. Contraindications to IC

Absolute	Relative
• high intravesical pressure that would require continuous free drainage to avoid renal damage	• poor manual dexterity in the absence of an appropriately trained caregiver/attendant • urethral trauma • urethritis • prostatitis/UTI • significant visible haematuria

Alternatives

Alternatives to IC exist. The choice may depend on factors such as duration and patient discomfort. Male external catheter drainage systems can be considered in patients with voiding problems without symptoms or complications and without residual volume.[6,7] Alternative bladder emptying methods include:

- suprapubic catheterisation
- indwelling urethral catheterisation
- use of a male external catheter, eventually with sphincterotomy
- use of a female catheter[8,9]
- neurostimulation (eg, sacral neuromodulation, tibial nerve stimulation, or pudendal nerve stimulation)[10]
- use of a Brindley stimulator
- urinary diversion.

Infection prevention

Infection prevention and control is a mainstay of nursing practice and is imperative in reducing the incidence of UTIs. Patients' QoL can be negatively impacted by UTIs, including patients refraining from social activities, duration of illness, and number of days lost from work.[11] Bacteriuria is acquired at the rate of 1%–3% per catheterisation.[7] Asymptomatic bacteriuria does not require treatment. The definitions of the different catheterisation techniques are presented in Table 3. The differences in definition of UTI and the classification of UTI are described in **Section 4. Terminology** of the full *Guidelines*. The bladder volume should preferably not exceed 400–500 ml in IC users.[11-12]

Table 3. Definitions of catheterisation techniques

Technique	Definition
Sterile	Complete sterile technique is only used in operating theatres, diagnostic situations, and immunocompromised patients. Sterile technique implies that all the material is sterile and catheterisation is performed with sterile gown, gloves, etc. – that is, full operating theatre conditions. It is now widely accepted that sterile IC has been used incorrectly for aseptic technique. The focus in these *Guidelines* is on aseptic technique, which is the most commonly used technique in different settings.
Aseptic	Aseptic technique includes: o use of a sterile catheter o cleansing of the genitals (water and soap) o use of sterile gloves o use of sterile lubricant (if the catheter is not pre-lubricated) o use of sterile tweezers (optional)
Non-touch	A non-touch technique is an aseptic technique that is usually performed with a sterile ready-to-use catheter. An insertion grip/sleeve or special packages can be used to touch the catheter.[13] Additionally, limiting touch to only the conus side of the catheter is also considered a non-touch technique. o cleansing of the hands o non-sterile gloves o cleansing of the genitals (water and soap) o use of a sterile or ready-to-use catheter
Clean	Clean technique is only used by patients or caretakers in the home setting. o use of a sterile catheter o cleansing of the hands o cleansing of the genitals (water and soap) o use of non-sterile or sterile lubricant (if the catheter is not pre-lubricated)
Hygienic	The term hygienic technique is sometimes used for aseptic and sometimes for clean technique. The Working Group decided not to use this term

The *Guidelines* provide six recommendations related to infection prevention encompassing urinalysis, fluid intake, cranberries, and hand hygiene

Recommendations	References	Level	Grade
Undertake urinalysis or collect a specimen of urine for culture if an IC user has symptoms suggesting a UTI	6,14	1a	A
Advise users how much fluid they need based on their weight (25–35 ml/kg/day), fluid loss, food intake, and circulatory and renal status		4	B
Encourage IC users to drink enough fluid to maintain a urine output of at least 1200 ml per day	15	4	C
Do not recommend cranberry supplementation routinely to prevent or treat UTI	16-18	1b	A
Adhere to protocols on hand hygiene before catheterisation	7,19,20	1b	A
Educate patients and caregivers in techniques of hand hygiene	19	4	B

Note. IC = intermittent catheterisation, UTI = urinary tract infection

Complications

Refer to section 6 of the full *Guidelines* for a description of the major complications of IC.

Infection

A UTI is an infection involving any part of the urinary system, including urethra, bladder, ureters, and kidney. A UTI is the most common complication and is often associated with inflammation. The definition of catheter-associated UTIs belongs to indwelling catheters and is not applicable for IC.[21] Factors increasing the risk of infection in IC are presented in Table 4.

Hydrophilic-coated or pre-lubricated intermittent catheters with a *non-touch* sleeve pose a lower risk of UTIs than other intermittent catheters. Because hydrophilic-coated catheters do not require additional external lubrication, there is no need to touch the catheter before insertion.[34] Reduced pain and microtrauma improves QoL and adherence to clean IC. Table 5 lists the complications experienced by IC users.

Table 4. Factors increasing the risk of infection in IC

Risk Factor	LE
low frequency of IC [11,22-27]	2b
bladder over-distention [28]	1b
female [11,29]	1b
poor fluid intake [11]	3
non-coated catheters [30,31]	1a
poor technique [32]	3
poor education [22,24,27,29,33]	2b

Note. LE = level of evidence

Table 5. Complications experienced by IC users

Type	Description	Frequency
Infection and/or inflammation		
Nosocomial infection	Acquired while receiving care not present on admission.[35] Note. Hydrophilic or pre-lubricated catheters with a *non-touch* sleeve are associated with fewer UTIs.	62%–77% among IC users with a neurogenic disorder and 38%–42% among IC users with a non-neurogenic disorder.[11,36,37]
Epididymo-orchitis	Inflammation of the epididymis and/or testicle, which may or may not be infectious.	27.9% in SCI.[38]
Urethritis	Inflammation of the urethra, which may or may not be infectious.	Occurs in 1%–20% in SCI.[22,39]
Prostatitis	Painful inflammation of the prostate. Acute bacterial prostatitis usually presents with voiding symptoms.	Can be a cause of recurrent UTIs.[22,23]
Pyelonephritis	Inflammation of the kidney due to bacterial infection.	<1% per patient per year in patients with neurogenic and non-neurogenic bladder.[40]
Urethral trauma/haematuria		
Urethral bleeding	An acute form of urethral trauma that manifests in blood in the urine.	2.2% frequency of bleeding per year.[40]
False passage	Occurs when an object passes through the wall of the urethra.	Incidence 2.2%–9% of patients performing daily IC.[41]
Urethral stricture	A narrowing of the urethra.	Incidence of 4.2%–25% in men.[42,43] Rare in women.[44]
Meatal stenosis	Abnormal narrowing of urethral opening (meatus). Voiding may be impaired and cause incomplete bladder emptying.	Rare.[45,46]
Bladder perforation	Tends to occur in augmented bladders along anastomotic site.	Rare.[47,48]
Miscellaneous		
Catheter knotting	Occurs when catheter coils.	Very rare but more common in children.[49]
Formation of bladder and prostate stones (calculi)		2% incidence of bladder stone formation in SCI.[50]
Pain/discomfort	May occur during IC insertion and removal.	

Note. IC = intermittent catheterisation, PVC = polyvinyl chloride, QoL = quality of life, SCI = spinal cord injury, UTI = urinary tract infection.

The *Guidelines* provide six recommendations related to complications.

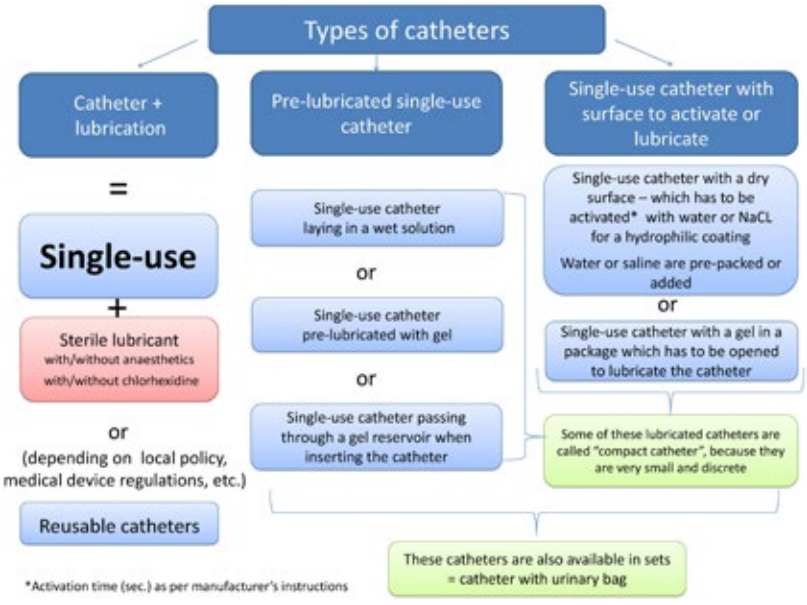
Recommendations	References	Level	Grade
In all IC users, only treat symptomatic UTI	14,51	1b	A
In all IC users, explore if the bladder volume exceeds 400–500 ml	11,12	3	C
Hydrophilic-coated or pre-lubricated catheters should be used for IC	30,31,52,53	1a	A
Hydrophilic-coated catheters to prevent urethral strictures should be used	53	1a	A
In the event of inability to catheterise, seek advice of a urologist		4	A
PVC-free catheters should be used for IC to reduce pain and burning	54	1b	A

Note. IC = intermittent catheterisation, PVC = polyvinyl chloride, QoL = quality of life, UTI = urinary tract infection.

Catheter material, types of catheters, and equipment

The choice of catheter should consider the patient assessment, patient preference, limitations or disabilities, cost-benefit, cost effectiveness, ease of use, and storage issues. The patient should be given guidance on selecting the best product for their needs, recognising that their needs may change over time. Several types of catheters, including complete set options, are available for IC, some of which are shown in Figure 1. Practitioners should base decision on type of catheter and technique using clinical judgement and in conjunction with the patient.

Figure 1. Types of catheters



Note. NaCl = sodium chloride.

Refer to section 7 of the full *Guidelines* for descriptions of catheter material, lubrication/coating, tips, diameter, length, connectors, packaging, and disposal. Extensive examples are provided.

Catheter materials

Catheters are made from a variety of materials that aim to strike a balance between medical safety, functionality, efficiency, patient comfort, and environmental performance. There is an increasing demand from the community for polyvinyl chloride (PVC)-free materials and their phthalate components in medical devices.[55] According to REACH, phthalates are harmful and hazardous to the human body.[56] Finding good alternatives is a technical challenge, yet phthalate-free alternatives are available.

Catheter lubrications/coating

The purpose of using lubrication is to reduce friction and, thus, to protect the sensitive urethral mucosa during catheter insertion and removal.[57] Currently, most catheters have a hydrophilic coating that reduces friction between the urethral mucosa and the catheter. Apart from the hydrophilic coatings, there are plain PVC or silicone catheters that are packaged with a separate gel/lubricant or packaged as pre-lubricated catheters with a gel coating applied. Sterile lubricants are always for single use. An open package should not be used again.

Hydrophilic-coated catheters are characterised by a layer of polymer coating that absorbs and binds water (up to 10 times the coating's weight) to the catheter. This results in a thick, smooth, and slippery surface that reduces friction between the catheter surface and the urethral mucosa during insertion. The coating layer remains intact upon introduction into the urethra and ensures lubrication of the urethra throughout its length.[58]

Catheter tips

There are a variety of catheter tips (summarised in Table 6) that have been designed to be helpful in various situations and with different types of patients.

Table 6. Catheter tips

Tip	Description	Considerations
Nelaton	Standard catheter. Soft rounded tip, flexible, straight proximal end. Two lateral drainage eyes.	General use.
Tiemann/ Coudé	Slightly curved tapered tip. Up to three drainage holes.	Particularly useful with narrow urethral passage or prostatic obstruction. Angle tip for directional stability. More rigid tip allows insertion through obstructed areas.
Flexible rounded	Easy passage irrespective of configuration, tortuosity, or degree of obstruction.	Flexibility can cause lack of control for some patients.
Pointed	Squeezable with bendy end. Tip ends in a ball.	Useful in obstruction and dilatation. Ball prevents catheter being caught in urethra.
Introducer/ Protective	It is assumed that many UTIs are caused during IC when the catheter tip passes through the colonised portion of the urethra, pushing the bacteria further into the urinary tract.	Intended to allow the catheter to bypass the colonised portion of the urethra. The Working Group did not find evidence to underpin advantages.
Micro-hole zone catheter	The micro-hole zone technology catheter has micro-holes instead of 2 or 3 eyes emptying, which empties the bladder in one free flow without the need to reposition the catheter.	Intended to prevent suction in the urethra, trauma, and residual urine.

Note. IC = intermittent catheterisation, UTI = urinary tract infection.

Catheter diameter, length, and connectors

Size. External diameter of intermittent catheters is measured in millimetres and is known as the Charrière scale (Ch or CH) or French scale (F, Fr, or FG), which measures the circumference. Sizes range from 6 to 24. Female adult sizes are commonly 10–14, and male adult 12–14; although, larger sizes are used for treating strictures.[59] The catheter chosen should be large enough to allow free flow of urine without causing damage to the urethra.

Length. Intermittent catheters are available in both male (~40 cm) and female lengths (7–22 cm).

Catheter connectors. Universally colour coded to denote the size of the catheter for ease of recognition. Figure 2 illustrates the colour coding of the catheter sizes available. *Note*, while the colours are international, not every manufacturer uses the colour coding; so, it is necessary to check the packaging and connector for size confirmation. A Luer lock connector is connected to a catheter when irrigating (or instilling) the bladder. This can be attached to the pre-installed connector. It is also possible to use a catheter with a standard connection and use a special connector with a Luer lock on one side and tip on the other side to insert the connector.

Figure 2. Standard catheter connector colour chart

Catheter size (Fr)	8	10	12	14	16	18	20	22
Colour								
Tube diameter (mm)	2.7	3.3	4	4.7	5.3	6	6.7	7.3

Note. Fr = French scale (F, Fr, or FG).

Catheter packaging and disposal

Opening catheter packaging can be difficult for patients with reduced dexterity. If a urine bag is attached to the catheter, it can be easily drained by pulling a tap or cutting the bag with scissors. The empty urine bag and catheter can be discarded with the packaging. As a society, we are also more cognizant to reduce unnecessary packaging. Packaging waste can be reduced in the community by dispensing with outer packaging only or ordering bulk containers.

Types of catheters

As illustrated in Figure 1, there are many varieties of catheters; thus, decision making can be a challenge. Catheters are either supplied as (a) a standard catheter, (b) a complete catheter set, or (c) a compact catheter. Figure 3 shows examples of complete catheter sets / catheter systems, while Table 7 summarises the options.

A standard catheter has no bag attached, is easy to store when travelling, is discreet, and is easy to dispose of. A standard catheter like the example in Figure 3 enables the patient to pass urine via the catheter directly into the toilet.

Figure 3. Example of a standard catheter

Note. LoFric® Origo™ hydrophilic catheter with sleeve for non-touch technique. Courtesy of Wellspect.

A complete catheter set / catheter system contains a catheter connected to a urine bag that enables the patient to measure residual volume with ease and is convenient to use when the patient needs to catheterise in a non-hygienic area or is lying on a bed. Clinical practice shows that patients with reduced dexterity sometimes find sets easier to use because urine is contained. Examples of sets shown in Figure 4 can be used for aseptic and non-touch techniques.

Figure 4. Example of catheter sets / catheter systems

Note. Reproduced from full Guidelines. LoFric® Hydro-Kit™, Wellspect; Actreen® Mini Set, B. Braun; Advance Plus™, Hollister; EasiCath® Set, Coloplast.

Figure 5. Example of a female compact catheter

Note. LoFric® Elle™ female compact catheter. Courtesy of Wellspect.

Table 7. Summary of catheter types

Type	Description	Considerations
Standard Catheter		
Single-use catheter	Available in male and female versions.	
Single-use catheter without coating	Sterile catheters without any equipment and no coating can be used with lubricants.	Single-use catheters in hospitals are often used in combination with standard catheter sets. Non-coated catheters are widely considered in the literature to cause an increase in urethral irritation, poor patient satisfaction, increased bacteriuria, and long-term urethral complications; although, there is a lack of hard evidence to support this.
Single-use catheter with coating or gel	Sterile catheters with hydrophilic coatings are a ready-to-use solution, with gel on the surface of the catheter or in the wrapping.	Designed for single use and are pre-coated to allow ease of insertion and removal, thereby reducing the risk of urethral mucosal irritation that can be more prevalent with an uncoated product.
Catheters with sleeves or non-touch catheters	In catheters with a plastic sleeve or plastic grip, the sleeve/grip around the catheter is used as guide to introduce the catheter without touching it.	There are two types: ○ catheter with a plastic sleeve/grip around it (sleeve/grip does not cover the catheter completely) ○ catheter with a plastic sleeve completely covering the catheter, so that the catheter can be inserted safely without sterile gloves and without touching the catheter, available for men and women.
Discrete/ compact catheter	Small, discreet compact intermittent catheters are available. The small packaging is more convenient, and the products are sterile and for single use.	The female catheters are designed specifically for the short urethra.The compact products have the same coating/ lubrication as the standard-length products. Both male and female catheters are easy to use and dispose of and offer a simpler storage solution. Can be used with a non-touch technique. Example Figure 5. Additional products specifically for these catheters, such as drainage bags, may be offered.
Complete catheter set / catheter system		
Complete catheter set / catheter system	Male and female versions are available. Pre-connected with an integrated urine bag. Either pre-lubricated; has a gel reservoir; or has activation fluid, if catheter is hydrophilic.	Convenient when the patient needs to catheterise in a non-hygienic area or is lying on a bed. They are particularly useful for wheelchair users.

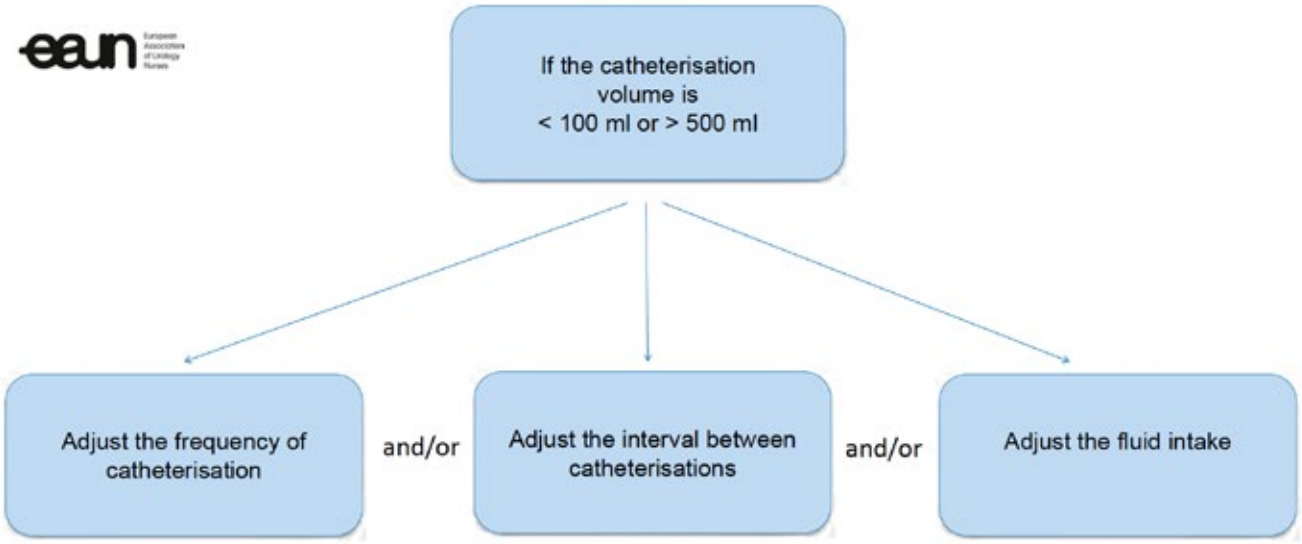
Principles of management of nursing intervention

The practitioner authorised to prescribe IC will depend on the jurisdiction and local health care organisation policy. Informed patient consent must be sought, where permitted. Nursing interventions for managing IC encompass considerations about the frequency of catheterisation, residual urine volume, patient/caregiver assessment and education, as well as ongoing support and follow-up. Consequently, almost half the recommendations in the full *Guidelines* describe these principles. They are summarised at the end of this section.

Frequency of catheterisation

Individualised care plans help identify appropriate catheterisation frequency, based on discussion of voiding dysfunction and impact on QoL, voiding diary, functional bladder capacity, and ultrasound bladder scans for residual urine. The number of catheterisations per day varies. In adults, a general rule is catheterising frequently enough to avoid a bladder volume >500 ml. However, guidance can also be based on urodynamic findings, such as bladder volume, detrusor pressures on filling, presence of reflux, and renal function, shown in Figure 6.[60]

Figure 6. Options when adaptation of the catheterisation pattern is needed



A 2023 prospective cohort study found that patients who adhered to the prescribed frequency of catheterisation had less risk of infection than those who did not.[61] Increase the IC frequency if the patient still has the urge to urinate or has motor restlessness or spasticity.

If the patient is unable to pass urine independently, they will usually require IC 4–6 times daily to ensure the bladder volume remains below 500 ml. Excessive fluid intake increases the risk of over-distension of the bladder and overflow incontinence.[15] Possible leg oedema is eliminated in lying position, and the bladder will fill within the first few hours of lying down.

Residual urine volume

In the early days of establishing IC, observation and management of bladder emptying and residual volume (including retention) are important to measure the urine volume drained to determine the frequency of IC.[23] Complete a voiding diary to record fluid intake, how much urine is voided independently, frequency of catheterisation, and residual volume. This can help in decision making and adjusting the IC frequency.

Patient and caregiver assessment

Patients and/or caregivers need to be assessed regarding their:

- ability to understand the information
- knowledge of diagnosis and understanding the need for catheterisation
- knowledge about the urinary tract
- general health status
- ability to perform the skill
- adherence
- need for psychological support
- motivation / emotional readiness
- availability to perform the procedure.[62,63]

Patient and caregiver education

There is a lack of agreed standards for patient and caregiver education on IC, and only properly trained nurses should provide teaching. Health care organisations should have an evidence-based guideline for members of the health care team for teaching patients and their families about the steps in IC.[64] Refer to the full *Guidelines* for an explanation of the why, who, when, where, and how.

Ongoing support and follow-up

Integrating IC into everyday life can be tough, meaning patients and caregivers require close ongoing support and follow-up.

The *Guidelines* provide 26 recommendations related to the principles of management of nursing intervention.

Recommendations	References	Level	Grade
Observe local policy before starting catheterisation		4	C
Assess the patients and their individual circumstances for IC before choosing types of catheter, tip, and aids		4	C
Be aware that the patient's privacy is paramount in all locations	62,65	4	C
Frequency of catheterisation			
Assess the frequency of catheterisation if the urine output is >500 ml or <100 ml per catheterisation		4	A
Review the patient's medication list influencing bladder function (such as anticholinergic medication and β3 agonists)		4	A
Perform IC shortly before sleep to prevent sleep disturbances and bladder over-distention		4	C
Patient and caregiver assessment			
Ensure patients and caregivers have access to appropriate educational resources and materials	66-68	4	C
Assess the caregiver's general health, dexterity, motivation, understanding, and availability to undertake IC	63	4	C
Ensure that the patient/caregiver understands the basic anatomy and function of the urinary system	69	4	C
Ensure that the patient and/or caregiver has a clear understanding of the patient's relevant urological condition and why they require IC	32	4	C
Ascertain the motivation of the patient	70	4	C
Investigate the need for special supportive devices	70	4	B
Offer support to patients and/or caregivers to help them overcome any initial resistance to IC	62	4	B
Counsel the patient and caregiver to express any psychological issues about the caregiver performing such an intimate procedure	71-73	4	C
Advise patients to take a medical travel document in case they are travelling abroad		4	C
Patient and caregiver education			
Ensure that health care professionals are proficient in the skills and teaching of IC		4	C
IC should be taught by an appropriately experienced nurse		4	C
Individualise teaching for the patients and their caregivers	74	4	C
Use consistent teaching methods and modelling of desired behaviour to increase patients' and caregivers' practical skills and satisfaction		4	C
Develop a relationship and environment that encourages and supports patients towards self-management of long-term bladder conditions	62	4	B
Empower patients and caregivers to take an active role in catheter management	71	4	C
Provide verbal explanation of IC and sufficient time for practical instruction of the procedure to the patients and caregivers		4	C
Ensure that all verbal information is reinforced with written information to help patients and caregivers learn the procedure		4	C

Recommendations	References	Level	Grade
Ongoing support and follow-up			
Provide ongoing social support (by consultation/telephone) to improve QoL and prevent complications	66,75-77	2a	B
Assess patient adherence by keeping a log of catheterisation practice, other relevant aspects, and IC cessation	70	4	C
Explore patient-perceived signs and symptoms of UTIs during follow-up	78	4	C

Note. IC = intermittent catheterisation, QoL = quality of life, UTI = urinary tract infection.

Patient QoL

IC may have a profound impact upon biopsychosocial aspects that impact a patient's QoL, remembering that not all impacts are negative.[79] The full *Guidelines* describe these positive and negative impacts and the research in this critical area.

IC adherence is key to maintaining health and renal function and to managing lower urinary tract symptoms. Adherence can be demanding for an individual[80,81]; therefore, educational, emotional, and psychological support and regular reviews are essential.[82,83]

Refer to section 13 of the full *Guidelines* for an expanded description of patient QoL. Unfortunately, much of the available evidence reviewed is more than 10 years old. Only a few studies have performed long-term follow-up reporting on QoL.[79,84]

The *Guidelines* provide four recommendations related to patient QoL.

Recommendations	References	Level	Grade
Educate patients and caregivers to use IC to improve long-term QoL in patients with neurogenic bladder	16	3	A
Explore patients' QoL and risk of complications to improve IC adherence	17,85	3	A
Recommend single-use catheters to promote patient QoL	86	3	A
Discuss sexuality and impact of IC as a part of a patient assessment; if necessary, refer to a psychologist/sexologist		4	C

Note. IC = intermittent catheterisation, QoL = quality of life.

Patient perspective/experience with IC

About 20% of people experience negative feelings about catheterisation.[75] The patient perspective and experience is a new section in the full *Guidelines*. Table 8 summarises the most common barriers to and facilitators for intermittent self-catheterisation.

Table 8. Barriers and facilitators to intermittent self-catheterisation

Barriers	Facilitators
○ the need to plan convenient times to catheterise ○ preparation before the procedure because of dependency on bathroom access and sanitary facilities ○ type and cost of intermittent catheters	○ achieving a positive self-image, because intermittent self catheterisation aids maintenance of a normal body image ○ good teaching instruction ○ ongoing support when needed ○ guidance to choose the right catheter gauge and length, and comfort of insertion

The *Guidelines* provide two recommendations related to patient perspective/experience with IC.

Recommendations	References	Level	Grade
Explore emotional factors for patients and families during training for bladder IC	87	3	B
Explore the everyday life of patients to guide their choice of the right catheter / catheter system for use inside and outside the home	88,89	4	C

Note. IC = intermittent catheterisation.

Intermittent urethral dilatation

Strictures are more common in men because the male urethra is longer than the female's and the female urethra is straighter than the male's. There are many potential causes of urethral strictures/stenosis. These include infection, trauma, catheterisation, intra-urethral diagnostics and surgery, radiotherapy, congenital abnormalities, inflammation, putting foreign objects in the urethra, and unknown reasons.

Identifying the cause of strictures can help treatment options to prevent occurrence of strictures and to help to decrease iatrogenic causes.[90] The European Association of Urology has a classification for the degree of urethral narrowing, measured on a scale of 0–5.[91] Table 9 lists common indications and contraindications for the use of intermittent urethral dilatation.

Table 9. Indications and contraindications for intermittent urethral dilatation

Indications	Contraindications
○ urethral stricture disease ○ stenosis of the external urethral meatus ○ bladder outflow obstruction ○ incomplete bladder emptying ○ inability to void	○ suspected or confirmed urethral rupture ○ suspected or confirmed UTI ○ suspected or confirmed false passage

Note. UTI = urinary tract infection.

Refer to section 15 of the full *Guidelines* for a description of materials, procedures, and frequency for intermittent urethral dilatation. Appendix F in the full *Guidelines* provides details of the procedures for female and male patients.

The ***Guidelines*** provide two recommendations related to intermittent urethral dilatation.

Recommendations	References	Level	Grade
Adhere to the hospital protocol on the frequency of dilatation		4	C
Advise a catheter type suitable for the location of the stricture		4	C

Note. IC = intermittent catheterisation.

Documentation

Obtain verbal or written consent before starting the procedure. Documentation should follow local policy. When a patient starts catheterisation, the following data must be collected and documented:

- reasons for catheterisation or dilatation
- residual volume
- frequency
- date and time of catheterisation
- catheter type, tip, length, and size
- problems negotiated during the procedure.

The *Guidelines* provide two recommendations related to documentation.

Recommendations	References	Level	Grade
Complete a voiding diary for all IC patients to assess bladder emptying		4	C
Offer patients an individualised care plan bearing in mind the patient's and caregiver's lifestyles and the impact this will have on the patient's quality of life		4	C

Note. IC = intermittent catheterisation.

Troubleshooting IC

Table 10 summarises the most common problems and suggested troubleshooting actions.

Table 10. Troubleshooting IC

Problem	Suggested action
Skin lesions (on the urethral meatus)	○ check the skin-cleansing agents and their additives ○ change of disinfectants ○ check for fungal infection ○ removal of the disinfectant residues/lubricant with water ○ consider referral to a dermatologist
Urethral mucosal trauma	○ check size of the catheter and tip ○ check insertion technique ○ check catheter material/coating/lubrication
Problems with insertion of the catheter ○ Mechanical problems ○ Blood on the catheter / catheter tip ○ Urethral bleeding	○ check catheterisation technique ○ check sufficient lubrication ○ check catheter (tip, rigidity, etc.) ○ for female use Tiemann tip as an alternative ○ urethral calibration of necessary ○ X-ray diagnostics of the urethra or cystoscopy if necessary ○ check for signs of constipation
Pelvic floor spasticity / spastic sphincter	○ provide relaxation (breathing technique and cough thrust) ○ check or change positioning (eg, frog position) ○ possibly adapt the choice of catheter and catheter tip ○ in most cases, it helps to wait until the spasticity is relieved
Pain	○ check catheterisation technique ○ advocate pelvic floor exercises before inserting catheter ○ provide for relaxation during catheter insertion and removal ○ check for UTI ○ check catheter system, tip, and coating ○ use of anaesthetic lubricant (eg, Instillagel) ○ consider psychological aspects
Incontinence	○ check for UTI ○ check catheterisation times ○ review drinking log and voiding diary ○ temporary supply with absorbent or draining aids ○ request bladder function diagnostics
Change in the appearance and odour of the urine	○ urine diagnostics ○ check daily fluid intake ○ think about possible nutritional factors and medications

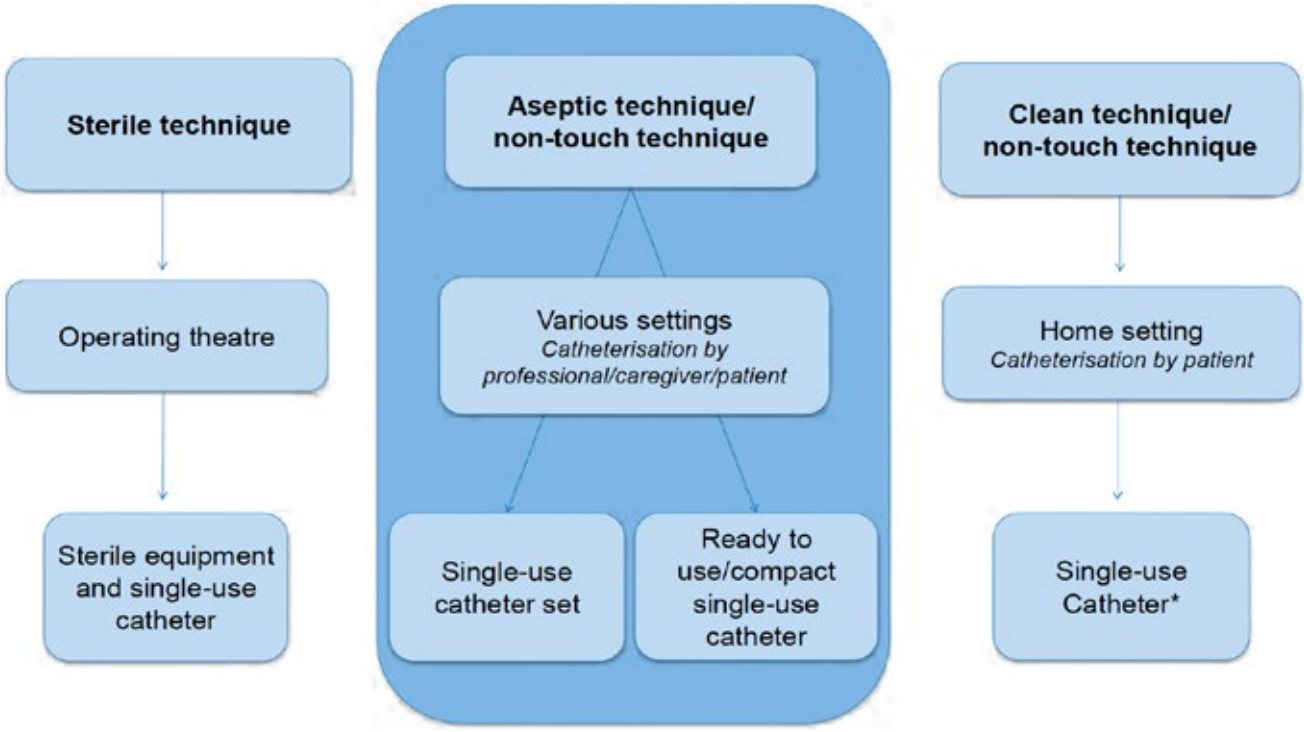
Note. UTI = urinary tract infection.

If problems persist or complications occur, a medical consultation should be made.

Procedures for IC

The full *Guidelines* describe the choice of technique, choice of catheter and equipment as well as meatal cleansing. More detailed procedures are presented in the appendices. There are nine recommendations related to procedures for IC, where those with an asterisk (*) should be included in the patient/caregiver education on IC. Figure 7 presents the simplified technique.

Figure 7. IC technique – simplified



**Note.* If single-use catheters are not available, use reusable catheter.

The *Guidelines* provide nine recommendations related to procedures for IC.

Recommendations	References	Level	Grade
Use local guidelines on procedures for IC	94	4	C
Use a sterile single-use intermittent catheter to prevent cross-contamination in clinical, rehabilitation, and long-term care settings	60	1	B
Check for allergies/sensitivity (eg, lidocaine or chlorhexidine) if using a lubricant*	95,96	4	C
Do not use antiseptic lubricants for IC routinely*	95	4	C
Clean the urethral meatus with water and pH-neutral soap	96-99	1a	A
Use lubricant in both women and men when using a non-coated catheter	95	4	C
Choose lubricant / type of catheter coating based on a comprehensive patient assessment and the reasons for IC		4	C
Choose a catheter size large enough to allow free drainage but small enough to reduce risk of trauma		4	C
Inform patients using reusable catheters how to handle the catheter with cleaning, storage, and lubrication according to local guidelines	100	4	C

Note. Recommendations with an asterisk (*) should be included in the patient/caregiver education on IC. IC = intermittent catheterisation.

Female urethral catheterisation by a health care professional–aseptic procedure.

These are adapted from **Appendix C** in the full *Guidelines*.

Material for catheterisation

1. Catheterisation pack–sterile content varies, but should at least contain:
   - one drape
   - one bowl with swabs
   - one pair of gloves
2. One pair of non-sterile gloves
3. Sterile catheter. Selection of appropriate catheters; it is advisable to take a spare catheter in addition to the one that is wanted, and one of a different/smaller size (non-coated, hydrophilic or pre-lubricated)
4. Sterile (anaesthetic) lubricating gel (syringe 6 ml) (if the catheter is not pre-lubricated)
5. Disposable towel
6. Disposable pad for bed protection
7. Container of 20 ml sterile water for hydrophilic catheter (if not pre-packed)
8. Universal specimen container (if required)
9. Cleansing solution (water and pH neutral soap)
10. Bactericidal alcohol hand disinfection
11. Catheter drainage bag or sterile receptacle for urine

Some steps for urethral catheterisation by a health care professional according to the aseptic procedure are common to both male and female. The table separates through steps 14-22.

Action	Rationale
1. Check the indication and patient file for past problems, allergies etc	To maintain patient safety
2. Before the procedure, explain the process to the patient	To gain consent and cooperation and to ensure the patient understands the procedure
3. Undertake procedure on the patient's bed or in clinical treatment area usingscreens/curtains to promote and maintain dignity. Assist the patient to get into a relaxed supine position of 30° (if possible). Do not expose the patient at this stage of the procedure	To ensure patient's privacy. To maintain patient's dignity and comfort during the procedure
4. Hand hygiene using soap and water / bactericidal alcohol hand rub	To reduce risk of infection
5. Clean and prepare the trolley, placing the outer cover and placing all equipment required on the bottom shelf. The top shelf acts as a clean working surface	
6. Take the trolley to the patient´s bedside	
7. Open the set with swabs to prepare equipment	
8. Make the swabs wet with the cleansing solution	To cleanse the genitals
9. The following steps may vary if using a **(a)** coated or **(b)** non-coated catheter **(a)** When using a hydrophilic catheter that requires hydration, open the package and fill with sterile water (following the manufacturer's instructions), and hang the packaging beside the patient or trolley and wait for the recommended time. When using a catheter with a lubricating bag in the package, break the lubricating bag, open the outer package, and hang the package with the catheter beside the patient. When using a hydrophilic pre-lubricated or ready to use catheter, open the package, and hang the package beside the patient **(b)** When using a non-coated catheter, open the catheter package and lubricating gel	To activate the coating of the catheter
10. Using an aseptic technique, connect the bag (if a bag is used) to the catheter	To reduce risk of cross-infection
11. Remove cover that is maintaining the patient's privacy and position a disposable pad or disposable towel under the patient's buttocks and thighs	To ensure urine does not leak onto the bed

Action	Rationale
12. Hand hygiene using soap and water / bactericidal alcohol hand rub	Hands may have become contaminated by handling the outer packs
13. Put on non-sterile gloves	To reduce risk of cross-infection

Steps for female and male catherisation aseptic procedures are adapted here from **Appendix B** and **Appendix C** in the full *Guidelines*.

Steps for female catheterisation	Steps for male catheterisation	Rationale
14. Spread the legs in a gynaecological position	14. Lift the penis and retract the foreskin using a gauze swab and cleanse the glans penis with the wet swabs (beginning with the urethral meatus, the glans and foreskin at the end). Use for each part a new swab	To obtain a good view of the meatus
15. Separate with one hand the labia and give traction upward with one hand	15. Steps 16–18 refer to situation non-coated catheter only (b) Allow some gel on the meatus, insert the cone of the lubricant syringe. Instil 10–15 ml of the (anaesthetic) lubricating gel slowly into the urethra while holding the penis firmly below the glans with the thumb and fingers, and the syringe firmly onto the meatus to prevent the gel from leaking out	To ease cleaning of the labia and meatus
16. If tweezers are used for inserting the catheter skip step 18 and read *tweezers* for *the hand with the sterile glove* in step 21	16. (b) Remove the syringe from the urethra and hold the penis upright and closed so that the gel stays in the urethra. Alternatively, a penile clamp may be used. In case of anaesthetic lubrication, wait as recommended by the product (3–5 min)	
17. Clean the labia majora exterior and then interior, and then the labia minor exterior, then interior, and finally the urethral meatus. One swab for each labia and meatus– use the wipe anterior to posterior. Alternatively, tweezers with swabs could be used for cleaning		To avoid wiping any bacteria from the perineum and anus forwards towards the urethra
18. Put on sterile gloves to work	18. Replace existing gloves with a sterile pair	To work aseptically and prevent infection
19. When using a non-coated catheter (b), put some lubrication on the meatus and then insert the cone of the syringe with (anaesthetic) lubrication in the meatus and slowly instil 6 ml gel into the urethra	19. Take the catheter with the other hand (wearing sterile gloves)	

Steps for female catheterisation	Steps for male catheterisation	Rationale
20. In case of anaesthetic lubrication wait as recommended by the product (3–9 min). Remove the nozzle from the urethra		To ensure a maximised anaesthetic effect. *Note.* Adequate lubrication helps to prevent urethral trauma. Use of a local anaesthetic minimises the discomfort experienced by the patient and can aid success of the procedure
21. Separate with one hand the labia and give traction upward with one hand. Take the catheter in the hand with the sterile glove. Insert the catheter in the meatus and gently advance the catheter into the urethra until it is in the bladder and urine drains	21. Insert the catheter in the meatus and gently advance the catheter into the urethra until urine drains (then insert the catheter 2 cm deeper), or until the end of the catheter. During insertion, hold the penis upright with traction of the other hand	Male: Advancing the catheter ensures that it is correctly positioned in the bladder. To be sure that the catheter is in the bladder. Lifting the penis straightens the urethra and facilitates catheterisation

The following steps are common to both females and males.

Female and male	Rationale
22. Connect the catheter to the bag with an aseptic technique	
23. If no urine flows gently apply pressure over the symphysis pubis area. Do not use force if there are difficulties inserting the catheter	To prevent injuries of urethra and bladder neck
24. Make sure the urine collection bag is below the level of the bladder	Assist in urine flow
25. When urine flow stops, withdraw the catheter very slowly, in small centimetre steps. If the urine flow starts again during withdrawal, discontinue withdrawal and wait for the flow to stop before resuming catheter withdrawal	Make sure that the entire bladder is empty
26. Discard the catheter completely	
27. Clean labia and meatus or the foreskin and the meatus	To avoid skin irritation
28. Help the patient into a comfortable position. Ensure that the patient's skin and bed are both dry	If the area is left wet or moist, secondary infection and skin irritation may occur
29. If necessary, measure the amount of urine. To be aware of bladder capacity for patients with previous occurrence of urinary retention	To monitor renal function and fluid balance
30. Take a urine specimen for laboratory examination, if required	To rule out urinary tract infection
31. Dispose of equipment in a plastic clinical waste bag and seal the bag before moving the trolley	To prevent environmental contamination
32. Record information in relevant documents; this should include: ○ reasons for catheterisation ○ residual volume ○ date and time of catheterisation ○ catheter type and size ○ colour and odour of urine ○ problems negotiated during the procedure ○ patient experience and problems	To provide a point of reference or comparison in the event of later queries

Glossary and Abbreviations

Glossary

Urinary tract infection

A UTI is an infection involving any part of the urinary system, including urethra, bladder, ureters, and kidney.

Urethral intermittent catheterisation

Intermittent (in/out) catheterisation (IC) is defined as drainage or aspiration of the bladder or a urinary reservoir with subsequent removal of the catheter.[101]

For a comprehensive list of definitions, refer to **Section 4.** Terminology of the full *Guidelines*, starting on page 18.

Abbreviations

EAUN	European Association of Urology Nurses
IC	intermittent catheterisation
LE	level of evidence
PVC	polyvinyl chloride
QoL	quality of life
RN	registered nurse
UTI	urinary tract infection

For a comprehensive list of abbreviations, refer to **Section 1. Abbreviations** of the full *Guidelines*, on page 10.

Appendix – List of appendices in the full *Guidelines*

Appendix A Checklist for patient information

Appendix B Male urethral catheterisation by a health care professional – aseptic procedure

Appendix C Female urethral catheterisation by a health care professional – aseptic procedure

Appendix D Male urethral catheterisation by a health care professional – non-touch procedure

Appendix E Female urethral catheterisation by a health care professional – non-touch procedure

Appendix F Intermittent urethral dilatation – female and male

Appendix G Patient/caregiver teaching procedure for intermittent self-catheterisation – female and male

Appendix H Help devices

Appendix I Voiding diary

Appendix J Changes in urine due to food and medication

Appendix K Medical travel document for patients

Appendix L Questionnaires/tools for evaluating intermittent catheterisation / intermittent self-catheterisation

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Supported by an unrestricted educational grant from Wellspect

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