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Evidence-based protocol for safe and effective bladder catheter insertion: Nursing Care

Protocolo basado en evidencia para la inserción segura y efectiva de catéter vesical: Cuidado de enfermería

Wilson Alexander Bermeo-Alarcón
wabermeoa84@est.ucacue.edu.ec
Catholic University of Cuenca, Cuenca, Azuay, Ecuador
https://orcid.org/0009-0002-1732-0468

María Graciela Merchán-Coronel
maria.merchan@ucacue.edu.ec
Catholic University of Cuenca, Cuenca, Azuay, Ecuador
https://orcid.org/0000-0002-3884-2022

Marcia Yolanda Cobos-Albarracín
mcobos@ucacue.edu.ec
Catholic University of Cuenca, Cuenca, Azuay, Ecuador
https://orcid.org/0000-0003-3390-2185

ABSTRACT

Objective: to design a protocol and establish appropriate therapeutic management for bladder catheter insertion, with the aim of providing clear and detailed guidance on the procedure. **Methodology**: systematic review of 31 scientific documents. **Results**: The protocol for bladder catheter insertion allows for the determination of techniques and procedures regarding hygiene, asepsis, and the insertion process, significantly reducing adverse effects, consequences, and hospital-acquired infections that could impact patient well-being. **Conclusion**: The prevention of iatrogenic complications during the bladder catheter insertion procedure is crucial for patient safety and health. It is essential that healthcare personnel are fully trained and up to date on the appropriate techniques, following established hospital protocols.

Descriptors: nurse-patient relations; nurses; nursing staff. (DeCS).

RESUMEN

Objetivo: diseñar un protocolo y establecer un manejo adecuado y terapéutico para la inserción de la sonda vesical, con el propósito de ofrecer una guía clara y detallada sobre el procedimiento.. **Metodología**: revisión sistemática de 31 documentos científicos. **Resultados**: el protocolo de la colocación de sonda vesical permite determinar técnicas y procedimientos acerca de la higiene, asepsia y proceso de colocación, disminuyendo considerablemente los efectos adversos, consecuencias e infecciones intrahospitalarias que podrían repercutir en el bienestar de los pacientes. **Conclusión**: La prevención de las iatrogenias durante el procedimiento de colocación de la sonda vesical es crucial para la seguridad y salud del paciente. Es esencial que el personal sanitario esté completamente capacitado y actualizado en las técnicas adecuadas, siguiendo los protocolos hospitalarios establecidos.

Descriptores: relaciones enfermero-paciente; enfermeras y enfermeros; personal de enfermería . (DeCS).

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Original Article

INTRODUCTION

Bladder catheterisation is an invasive procedure widely used in patients with urinary tract disorders, either as part of a specific treatment or as a measure for further diagnosis. This process requires adequate training of healthcare personnel who have the knowledge and skills to perform it properly. The correct insertion of the catheter is essential to avoid complications such as injuries or infections that may aggravate the patient's health condition. According to the Ministry of Public Health (1), it has been observed that 95% of cases of infections in Intensive Care Units (ICU) are related to the duration of catheterisation, which highlights the importance of following strict aseptic and monitoring protocols to reduce the risk of complications.

Proper management of each patient before, during and after bladder catheter placement will determine whether there was a correct management protocol to avoid consequences. Despite this, a study in which 1.82% had infections due to poor asepsis and non-infectious complications such as haematuria (29.2%), decreased protective application for accidental catheter removal (29.2%), skin lesions due to fixation of the catheter on lower limbs to avoid accidental weaning (17%), pain or discomfort (15%), urinary incontinence (4.8%) and accidental catheter removal (4.8%). All these complications should be assessed by the multifunctional team of healthcare staff, and care should be sought to improve each patient's condition or stage (2).

In a study carried out on a total of 42 patients who underwent interventions such as urinary catheterisation, 23.80% were found not to have any type of contamination of pathogenic microorganisms, both in the urine culture and in the culture of the tip of the catheter. The urine cultures were analysed and found *Proteus*, *Escherichia coli*,

Enterococcus faecium, *Enterococcus cloacae*. Forty per cent were related to permanent bladder catheterisation. Therefore, the use of antibiotics is fundamental, as 40% maintained prophylaxis, while 33% did not use it. This is why 86% maintained positive urine culture and catheter tip. All of this has the benefit of reducing the risks of catheterisation and reducing patients' hospital stay, as well as morbidity and mortality rates (3).

Preventing iatrogenesis during the bladder catheterisation procedure is crucial to ensure patient comfort and safety. It is essential that healthcare professionals are fully trained and updated in proper techniques, following established hospital protocols. Training should include not only the technical skill to perform the procedure, but also knowledge on how to recognise and manage possible complications, such as urinary tract infections or urethral injuries. In addition, proper communication among the healthcare team is paramount to ensure that, upon the occurrence of an adverse event, it is managed immediately, minimising the risks to the patient. In this way, by strictly adhering to protocols and maintaining a continuum of care, the incidence of adverse events can be significantly reduced and serious consequences that compromise patient health can be avoided (4).

This is why the application of this type of intervention is carried out in each of the medical areas, and must be carried out in accordance with the regulations or protocol applied in order to avoid complications. A study of women undergoing caesarean section determined the prevalence of bacteriuria associated with the placement of bladder catheters. A total of 133 participants were divided into groups according to schedules, with one group having catheter removal at 12 hours and the other at 24 hours. A total of 26.3% of the patients had positive bacteriuria after 24 hours, while 20.9% had positive bacteriuria after 12 hours, showing that the longer the catheterisation stay, the higher the risk of urinary tract infections. These patients underwent pharmacological treatment with antibiotics, and 1% of patients had

urinary retention associated with catheter removal during the 12 to 24 hours, and a new recatheterisation was performed (5).

There are several reasons why a patient may require bladder catheterisation. The healthcare professional must identify when this procedure is necessary. Some of the most common causes include urethral stricture with urinary obstruction, neurogenic bladder due to paralysis, sensitivity testing and urine cultures, urinary incontinence and patients undergoing surgery under anaesthesia. Studies have shown that the level of knowledge among nursing graduates and physicians about these specific causes is about 65%. This data highlights the importance of continuing professional training and updating in these procedures to ensure that interventions are performed properly and safely, reducing the risk of complications for patients (6).

A cross-sectional observational study in Australia and New Zealand, with a total of 200 adults with indwelling catheters, of whom 169 were men and 31 women, found a prevalence of 9%. Catheter-associated meatal pressure injuries were more prevalent in men at 10% compared to women at 3%. These injuries are associated with pathologies such as hypertension (HT), diabetes mellitus (DM), chronic kidney disease, congestive heart failure, bladder and prostate cancer, and spinal cord injury. Care should focus on placing a catheter only if necessary, identifying risk factors such as smoking, DM, obesity, proper cleaning of the catheter to reduce infection, and proper fixation (7).

There are two types of catheters, which are differentiated by their placement, either suprapubic or urethral, with urethral catheterisation being the most commonly used due to causes such as difficulty urinating due to underlying diseases such as benign prostatic hypertrophy. Patients who remain with these devices should receive constant education on catheter care and disinfection, as studies have shown that health care professionals have never communicated such care to the device (8).

In a study in which 59.6% of the participants were men, 60.8% had bladder catheterisation, 71.2% of the patients were over 70 years of age, and 57% had bladder catheterisation due to neurological pathologies. These individuals reported problems with bladder catheterisation care, for which they required professional services due to certain complications, such as infections and catheter blockages, considerably increasing the cost of medicines and supplies for these adult patients, with lower costs for women (9). The purpose of adapting regulations in clinical areas based on bladder catheterisation will allow for better education of health personnel and their students, making them more efficient and effective, improving aseptic techniques, the proper use of sterile equipment, hand washing, the use of personal protective equipment and the use of appropriate lubricants to ensure a safe intervention. While improving the quality of care by seeking up-to-date, scientifically based information, the number of patients undergoing this type of intervention with accurate and well-founded diagnoses can be considerably reduced, reducing the number of cases of bacteriuria and complications that affect the well-being of patients.

Prevention of urinary tract infections (UTI) in patients with bladder catheterisation is a priority in gynaecology, internal medicine and general surgery. In these services, several compliance criteria related to drainage management have been identified, such as correct permanent catheter connection, which was met by 96.3%, while 3.8% did not meet this standard. Regarding the position of the collection bag, it was observed that 85% of patients kept it below the bladder, while 15% did not comply with this protocol. In addition, 78.8% of patients recorded the day of insertion and verified the medical prescription, while 21.3% did not comply with the protocol. The correct fixation of the catheter, according to the sex of the patient, was complied with in 75%, but the remaining 25% did not follow this proper practice. Regarding hygiene measures by the nursing staff, only 30% compliance was observed, while the

remaining 70% did not comply with the established standards. This last indicator highlights the urgent need to implement health promotion actions to improve patient care, reduce the length of hospital stay, minimise the risk of complications and reduce hospitalisation costs (10).

Limitations in the application of the bladder catheterisation intervention to patients will depend on several factors, among which the particular characteristics of each health institution stand out. The cost associated with both the materials needed and the implementation of the procedure by healthcare personnel is one of the main barriers. Accessibility to appropriate supplies and the availability of trained professionals to perform this intervention also play an important role. These limitations may influence the quality of the service provided and the effectiveness of preventing complications, such as urinary tract infections or iatrogenic damage, which underlines the importance of optimising resources and ensuring continuous training of healthcare staff at all stages of the process.

For patients undergoing urethral catheterisation interventions, education is essential to avoid infections and increase their autonomy. Likewise, every risk and care involved in this intervention will be explained. The main care mentioned are: daily genital hygiene, which should be performed twice a day with emptying of the collection bag every 8 hours, adequate hand washing before contact, disconnecting the collection bag only when necessary and changing it every 8 days or earlier, verifying its label, placing the bag below the bladder, correctly fixing the bladder catheter, providing plenty of fluids, and identifying warning signs such as urinary retention, hyperthermia and general malaise (11).

Studies show that nursing care for bladder catheterisation is divided into data such as identifying whether catheterisation is necessary, as well as the reasons for it, in 77%, using hygienic measures when placing the catheter and drainage system in

66.7%, while care in the maintenance of the intervention stipulated using personal protective equipment and hand hygiene when handling the urinary drainage system in 47.1%, keeping the drainage bag elevated and emptying it in 5.9%, removing it as soon as possible and reviewing the reasons for maintaining it in 3.9%. A certain degree of non-compliance with international protocols was found with regard to asepsis during catheterisation and in each of the practices that avoid compromising the well-being of patients (12).

Nursing plays a fundamental role in healthcare practice, as nursing care must be based on scientific evidence and established protocols. In the case of patients with poor knowledge of bladder catheter management, implementation of NANDA protocols is essential to guide patient care and education. Adequate education is key to reducing associated complications, especially urinary tract infections. In this way, nurses can effectively plan each medical procedure, ensuring that they are performed with sufficient knowledge about the correct use of the catheter, the necessary care and the possible adverse effects that may arise during placement and maintenance (13).

The article aims design a protocol and establish an adequate and therapeutic management for bladder catheter insertion, with the purpose of providing clear and detailed guidance on the procedure**.**

METHOD

Bibliographic review , the search was carried out using five high-impact scientific databases: PubMed, Scopus, Web of Science, CINAHL and Cochrane Library, selected for their recognition and coverage in the area of health sciences.

The search strategy was structured using keywords derived from the MeSH (Medical Subject Headings) and DeCS (Health Sciences Descriptors) thesauri, which were

strategically combined with Boolean operators such as "AND" and "OR" to optimise the precision and scope of the results, terms such as "Nursing assessment AND urinary catheterization" and "urinary retention AND primary care nursing" were iteratively adapted based on preliminary results, integrating synonyms and related terms in order to maximise the sensitivity and specificity of the search.

RESULTS AND DISCUSSION

1. Front cover

Protocol title: Evidence-based protocol for safe and effective bladder catheter insertion in nursing care.

Institution: Catholic University of Cuenca

Date of creation and/or revision: June 2025

2. Introduction

The protocol for the placement of bladder catheters will allow the determination of certain errors that can be avoided when inserting a catheter into a patient, techniques and procedures that health personnel must maintain and know about hygiene, asepsis and the placement process, considerably reducing adverse effects, consequences and intra-hospital infections that could have repercussions on the well-being of patients.

Bladder catheterisation is one of the medical procedures performed for therapeutic purposes on each patient according to diagnosis, but it is clear that it entails complications and repercussions for many adult patients, making it a challenge due to the risk-benefit ratio involved, given that, certain risk factors such as age, prostatomegaly with transurethral resection of the prostate, infected permanent catheters and urethral trauma due to the insertion of non-specialised catheters, as well as excessive force at the time of insertion, cause complications such as rectal perforations(14).

According to the Pan American Health Organisation (15), 7% of patients admitted to hospital present complications related to each health intervention, and thanks to the adaptation of programmes that prevent and control infections by 70%, in compliance with scientific protocols that seek to improve health care.

General objective:

To design a protocol and establish appropriate and therapeutic management for bladder catheterisation, in order to provide clear and detailed guidance on the procedure.

Scope of application:

The protocol is available and can be implemented at the in-hospital and out-of-hospital level in each of the patient care areas. Certain circumstances should be taken into account where the patient's integrity, safety and security are protected on the basis of knowledge based on the protocol, within each of the first, second and third level health care areas.

3. Definitions and Key Terms

Table 1. *terms*

Key terms	Definition
Antisepsis	Any procedure that reduces or eliminates micro-organisms in living tissues, with the aim of reducing infections.
Bacteriuria	Presence of micro-organisms in the urine, significantly a urinary tract infection.
Haematuria	Presence of blood in the urine, which may be macroscopic or microscopic.
Bladder catheter	Medical device useful for draining urine from the bladder in patients with voiding difficulties.
Urine culture	Diagnostic test to determine the presence of microorganisms in urine.

Source: DeCS and MeSH health science descriptors.

Acronyms:

Table 2. *Important acronyms.*

Acronym	Definition
CAUTI	Urinary tract infection related to a bladder catheter
DM	Diabetes Mellitus
HTA	Arterial hypertension
IVU or ITU	Urinary tract infection.
MSP	Ministry of Public Health.
WHO	World Health Organisation
OPS	Pan American Health Organization

Source: Data collected in the study conducted by the author.

4. Theoretical Framework and Scientific Evidence

Theoretical foundations:

Bladder catheterisation is one of the invasive hospital and out-of-hospital procedures most commonly used in patients with urinary tract problems, whether for specific causes or others that require further diagnosis, which is why the use of a prevention and control protocol through audits is essential to determine compliance with the requirements established by health professionals, in turn reducing the morbidity rates of urinary tract infections (16).

In a study of geriatric patients, it was found that the most prevalent invasive procedures were bladder catheterisation (58.5%), followed by peripheral cannulation (57.3%), all of which depend on the patient's condition on admission and discharge and their short- or long-term treatment, bearing in mind that during the adult stage there are predisposing factors that cause acute and chronic pathologies (17).

Scientific evidence:

Evaluations of clinical histories determined that infections of the urinary system due to malpractice in the placement of catheters occurred, where 55.3% were in women and 44.6% in men, where 60.1% were with permanent bladder catheters, 6.3% by voiding catheterisation due to UTI and 24.5% without SV. The indications for this type of intervention were given by measurement of diuresis in critical, perioperative or post-surgical patients, acute or chronic urinary retention, palliative care patients. The most frequent agents were *E. coli* in 42.2%, followed by *K. pneumoniae* 23.4% and *Candida* with 8.4%, with secondary bacteraemia, septic shock, perirenal abscess and pyelonephritis (18).

In other studies it was identified that there are reasons for catheter placement of which 33.3% are due to bladder balloon, 22.2% neurogenic bladder, 11.1% multiple sclerosis, 8.9% urethral stricture, 2.2% urethral obstruction, stipulating that 66% were urethral catheters and 34% suprapubic catheters. Moreover, their duration of 1 to 2 years is 34.4% and 22.6% between 3 to 5 years, using catheters of different sizes ranging from 12 to 30 Fr (19).

Of a total of 93 patients, 65.6% were male, devices used during each medical practice were evaluated, where 100% were part of the pulse oximeter, 97.8% permanent bladder catheterisation, and 83.9% endotracheal intubation, but for each intervention performed, complications caused by these interventions were reported, where 28.6% were attributed to bladder catheterisation causing injuries to the urethral meatus, which is why it is mentioned that the longer the hospital stay the risk of injury increases (20).

This is why the experience of nurses together with the knowledge and attitudes that stand out during their work in each hospital unit is fundamental, as it will allow them to maintain an improved quality of care, bearing in mind that as professionals we

can carry out the activity normally, applying an effective diagnosis, identifying the appropriate indication, monitoring the evolution of the patient, trying to reduce complications as much as possible and keeping the patient as little time as possible in a hospital to prevent the risk of acquiring greater nosocomial infections.

5. Description of the procedure

Table 3. *Materials needed for catheter insertion*

Materials needed
Sterile gloves
Non-sterile gloves as personal protective equipment
Sterile field
Urological lubricant
Syringe plus saline or bidistilled water
Bladder catheter according to size Fr and according to use either intermittently or permanently
Collector bag or collection equipment
Sterile gauze pads
Tape

Adapted from: Insertion of an Indwelling Urethral Catheter in the Adult Female. Urologic Nursing (21).

Table 4. *Preparation prior to medical intervention*

Advance preparation
Collect timely information about the patient and determine if the placement of this medical device is necessary.
Communicate with the patient about the procedure and explain any uncertainty.
Maintain convenience, comfort and an intimate atmosphere.
Hand washing
Keep all necessary equipment and material organised.
Adjust the optimal position of the patient to either supine or lateral decubitus.
Disinfection of the perianal area and urinary meatus is performed.
Locate the urethra correctly, as this is more difficult in women.
Adjust bedding, maintain adequate lighting

Adapted from: Insertion of an Indwelling Urethral Catheter in the Adult Female. Urologic Nursing (21).

Step-by-step procedure:

Table 5. *catheterisation procedure*

Placement of an indwelling bladder catheter	
Women	Men
Hand washing and correct donning of gloves. In addition to creating a sterile field over the patient's perianal region, the patient's hands should be washed and gloved.	Hand washing and correct donning of gloves. Cleaning of the genital region from the meatus outwards.
Put on sterile gloves. All supplies are opened.	Put on sterile gloves. All supplies are opened
The tip of the catheter is lubricated with gel between 2.5 to 5 cm. Proceed to separate the labia majora and identify the urinary meatus for placement until an adequate flow of urine is obtained.	The penis is cleaned in a circular motion from the urinary meatus to the glans penis, using a new swab or clean gauze twice.
Clean the area from the top to the bottom of the urinary meatus to reduce infections.	Insert the tip of the pre-filled syringe with lubricant to facilitate the insertion of the probe.
Hold the catheter and slowly insert about 6 cm until urine is obtained, then advance another 5 cm of the catheter without forcing it.	Hold 5 cm from the tip and proceed to slowly introduce the probe to its bifurcation between 15 to 20 cm without using excessive force, ask for a deep breath.

Hold the catheter correctly and immediately inflate the bladder balloon, after which some traction will be performed to determine its resistance.	Hold the catheter and proceed to inflate the balloon, once inflated it should be clamped to the thigh or lower abdomen and reduce the foreskin over the glans penis.
Connect the catheter to the drainage system, remove all the equipment used.	Apply traction to identify if it is correctly fixed.
The catheter should be properly secured to one of the thighs with adhesive tape.	Attach to the drainage system and place the bag under the bladder.
The bag shall be placed below the bladder to prevent retrograde flow,	Remove and dispose of equipment
At the end, health workers should remove their personal protective equipment and wash their hands.	
Intermittent bladder catheterisation	
The execution and techniques should be applied in the same way, using every measure of aseptic and comfort for the patient.	
A non-balloon catheter should be used to determine the collection, collection and analysis of urine according to medical criteria.	
Connect your drainage system as directed to collect urine.	
Remove the catheter when there is no more urine output, if only 500 ml is obtained, clamp and wait approximately 15 minutes avoiding bladder decompression.	
Finally, the bladder catheter must be removed definitively.	

Adapted from: Clinical Manual, General Nursing Procedures / Nursing Procedure Guide: Insertion, Maintenance and Removal of Vesical Catheter (22).

Table 6. *Special precautions and considerations*

Precautions and special considerations
Before handling the catheter, hand hygiene should be performed and avoid dropping the catheter.
Intense pain when the balloon is inflated, most likely because the balloon is still in the urethra and not in the bladder, leading to consequences such as urethral injuries.
Check that the catheter is not obstructed or pressurised, making it impossible to pass urine.
Do not use a catheter with a larger diameter than the patient as this may cause urethral and bladder injuries.
An enlarged prostate may make it difficult to pass the catheter, so a Coude type catheter should be placed by the doctor or nurse practitioner.
Identify that there are no areas of inflammation and infection.
Keep the collection bag under the bladder and change it every 4 to 5 days according to medical criteria.

Adapted from: Clinical manual, general nursing procedures (23).

6. Roles and responsibilities of nurses

Assignment of roles:

The roles of nursing staff are currently affected by the fact that in certain public and private institutions they are carried out by medical staff, however, nursing staff are able, through knowledge and theoretical bases, to correctly assess the patient, prepare the field avoiding contamination, place the bladder catheter, control the patient's posture to start the process, fill the bladder balloon with an adequate quantity and content, correctly fix the catheter and maintain constant vigilance that allows me to know the stage and quality of the catheterisation.

Experience on the part of nurses, knowledge and attitudes that stand out during their work in each hospital unit is fundamental, since in a study carried out, 50% were professionals who had been working in the profession for more than 10 years, where 10% worked in hospitals and 83% in clinics. Fifty per cent had knowledge at the time of bladder catheterisation (24).

Required competencies:

Teaching and education is framed towards both medical and nursing students where a study conducted at the Freiburg Medical Centre analysed the learning process regarding the subject, of which 84.1% already had experience in the placement of urinary catheters, it is mentioned that during the process of training professionals, practice was applied on mannequins and then performed on patients, thus increasing scientific knowledge and the ability to place bladder catheters in a sterile and safe manner with a percentage of 72.8% of expectations fulfilled during each learning process (25).

Training and capacity building:

Likewise, education is fundamental, which is why a group of nursing students underwent an educational evaluation regarding urinary disorders, of which a total of 29 participants, 93.1% stated the importance of hand washing, in addition to the use of sterile gloves (100%), which will reduce the levels of urinary tract infections, as well as performing antisepsis of the site (90%). Once the bladder catheter has been inserted, the urine return should be checked and the balloon should be inflated with sterile solution by 100% to ensure that it is fixed correctly and to reduce the patient's ease of removal. Care should be taken as the risk of injury due to traction without deflating the balloon is high. Correct placement. It was determined that each of the knowledge presented by the health personnel will be evidenced to maintain a healthy quality of life for the patients and improve the interventions by the nursing staff (26).

At the same time, it is important that all healthcare personnel are always updated and trained, including both practical and theoretical aspects that allow for adequate feedback and improvement of techniques and procedures to reduce certain complications and adverse effects at the level of the healthcare system. The use of

certain virtual programmes such as courses and lectures are the methods that are best applied in the health area for teaching by other, much better trained professionals with expertise.

7. Compliance and Quality Indicators

Evaluation criteria:

The evaluation criteria are useful to determine the correct application and compliance with the bladder catheterisation protocol, where the success rate at the first insertion is determined, the decrease in the prevalence of complications, infections and adverse events, as well as the fact that the more the protocol is incorporated, the more we will have highly trained health personnel, patients satisfied with each of the nursing procedures, the use of excessive material will be considerably reduced, which will reduce the cost, the time the patient has to wait and the time for which he/she must remain catheterised will be reduced, and medical malpractice will be considerably reduced.

For Batt NR, (27); audits are the cornerstone to avoid errors at the time of these interventions, for which the correct indications were evaluated in a total of 103 patients in the emergency area where 68% of patients required the intervention, likewise, Similarly, health personnel had to document the moments of pre-insertion and post-insertion, of which only 8% were described as being before catheterisation and 30% after catheterisation, meaning that the greater the documentation, the fewer the complications related to the catheterisation process, the better the quality of life and the savings in institutional supplies.

On the other hand, for Waheed,Shahan, (28); the audit in the emergency department evaluates the performance and skills of both doctors and nurses when inserting a bladder catheter. In the case of trauma and benign prostatic hypertrophy, 82.7% were performed by nurses and 13.6% by doctors. The health care personnel

performed their work on the basis of their attitudes and knowledge, in addition to their expertise in the field in which they work, 67.9% had between 1 and 3 years and 25.9% more than 5 years, which is why 95.1% of the catheterisations were performed on the first attempt, 1.2% on the second, 2.5% on the third and 1.2% on the fourth attempt. Indications were given for diuresis measurement 91.4%, relieving bladder balloons in 4.9%.

Frequency of evaluation:

The frequency with which each public or private institution should apply the respective evaluations will be given according to the objectives set by each health area, and may present a daily evaluation to determine correct placement, visualise the nursing report according to conditions, determine staff knowledge and identify patient comfort, followed by an analysis of the number of adverse reactions and complications and adherence to compliance with the protocol, which would be carried out monthly.

Measuring tools:

The measurement tools will allow us to analyse the variability that exists when applying a protocol that improves sanitary conditions, maintaining a quality enhancement in the institutions that help the health of the population. It is fundamental that we highlight the incidence of patients submitted to bladder catheterisation, the index of patients who presented complications at the time of the intervention and the index of patients submitted to permanent catheterisation, all of these aspects will help in the evaluation and provide criteria for improvement in the case of common errors in the placement of the bladder catheter.

8. Ethical and legal considerations

Ethical aspects:

The ethical aspects that should always be taken into account are to provide patients with as much education as possible about the actions that are going to be carried out and to indicate the purpose of the intervention with bladder catheterisation, followed by the application of informed consent, allowing the patient autonomy. However, in certain public institutions, consent is not signed due to the high demands of patients, on the understanding that the guidelines were provided so that the patient understands the process that will be carried out.

Every process or action aimed at improving patient health is governed by conceptualisations of confidentiality to guarantee privacy and ensure a state of comfort, thus improving nurse-patient relations. Aspects such as the principles of beneficence and non-maleficence are oriented towards increasing the quality of health, reducing risks, complications and seeking to establish therapeutic measures that restore the well-being of the community.

Legal aspects:

Strict compliance and monitoring by trained personnel or quality control that indicates the compliance of health personnel with the techniques and use of the protocol, in addition to the application of patient safety, it should be borne in mind that health personnel are subject to legal responsibilities when dealing with human beings, of which there are penalties and sanctions when carrying out mishandling procedures that aggravate and complicate the patients' condition.

9. Contingency plan and management of complications

Identification of possible complications:

The risk of acquiring complications during this type of intervention will have to do with good clinical management of its placement with each of the rules and techniques that were disclosed in the protocol, such as (29):

- Urinary tract infections or UTIs.
- Obstruction of the bladder catheter either by kinking or clots.
- Laceration - bladder and urethral perforation.
- Haematuria.
- Allergic reactions.

The permanence of the urinary catheter will depend on the stage and the medical purpose of the intervention, but one study found that 34% of infections occurred after 7 days, 24% between 4 and 7 days and 11% between 1 and 3 days. It was determined that the higher the stage of bladder catheterisation, the higher the risk of urinary tract infections, for which it is essential to maintain constant surveillance that allows us to identify certain consequences of the intervention (30).

Protocol for dealing with complications:

The nursing staff should determine, by means of their diagnosis with the help of the clinic, which could be the complications when the patient remains with the bladder catheterisation and determine the therapeutic management in case of existing alterations, of which it is necessary to maintain basic knowledge to provide an immediate solution, if in such a case, certain medical procedures are not known, request the help of a professional with more training in the subject to improve the patient's health conditions.

Table 7. *Actions in case of complications (31)*

Protocol for dealing with complications
In the presence of a UTI, a thorough diagnosis should be made, in which urine culture tests are carried out and guided by the clinic, for which, antibiotic treatment should be started either orally or intravenously in the case of a very serious infection, the patient should be instructed to drink plenty of fluids, if the CAUTI continues, an intermittent catheter should be removed and inserted.
If the catheter is obstructed, it should be monitored periodically, as patients may experience pain and urine leakage, the cause should be checked immediately, the clamp should be removed or the catheter flushed with a syringe, and if this does not resolve the problem, the catheter should be replaced.
If urethral and bladder trauma is present, it should be removed immediately and the patient should undergo surgical repair or suprapubic cystostomy.
Haematuria is mostly considered a normal process due to the introduction of material into the urinary tract, but care must be taken as it can cause obstruction due to the generation of clots.
Before placing the probe, it would be advisable to carry out a good anamnesis to determine whether the patient has allergies, but if this has not been done, it should be removed and an antihistamine drug administered immediately, silicone probes may be used, and in the case of a more serious condition such as anaphylactic shock, resuscitation manoeuvres and the use of epinephrine should be carried out.

Adapted from: Evidence-based position on the prevention of urinary tract infections (UTIs) related to bladder catheterisation (VC) use (31)**.**

10. Evaluation and Continuous Improvement

Periodic review of the protocol:

The review time of each protocol should be carried out according to the needs of each institution, also showing whether there were changes at the time of the application of the protocol in order to reduce the consequences and increase patient safety. Most of the scientific evidence is updated as scientific advances are made, which is why it is necessary to improve the search for current information in order to be able to determine the need to revise the protocol for bladder catheterisation.

Content update:

Content updates should be scientifically based and have a significant impact on research, thus complying with the most up-to-date information available.

The use of feedback will make it possible to analyse the quality of care provided by each health personnel and to identify the shortcomings found within the area, through the use of satisfaction surveys.

Sharing ideals with individual professionals for the analysis and implementation of better interventions.

11. Annexes and Appendices

Formats or checklists: Include checklists or forms that facilitate the implementation of the protocol.

Table 8. *Verification of correct bladder catheter placement (24).*

Bladder catheterisation checklist		
Date:	Start time;	Time fin:
Responsible:	Service.	
Questions	Knowledge (Y/N)	Observation
Meets criteria for indication for bladder catheterisation application		
Selection of materials needed for the intervention		
Identifies the patient		
Explain the intervention to the patient and sign informed consent form.		
Perform proper hand hygiene		
Pre-preparation of environment and materials		
Correct sequence of genital cleansing		
Uses aseptic technique for bladder catheter insertion		
Fix the bladder catheter, allowing mobility and no traction of the catheter.		
Keep the drainage system closed.		
Place the collection bag below the level of the bladder without it touching the floor.		

Record time, date, probe calibre and responsible party		
Explain to the patient/family about the care to be maintained while the patient remains probed.		

Adapted from: Development of a knowledge, attitude and practice questionnaire on urine leakage with an indwelling urethral catheter for nurses in China (24).

Table 9. *UTI prevention criteria for bladder catheterisation (1).*

Compliance with criteria for UTI prevention in bladder catheter placement		
Date:	Start time:	Time fin:
Criteria	Complies (YES/NO)	Comments
Collection bag below the bladder		
Placement of the catheter depending on the sex of the patient		
Correct identification of the patient		
Drainage system correctly connected		
Probe normal operation data logging		
Record date of introduction and corroborate with medical prescription.		
Reporting signs and symptoms of infection		
Performs and records patient hygiene measures		

Adapted from: Guidelines for prevention and control of healthcare associated infections (HAI) (1).

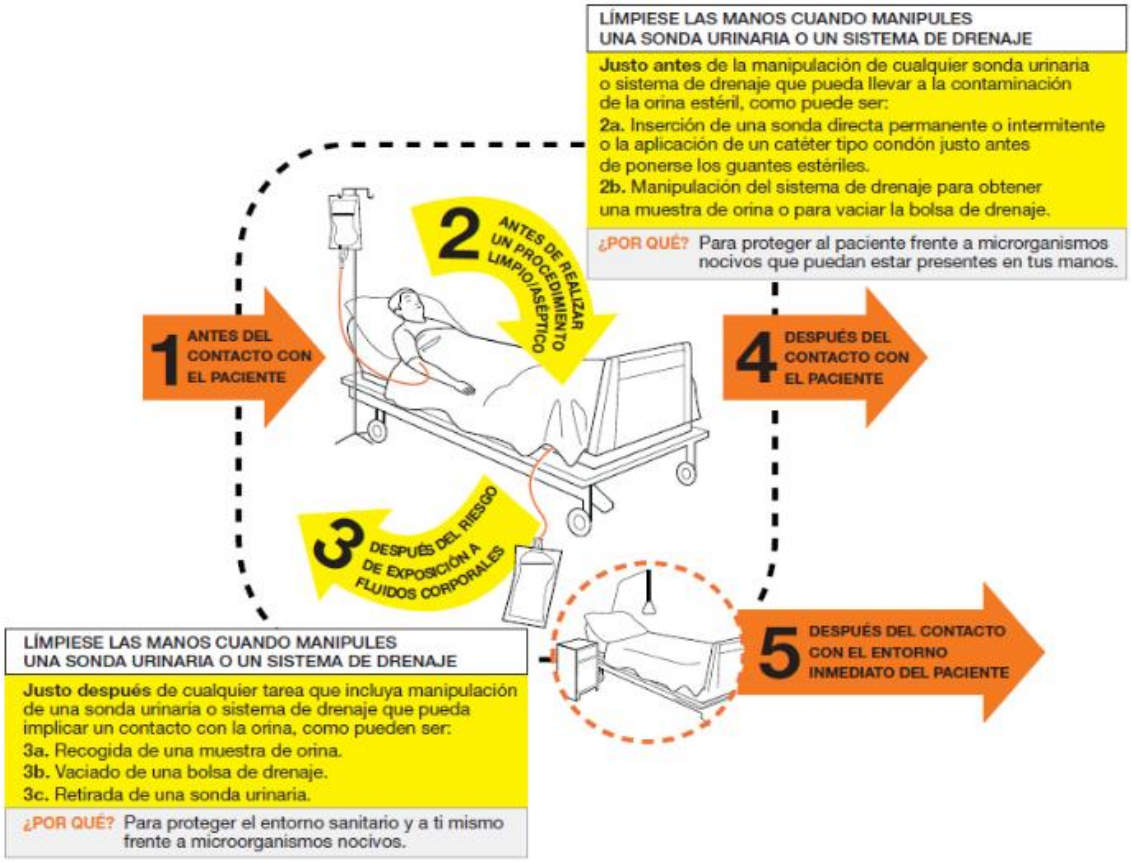
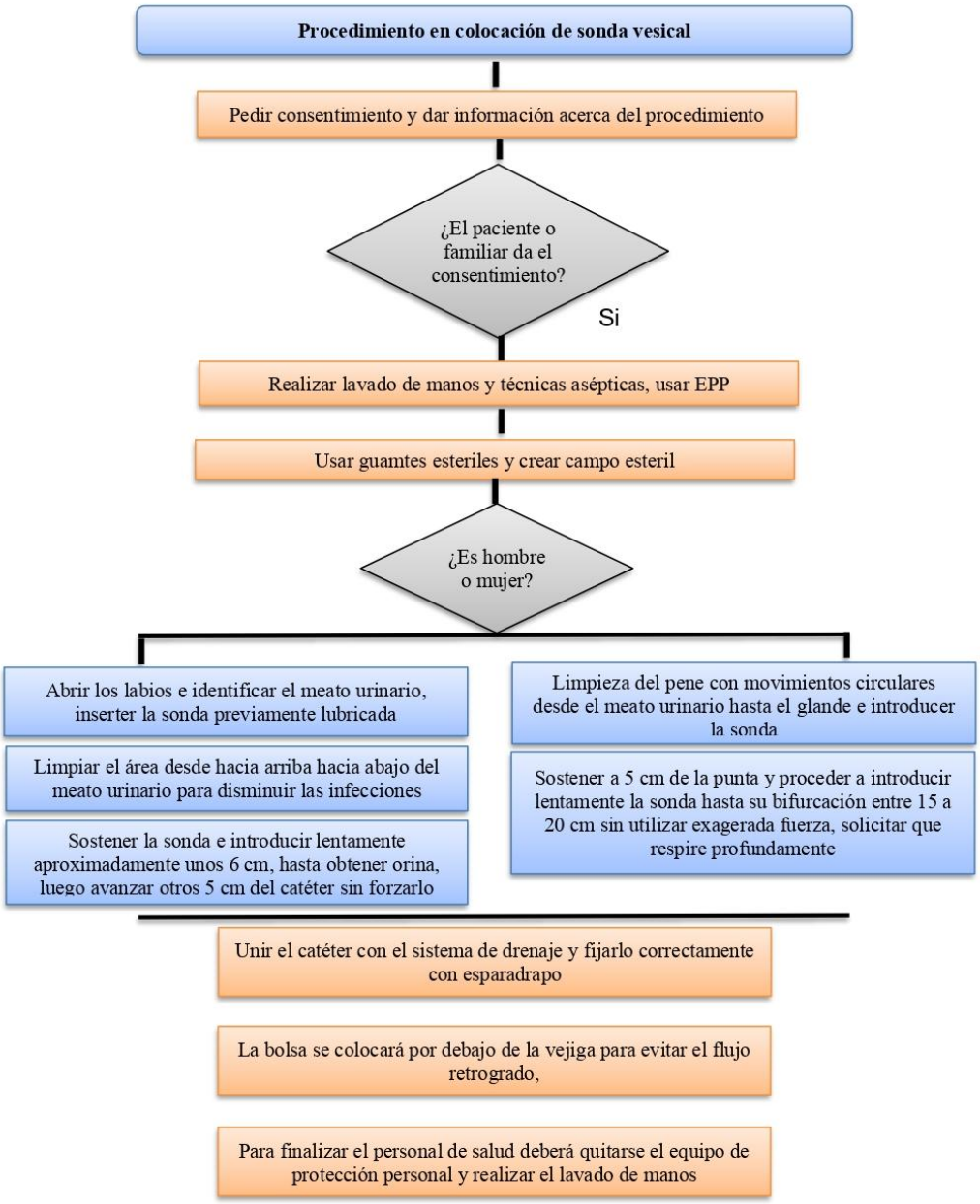


Figure 1. *The five moments for hand hygiene: caring for patients with urinary catheters.* Image retrieved from: Ministry of Public Health. Guidelines for prevention and control of healthcare-associated infections (HAI). Urinary tract infection (UTI) associated with indwelling urinary catheter use (1).

Diagrams or schematics: Visual material to help illustrate the procedure.

Diagram 1. Bladder catheter placement protocol



Source: Data collected in the study conducted by the car.

CONCLUSION

The placement of bladder catheters is performed daily in both hospital centres and community areas, and is one of the invasive procedures in which a multidisciplinary team of duly trained health professionals participates. The purpose of this procedure is to provide clinical solutions when inserting bladder catheters. Constant monitoring and evaluation of the application of this protocol is essential to determine the benefits of the study in the different health areas.

Improving health conditions and quality of care requires every health professional to keep up to date and trained, with the aim of achieving high levels of satisfaction in care, ensuring patient safety, reducing costs and optimising health services.

Each of the techniques evaluated using checklists contributes significantly to the reduction of urinary tract infections, a problem that frequently occurs due to prolonged catheter dwell time, poor asepsis of the genital area or omission of hand washing. These inappropriate practices can lead to nosocomial infections, increasing healthcare costs and prolonging hospital stay. Patient safety is enhanced when the professional is able to perform an adequate clinical assessment, thus minimising the risks of injuries and complications, such as lacerations or bladder or urethral perforations, in the event that the preparation measures prior to catheter insertion are not correctly applied.

Continuous training of health personnel allows procedures to be carried out in a safe, effective and efficient manner. In this sense, it is essential that each health unit recognises that nurses have the necessary knowledge and skills to carry out this procedure, as in many cases this task falls solely to doctors.

The update of the bladder catheterisation protocol based on scientific evidence highlights the activities to be carried out by the nursing staff, including indications, possible complications and immediate actions to be implemented. The aim is to protect the patient's health and wellbeing, to foster appropriate intercommunication

and interrelationship between nurses and patients, and to incorporate health education strategies aimed at both the patient and their family to promote the necessary care and self-care.

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CONFLICT OF INTEREST

There is no conflict of interest with persons or institutions involved in research.

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